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Professional Paper 99

CHEMICAL ANALYSES OF IGNEOUS ROCKS

PUBLISHED FROM 1884 TO 1913, INCLUSIVE

WITH A

CRITICAL DISCUSSION OF THE CHARACTER AND USE OF ANALYSES

A REVISION AND EXPANSION OF PROFESSIONAL PAPER 14

BY

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ILLUSTRATIONS.

For their rock is not as our rock; even our enemies themselves being judges.—Deut. xxxii: 31.

PREFACE.

The present paper is a revised and enlarged edition of Professional Paper 14,[1] published by the United States Geological Survey in 1903. In the 13 years that have elapsed since that paper was published there has been very noteworthy progress in the chemical analysis of igneous rocks. This progress is evident in the greatly increased number of analyses here tabulated, more than twice as many having been published between 1901 and 1913, inclusive, a period of 13 years, as were published between 1884 and 1900, inclusive, a period of 17 years. It is also evident in the improved quality of the analytical work, and one may venture to think that the publication of Professional Papers 14 and 28[2] encouraged and to some extent brought about this improvement.

The betterment in quality is manifested both in the greater proportion of more accurate analyses and the more frequent determination of the minor constituents; but even now our knowledge of the occurrence of the rarer elements in igneous rocks is sadly deficient for many countries in which the rock analysts, though doing active and accurate work, have failed to determine most of the minor constituents.

The present collection embraces the years from 1884 to 1913, both inclusive. With very few exceptions all the analyses published in Professional Paper 14 are reproduced here, for that paper is now out of print and may be inaccessible to many.

Further search of the literature has yielded a considerable number of additional analyses that were published within the time limits of the first collection but which were omitted from it. Several sets of analyses published prior to 1884 have also been included because they seemed to be of special importance or because they were not incorporated in Roth's Tabellen, covered by Professional Paper 28. Among these may be mentioned Hawes's analyses of the rocks of New England and New Jersey, and analyses of rocks of the West Indies and of Sumatra, published, respectively, by Cleve and Verbeek. Although the end of 1913 was fixed on as the final date to which the work should be brought, yet a number of analyses published subsequently have been included. These embrace many which were contributed prior to publication by generous friends and which have appeared since, as well as a few which, for one or another reason, it seemed to be advisable to include. Professional Paper 14 embraced 2,881 analyses, and this paper embraces 8,602, including, as has been said, practically all those in Professional Paper 14 but not those from Roth's Tabellen, published in Professional Paper 28.

The collection is confined to analyses of igneous rocks, though it includes some analyses of orthogneisses. Dr. Paul Niggli, of the University of Leipzig, is engaged, I understand, in the compilation of the analyses of metamorphic rocks, a work which will be of great benefit to the student of these, for the most extensive collection of the analyses of these rocks so far available has been the selection published by Grubenmann.[3] The analyses of meteorites have been recently collected by Farrington,[4] who has classified the stony meteorites according to the quantitative system. He has also recently published[5] a complete collection of descriptions and analyses of North American meteorites to January 1, 1909. In this connection may be mentioned the collection of analyses of meteorites and of some terrestrial peridotites published by Wadsworth.[6]

An aim kept constantly in mind has been to make the present collection as complete and accurate as possible and, in a sense, definitive. The search through the literature has therefore been very extensive, systematic, and thorough, the serial publications examined having extended from 1883 to the final date. Its extent may be gathered from the "List of publications examined," which is to be found on pages 38–44. In this search the extremely complete Library of the United States Geological Survey served as a basis and was examined very thoroughly. In this connection I take pleasure in expressing my thanks to Miss Julia L. V. McCord, librarian, and to the other officials of the library for their many courtesies and their friendly assistance. The libraries of Yale and Columbia Universities, of the Museum of Natural History in New York, and of the United States

[1] Washington, H. S., Chemical analyses of igneous rocks published from 1884 to 1900, with a critical discussion of the character and use of analyses: U. S. Geol. Survey Prof. Paper 14, 1903.

[2] Washington, H. S., The superior analyses of igneous rocks from Roth's Tabellen, 1869 to 1884, arranged according to the quantitative system of classification: U. S. Geol. Survey Prof. Paper 28, 1904.

[3] Grubenmann, Ulrich, Die krystallinen Schiefer, Berlin, 1910.

[4] Farrington, O. C., Field Columbian Mus. Pub. 120, 1907; Pub. 151, 1911.

[5] Idem, Nat. Acad. Sci. Mem., xiii, 1915.

[6] Wadsworth, M. E., Lithological studies, Cambridge, Mass., 1884.

National Museum have also been examined, to the officials of which I also extend my thanks.

I have also availed myself of Prof. A. Osann's valuable collections of analyses,[1] from which I have taken a number that had escaped my notice. The many analyses and the bibliography given by Iddings in volume 2 of his Igneous Rocks (1913) have also been collated. A collection of analyses of Swiss rocks from 1900 to 1915 [2] reached me too late for collation with my collection. The same is true of a set of analyses of Queensland rocks.[3] The authors of both were so kind as to send me many of the analyses prior to publication.

Through the kindness of F. W. Clarke, chief chemist, the records of the chemical laboratory of the United States Geological Survey were placed at my disposal, and the numerous analyses there recorded up to January 31, 1914, are included here. I would express my sincere appreciation of the courtesy of Mr. Clarke and the many geologists of the Survey, for whom the analyses were made, in thus making available, much of it prior to publication, a great amount of most valuable material.

It is also a pleasure to acknowledge my great indebtedness to many friends and fellow petrologists who have been so kind as to contribute analyses prior to publication and whose great generosity is deeply appreciated. Among these may be specially mentioned Prof. A. Lacroix; Dr. K. Inouye, director of the Geological Survey of Japan; Prof. U. Grubenmann, and the Geological Survey of Switzerland; Mr. J. J. H. Teall, ex-director, and Mr. A. Strahan, director of the Geological Survey of Great Britain; Mr. R. D. Brock, director, and other geologists of the Geological Survey of Canada; Drs. G. W. Card, W. N. Benson, J. W. E. David, H. C. Richards, and W. H. Twelvetrees, of the Australian Geological Surveys; Dr. P. G. Morgan, director of the New Zealand Geological Survey; and Drs. F. D. Adams, Florence Bascom, C. H. Clapp, H. P. Cushing, E. Gourdon, J. B. Harrison, J. P. Iddings, G. Kalb, J. F. Kemp, S. Kozu, G. P. Merrill, L. Milch, E. W. Morley, P. Niggli, P. Quensel, G. W. Tyrrell, and T. L. Watson. The many valuable analyses contributed by these and others have added much to the completeness of the present collection. A number of hitherto unpublished analyses made by me are also included.

Considerable changes, both additions and omissions have been made in the text. The additions consist in the incorporation of new matter and the expansion of the old. The omissions include considerable matter relative to the quantitative system, which is now so well known that the discussions were considered needless. The section on the "Calculation of center points" has also been omitted. Greatly to my regret, the entire discussions of the distribution of magmas and the average rock have had to be omitted, as it was found to be quite impossible, with the time at my disposal, to work up the vast mass of data so as to arrive at a satisfactory and adequately complete treatment. Both of these topics are to form the subjects of separate publications.

In the tables the separate columns for CO_2 and BaO are omitted and one for the magmatic symbols in the quantitative classification is inserted. These symbols will be found very useful (more so than the systematic names), after a little experience with them, in giving a concise idea of the chemical character of a rock and its relations to others. These symbols are also used for the page headings, instead of the magmatic names used in Professional Paper 14.

All the norms of the analyses given in Professional Paper 14 have been recalculated. Indeed I have recalculated personally all published norms, to insure their uniformity and to verify or correct them. In this connection I would express my thanks to Dr. H. H. Robinson, who some years ago very kindly calculated for me many norms, which, however, were not used because I subsequently decided to calculate every norm myself. It can not be hoped that all analyses have been collected or all errors avoided in the present compilation. The list of errata on page 67 of Professional Paper No. 28 is sufficient evidence that such a hope is vain.[4] My attention was called to several such errors, both of omission and commission, by friendly critics, and I trust that the same interest will be shown in regard to the present collection. I would also deeply appreciate the contribution of papers embodying further analytical data, especially inaugural dissertations and other difficultly accessible literature, for incorporation in supplements which it is hoped to issue in the future.

To my friends Whitman Cross and Joseph P. Iddings I am deeply indebted for much helpful criticism and advice, especially in the selection of the magmatic names. I must also express my thanks to Prof. M. Kawamura, of Kiushiu University, Japan, for his great assistance in reading much of the proof.

I would express my sense of deep obligation to Dr. Arthur L. Day, director of the Geophysical Laboratory of the Carnegie Institution of Washington, for his great liberality and kindness in allowing me to devote a very large part of my time during the last four years at this laboratory to the prosecution of the present work and in permitting its publication by the Geological

[1] Osann, A., Beiträge zur chemischen Petrographie; Teil 2, Stuttgart, 1905; Teil 3, (1), Leipzig, 1914.

[2] Grubenmann and Hezner, Viertjhsch. Nf. Ges. Zur., LXI, pp. 150–203, 1916.

[3] Richards, H. C., Pr. R. Soc. Qld., XXVII, p. 105, 1916.

[4] To eliminate one source of error every analysis in Part I has been compared by me or by Dr. Kawamura in the proof with the card on which it was collected, not with the manuscript.

Survey. Indeed, had it not been for the opportunity thus generously given, the completion of the work would have been impossible.

Finally, I would add a personal word of appreciation of the care and accuracy shown by the editorial staff of the Survey, and especially of the work of the compositors of the Government Printing Office in setting up this exceptionally difficult manuscript. Up to No. 140 of III. 5. 4. 4, page 656, a count was kept of the errors in the figures, some of which were unquestionably my own in writing the manuscript. From the beginning of the tables to this point the proof sheets show only 79 errors in about 350,000 digits, and in the corresponding norms 47 errors in about 130,000 digits.

H. S. W.

GEOPHYSICAL LABORATORY,
CARNEGIE INSTITUTION OF WASHINGTON,
November 30, 1916.

CHEMICAL ANALYSES OF IGNEOUS ROCKS.

By H. S. Washington.

THE IMPORTANCE OF ROCK ANALYSES.

In the first two or three decades of the nineteenth century, when the study of rocks as such was being differentiated from that of minerals and of rock terranes—that is, when the science of petrography was in its infancy, little attention was paid to their chemical features. It is true that a number had been analyzed, but most of these were of such a character as to lead the investigator of those early days to consider them minerals, as was the case with the first described lherzolite and wehrlite. In contradistinction to well-defined minerals, rocks were regarded as merely aggregates of minerals, occurring in presumably fortuitous combinations, and lacking that definiteness or constancy of composition in one mass or in different masses which would justify their chemical study as a whole. As, however, they became more and more the subjects of special research, beginning with the earliest investigations of Cordier,[1] a knowledge of their chemical composition assumed gradually increasing interest. The great importance of this side of the study of rocks was first clearly recognized by Abich,[2] who pointed out, as early as 1841, the necessity of a knowledge of their chemical composition for the solution of such problems as their origin, mode of formation, and connection with the interior of the earth, as well as the value of a comparison of their analyses as a proper basis for their classification and nomenclature. To him, therefore, is due the credit of introducing the chemical composition of rocks as a basis for their classification; though the good influence of this suggestion for their right understanding was largely nullified by the coincident use of the feldspars alone as one of the main factors of classification,[3] an idea which has had a deplorably retarding influence on the development of systematic petrography for many years, and which even now holds many systematists firmly in its grasp.

For about 30 years after Abich's publication chemical analyses occupied a prominent position in petrographical discussions, being employed largely for the purpose of determining the probable mineral composition of rocks. Abich, in the work just cited, had adopted as a means to this end the ratio of the oxygen of the bases to that of the silica, and was thus enabled to calculate approximately their mineral composition, as Rammelsberg and others did later.

A modification of this method, known as the "Oxygen-ratio" (Sauerstoffquotient), was introduced by Bischof,[4] and was long employed for the correlation of rock analyses and for the investigation of the question whether or not the various oxides were present in rocks in stoichiometric proportions. This ratio for any given rock is obtained by dividing the amount of the oxygen in all the bases by that in the silica, and was supposed to be characteristic of different broad groups. This supposition was eventually found to be unwarranted, as rocks of very diverse chemical or mineralogical characters were shown to have the same or similar oxygen-ratios. It is noteworthy that, although Roth himself pointed out this and other grave objections to the use of this ratio,[5] he gives it in connection with the separate analyses in all his tables—even in the last one, published in 1884. He justifies this by saying[6] that it is done "only in the absence of a better means of comparison, as well as to make it possible to compare the older and newer analyses."

It was also shown by Roth and others that rocks could not be referred to simple chemical formulæ; in other words, that the oxides were not present in stoichiometric proportions. This, indeed, is one of the most important results arrived at by Roth from his study of the analyses collected by him and first published in 1861.

Soon after Bischof's suggestion of an oxygen ratio there appeared[7] Bunsen's well-known hypothesis of the formation of igneous rocks by the mixture of two supposed original magmas—the "normal trachytic" and the "normal pyroxenic."[8] For the application or the discussion of this hypothesis, analyses were, of course, all important. Founded, as the hypothesis was, on insufficient data, it had to yield to the evidence furnished by the many analyses to which it gave rise.

With the abandonment of this view of the genesis of igneous rocks, and because of the coincident intro-

[1] Cf. Cross, Whitman, Jour. Geology, vol. 5, p. 352, 1902.
[2] Abich, H., Natur der vulkanische Bildungen, p. 5, Braunschweig, 1841.
[3] Cross, Whitman, op. cit., p. 362.

[4] Bischof, G., Lehrb. chemischen and physicalischen Geologie, vol. 2, p. 631, 1849.
[5] Roth, J., Gesteins-Analysen, Berlin, p. 10, 1861.
[6] Roth, J., Beiträge Petrographie pluton. Gesteine, p. 87, 1869.
[7] Bunsen, R., Pogg. Ann., vol. 83, p. 197, 1851.
[8] These terms are ill-chosen because of their incongruity. It would be more fitting to contrast "basaltic" with "trachytic," or else "feldspathic" with "pyroxenic."

duction of the microscope in the early seventies, analyses lost much of their importance. Though they were still published, it is evident that they were, as a rule, inserted perfunctorily in petrographical writings, in obedience to custom, as ornamental embellishments. Little or no stress was laid on them, and the efforts of the petrographer were devoted chiefly to the elucidation of the purely mineralogical and textural characters of the rocks described.

The microscope poured a flood of light upon the mineralogical composition as well as on the texture of rocks and rendered easy and certain of attainment results which by the older methods, based on analysis, had been attained only with difficulty or not at all. At the same time the collapse of Bunsen's hypothesis left for the time being no general theory of rock formation and genesis in its place, Durocher's liquation hypothesis [1] and Roth's first suggestion of differentiation [2] attracting little attention. Petrographers were too busy collecting and assimilating the vast mass of facts discovered through the microscope to be able to devote much of their energies to theoretical studies.

With the opening of the last decade of the nineteenth century, however, there arose an interest in theoretical petrology in contradistinction to descriptive petrography, which had prevailed since 1870. This was started by the work of Lagorio, Teall, Rosenbusch, Brögger, Iddings, and others, and since that time analyses have occupied a more and more prominent place in petrological discussions. They are no longer ornamental adjuncts, but essential parts of most petrographical publications, on which much of the discussion hangs, and from which the most important conclusions are drawn. The crystallographic and optical properties of the constituent minerals and the details of texture are no longer the main subjects of investigation, but are finding their place with the chemistry of rocks and the broad and far-reaching physico-chemical studies based on this. The microscope is sharing the throne with the balance.

It is coming to be recognized by petrologists in general that the study of igneous rocks is in large part the study of silicate solutions and their equilibria, often complicated by the presence of volatile components, and is thus to be regarded as essentially a special branch of physical chemistry. It is true that some of the conditions under which they are formed in nature are not yet reproducible with the present laboratory facilities and that the solutions involved are of great complexity, but these difficulties may be and are gradually being overcome, so that it would seem that the study of rocks is now being placed on its proper and sure basis. For this rock analyses are all-important—indeed, indispensable.

[1] Durocher, J., Ann. des Mines, vol. 11, p. 217, 1857.
[2] Roth, J., Gesteins-Analysen, p. xix, 1861.

THE CHARACTER OF ROCK ANALYSES.

GENERAL CONSIDERATIONS.

With the growing interest in rock analyses it is of the utmost importance that they be used intelligently, not only in their application to theoretical discussions, but, which is of especial interest here, with a just appreciation of their character and applicability to the purpose in view. It is a somewhat surprising and, it must be said, a rather saddening fact that the critical judgment of petrographers in general as regards rock analyses often seems to be in abeyance or wholly lacking. Though there has been in recent years a marked improvement in this respect, yet there is still among them now, as there seems always to have been, a tendency to place implicit confidence in the results of analytical work—to accept readily whatever figures the analyst may furnish, with seldom an attempt at a critical estimate of the worth of the analysis or a comparison of it with the chemical character of the rock itself as revealed by microscopic study. It seems to be taken for granted by most petrographers that the analyst, like the proverbial king, can do no wrong. This assumption applies, of course, not to the personal good faith of the analyst, but to the analytical processes, which, possibly because they belong to one of the exact sciences, are for the most part tacitly assumed by the petrographer to be infallible. It is noteworthy that this attitude of mind obtains, not only among beginners, but among the foremost workers in the science. There are, it is true, many examples of the application of expressed criteria in the selection of analyses in well-known papers, especially in recent years, but in all these examples the criteria applied are few and quite inadequate to the purpose, being confined, for the most part, to the freshness of the rock. Comparatively few petrographers seem to recognize the difficulties and uncertainties of analytical work or to display any practical acquaintance with its methods.

It goes without saying that this way of regarding analyses is totally at variance with the best interests of the science. Analyses constitute the basis of much of the investigations and discussions with which petrographers and petrologists must occupy themselves, and it is surely not the part of wisdom to erect elaborate structures on foundations of whose stability and careful workmanship one is not assured. Time and labor will be saved in the end, and the superstructure, however well built in itself, will have a far better chance of withstanding the ravages of time and the attacks of critics if all the rotten and unsound blocks in its foundation are removed and only the best and strongest material is retained.

A consequence of this unquestioning confidence in the results of analytical work is that it is frequently intrusted to a student in chemistry, one with little or no experience in the analysis of rocks and with no appreciation of the complexities and difficulties inherent in this department of quantitative analysis. That the results furnished by such inexperienced and to this extent incompetent analysts should be received with the greatest caution is a truism to anyone acquainted by actual experience with the difficulties and complexities of rock analysis. But Hillebrand [1] and Pirsson [2] have expressed so clearly and concisely the views which I hold that I can do no better than refer to them. It is certainly remarkable and significant that in petrography the most difficult and intricate work is intrusted to novices, and that their results are accepted by nearly all with the same confidence that is given to the work of an experienced analyst.

This general laxity among petrographers as regards the quality of rock analyses is only too painfully evident in the present collection. There is an astonishingly large proportion of poor work, much of it of such a character that it would seem that even a tyro would reject the analyses as hopelessly inadequate for use. Analyses are given with summations over 105 or below 96. Some analyses of leucite-basanite show alkalies so low that 10 or more per cent of quartz must be present, even though in the calculation all the potash is assigned to orthoclase and all the soda to albite. Some analyses of rocks rich in olivine show 30 per cent of alumina and only small amounts of ferrous oxide and magnesia. In certain analyses of alkalic rocks the alkalies have not been separately determined. Rocks with abundant ægirite contain no ferric oxide, and some with sodalite contain no chlorine, to judge from the figures furnished.

Lagorio's long, elaborate, and classical discussion of rock magmas and the relations of phenocrysts and groundmass is based on numerous analyses, of which scarcely any have been judged by me to be of "superior" quality, so that very few of them appear in Part I of these tables. Vogt's well-known discussion of eutectics centers largely around five analyses of graphic granites in which only five constituents are determined and which must be relegated to the inferior analyses of these tables.

The chief reason for this low standard of criticism on the part of petrographers as regards analysts and analyses would seem to be that, while all of them are necessarily conversant with chemistry from the theoretical side, few have knowledge of the theory of quantitative analysis or experience in its methods. The fact is not generally recognized that the complete and adequate analysis of an igneous rock is one of the most complex and in some respects one of the difficult problems of analytical science, demanding not only chemical knowledge and manipulative skill, but often the exercise of considerable judgment derived from experience in solving the perplexing problems which may present themselves.[3]

In view of the present greatly increased importance of chemical analyses in petrography, it can justly be insisted that the ability to make an accurate and complete chemical analysis of an igneous rock should form an essential part of the training and equipment of every petrographer, for by such knowledge one can best judge the true value of an analysis, see where errors have possibly crept in, and discriminate between what is good and worthy of use and what is bad and to be rejected.

In view of this state of affairs it will be pertinent to discuss at some length the essentials of a good analysis, the theoretical and practical criteria by which analyses may be judged, and, in a rough way, to estimate the weight which may be given to any analysis in theoretical discussions.

REPRESENTATIVENESS.

CHARACTER OF THE ROCK MASS.

An analysis of an igneous rock is of value in direct ratio as it fulfills three conditions—that the specimen analyzed is representative of the rock mass, and that the analysis itself is accurate and complete in its determination of the constituents present. We may consider these three factors in the order stated.

The representative character of the specimen depends partly on the character of the rock mass and partly on the amount of material taken. If the mass is uniform or if a single uniform facies is the object of investigation two courses of procedure are possible. A single representative specimen from one locality may be selected for analysis, or pieces of several specimens collected from different parts of the mass may be taken, pulverized, and mixed, and the analysis made of this mixture. The course last described labors under the disadvantages that the analysis can not be checked by analyses made by others, and that uncertainty will always exist whether the mixture of several specimens really represents the composition of the whole better than does a single specimen.

Generally it is by far the best plan to select a definite locality, preferably one that can be identified later and that is not likely to become inaccessible through building or other operations, the rock from which can be considered representative of the whole mass, and make the analysis of a specimen from this.

If there should be doubt as to the general uniformity of the whole mass, it is better to take samples from different parts, even if this procedure should involve considerably more analytical work, for a much more detailed knowledge will thus be gained, and

[1] Hillebrand, W. F., U. S. Geol. Survey Bull. 148, p. 16, 1897.
[2] Pirsson, L. V., U. S. Geol. Survey Twentieth Ann. Rept., pt. 3, p. 578, 1900.
[3] Cf. Hillebrand, W. F., op. cit., p. 16.

important features which may otherwise be overlooked may be rendered evident.

In making analyses of a heterogeneous mass, such as a stock or dike with marginal facies, it is likewise always the wisest plan to have separate analyses made of the different facies, even if the determination of the character of the mass as a whole is the only object in view.

The decision as to the representative character of the specimen selected must be left to the collector, and it would seem natural that a petrographer who had the analysis of a rock in view and who thought its analysis might be of value would carefully consider this question in the field and select his material accordingly. The evidence is conclusive, however, that many specimens analyzed have been collected with no reference to this point, a fact that has greatly diminished the value of the analytical work afterward expended on them.

In connection with this subject the question naturally arises whether rock masses are indeed so uniform in character that any single specimen will truly represent the whole, and whether specimens from different parts of an apparently uniform mass, even if taken close together, may not differ widely in composition. A full treatment of this fundamentally important topic is impossible here, but the outcome of such a discussion would be that, though differences may be found in modally or normatively (but not texturally) eutaxitic or schlieric masses, yet a rock mass which is megascopically and microscopically uniform will generally furnish specimens that, if examined by two or more competent analysts and by reliable methods, will yield results that are practically identical. In other words, in the terms of the new classification, they would fall in the same subrang, or very close to the same border lines.

No investigation appears to have been made especially to decide this point, but the present collection furnishes a number of examples that sustain the conclusion just stated. Among them may be mentioned the analyses of the Butte quartz monzonite, (No. 5, I. 4. 3. 3 and Nos. 6, 7, 8, II. 4. 3. 3), the phonolite of the Black Hills (Nos. 10 and 11, I. 6. 1. 4), the essexite of Salem Neck (Nos. 4 and 5, II. 6. 2. 4), the keratophyre of Marblehead Neck (Nos. 20 and 21, I. 4. 1. 3), the leucite banakite of the Yellowstone Park (Nos. 10 and 11, II. 5. 3. 3), and the Quincy granite (Nos. 28 and 29, I. 4. 1. 3).

The specimens should, of course, be taken from fresh, unaltered rock, for only such specimens represent the chemical character of the magma. In some places, however, absolutely fresh material is not to be had; but if there is more than a very slight degree of alteration an elaborate analysis is not necessary. We can hope to obtain from an analysis of such a rock but a general idea of its magmatic character, and, though the main constituents should be determined with accuracy, it will scarcely be worth while to determine the minor constituents except for special purposes, as for the study of rock weathering. If the alteration is slight the proportions of the main oxides will not be much changed, but those of the minor oxides will be relatively much more so.

AMOUNT OF MATERIAL.

The amount of material that will adequately represent the rock mass is a matter that deserves the careful consideration of the petrographer and the analyst. For actual analysis at least 10 grams of pulverized rock should be available, but, in view of the possibility of the redetermination of some or all of the constituents or the determination of some for which large portions are needed, it is well to have 20 or 30 grams.[1] No definite rule can be laid down as to the amount that should be taken, which depends on the granularity of the rock and whether it be porphyritic or not. For an analysis of fine or medium-grained, aphanitic or glassy rocks, which are not porphyritic or are only finely so, a few chips, amounting to 30 or 40 grams, will be quite sufficient. Of coarse-grained rocks, or those that are coarsely porphyritic, much more will be needed, the amount being dependent on the coarseness of the grain. For nearly all ordinarily coarse-grained rocks, or those in which the phenocrysts are less than an inch in diameter, an ordinary small hand specimen, or even a smaller fragment, will be quite sufficient, the size being determined by the judgment of the petrographer. If the rock is abnormally coarse, as are some pegmatites and nephelite syenites, much more must be taken, perhaps several pounds. At a few places a large rock surface must be measured to determine the relative amounts of the various minerals, and proportionate amounts of these must be taken and mixed for analysis. This last condition, fortunately, is of rare occurrence, and an analysis made of such material must be regarded as only approximate at best.

If more than 50 grams or so of material is used it is not necessary to pulverize the whole, for a sample may be obtained by making successive crushings and quartering, as in assay work. Care must be taken to do this properly and systematically, according to methods described in any work on assaying.

It should be noted that the whole of the small amount of chips or sample obtained by quartering must be pulverized and used for analysis. The rock-making minerals differ so greatly in brittleness that if only a portion of the sample be pulverized it will not represent the true average composition, for the more brittle minerals, such as quartz and the feldspars, will be reduced to powder first, while the tougher ones, as hornblende, pyroxene, and mica, will

[1] Cf. Hillebrand, W. F., U. S. Geol. Survey Bull. 148, p. 23, 1897.

need more crushing and grinding. If, therefore, the last portions, which do not pass easily through the silk sieve, are rejected, the analysis will show a slightly more salic composition than exists in fact.

On the other hand, owing to the same fact, the fine dust lost during the operations of crushing, sifting, and grinding will be composed chiefly of salic minerals, so that, strictly speaking, all rock analyses show a somewhat more femic composition than they should, though the error must be very slight.[1]

MICROSCOPICAL EXAMINATION.

A microscopical examination of the rock in thin section should always precede the chemical analysis. This examination will not only reveal clearly the general composition and freshness of the rock, but may indicate its minor constituents, such as zirconia, sulphur trioxide, and chlorine.

The petrographer can thus indicate to the analyst the minor constituents to be estimated and those for which it is not worth while to look. Some of the main analytical processes may also be modified and shortened by a knowledge of the general character of the rock. Useless labor may thus be saved to the careful and thorough but nonpetrographical analyst, who, in the absence of such indications and in the conscientious endeavor to have his analysis complete, may spend much time looking for constituents that are absent, or present in only insignificant amounts.

ACCURACY.

DETERMINING FACTORS.

Assuming that the sample analyzed is representative of the rock mass, the degree of correspondence between the figures yielded by the analysis and the true composition of the rock is dependent on two factors—the accuracy of the analysis and the degree of its completeness.

By accuracy is meant the degree of precision with which the constituents sought for have been determined, quite apart from the fact whether all those present have or have not been determined or separated one from another. The accuracy of an analysis, which may be discussed apart from its completeness, depends on the personal ability of the analyst to make analysis, on the reliability and adequacy of the methods employed, and on the quality of the reagents and apparatus used.

The factor of the analyst has already been touched on in speaking of the practice of intrusting rock analyses to students, and the obvious truth that the personal factor is a most important one in the making of analyses need only be stated here. Thus the work of a trained and experienced chemist will presumably be of far higher character than that of a beginner publishing his first analysis in an inaugural dissertation or that of a student in chemistry to whom the analysis of a rock has been given for practice. It is true that the man of experience may not be a good analyst, or that he may be hampered by bad methods or poor reagents, and, conversely, the work of the beginner may be, and often is, of very good quality; but the fact remains that the work of the tyro will not carry the weight of that of the expert in the absence of confirmation of its character by other evidence.

The employment of reliable and accurate methods is of course essential to good analytical work. As this paper, however, is not intended to be a treatise on the analysis of rocks, the matter can be only briefly touched on for the especial purpose of pointing out to the nonanalytical petrographer some of the more common pitfalls that beset the path of him who undertakes the analysis of rocks.

In view of the wide experience of the chemists of the United States Geological Survey, and the uniformly high standard of excellence shown by their work, it may be recommended that the methods adopted by them[2] should be employed whenever possible, at least until improvements on them, or better methods, shall have been devised. Too high commendation can hardly be bestowed on their analyses, especially the later ones, which stand in a class apart from almost all others, as a study of the material here collected will render evident.

POSSIBLE ERRORS.

The fact must not be lost sight of by petrographers unacquainted with quantitative analysis that in certain portions of the processes there is liability to serious error, due either to inherent defects in the method or to the necessity for special care in manipulation, such care as can be exercised only by a careful and experienced analyst. The most prominent of these sources of error will be briefly stated.

Liability to error attends the determination not only of the minor constituents, which is generally of comparatively small moment, but unfortunately that of most of the main and important chemical constituents, where it becomes a matter of great importance. The determinations which will be discussed are those of silica, alumina, ferric and ferrous oxides, magnesia, lime, soda, potash, titanium dioxide, phosphorus pentoxide, and manganous oxide.

[1] The only instance known to me where this has been especially investigated is that in S. Zaleski's study of the amount of quartz in granites (Tschermak's Mineral. Mitthell., vol. 14, p. 350, 1895). He shows by determinations of silica that the dust produced in the pulverization of granites is notably richer in feldspar relatively to quartz and dark minerals than the coarser portion of the powder.

[2] Cf. Hillebrand, W. F., U. S. Geol. Survey Bull. 422, 1910; and Washington, H. S., The chemical analysis of rocks, New York, 1910.

In regard to silica, Hillebrand,[1] has clearly shown that the methods usually employed do not yield accurate results, but that two or more evaporations, alternating with filtrations, together with prolonged ignition over the blast, are advisable. He also shows that silica is not wholly thrown down by ammonia or sodium acetate along with the aluminum and iron, and that it is appreciably soluble in melted potassium pyrosulphate. But assuming that the silica has been corrected for impurities by evaporation with hydrofluoric acid, as must always be done, it may be said that these errors incident to its determination are in general of small magnitude and do not seriously affect the value of the analysis, especially as this constituent is almost invariably present in greatest amount.

Alumina is, of all the constituents, the one most liable to serious error, the general tendency being almost uniformly toward too high figures. This tendency arises in part from the fact that alumina is determined by difference, so that the nondetermination of certain constituents raises its apparent amount.

Increase in the apparent amount of alumina, due to imperfect separation of magnesia, is probably the error of considerable magnitude most commonly met with in rock analyses, especially in those of the more femic (basic) rocks. It arises from the fact that magnesium hydroxide tends to fall down with aluminum hydroxide on precipitation with ammonia. This can be prevented only by the presence of sufficient ammonium salts and by repeated precipitations, either with ammonia alone or with sodium acetate as well. These conditions are easily neglected by the inexperienced analyst, and in compiling the present collection so many analyses have been noted where this error has certainly been made, and so many others where it is strongly suspected but not definitely provable, owing to the insufficiency of the petrographic description, that I must add my word of warning to those of Hillebrand[2] and Pirsson.[3]

Another error, probably of very frequent occurrence but of less magnitude, and hence less readily detectable, is that due to the use of ammonia water which is not fresh and which has absorbed carbon dioxide from the atmosphere. A certain, though generally a small, amount of lime will then be precipitated along with the alumina and weighed with it.

A third error, which may be of very considerable magnitude, arises from the use of ammonia water that has been kept in uncoated glass bottles. The glass is invariably decomposed and the ammonia water becomes contaminated with impurities, chiefly silica, which add to the apparent weight of the alumina of the rock. This error can readily be avoided by purchasing the reagent in ceresine bottles and, as the ceresine stoppers are not usually effective in excluding carbon dioxide, by transferring it to a glass-stoppered bottle that has been coated internally with paraffine. For the same reason it is also well, in the most accurate work, to make the ammonia precipitations in a gold or platinum basin.

[1] U. S. Geol. Survey Bull. 422, p. 91, 1910, and Jour. Am. Chem. Soc., vol. 24, pp. 362 et seq., 1902.

[2] Hillebrand, W. F., U. S. Geol. Survey Bull. 176, p. 55, 1900.

[3] Pirsson, L. V., Jour. Geology., vol. 4, p. 688, 1896.

In regard to the determination of ferrous oxide, Stokes[4] has shown that ferric sulphate exerts a marked oxidizing effect on pyrite, and, starting from this fact, Hillebrand[5] demonstrates the unreliability of the Mitscherlich method, commonly employed in Europe for the determination of ferrous oxide—that is, decomposition with sulphuric acid in a sealed tube. It should also be noted that the glass of the tube is likely to be seriously attacked. This method often gives, especially in rocks rich in iron, too high results for ferrous oxide. Decomposition by hydrofluoric acid in an atmosphere of carbonic acid is to be preferred, which, however, in the hands of inexperienced analysts, is liable to give low figures for ferrous and correspondingly high figures for ferric oxide, in consequence of the partial oxidation of the ferrous oxide due to careless manipulation. These errors undoubtedly explain a number of anomalous figures for ferrous oxide found in the present collection, for these figures do not accord with the mineralogical composition shown by the descriptions.

The error involved in the determination of ferrous oxide through its oxidation in grinding[6] should also be considered. Though possibly of importance, especially in rocks high in ferrous oxide, if the grinding is prolonged and the powder is very fine, I believe that it has been exaggerated and that it is negligible if the portion of rock powder taken for the determination of ferrous oxide be that used for the main analysis, without further grinding than that involved in preparing the sample for analysis—a matter of a few minutes' grinding after crushing.[7]

Another possible error in the determination of the iron oxides, one that may be easily made by the novice, is that which is involved in the reduction of the solution of the precipitate by ammonia water for determining the total iron. If the current of hydrogen sulphide or sulphur dioxide is not continued for a sufficient length of time, the ferric sulphate will not be completely reduced to the ferrous state, so that the apparent amount of ferric oxide will be too low and that of alumina correspondingly too high. This will not, of course, affect the ferrous oxide, as this is always determined in a separate portion. If zinc is used for

[4] Stokes, H. N., U. S. Geol. Survey Bull. 186, 1901.

[5] U. S. Geol. Survey Bull. 422, p. 157, 1910.

[6] Mauzelius, R., Sver. geol. Und., Årsbok I, No. 3, 1907. Hillebrand, W. F., U. S. Geol. Survey Bull. 422, p. 154, 1910. Washington, H. S., Chemical analysis of rocks, p. 135, 1910.

[7] Cf. Washington, H. S., Chemical analysis of rocks, p. 135, 1910. In this opinion Dr. J.C. Hostetter, of the Geophysical Laboratory, is in accord with me.

the reduction of iron, titanium dioxide will also be reduced to sesquioxide, which will be titrated with potassium permanganate, and will add to the apparent amount of ferric oxide.

The source of error in the determination of lime due to the presence of calcium carbonate in the ammonia water has been mentioned in connection with alumina on the preceding page.

The error involved in the liability of the magnesia to be precipitated in part with the alumina, which has already been noted, will lead to figures that are too low for this constituent.

Another error in the determination of magnesia, though in general of less magnitude and importance, is that involved in its precipitation as ammonium magnesium phosphate. Under the conditions usually obtaining in this determination there is a tendency toward errors that apparently increase the amount of magnesia, owing to the presence of excess of the precipitant, ammonium salts and free ammonia. Since this error is due to the fact that, under these conditions, the ammonium magnesium phosphate contains more phosphorus pentoxide than is called for by the ideal constitution, it will not affect other constituents but will be positive in its effect, and will thus raise the summation of the whole analysis. This error will usually be small, and even if the analyst is not expert will be of less magnitude than that involved in precipitation of magnesia with alumina.

In regard to the determination of the alkalies, I need only add a word in confirmation of the view expressed by Hillebrand as to the advantages of the Lawrence Smith method, both as to accuracy and as to time saved. The slight correction necessary for the minute amount of alkalies in the calcium carbonate used is constant and is easily and safely applied; whereas the other methods of decomposition, involving the preliminary separation of alumina, iron oxides, lime, and magnesia introduce a large element of uncertainty and possible error, owing to the impurities contained in the reagents or taken up from the glass vessels.

The colorimetric method for the determination of titanium dioxide is by far the most accurate and the quickest, and should be uniformly used, for the older methods, based on its precipitation by prolonged boiling, are very uncertain unless the conditions are very exactly adjusted, especially when much titanium dioxide is present, in which case it is very liable to be contaminated by alumina and ferric oxide. The assumption which is sometimes made, that the residue left on evaporation of the silica with hydrofluoric acid represents all the titanium dioxide present, is quite unwarranted, for this residue contains only part of it, and also some alumina, ferric oxide, and phosphorus pentoxide.

Because of the likelihood of error involved in the use of the acetate method, as well as the far greater expeditiousness of the colorimetric method, manganese should always be estimated in a separate portion by the latter.

COMPLETENESS.

CONSTITUENTS TO BE DETERMINED.

The ideal analysis should show the percentage of every constituent of the rock, and, for practical purposes at any rate, all those that it contains in amount sufficient to make their determination a matter of interest or whose presence or absence bears on the problem for which the analysis is made.

The amount which may make a constituent worth determining and the number of constituents to be sought will vary, of course, for different rocks. Thus for rocks as simple as most granites, rhyolites, and anorthosites it is not necessary to determine so many constituents as should be determined in nephelite syenites and rocks belonging to the dosalane and salfemane classes. But as an analysis should truly represent the composition of the rocks, as it may, if complete, be of use to others for the discussion of problems other than the one immediately in hand, and as only good work should be countenanced in science, every analysis should be as complete as it is practicable to make it.

MAIN CONSTITUENTS.

In every rock analysis worthy of the name all the main constituents must be determined. These include silica, alumina, ferric and ferrous oxides, magnesia, lime, soda, potash, and water.

Unfortunately, in many analyses the iron oxides have not been separately determined but are given together as either Fe_2O_3 or FeO or equivocally bracketed opposite both of these. Unless the iron oxides are present in very small amount—for example, less than 1 per cent—or unless the presence of a considerable amount of pyrite or pyrrhotite makes the determination of ferrous oxide very uncertain, this is unjustifiable, as the proper separate determination of these two is essential to the complete chemical discussion of the rock magma and the calculation of the mineral composition, either normative or modal. This fault and the error involved in the separation of alumina and magnesia are the most common defects in rock analyses, and a surprisingly large number have been rejected from Part I of the tables on their account.

The alkalies are occasionally estimated together (as Na_2O) or determined by the difference from 100 per cent. This procedure is followed especially in analyses of the more femic rocks, but sometimes in analyses of rocks in which the alkalies amount to several per cent. For this form of slovenliness there should be no excuse, except in analyses of rocks composed largely or entirely of such minerals as olivine, magnetite, and ilmenite, in which the alkalies can be present only in traces at most.

The molecular weights of orthoclase and albite are so high[1] that in any chemicomineralogical system of classification, or in the calculation of the mode, the determination of both of these oxides is of great importance. Furthermore, the assumption is made that the sum of the analysis will be exactly 100 per cent—an assumption quite unwarranted in view of the great rarity of this occurrence, especially when the chemist thinks so little of his work as to be unwilling to determine the alkalies properly.

In some analyses of highly salic or highly alkalic rocks magnesia and lime are not determined but are given as "traces." In most of these analyses their nondetermination will not seriously affect the results of calculation, but it is to be deplored; it shows that the work was not first class. In the statement of an analysis the term "trace" should indicate strictly and uniformly that the constituent has been looked for and found, though in negligible amount (0.1 milligram or less), but if it is not looked for because it is supposed to be present in small amount, some such phrase as "present, not determined" (p., n., d., not det., or undet.) may be employed. The limits assigned to the term "trace" vary widely, and the present collection includes analyses in which this term is used of constituents that are certainly present to the extent of 1 or 2 per cent or more. This applies especially to titanium dioxide.

MINOR CONSTITUENTS.

Assuming that the nine main constituents are determined, we may now consider those usually regarded as "minor." Both Clarke[2] and Hillebrand[3] lay stress upon the importance of their determination for the solution of some broad petrological problems. Thus the work of the chemists of the United States Geological Survey has demonstrated the comparative abundance and general distribution of titanium, barium, and strontium, and a greater abundance of barium along the Rocky Mountain region than in the eastern and the extreme western parts of the United States. The presence of vanadium in many of the more femic (basic) rocks and of molybdenum in the more quaric (siliceous) rocks,[4] of zirconium in presodic and especially nephelite-bearing rocks, and of nickel and chromium in very femic rocks has been discovered by means of complete analyses. The correlative distribution of the minor elements has been discussed elsewhere.[5]

Indeed, Hillebrand has entered so strong a plea for completeness in rock analysis that little more need be said to convince petrographers of the correctness of his position. Since, however, there is a strong tendency to regard as adequate for petrographic purposes analyses in which only the nine main constituents have been determined, further remarks, especially in elucidation of some special points, may not be amiss.

It is obvious that if a rock carries notable amounts of minerals that contain as essential ingredients any of the minor constituents, these should always be determined. Thus, Cl and SO_3 should be included in the analysis if the rock contains sodalite or noselite; TiO_2, if it contains titanite, ilmenite, hornblende augite, or magnetite; P_2O_5, if it contains apatite, and ZrO_3 if it contains considerable zircon or eudialyte. If these constituents are not determined the analysis will not show adequately the composition of the rock, or, as Clarke puts it, "the petrographer has been more thorough than the chemist."

It is chiefly for this reason that a microscopical study of the rock section should always precede the analysis. The conscientious chemist who is not a petrographer, and who therefore does not know what minor constituents are especially to be looked for, can only make sure of the completeness of his work by the determination of everything possible. The results of his work will be of value, yet in many analyses part of his labor may be quite unnecessary, involving a waste of time which would be obviated if the petrographer furnished with the material an indication of the minor substances that should especially be looked for.

Although the determination of all constituents, even those which are present in mere traces, is to be desired, yet in practice a compromise must be made, generally, between the degree of completeness and the time to be devoted to practical analytical work. The determination of most of the minor constituents takes considerable time, and if the number of analyses to be made is great or the time available is short it may not be advisable to determine all the lesser constituents, but only those essential to a proper understanding of the rock. This is especially true of the rarer substances, such as ZrO_2, Cr_2O_3, V_2O_3, F, NiO, CoO, CuO, and SrO, as well as SO_3 and Cl in rocks without the sodalite group of minerals. On the other hand TiO_2, P_2O_5, MnO, BaO, and S, which are now known to be commonly present and widely distributed, should be determined in every analysis that aims at completeness. It is also generally of interest to determine Cr_2O_3 and NiO in the most femic rocks, expecially if olivine is abundant, as they are likely to be present in considerable amount.

In view of the length of time needed to make a rock analysis and the very considerable addition to it involved in the determination of the rarer

[1] One per cent of K_2O corresponds to 6 per cent of orthoclase, and the same amount of Na_2O to 8 per cent of albite.

[2] Clarke, F. W., U. S. Geol. Survey Bull. 591, p. 17, 1915.

[3] Hillebrand, W. F., Jour. Am. Chem. Soc., vol. 16, p. 90, 1894. U. S. Geol. Survey Bull. 422, p. 18, 1910.

[4] Hillebrand, W. F., Am. Jour. Sci., vol. 6, p. 216, 1898.

[5] Washington, H. S., Am. Inst. Min. Eng. Trans., p. 735, 1908.

elements the following general procedure seems to me to be advisable in investigating a region, locality, or volcano where there is much variety in the igneous rocks. At least two analyses should be made of each of the main rock types, the specimens to be taken from different parts of the mass or from different flows, and one analysis of each of the minor types. All these analyses should show, besides the nine main constituents, TiO_2, P_2O_5, and MnO, but not the rarer elements, which need be determined only in two or three of the analyses, each representing one of the main types from the most salic to the most femic, as their amounts and variations are small and the verification of their presence or absence in the region or in the various magmas is of most importance. We would thus obtain, with a minimum expenditure of time, the data needed for a proper petrologic discussion of the region in its main features and a sufficient knowledge of the presence of the rarer elements to permit its comparison with others.

In discussing this matter a point to bear in mind is that the determination of certain of the minor constituents affects the figures for other and often very important ones. This arises from the methods of analysis necessarily employed, in which several constituents are precipitated together in one operation, and subsequently some of them separately determined, the figures for one being represented by the difference. Of these those of by far the most influence are titanium dioxide and phosphorus pentoxide. These are not only almost always present, often in very considerable amount, but their determination affects that of the highly important alumina. In the course of the analysis alumina, ferric oxide, titanium dioxide, and phosphorus pentoxide are precipitated together, the three last are determined separately, and the alumina is estimated by difference from the sum of the four, since so far no satisfactory method has been devised for its independent determination. It is obvious, therefore, that, if the oxides of titanium and phosphorus are not determined, the figure for alumina will be too high. In analyses of all but the most salic rocks the error may be of great moment, for these two oxides may be present in a very considerable amount, and the alumina is the only measure we have for the calculation of the amount of anorthite—modal or normative—from the analysis.

Similarly, the nondetermination of ZrO_2 and Cr_2O_3 will raise the figures for alumina, since these are also precipitated together. In most analyses, however, the error due to these defects will be negligible, owing to the minute quantities of these oxides usually present.

As the vanadium is thrown down with the phosphorus as a vanadomolybdate its amount should be subtracted from the P_2O_5 and not from the alumina. Vanadium also affects the determination of ferrous oxide, and if presumably present in more than traces it may be determined and a proper correction applied to the ferrous oxide in the most accurate work. Fortunately this course will seldom be necessary, as its amount is almost always exceedingly small.

As strontia is precipitated with lime as oxalate, its nondetermination will make the apparent amount of lime too high. But strontia rarely occurs in more than traces, so that this error is negligible for all but the most accurate investigations.

Lithium remains with the sodium after separation of the potasium as platinichloride, but has rarely been found in quantity great enough to warrant its estimation.

In Professional Paper 14 the determination of manganese was discussed and the conclusion was reached, in view of its usually very small amount and the liability to error in alumina involved in the acetate method, that its determination was not usually called for as essential to good work. Since then the simple, accurate, and expeditious colorimetric method for this element has been introduced in rock analysis, so that it may be said that it is always advisable to determine it. The long list of analyses made by the chemists of the United States Geological Survey, as well as those made elsewhere, show that, though almost always present, its amount is very small, in general little more than a trace. Indeed, it is of interest to note in this connection that Clarke's estimate of the average composition of the igneous rocks of the United States shows that the amount of manganese in them is only about one-sixth of that of titanium, and is even less than that of phosphorus. In view of the great variety of igneous rocks represented by these analyses and of the very high character of the analytical work, the high figures sometimes found for this oxide in analyses are to be regarded with suspicion, the probability being that in them the error already spoken of has been made.

That the nondetermination of manganese will affect the figures for other constituents is certain, but to what extent is not very clear. If the alumina, etc., has been separated with ammonia water, a portion will be thrown down and be weighed as alumina. Part of that which passes through in the filtrate will be thrown down with calcium oxalate and weighed as lime. But as manganese oxalate is slightly soluble in water, some of the manganese will be thrown down as phosphate with the magnesia and weighed with this. Little is known of the various proportions of the manganese which will thus be distributed, and the matter is one that calls for investigation. Hillebrand [1] gives some figures of George Steiger for carbonate rocks, which indicate that most of it generally falls with the magnesia, an equal or much less amount with the alumina, and only a very small portion with the lime.

[1] Hillebrand, W. F., U. S. Geol. Survey Bull. 422, p. 114, 1910.

In regard to the determination of water, I am in accord with Dittrich[1] and Hillebrand,[2] that the rock powder taken for analysis should be air dry, and that it is advisable (though not necessary) to discriminate between combined and hygroscopic water—that is, water driven off above and below 110°. The importance of this distinction appears to be much exaggerated, as the amount of "hygroscopic" water driven off is not constant for any given sample of rock powder, but varies with the temperature and the time of heating, thus including some of what would be called "ignition" water. Furthermore, it is well known that a small but perceptible amount of water is adsorbed from the atmosphere by rock powder. The remarks of Hillebrand on the inadvisability of the method for the determination of water by "loss on ignition" will be concurred in by every experienced analyst who has considered the matter, because of the oxidation of ferrous oxide and the loss of volatile constituents.

Except where minerals containing water or hydroxyl, as analcite or muscovite, are primary components of a rock, the determination of water is not essential to a proper comprehension of the rock magma, but its amount, as well as that of carbon dioxide, is of importance as a measure of the freshness of the rock. The determination of water must therefore be regarded as essential to every rock analysis, and that of carbon dioxide also when the presence of calcite or cancrinite or the altered condition of the rock demands it.

In this connection a common practice may be briefly alluded to, namely, that of deducting water and carbon dioxide when the rock is not fresh, calculating the remainder to 100 per cent and assuming that the result represents the composition of the original unaltered rock. This assumption is unwarranted and may lead to erroneous conclusions, since the processes of weathering or alteration do not usually consist in the simple addition of water and carbon dioxide, but in the assumption of these concomitantly with changes, either additive or subtractive, in some or all of the other components. We are not yet able to determine these with much success. Furthermore, by concealing the original summation, such a procedure, like any recalculation to 100 per cent, unless the original figures are given, deprives others of one of the methods of judging the value of the analysis.

RATING OF ANALYSES.

METHOD OF RATING.

We have hitherto considered rock analyses from the point of view of the analyst. It remains to discuss them from that of the petrographer who wishes to use the results, and who therefore needs to have some means of judging their reliability. For this purpose it is necessary to discuss the features of an analysis on which this judgment may be based, and it will also be convenient to formulate a mode of expressing concisely the general character of an analysis. The expression of the relative worth of an analysis may conveniently be called its "rating," in analogy with that of commercial houses.

The user of the analysis must rely on the judgment of the collector and the analyst that the specimen, both as to locality and size, correctly represents the rock mass, unless some reason appears to the contrary. The analysis in itself rarely gives any decisive indication as to this point.

Analyses of the groundmass of a rock are, however, not uncommon, and may be briefly discussed. For the general purposes of petrography such analyses are of little use, and they have been excluded from the present collection. On the other hand, for the solution of certain special problems they may be of great value. It must be pointed out, however, that an essential adjunct to their use is a knowledge of the relative amounts of the phenocrysts and the groundmass, unless only a knowledge of the composition of, for example, glassy or microaphanitic groundmasses be desired. If the purpose is the study of the order of crystallization, or some such thing, a knowledge of the quantitative relations is indispensable.

Unfortunately, this knowledge is wanting in most cases, quantitative relations being given only in analyses of the portions soluble and insoluble in acid. This is another example of the prevailingly qualitative way of regarding petrological problems.

It can scarcely be reiterated too often that the science of petrography must become quantitative. The time has passed when a simple statement of the minerals composing a given rock and a description of their physical properties will suffice. We need to know in addition the relative amounts of the minerals as accurately as may be, with their chemical composition, as well as that of the rock itself, derived either from chemical analysis or from determination of the quantitative mineral composition. Otherwise many of the broadest and most fundamental problems in petrology will be incapable of solution, and the science will still consist of vague gropings after the truth, because some of the most essential facts—the quantitative relations—remain neglected and unknown.

ACCURACY.

EVIDENCE AVAILABLE.

Assuming, therefore, that the analysis is representative as far as the material goes, we have its accuracy and its completeness as means of judging its value. The features on which this must rest, as far as accuracy is concerned, may be stated as follows:

Internal evidence:
- (a) Agreement with the mode.
- (b) Summation.

External evidence:
- (c) Analyst.
- (d) Methods of analysis.
- (e) Indirect evidence.

[1] Dittrich, M., Mittheil. Badischen Geol. Landesanst., vol. 3, p. 79, 1894.
[2] Hillebrand, W. F., U. S. Geol. Survey Bull. 422, pp. 65 et seq., 1910.

INTERNAL EVIDENCE.

Agreement with the mode.—It may seem superfluous to state that the chemical analysis of a rock must accord with its quantitative mineral composition as determined by the microscope. Such a statement is however, necessary, as a study of the many discordant results given in the present collection will clearly show.

The mode of a rock affords the best means of ascertaining whether or not the analyst has done his work well. If the composition and the amounts of the minerals present are known, the chemical analysis can be easily checked by the calculation of the chemical composition from the mineralogical data. The agreement need not be exact, and indeed it seldom is except under the most favorable conditions, for the measurement of the amounts of the constituent minerals seen under the microscope can not be of the highest order of accuracy, and assumptions must often be made as to the chemical composition of some of them. But the result will often be sufficiently accurate to show whether or not notable analytical errors have been made.

In the great majority of cases, however, only the roughest kind of quantitative data are either given in the descriptions or conveyed by the present rock names, if indeed one is fortunate enough to have any kind of quantitative information as to the mineral composition vouchsafed him. Here one can detect only errors of a flagrant kind and of magnitudes involving several per cent of certain constituents.

In considering the possibility of any of the errors already mentioned, the judgment of the petrographer, based on a knowledge of the chemical composition of minerals as well as on his knowledge of analytical work, comes into play. All the chemical features must be taken into consideration in connection with the description, especially in the absence of exact quantitative mineralogical data.

Thus high alumina (for example, 20 per cent or more) in a rock containing 50 per cent or less of silica, and even with low magnesia, is presumably, but not necessarily, due to error in the separation of alumina and magnesia. It may be caused by the nondetermination of titanium and phosphorus oxides, or by the presence in abundance of anorthite or nephelite, which will be indicated by correspondingly high lime or soda. Apparently high soda and low potash in a so-called orthoclase rock may arise from an imperfect description or incorrect identification of the feldspar, which may be in reality a soda-orthoclase.

It must also be borne in mind that the microscopical may seemingly be at variance with the chemical analysis, and yet the chemist may be undeniably correct. This is especially true of analyses of very fine-grained holocrystalline or hypocrystalline rocks, and not infrequently further, more critical, microscopical study will reveal the presence of a constituent which has been overlooked but which is manifest only after the analysis has indicated its existence. On the other hand, the most careful microscopical study may not reveal the presence of certain minerals, such as quartz or orthoclase, which the analysis shows must necessarily be present. These undiscovered constituents have been called by Iddings[1] "occult" minerals. This phenomenon is possibly due in part to solid solution.

An example of this phenomenon is afforded by the kulaite of Phrygia, investigated by me, in which the rather abundant nephelite was at first overlooked in the partly glassy groundmass and was discovered only when repeated careful chemical work and calculation of the mode showed that it was necessarily present.[2]

Other well-known rocks whose chemical analyses do not correspond with their microscopical characters are the wyomingite and orendite of the Leucite Hills. In the wyomingite, although modally the only salic minerals visible are leucite and noselite, the analysis shows a large excess of silica. In the orendite there is an excess of alkalies over alumina, with excess of silica in one case. These discrepancies have not yet been explained, but there can be no doubt of the high degree of accuracy and completeness of the analyses[3] or of the mineralogical determinations.

Another example is the lava of Grenada, West Indies, called "augite andesite" in the first collection (p. 353), with the remark that the norm and mode do not agree. Prof. Harrison has kindly informed me that a reexamination of the rock shows the presence of considerable nephelite in the glassy base (analogous to the base of the kulaite) and that it is really a nephelite tephrite.

The norm and mode are seemingly at variance, though the analysis is correct, in many basalts and similar rocks in the dofemane and salfemane classes. The norms of many of these rocks show several per cent of quartz, though the presence of this is not mentioned in their descriptions; or the rock may even carry a considerable amount of olivine. Examples may be found in andose (II. 5. 3. 4), hessose (II. 5. 4. 4–5), camptonose (III. 5. 3. 4), and auvergnose (III. 5. 4. 4–5). If the rock is holocrystalline, examination often reveals the presence of small amounts of quartz, generally as micropoikilitic interstitial patches. Quartz also occurs thus with olivines, or it may be occult in the groundmass. Here we are dealing with the fact, established by Bowen and Anderson,[4] that olivine crystallizes out—that is, it is stable and less soluble—at high temperatures, leaving the liquid with an excess of silica, which appears as quartz if the cooling is rapid. If the cooling is sufficiently slow, the olivine will be

[1] Iddings, J. P., Igneous rocks, vol. 2, p. 19, 1913.
[2] Washington, H. S., Jour. Geology, vol. 8, p. 611, 1900.
[3] Cross, Whitman, Am. Jour. Sci., vol. 4, p. 132, 1897.
[4] Bowen and Anderson, Am. Jour. Sci., 4th ser., vol. 37, p. 499, 1914. Bowen. N. L., Am. Jour. Sci., 4th ser., vol. 38, p. 260, 1914.

reabsorbed, forming metasilicate (hypersthene) with the excess silica.

But unless there is reason to suspect the presence of occult minerals, and unless explanation is afforded by the description to account for the peculiarities of the analysis we may, in general, assume that errors have been made and consider the analysis untrustworthy in this respect.

In this connection it may be well to mention that the calculation of the norm of a rock is of great use in checking an analysis. Though this calculation may appear complicated, it is as a rule really simple and easily and quickly made. Some knowledge of the relations of the standard and the mafic minerals then affords a means of making sufficiently close determinations of the mineral molecules to permit a comparison of the mode with the analysis.

It must not be forgotten, even here, that in the absence of a knowledge of the quantitative relations of the component minerals very serious analytical errors may not be revealed by calculation of the mode, in this or any other way, from the chemical data. The error in one or more constituents may amount to several per cent, and yet a mode can be calculated which will apparently agree with the description or with a qualitative microscopical examination. This fact is illustrated by my own first analysis of the ciminite of Fontana Fiescoli, near Viterbo.[1] The mode, as calculated from this analysis,[2] seemingly agreed with the microscopical examination, although subsequent investigation and analysis showed that the alumina and the magnesia were, respectively, too high and too low by about 3 per cent.[3]

Of the very common error involved in the incomplete separation of magnesia and alumina, perhaps the most noteworthy illustration is found in Doelter's analyses of the augitites of the Cape Verde Islands. These analyses show 16 to 24 per cent of Al_2O_3 and only 3 to 5 per cent of MgO. It is significant of the common ignorance of possible analytical error that Rosenbusch,[4] who gives some of them in his table of analyses of augitites, merely remarks, "ueberraschend ist ihr höher Gehalt an Al_2O_3 bei niedriger MgO."

Another example of the error in the separation of alumina and magnesia is seen in an analysis of the essexite of Rongstock,[5] which shows 46.93 per cent of silica, 24.19 alumina, and 2.42 magnesia. Part of the high alumina is to be ascribed to titanic and phosphoric oxides, which were not determined; but, even after due allowance is made for these, it is evident that some of the magnesia has been weighed with the alumina. This will clearly appear by comparing the analysis with two other analyses of the same rock mass published by Hibsch,[6] which, with 50.50 silica, show about 17.85 alumina and 3.35 magnesia. The error will be even greater than that indicated by the difference between these figures, for the percentages of silica and other constituents shown by the analysis published by Lang make it certain that his specimen was more femic than those of Hibsch.

Another example of this very common error is the first analysis of the monchiquite of Shelburne Point,[7] which gave 18.06 alumina and only 1.12 magnesia, although hornblende and olivine are abundant. Attention having been called to the manifest discrepancy,[8] it was reanalyzed by another chemist, with a result showing 15.87 alumina and 8.32 magnesia. Although this second analysis is by no means above reproach, yet it is sufficiently accurate to show that in the first analysis the greater part of the magnesia had been precipitated with the alumina. It is also almost certain that the two chief errors in the first analyses had been made in the determination of iron oxides—one due to the partial oxidation of the ferrous iron in the course of its determination and one involved in the reduction of the solution containing total iron by insufficient treatment with hydrogen sulphide. The figures for the alkalies also are very improbable and indeed the only figures that have any semblance of correctness in this unfortunate example are those for silica, lime, and water.

An illustration of the incorrect determination of the iron oxides, specimens of the rock being taken as a basis of judgment, is furnished by the oft-cited analysis of the syenite of Biella[9], in which the ferric oxide is given as 6.77 and the ferrous as 2.02. Here there is a large excess of ferric oxide over that needed for the maximum possible amount of magnetite or for the augitic molecule $Fe_2O_3 \cdot (Mg,Fe)O.SiO_2$, with no hematite in the rock to account for it. We are therefore forced to conclude that a partial oxidation took place in the determination of ferrous oxide, resulting in the erroneous figures reported.

A striking example of the error due to incomplete precipitation of alumina by the sodium-acetate method in separating manganese oxide is seen in two analyses of the quartz-syenite of Fourche Mountain, Ark.[10] One analysis gives 13.45 alumina and 5.29 manganous oxide; the other gives, respectively, 18.15 and 1.00, the sum of the first pair being 18.74 and that of the second 19.15. Here it is obvious that in the first analysis more than 4 per cent of alumina has been weighed as "MnO," and it is almost as certain that the 1 per cent of the second is too high from the same cause, for the rock is very largely felic (feldspathic), and no manganese-bearing minerals are mentioned as present.

[1] Washington, H. S. Jour. Geology, vol. 4, p. 837, 1896.
[2] Idem, vol. 5, p. 354, 1897.
[3] Washington, H. S., Am. Jour. Sci., vol. 9, p. 45, 1900.
[4] Rosenbusch, H., Elemente der Gesteinslehre, p. 378, 1901.
[5] Lang, H. O., Tschermak's Mineral. Mittheil., vol. 15, p. 191, 1896.
[6] Hibsch, J. E., idem, p. 487.
[7] Kemp and Marsters, U. S. Geol. Survey Bull. 107, p. 34, 1893.
[8] Kemp, in Weed and Pirsson, U. S. Geol. Survey Bull. 139, p. 116, 1896.
[9] Cossa, Mem. Acc. Sci. Torino, vol. 18, p. 28, 1875.
[10] Williams, J. F., Ann. Rept. Geol. Survey Arkansas, 1890, vol. 2, p. 99, 1891.

Two analyses, by different chemists, of a sölvsbergite of Port Cygnet, Tasmania, given by Paul[1] also afford examples of the same error. One shows 18.21 Al_2O_3 and 2.61 MnO and the other 20.91 Al_2O_3 and 0.77 MnO.

Examples of error in the determination of the alkalies are furnished by a large series of analyses by Ricciardi of Italian leucite-bearing rocks. One of these rocks is a leucite-basanite of Monte Jugo, near Montefiascone, which, with 48.30 silica and 15.07 alumina, shows only 0.94 soda and 1.73 potash. The amount of potash reported in the analysis yields but 7.8 per cent of leucite and is certainly far too low. This analysis and others of basanites of this region by the same chemist are so low in alkalies (especially potash) that if they were correct the rocks would necessarily carry as much as 10 per cent of quartz, even on the assumption that all the bases took their highest possible quota of silica, yielding orthoclase instead of leucite and hypersthene instead of olivine. An analysis of the Monte Jugo rock (both specimens coming unquestionably from the same small quarry) made by me[2] shows 47.39 SiO_2, 14.79 Al_2O_3, 1.49 Na_2O, and 6.93 K_2O, and yields a norm that is quite consistent with the measured mode of the rock.

What appears to be an instance of the coprecipitation of lime with alumina (see p. 14) is seen in two analyses of "albite-oligoclase porphyry," given in porphyrite (p. 1015) and I.5.2.5 (p. 301). Comparison of these two makes it appear probable that much of the lime in the first was precipitated with the alumina through the use of impure ammonia water, as there is by no means sufficient to form enough of the anorthite molecule to justify the use of the qualifier "oligoclase."

Many more examples of incorrect determinations could be cited, both of these and of nearly all other constituents, but the above must suffice to point out the importance of close scrutiny of the analytical figures in conjunction with the mineralogical data. It may be mentioned that in none of the analyses cited, and indeed in scarcely any analysis containing serious error, has misgiving been expressed by the petrographer at the time the analysis was published as to the possibility of error, nor has there been any comparison of the analysis and the mode, no matter how apparent the incorrectness. As a result of some experience in judging analyses it may be added that in manifestly poor work the figures for silica and lime are generally the only ones which may be accepted with some degree of confidence as to their approximate accuracy.

Summation.[3]—The summation of a rock analysis may be a good index to its character, and should always be taken into consideration in rating it. In discussing the limits in the summation that are consistent with good work, Hillebrand puts the matter very clearly[4] in his remarks to the effect that a summation somewhat over 100 per cent is better than one below 100, and he also assigns the limits for good work as 99.75 and 100.50. With his reasoning and his limits I fully concur, though in practice one may be lenient and extend the allowable limits to 99.50 and 100.75 with advantage.

Though figures that do not fall within these limits are good evidence of error, either of omission or commission, in the analysis, the converse is not necessarily true—that figures within these limits are proof of correct results. Several errors may balance one another, so that the summation may be very close to 100, although the analysis is very poor. At the same time, unless indications appear that the analysis is not good, it must be taken at its face value. A good summation is evidence of good analytical work, as far as it goes. On the other hand, very low or very high results prove that an analysis is incorrect in some particulars, or possibly as a whole.

A low summation may be due to the nondetermination of some constituent, to poor methods, to careless manipulation, or to all combined. The determination of water by "loss on ignition" tends to yield a low total, owing to the oxidation of the ferrous oxide. This error will reduce the apparent weight of water and may give an unfavorable summation, though the other essential constituents may have been accurately determined.

It must also be borne in mind that a low summation can not be ascribed to the nondetermination of a constituent which is precipitated and weighed with others that have been determined, such as TiO_2 and P_2O_5 with Al_2O_3, or SrO with CaO. If it is due to incompleteness, the missing constituent must be sought among those which are determined independently in the course of the analysis, such as CO_2, SO_3, Cl, S, or BaO. If the deficiency is marked and the description of the rock indicates that none of such constituents are present, the low summation must be held as evidence of error somewhere in the analytical work.

It may also be noted in this connection that if ferric oxide is calculated as ferrous there will be a deficiency of one-tenth of its weight, due to the loss of oxygen. The converse is also true. Consequently, if the iron oxides are given only as FeO, the total of the analysis will be too low by one-tenth of the amount of ferric oxide really present. And, conversely, if they are given as ferric oxide the sum will be too high by one-ninth of the ferrous oxide. If the amount of either is considerable, as it usually is in very femic rocks, the nonseparation of iron oxides may thus give rise to an apparently poor or an apparently good summation.

[1] Paul, F. P., Tschermaks Min. Pet. Mit., vol. 25, p. 295, 1906.
[2] Washington, H. S., Carnegie Inst. Washington Pub. 57, p. 124, 1906.
[3] This topic has been discussed by M. F. Connor (Cong. géol. internat., Comptes rendus, p. 888, 1914).
[4] Hillebrand, W. F., U. S. Geol. Survey Bull. 422, p. 27, 1910.

In analyses of rocks containing such minerals as sodalite, fluorite, much biotite or apatite, pyrite or pyrrhotite, in which chlorine, fluorine, or sulphur has been determined, it must be remembered that an equivalent amount of oxygen is to be deducted to get a correct result. If the amount of these constituents is considerable, an apparently high summation may prove to be satisfactory, whereas one that lies within the assigned limits may prove to be too low.

It is possible that a summation higher than that allowable may be due to the determination of iron oxides as Fe_2O_3 only, the excess being attributable to the excess of oxygen in this over that in FeO, as just explained; or it may be due to the fact that no correction has been made for the oxygen equivalent to chlorine, fluorine, or sulphur, also mentioned above.

In the absence of these two possibilities, the high summation can be attributed only to analytical errors, such as impure reagents, poor glassware, imperfect washing of precipitates, incomplete ignition, or a dusty laboratory. No explanation based on incompleteness and the nondetermination of some constituent will apply here, and if the excess above the allowable limit is considerable the presumption is strong that the analytical work was careless.

Furthermore, it must be remembered that the excess or deficiency in all high or low summations can not be distributed among all the constituents, for "it is more than likely to affect a single determination." [1]

The importance of the summation in determining the rating of an analysis lies in the fact that it is itself presumptive evidence of good or poor analytical work somewhere in or all through the analysis, so that if the sum falls within the limits assigned for good work the analysis is presumably good, provided that no marked discrepancy is evident between the analysis and the described mode, that the degree of completeness is satisfactory, and that there is no other evidence tending to throw doubt on the results.

On the other hand, if the sum is considerably below or above the limits fixed the evidence is much stronger than the apparently slight departure of a fraction of 1 per cent from the limits might at first sight seem to indicate, as it shows that some error or errors have been made, and that consequently the character of the analytical work as a whole is open to suspicion. Thus a summation of 99.00 may be due to the nondetermination of some constituent, but in the absence of evidence to this effect we can only conclude that some error has been made. This departure of but one-half of 1 per cent from the limit of the standard of good work may affect either the silica or the alumina, the constituents that are present in largest amount, and may not seriously affect the value of the analysis; or it may affect some constituent present in less amount, and thus be of relatively greater importance; or it may be distributed among several constituents. We have no means of deciding the nature of the errors in most of such analyses, but we must conclude that, as the work is certainly incorrect, even to so small an extent, in some particular, it may be incorrect in others, and possibly all through.

Summations somewhat above or below the limits fixed are excusable in analyses of complex minerals or of meteorites if the material available for analysis is scanty or the analytical processes are especially complex or difficult, and the allowable possible limits of error are consequently considerably greater than that fixed for analyses of igneous rocks. It must also be remembered that the analyses of minerals may be checked by their agreement with the known calculated chemical composition. For most analyses of rocks, on the other hand, we have no such check, as adequately exact data as to the relative amounts of the constituent minerals are seldom given. If, therefore, the analysis of a rock is satisfactorily complete, there is no excuse, as Dr. Hillebrand remarks, for a summation that does not fall within the somewhat liberal limits here assigned.

In a series of analyses by the same analyst, some of the analyses may show summations within the acceptable limits, whereas those of others may be as high as 102 or as low as 98 (an actual case). The bad summations in such a series of analyses indicate serious errors in the whole series and lead one to reject those analyses of the series whose summations are apparently acceptable, for one is justified in assuming that the good summations result from the chance balancing of errors.

In stating analyses it is the almost universal practice to use two places of decimals, a practice justified because the last figure, though not very significant, expresses the limit of accuracy in weighing (0.01 milligram), and because of uniformity. Also, when the amount of any constituent is less than 1 per cent, the use of but one decimal is clearly not adequate. The use of three decimals is unjustifiable, for it implies a greater degree of accuracy than can be reached in practice, and my experience shows that most of the analyses thus stated clearly afford other internal evidence of unsatisfactory work.

EXTERNAL EVIDENCE.

Analyst.—Among the factors that may come under the head of "external evidence" the analyst himself is the most important, but for several reasons this factor can be used only with caution and subsidiary to other criteria. That is, the analyst is to be judged by his work rather than the work by the analyst.[2] Though as a general rule it may be said that the work of a beginner will probably not be so good as that of an expe-

[1] Hillebrand, W. F., U. S. Geol. Survey Bull. 422, p. 28, 1910. Cf. Appendix to Fresenius's Quantitative Analysis.

[2] H. H. Robinson, in a recent paper (Am. Jour. Sci., vol. 41, p. 257, 1916), discusses the work of different analysts on the basis of the summations of their analyses.

rienced analyst, yet exceptions occur; so that we must not be too sweeping in our judgment of the analyses of a student unless they show distinct signs of poor work. On the other hand, an experienced analyst may turn out analyses that are manifestly incorrect, possibly because of the employment of poor methods or poor reagents, so that in the appraisal of these the long experience of the analyst will count for little, for a rock analysis made by him which can not be checked by comparison with the mode will be looked on with misgiving.

A word may be said of the analytical work of women: I know of but three[1] who have made any considerable number of rock analyses, and I have found the work of all to be uniformly good. It would seem that analytical work is especially well adapted to feminine characteristics, and that rock analysis could be advantageously undertaken by women.

Methods.—The methods employed in making an analysis are seldom stated and are therefore not often available as a means of judging its value. When they are known, however, a petrographer who is experienced in rock analysis can determine the extent to which they may affect the value of the analysis.

Indirect evidence.—Evidence of an indirect nature is sometimes afforded by analyses of the same or similar rocks by other analysts, which may either corroborate or discredit an analysis under consideration. Also, as noted above, if some analyses of a series show evident signs of error the presumption is strong that the others are also subject to the same error unless they can be checked by comparison with the mode.

COMPLETENESS.

In order to ascertain fully and accurately the composition of a rock the exact amount of every one of its constituents must be determined, so that, in general, the more constituents determined the more closely will the analysis represent the composition of the rock. This statement, however, is subject to the limitations that some rocks are of simple composition, containing only a few chemical constituents, and that the statement of figures for all these possible constituents is no evidence that they have been correctly determined. Assuming, however, that the analysis is accurate and that the rock is of complex composition, as it usually is, we may briefly discuss the relative importance of the various constituents in the rating of analyses.

Speaking generally, and bearing in mind the possible occurrence of rocks containing large amounts of minerals that are regarded as rare, or that are usually only sparingly present, it may be said that in the most satisfactory work every constituent should be determined that is present in amount greater than traces, as already defined, or the knowledge of whose absence or presence, even in minute quantity, is essential to our study of the rock or to the object of the investigation.

[1] M. W. Adams, L. Hezner, and N. Sahlbom.

This determination will include the nine main constituents that are almost universally present and whose absence would be a matter of interest; that is, SiO_2, Al_2O_3, Fe_2O_3, FeO, MgO, CaO, Na_2O, K_2O, and H_2O. The iron oxides should be determined separately, or the absence of one or the other should be shown, even in analyses of the most salic rocks, though it must be borne in mind that the influence of this separate determination increases with increase of the femic components. Likewise, the alkalies should always be determined, of course separately, and even in the most femic rocks their presence in traces or their complete absence should be definitely proved. CaO and MgO should also be determined, even though they exist actually as traces, as defined above. H_2O should, in general, be determined directly, and not by "loss on ignition," but the distinction between that below and that above 110° is not usually essential, yet is desirable. CO_2 should, however, be determined if the rock is not fresh, or if calcite or cancrinite be present.

It is next of interest to know the amounts of the so-called minor constituents likely to be present in notable amount, including TiO_2 and P_2O_5 in nearly all rocks, except the most salic ones, Cl and SO_3 in rocks containing sodalite, noselite, or haüyne, S in a good many femic rocks, ZrO_2 in rocks with nephelite, much eudialyte, or zircon, and in alkalic, especially sodic, rocks in general, and Cr_2O_3 and NiO in many dofemanes and perfemanes. It is also well to determine BaO in alkalic and especially potassic rocks.

Of course any one of these may at times assume the importance of one of the nine main constituents, as TiO_2 in nelsonite and ores produced by segregation or differentiation, Cl and SO_3 in such rocks as taimyrite, tawite, and haüynophyre, P_2O_5 in the apatite syenites of Finland and nelsonites, or Cr_2O_3 in many dunites.

Assuming that, as usual, the minor constituents are present in only small amounts, the most noteworthy are TiO_2 and P_2O_5, especially the former. Both are almost invariably present and are also of special importance, because their estimation affects that of Al_2O_3, as already explained. In fact, on this account these two should always be determined in any analysis that is to be considered good. MnO, although also nearly always present, is of comparatively little consequence, and its determination or nondetermination should not affect seriously the rating of the analysis.

Of the other generally rare or very minor constituents, such as ZrO_2, Cr_2O_3, NiO, BaO, SrO, little need be said. Except when they assume an important rôle, as already mentioned, they scarcely affect the value of an analysis for general purposes. Still, since they are or may be of great value for the study of certain broad and as yet undeveloped problems, and as their determination, other things being equal, is evidence of careful and thorough analytical work, analyses in which they are reported must be rated higher than those in which they do not appear.

RATING ADOPTED IN THE TABLES.

We come now to the practical application of the foregoing remarks—that is, to a concise expression of our judgment of the value of any given analysis, based on the features described. We have been accustomed to express our judgment in a rough way by calling analyses good, or poor, or bad. But there seems to be a need of making these terms more precise, of defining their meaning more exactly.

As a preliminary, the fact must be recognized that though the features discussed permit a fairly accurate judgment on most analyses, some or all of these features are not invariably available and an analysis must often be taken, so to speak, at its face value.

Thus it frequently happens, especially with the prevalent almost purely qualitative descriptions, that we can form little or no estimate of the correspondence of the analysis with the mode. In a gabbro, for instance, of which it is merely known that the constituent minerals are labradorite, augite, and magnetite, the analysis may show high Al_2O_3 and low MgO. This showing may be due to the common error in the separation of these two; or, again, it may be due to the fact that the rock is very salic, so that anorthite is abundant and the mafic minerals present in small amount, though the rock would be called a gabbro, equally with a very femic one, in the current vague qualitative systems. In the first case the analysis would not and in the second case it would correspond with the mode, and the analysis would be, respectively, either incorrect or correct. But in the absence of some evidence to determine the matter, such as an indication of the quantitative relations of the two minerals in the description, we should have no means of deciding the question provided that CaO was high enough, with the alkalies, to satisfy the Al_2O_3, and if the analysis were otherwise good we should scarcely be justified in rejecting it on this account.

We must also make the general assumptions, in the absence of evidence to the contrary, that the material analyzed is representative of the rock mass and that the analyst is competent and the methods employed are reliable.

Admitting these serious difficulties in judging many analyses and the fact that any such concise characterization is necessarily to some extent arbitrary or subjective, I venture to propose and have used throughout this collection the following practical method of expressing the rating of analyses.

The method is closely analogous to that of Dun and of Bradstreet in rating the credit of mercantile houses in the United States, which, indeed, suggested the present form of the scheme. In commercial rating the credit of a firm is dependent on two factors—the amount of capital invested or at command and the personal character and reputation of the individuals. The rating or credit will be high as the personal character and the capital both approach the maximum.

Following out this analogy, our judgment of analyses is dependent on two factors—the accuracy and the completeness. For most of the purposes for which rock analyses are used each of these may compensate the other to a certain extent. Thus if the analysis is not very complete this fault may be partly compensated for by the accuracy of the determinations which have been made, and, conversely, if the accuracy of some of the determinations is not entirely satisfactory a complete determination of all the constituents may partly make up for it. This, of course, should be within reasonable limits. Furthermore, the higher the standard of each factor the more valuable will be the analysis.

To express the degree of accuracy the letters A, B, C, D are used, and to express the degree of completeness the figures 1, 2, 3, 4. These are used in combinations of a letter and a figure, the letter preceding, since, in general, the degree of accuracy is more important than that of completeness. The bases on which these are assigned are as follows, the limitations and the frequently arbitrary character of the scheme being understood:

A is used when the analysis gives evidence of the highest degree of accuracy—that is, when it corresponds well with the mode and when the summation is between the limits 99.50 and 100.75. When the analyst is of the first rank and when the methods are known to be of the best, these facts constitute additional reasons for the assignment of this letter. It must be understood, however, that in rating the analyses in the collection I have usually refrained from considering the personal competence of the analyst, as this is often a difficult and always a delicate matter. So, except when the methods or general results were known to be not very reliable or positively bad, I have generally used only the impersonal features of each analysis in deciding its rating.

B is used when the analysis and the mode correspond and when the summation is between 99.50 and 99, or between 100.75 and 101.25. Due allowance must, however, be made here, as elsewhere, in considering low summations, for the effect of the nondetermination of certain constituents, as already explained, and in considering high summations for the correction to be applied in the presence of Cl or S.

C is used when the analysis corresponds fairly well to or varies but little from the mode and if the sum is between 99 and 98.50 or between 101.25 and 101.75.

D is used when the analysis varies decidedly from the mode in any essential particular, or when the sum is below 98.50 or above 101.75. It also applies when the methods used for determining important constituents are known to be bad, or when an analysis, apparently good, is made up by combining parts or the whole of two or more poor analyses.

Analyses stated in one or three decimal places have been consistently rated 1 degree less as regards accuracy than they would have been had they been stated in two decimals, as it has been found that they are generally of inferior quality. Analyses stated in only one decimal place fail to conform with the weighings of the analysis and do not adequately show the amounts of the minor constituents. For these and other reasons I differ with the recent usage of Prof. Milch.[1] This has been discussed elsewhere.[2]

1 is assigned when the analysis is perfectly or nearly complete, as when, in addition to all the main constituents and those of secondary importance, ZrO_2, Cr_2O_3, NiO, BaO, SrO, and the like, or several of them, are determined in rocks not containing notable amounts of minerals having these as essential components. In general MnO should be determined for this rating, but not necessarily, and the same is true of the separate determination of combined and hygroscopic water, though the determination of water as "loss on ignition" renders the application of this rating doubtful. The iron oxides must be separately determined in all analyses to which this figure can be applied.

2 will be used when all the main constituents, including both oxides of iron, have been determined, as well as the constituents of secondary importance, including TiO_2 and P_2O_5 in nearly all rocks, Cl and SO_3 in those that contain abundant minerals of the sodalite group, and so on, as has been explained. The minor constituents, ZrO_2, BaO, etc., are not determined in analyses rated with this figure. 2 will be used also for analyses of very salic rocks in which the iron oxides are present in small amount (up to about 2 per cent), but have not been separated, and which are otherwise so complete as to fall under 1.

3 applies to analyses in which the main constituents, including both oxides of iron, have been determined, but not TiO_2, P_2O_5, Cl, etc. (or the minor constituents), unless minerals rich in these are so abundant, or, as regards TiO_2, the rock is so femic, as to make their estimation of the same importance as that of the main constituents. 3 also includes analyses of rocks low in iron oxides, in which these have not been separated, but which are otherwise complete according to the requirements of 2.

4 is to be assigned to analyses of all rocks except those very low in the iron oxides when these oxides have not been separated, when the alkalies or other constituents are determined by difference from 100 per cent, when the alkalies are not separated, when any constituent of the first importance is not determined, when the analysis has been made of ignited material (not including drying at 110°), or when it is given, without the original figures, as having been recalculated on a water or carbonic-acid free basis.

[1] Milch, L., N. J. B. B., 15, p. 111 (note), 1902.
[2] Washington, H. S., Chemical analysis of rocks, p. 30, New York, 1910.

Under the working plan already described, one of these factors compensates for the other to a certain extent. Thus a less degree of completeness is compensated for by a greater degree of accuracy. We would then judge, for example, an analysis of rating A2 and one of rating B1 to be of about equal value for many purposes. This is, confessedly, only true within limits and must be used with judgment and with a recognition of its empirical character.

To express, then, the various ratings of equal value, we can employ five series of terms as follows: Excellent or first rate, good or second rate, fair or third rate, poor or fourth rate, and bad or fifth rate. Their meanings, in terms of the symbols chosen, will be seen in the subjoined table, ratings of the same value falling on the same horizontal line.

First rate (I)	A1	......	......	......	Excellent.	Superior.
Second rate (II)	A2	B1	......	......	Good.	
Third rate (III)	A3	B2	C1	......	Fair.	
Fourth rate (IV)	A4	B3	C2	D1	Poor.	Inferior.
	......	B4	C3	D2	Bad.	
Fifth rate (V)	......	......	C4	D3		
	......	......	......	D4		

In other words, analyses of the rating A1—those that are perfectly satisfactory both as to accuracy and completeness—would be called "excellent" or "first rate (I)," the two terms being synonymous. An analysis to which is assigned the rating either A2 or B1 would be spoken of as "good" or "second rate (II)"; one with either of the three ratings A3, B2, or C1 would be called "fair" or "third rate (III)"; one with the rating A4, B3, C2, or D1 would be "poor" or "fourth rate (IV)"; and one worse than these would be "bad" or "fifth rate (V)."

In any case, it must be remembered that accuracy should count rather more than completeness, since often an approximate correction can be made for constituents not determined, as for TiO_2 and P_2O_5 affecting Al_2O_3. Consequently, though of the same general rating, an analysis rated as A2 is worth rather more than one rated as B1, and those rated as A3, B2, and C1 should be similarly appraised in the order of merit.

As a mnemonic convenience it may be useful to note that, if the letter indicating accuracy in any rating be replaced by the figure representing its place in the alphabet, the sum of this figure and the figure indicating completeness will be one unit greater than the rating of the analysis. Thus in a first-rate analysis, of rating A1, the sum will be 2; in a second-rate analysis, of rating A2 or B1, the sum will be 3; in a third-rate one, of rating A3, B2, or C1, the sum will be 4. In the rating of fifth-rate analyses, however, the sum may be greater than 6, as for instance, in the rating D4, where it will be 8.

As will be seen presently, analyses of the first three ratings—that is, excellent, good, or fair—are worthy of use in petrological discussions, whereas those of the fourth or fifth rate—that is, poor or bad—are of little or no use. In order to be able to distinguish between the two it will be well to have some short terms expressing the difference. It is suggested, therefore, that excellent, good, and fair analyses be spoken of collectively as *superior*, and that poor and bad ones be called *inferior*.

It may be desirable to indicate a higher degree of accuracy or completeness than is generally implied by A and 1. Thus, though A will apply to the general run of excellently accurate analyses, we might wish to distinguish some of a still higher order, as the best of those which Drs. Hillebrand, Stokes, Steiger, and Mingaye have made. These may be distinguished by the use of A*. Similarly it may be useful to discriminate analyses having the completeness found in Hillebrand's analyses of the rocks of the Leucite Hills, in which everything possibly present has been determined, from those in which some but not all of the rarer constituents have been estimated. This discrimination would involve the use of 1*. A combination of A* and 1* might be called "perfect," the word being used subject to human limitations. There does not yet seem to be much need of this distinction, though it will undoubtedly be more needed in the future than a discrimination between degrees of badness.

It should be remembered that these ratings indicate the *general character* of an analysis. Some features may justify us in calling an analysis as a whole either poor or bad, and yet it will be of use in a limited way. Thus, the iron oxides may not be separated, or the common error may be made in regard to alumina and magnesia, so that the analysis must be rated as fourth or fifth rate, *taken as a whole*, yet the lime and alkalies, for instance, may have been correctly determined, as well as the silica, so that for purposes in which only these determinations are needed the analysis may be useful to this extent. But, notwithstanding this, in view of its evident errors, the analysis can not be regarded as satisfactory.

The question now arises as to what ratings are of practical use. Leaving out of account conditions such as those just mentioned, in which utility attaches to some single determinations, it may be held that, for general purposes, only first or second rate (excellent or good) analyses should be countenanced or used by petrographers. The high standard set by the chemists of the United States Geological Survey should be adopted by all, and the chemical side of petrology should be established on as firm and satisfactory a basis as the microscopical.

At the same time an otherwise good analysis in which the more important of the minor constituents have not been determined, such as TiO_2 and P_2O_5, may be of use for some purposes, as for the classification of the rock. Third-rate or "fair" analyses may therefore be considered usable, especially if of high rate as to accuracy, since in many of them approximate corrections may be applied for constituents which have not been determined.

Excellent, good, and fair (superior) analyses may therefore be considered usable, but poor or bad (inferior) analyses should be rejected in any inquiry or discussion, unless the only question at issue is the elucidation of a special point for which some of the reliable determinations may serve.

THE TABLES.

DIVISION INTO PARTS.

It was desired to arrange the analyses embraced in the collection according to the quantitative system of classification. For most analyses such an arrangement was perfectly feasible, but a critical study of all of them showed that only a part could or should be thus arranged. In a surprisingly large number the iron oxides, for example, had not been determined. Though this is of comparatively small importance in analyses of persalanes, where these constituents form only 1 or 2 per cent, it becomes a most serious matter in analyses of other classes of rocks. Indeed, if the iron oxides amount to more than about 2 per cent and are not determined separately it is generally impossible to classify the rock with certainty, for some assumption must be made as to the real state of oxidation of the iron, and this assumption may not accord with the facts.

If the iron is assumed to be present as ferric oxide alone, this must generally be calculated as hematite to find the norm, thus freeing an amount of silica equivalent to the ferrous iron, which will alter the relative amounts of the other minerals, changing lenads into polysilicate feldspar or olivine into hypersthene. On the other hand, if all the iron is assumed to be ferrous, which is the rule followed for the sake of uniformity, an amount of silica will be needed which would not be used if part of the iron were ferric, and this would have the reverse effect on the other normative minerals to that just mentioned. It will, of course, probably be equally at variance with the true composition of the rock to make any other intermediate assumption—for instance, that ferric and ferrous oxides are present in equal molecular amount, the iron being thus assumed to be only in the form of magnetite.

We are therefore compelled to reject nearly all such analyses for the purpose of classifying the rocks of which they have been made, as has been already stated.[1] Along with them must go a large number in which it is certain that the alumina is much too high and the magnesia correspondingly low, or in which we know that there must be a very notable amount (several per cent) of TiO_2 which has not been determined, and which consequently serves to raise the apparent amount of alumina. In these analyses the salic lime, and therefore the normative anorthite, will be too high and the classificatory position of the rock consequently false.

A very large number of analyses are obviously so bad in other respects that they are almost or wholly worthless. It is needless to cite examples, for they may be found throughout the whole of Part IV.

Analyses of tuffs and of rocks so badly decomposed that the analyses do not represent their original composition were also found in abundance. Though many of these are analyses of the highest ratings, yet they were obviously of no use for purposes of classification, and hence could not logically be correlated with analyses of massive or unaltered rocks.

Analyses of volcanic ashes offer a peculiar problem. In Professional Paper 14 they were relegated to Part II, on the ground that the ashes presumably undergo a sorting or winnowing in their progress through the air, so that their eventual composition as analyzed would be more or less adventitious and not be representative of that at the place of ejection. Further consideration and study of many analyses of ash, however, has led me to assign less weight to the influence of such a process, especially when the ashes are collected near the eruptive center, and consequently in this paper analyses of volcanic ashes are included in Part I if of superior quality, not obviously decomposed, and not collected very far from the place of eruption.

In Professional Paper 14 all the analyses were placed in two parts. Part I contained all the superior analyses (ratings I, II, and III) of fresh rocks and a few analyses of inferior quality or of rocks that were not quite fresh, which were inserted chiefly because they "were deemed to be of especial interest and importance or were almost the only examples available for illustrating the chemical and mineralogical composition of the divisions into which they seemed to fall." In Part II were placed the inferior analyses and analyses of altered rocks, tuffs, etc., even if of the highest rating, except the few admitted to Part I.

This arrangement seemed to be unjust to the makers of excellent or good analyses of altered rocks, for, though the rating symbols were given, the analyses were naturally associated with those which were bad. There were also included in Part II a number of analyses that were good as to most of the constituents, but that could not be classified because of the nondetermination of some one constituent, most often that of both iron oxides, though they were usable otherwise for many purposes.

It has therefore been decided to arrange the analyses in four parts, which will be constituted as follows:

In Part I are placed all the superior analyses of fresh rocks—those which are excellent, good, and fair—except those which can not be properly classified in the quantitative system because of the nondetermination of *one* constituent. It does not include analyses of any tuffs or of rocks which are more than very slightly altered (weathered or metamorphosed). In general the presence of more than about 3 per cent of water in an analysis has excluded it from this part, except analyses of evidently fresh glassy pitchstones and like rocks or of analcite rocks (such as monchiquites), where this mineral is considered to be of primary origin. Also, in general, the presence of one-half of 1 per cent or more of carbon dioxide has excluded the analysis from this part, except a few analyses in which calcite is apparently taken from surrounding limestones, as in some Ontario rocks, and in which it has been allowed for and not brought into the norm; or unless cancrinite is apparently primary. Analyses of rocks in the descriptions of which chlorite, epidote, zeolites, kaolinized feldspars, or other alteration minerals are mentioned as present in more than very small amounts are of course excluded. Analyses of volcanic ash are included, in general, if of superior quality, not obviously decomposed, and not collected very far from the volcano.

The number of analyses has increased so greatly that the qualifications for entering Part I have been much stricter than those required in Professional Paper 14, and a great many that were put in this part must now be sought elsewhere. On the other hand, a few have been transferred from Part II of the first edition to Part I of this. In spite of this increased strictness, almost every systematic division in Part I now contains several times as many analyses as before.

In Part II are placed the superior analyses—generally good or fair—which were not deemed to be properly classifiable in the quantitative system, because of the nondetermination of some one constituent. Most of them are placed here because of the nondetermination of one of the iron oxides, with analyses of a few of the more femic rocks in which TiO_2 was not determined. Analyses of the more femic rocks which do not show both iron oxides and titanium dioxide have been placed in Part IV. They are arranged in the order followed in Zirkel's Lehrbuch, somewhat modified to accord with Iddings's "Igneous rocks."

In Part III are placed the superior analyses of tuffs and of weathered or otherwise altered rocks and analyses of some ashes. When possible a reference is given in the last column headed "Remarks" to the analysis of the fresh form of the altered rock.

[1] Cross, Whitman, Iddings, J. P., Pirsson, L. V., Washington, H. S., Jour. Geology, vol. 10, p. 646, 1902; also The quantitative classification of igneous rocks, p. 190, 1903.

In Part IV are placed nearly all the analyses deemed to be poor or bad. This part and Part III embrace many analyses formerly placed in Part I.

BASIS OF ARRANGEMENT OF ANALYSES.

ATTEMPTED USE OF CURRENT PETROGRAPHIC SYSTEM.

When this collection was first started, more than 15 years ago, the analyses were classified according to the system of Rosenbusch. Generally the name given by the author to the rock was adopted, but many rocks seemed to me to have been wrongly named, so I took the liberty of renaming them, but put the author's name in brackets. As the collection progressed this renaming became frequent, as is by no means surprising in view of the loose and often contradictory principles, the subjective and qualitative character, and the vague definitions prevalent in the systems in vogue. It furnished a most striking illustration of their illogical, inconsistent, and unsatisfactory character, and was a most cogent argument against their continued use. It indicated, indeed, that there was in reality no one system to which one could turn for guidance, but that each petrographer had set up his own standards to some extent, made his own definition of many of the terms in use, or assigned his own limits to them, which might or might not correspond with those of others—in a word, had partially made his own classification and nomenclature. Each was a hodgepodge, made up of bits taken from this or that authority or evolved from the individual author's own ideas. There was seldom if ever any broad principle which one could apply throughout, and the result was a clashing of principles, inconsistencies everywhere, and a lack of harmonious and even development. If a petrographer had been working on a certain group of rocks his classification in that group would be very detailed, whereas in other groups the names he gave would be few, and the classification of some authority would be used with no critical estimate of its applicability and no thought of its logical consistency with the other more detailed and familiar parts of the scheme.

Everyone has recognized this state of affairs more or less clearly; but it is forced most strongly upon one who makes a large collection of rock analyses and a careful comparison between the descriptions and analyses and the names applied to rocks by the different writers.

Roth [1] has expressed somewhat similar views, and is inclined to think that no one system will ever receive general acceptance. I am less pessimistic, for I regard the lack of any universally adopted system of classification as due less to difficulties caused by the characters of the rocks than to the general lack of appreciation of the necessity for logical and consistent principles, and to a natural disposition to patch up the old rather than to substitute something totally new, even if better.

[1] Roth, J., Chem. Geologie, vol. 2, p. 41, 1883. Cf. Cross, Whitman, Jour. Geology, vol. 10, p. 473, 1902.

ADOPTION OF THE QUANTITATIVE SYSTEM.

While this early collection was being made I became interested, with Cross, Iddings, and Pirsson, in the working out of the system of classification and nomenclature of igneous rocks which has been proposed by us. In the course of this work the growing collection of analyses was continually referred to, the modes of many of the analyses were calculated, and they were rearranged from time to time to test the various propositions or suggested lines of classification until agreement with any system at present in use was lost.

After having arrived substantially at the system of classification which we finally adopted, we saw that the collection if arranged in accordance with this system would not only be its best exponent, but would be an indispensable foundation for purposes of nomenclature, the consideration of which was taken up only after the main features of the classification had been disposed of.

The collection was therefore finally made as complete as possible and arranged in accordance with the new system,[2] and we decided to publish it in that form. The same course has been followed in this edition.

FEATURES OF THE TABLES.

Geographic arrangement.—In each of the subrangs in Part I and in each of the rock groups in the other parts the arrangement is geographic. The primary step is by continents, North and South America coming first, then in order, Europe, Africa, Asia (including the Malay Archipelago), Australia and New Zealand, Polynesia and the scattered islands of the Pacific, Indian, and South Atlantic oceans, and finally Antarctica. The States and minor divisions are arranged in zones running from north to south (except in Germany, where it is from west to east), and in a rough way localities have the same general order. At any one locality the analyses are arranged according to decrease in silica, or, if this should be the same in two analyses, according to decreasing alumina.

The general scheme is shown in the annexed list. The scattered islands are not included. Though this order is followed in general, yet in places it has been inadvertently departed from.

[2] This classification is described in Appendix 1.

NORTH AMERICA.

Greenland, etc.
Eastern Canada:
Labrador, Newfoundland, Maritime Provinces, Quebec, Ontario.
Eastern United States:
Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia, Virginia, Kentucky, North Carolina, South Carolina, Tennessee, Georgia.
Central and Western United States:
Michigan, Wisconsin, Minnesota, Missouri, Arkansas, Oklahoma, Texas, North Dakota, South Dakota, Montana, Yellowstone National Park, Wyoming, Idaho, Colorado, Utah, New Mexico, Arizona.
Pacific Coast:
Alaska, British Columbia, Washington, Oregon, California, Nevada.
Mexico.
Central America.
Panama (including Canal Zone).
West Indies.

SOUTH AMERICA.

British Guiana.
Colombia.
Ecuador.
Peru.
Bolivia.
West Argentina.
Chile.
Patagonia.
Brazil.
Paraguay.
East Argentina.

EUROPE.

Iceland.
Great Britain:
Northern Islands, Scotland, England, Wales, Cornwall, Ireland
France, Corsica.
Spain.
Portugal.
Azores.
Spitzbergen.
Norway.
Sweden.
Finland, Kola.
Germany:
Westphalia, Rhineland, Alsace-Lorraine, Hesse, Baden, Wurttemberg, Prussia, Thuringia, Bavaria, Saxony, Silesia.
Austria-Hungary:
Bohemia, Moravia, Lower Austria, Galicia, Hungary, Bosnia, Tyrol.
Switzerland.
Italy:
Lombardy, Piedmont, Emilia, Tuscany (Elba), Rome, Campania, Apulia, Sardinia, Sicily, Pantelleria.
Russia:
North Ural Mountains, South Ural Mountains, South Russia, Caucasus.
Balkan States.
Greece, Archipelago.
Asia Minor.

AFRICA.

Algeria.
Morocco.
Madeira.
Senegal.
French Guinea.
Nigeria.
Kamerun.
French Kongo.
Egypt.
Kordofan.
Eritrea.
Somali (Aden).
Abyssinia.
British East Africa.
German East Africa.
Madagascar (Reunion).
Rhodesia.
Transvaal.
Natal.
Cape Colony.

ASIA.

West Siberia.
Persia.
Turkestan.
East Siberia, Kamchatka.
Manchuria.
China.
Chosen (Korea).
Japan.
Indo-China.
India.
Philippine Islands.
Malay Archipelago:
Borneo.
Celebes.
Sumatra.
Java, Flores, etc.
Moluccas.
Papua (New Guinea).

AUSTRALASIA.

Queensland.
New South Wales.
Victoria.
South Australia.
Western Australia.
Tasmania.
New Zealand.

In this connection attention may be called to the striking gaps in our knowledge of the chemistry of the igneous rocks of various parts of the globe. Though some countries have been very thoroughly studied in this way and are represented by numerous superior analyses, others have been much neglected or are quite unrepresented. The long line of gigantic Andean volcanoes show an inadequate number of analyses, and most of these of not very satisfactory quality. Other very well known regions, of which the Eifel, Siebengebirge, Schemnitz, and Etna may be mentioned, are represented by few analyses other than those of early date, so that we know little about them chemically. The vast expanses of India, Tibet, and China are represented by a surprisingly small number of analyses, and few of these are very good. Not a single analysis was found of the igneous rocks of such large and well-known islands as Cuba, Porto Rico, and Jamaica.

Numbering of analyses.—For purposes of reference each analysis is numbered, the numbering beginning anew with each subrang in Part I and with each general group in the other parts. In referring to any given analysis the number will be used with the symbol, not with the subrang name, as in the first edition. The number is repeated on the right-hand page.

Rating of analyses.—With the number is given the rating assigned to the analysis by me, according to the principles already described. The letters and numbers which indicate the degree of accuracy and completeness are given, with a Roman numeral to express its general rating, as shown on page 25. Thus, A 1. I means that the analysis is excellent or first rate, being highly accurate and complete, A 3. III that it is fair or third rate, being of high accuracy, but only moderate as to completeness.

The rating of some analyses has been difficult. The criteria for judgment outside of the analysis itself are often lacking or insufficient, but I have endeavored to be judicial and unprejudiced, and the rating generally expresses my frank opinion of the value of the analysis. Where I have had serious doubt as to the accuracy of the work, yet have been unable to assign any definite reason for the doubt, I have settled it in favor of the analyst, so that I look with suspicion on some analyses that are here rated as superior and that appear in Part I, though I have no positive proof of their inferiority. An interrogation point (?) after a symbol indicates that the rating assigned is one degree higher than that which I suspect it deserves.

I may repeat that each individual analysis has been the object of careful consideration and that many of the ratings given in the first edition have been revised in the light of increased knowledge, so that I feel confident of the correctness, according to the standards adopted, of nearly all of them.

Time was lacking for a critical study of the number of analyses assigned to each of the several ratings, and of the progressive improvement in quality—such a study as was made for Professional Papers 14 (p. 65) and 28 (p. 15). This study will be made, however, and will form the subject of a separate paper. A general survey indicates, as would be expected, that the improvement since 1900 has been steady, so that probably 75 or possibly 80 per cent of the analyses made since then are superior, against the 65 per cent of those made between 1884 and 1900.

Constituents.—The main constituents are given in horizontal rows on the left-hand page. This is the arrangement employed by Roth and by Osann, and it was adopted here rather than an arrangement in vertical columns, because it facilitates reference and for typographical reasons. With the chief constituents are included TiO_2, P_2O_5, and MnO, since these are in general the most important of the minor constituents, and the two former are present in all excellent and good analyses and in many that are rated fair. CO_2 and BaO have been transferred to the column headed "Inclusive," partly for spatial reasons, partly not to magnify their importance, and partly because most of the rocks that contain CO_2 are not fresh and have been transferred to Part III.

In analyses in which the iron oxides are not separately determined, the figures are given under Fe_2O_3 or FeO, according to the statement of the original analysis. When, however, there is no indication as to this point in the original, the two oxides being connected by a bracket, I have assumed that they really represent Fe_2O_3, as this is the form in which they are weighed. This may not always correspond with the facts, but their nonseparation greatly lessens the value of the analysis, and this seemed the most reasonable assumption to make in order to calculate the norm, so that this course has been uniformly followed in the absence of information to the contrary.

When they are so stated in the analysis, combined and hygroscopic water are both given, but no attempt has been made to discriminate between the various temperatures at which the hygroscopic water has been determined. Usually this is 110°, but often 100° or 105°, and occasionally 120° or 130°. The difference in the result is so small and unimportant that it seemed to be not worth while to indicate the exact temperature.

Nor is indication given as to whether the water has been determined directly or as loss on ignition. This is a defect in the collection which is regretted and which would have been corrected were time and opportunity at my disposal. It arose from the fact that a very considerable number of analyses had been collected before publication was decided on, and in these the discrimination had not been made. As a matter of uniformity, the same course was adopted in the analyses collected subsequently. It may also be remarked that most analyses as originally published give no hint as to how the water was determined, so that even if special attention had been paid to this point, decision would have been impossible as to very many analyses.

The molecular numbers of the main constituents are given below the figures showing percentages. Those given in the first edition have been gone over and corrected where necessary, and all those of other analyses have been calculated by me, even though they were given by other authors. In calculating these, the tables given in the publication of the quantitative system[1] have been used. In taking the figures from these tables, when the second decimal of the percentage was 4, 5, or 6, and there was a gap of two units between the tabulated ratios above and below, the figure chosen was that midway. Thus, with 4.84, 4.85, or 4.86 per cent of CaO, the ratio given is 0.087.

[1] Cross, Whitman, Iddings, J. P., Pirsson, L. V., Washington, H. S., The quantitative classification of igneous rocks, pp. 237-246, 1903. See also Appendix.

If the iron oxides have not been separated and are stated in the analysis as Fe_2O_3 only, the molecular number of the ferric oxide as stated is given, and the equivalent of this number reckoned as that of FeO is given in parentheses and used in calculating the norm. If the alkalies are in excess of Al_2O_3—that is, if normative acmite is present—the appropriate molecular amount of Fe_2O_3 is given under this head and the rest of the iron calculated as FeO. It may be noted that the molecular number of FeO equivalent to Fe_2O_3 is obtained by doubling that of the latter.

The minor constituents, except TiO_2, P_2O_5, and MnO, are placed in the column headed "Inclusive" and their molecular numbers are omitted.

In checking the summations a number of errors in the original figures were detected. Each of these errors has been corrected by giving the proper summation above that given in the original paper, which appears below in parentheses.

Specific gravity.—The specific gravity of the rock is given if it could be ascertained from the original paper. The temperature at which it was determined is generally omitted, as it is but rarely of value.

Symbols.—The symbol which represents the magmatic position of each rock [1] has been given in Part I, with certain modifications introduced later[2] to indicate intermediate and transitional positions. I have introduced a further refinement, the symbol ″. In the original publication parentheses ( ) were used to indicate a transitional magma. This device is retained here. The symbol ′ was used to indicate that the magma was intermediate, this term including both transitional magmas and those that fall between these and those that stand in a central position.[3] For indicating the distal position no provision was made, though Iddings[4] uses ′ uniformly for this purpose. As this is a subdivision of the intermediate position represented by ′, the secondary symbol ″, used for seconds or inches, seems appropriate, and I have used it consistently in this sense in several recent papers, though unfortunately without explanation.

For rocks of persalane, dosalane, dofemane, and perfemane classes only the symbol of the preponderant salic or femic portion is given, as the other is subordinate or negligible.[5] In those of the salfemane class the symbol for the salic portion is given first in full detail, and below (in italics) that of the femic portion, which is about equal in weight to the other. If the position is central in all respects the symbol ⊙ is added, lack of it implying that only the *general* symbol for the subrang or subgrad is intended.

Norm.—The norm is given for each analysis in Part I, which includes all those that have been classified according to the quantitative system. As has been stated, the norm of every analysis which is found in the first edition, and which is here found in Part I, has been recalculated by me, and carried out to the second place of decimals, which is generally the significant figure. A number of errors in norms have been thus detected, for in the old norms the stated amount of magnetite frequently included the ilmenite, and MnO was also not generally reckoned in with FeO. The correction of these errors has necessitated a few changes in classification position.

The norms of all other analyses here included have also been calculated by me, no norm being accepted as published. Here, again, some errors have been detected, some of them very serious, and generally due to a misunderstanding of the principles on which the calculation is based.

The norms have been scrutinized in the work of copying the analyses in the manuscript and many have been collated with those given by Iddings,[4] so it is believed that few errors have been made and that they can be accepted as here given, though it is too much to hope that they are all free from error.

In calculating the norm, molecular amounts down to 0.001 have been recognized, especially of P_2O_5 and MnO, a lower percentage than 0.10 of the former and 0.07 of the latter having been neglected. The molecular amount of MnO has been reckoned in with that of FeO and, when necessary (as when hematite is present), has been assumed to form magnetite and ilmenite. BaO and SrO have been reckoned in with CaO when they amount, molecularly, to 0.002 or more. When the rock contains cancrinite CO_2 has been calculated as Na_2CO_3, and this is regarded as salic.

Cl has been calculated as NaCl (halite) and SO_3 as Na_2SO_4 (thenardite), in accordance with the modification of the quantitative system proposed in 1912.[6] In accordance with a later modification, based on researches in the Geophysical Laboratory, and for other reasons,[7] the åkermanite molecule, 4CaO, $3SiO_2$, has been replaced by the calcium orthosilicate molecule, $2CaO.SiO_2$. The new equations used for the calculation will be found in the appendix. Changes in position due to this modification are very few and of slight importance. Great care has been exercised in distributing FeO and MgO in the same proportions between diopside, hypersthene, and olivine, a slide rule proving very useful for this.

[1] Cf. Iddings, J. P., U. S. Geol. Survey Prof. Paper 18, pp. 67, 72, 1903; Washington, H. S., U. S. Geol. Survey Prof. Paper 28, p. 13, 1904.

[2] Cross, Whitman, Iddings, J. P., Pirsson, L. V., Washington, H. S.: Jour. Geology, vol. 20, pp. 553-557, 1912.

[3] This position, between central and transitional, may be called *distal*, a term slightly modifying the meaning suggested elsewhere (Am. Jour. Sci., vol. 36, p. 583, 1913).

[4] Igneous rocks, vol. 2, 1913.

[5] Lack of a subscript roman numeral after the roman numeral denoting class implies that the subclass is I.

[6] Cross, Whitman, Iddings, J. P., Pirsson, L. V., and Washington, H. S., Modifications of the quantitative system of classification of igneous rocks: Jour. Geology, vol. 20, p. 557, 1912.

[7] Washington, H. S., The calculation of calcium orthosilicate in the norm of igneous rocks: Washington Acad. Sci. Jour., vol. 5, p. 345, 1915.

In stating the norm the salic and femic molecules are kept separate, and are denoted by the symbols adopted for them. A list of all symbols used is given in the table of abbreviations on page 46.

Locality.—The names of localities are those given by the author, though lack of space necessitated the omission of some details. such as distances and quarry names. With some exceptions, such as the use of the name commonly accepted in English, the names of countries and localities are those which were in use prior to the present war. The name of the country is omitted if the State, province, or district is given and is well known, though it is inserted if the locality is small or little known, and if the province or other geographic division is not furnished by the original paper. The endeavor has, however, been made to look up doubtful localities, Stieler's Atlas (1906) being used, so as to determine the province or district.

The orthography of the geographic names conforms with the decisions of the United States Geographic Board so far as they extend. When these were not available, in case of doubt, Lippincott's Gazeteer (edited by Heilprin, 1906) was the accepted authority. I must disclaim responsibility for the omission of the apostrophe in such names as Pikes Peak, Lands End, and St. Davids Head, which is in accordance with the ruling of the United States Geographic Board. I may add that I thoroughly disapprove of the omission as grammatically incorrect. With the exception of ä, ç, é, è, ñ, ö, and ü, diacritical marks are omitted from letters both in locality names and in the references.

Analyst.—The name of the analyst precedes that of the author of the paper, because this is a collection of analyses and because the analyst is a useful factor in rating analyses. When known, the initials of the Christian names are inserted, but, as some were not given by the author and were unknown to me they are perforce omitted. If the analyst is quite disregarded by the author I have had to rest content with the phrase "not stated."

Reference.—The aim has been, in the column headed "Reference," to indicate the author by whom and the place where the analysis was first published. Subsequent publication, whether by the same author or by others, has been as a rule disregarded. Many analyses, however, made for authors who are connected with Government surveys, notably the United States Geological Survey, have been first published in papers appearing in unofficial journals or proceedings of societies, and only subsequently in official reports. For such analyses there is given in the column headed "Reference" the place of the first (unofficial) publication, and under "Remarks" is noted the place of the first official publication. This seems just to the Survey, for the analyses were made by official chemists.

In general, such publications as "Report of work done," "Summary of progress," even though official, in which the analysis appears without a description of the rock, are neglected unless this is the only reference available. In the case of analyses made by the chemists of the United States Geological Survey and published in unofficial journals but not in official publications prior to 1914, only the place of first publication is given, not Bulletins 148, 168, 228, 419, 591 of that Survey, in which they may appear. Reference to one of these five bulletins indicates that the analysis has been found only in that bulletin or elsewhere as a citation from it. In such cases the "author" cited is the petrographer who furnished the description for the bulletin.

The page number[1] given in the reference is that on which the analysis occurs, not that on which the paper commences. The date given is the year of publication, not the year for which the report is issued, this being placed in parentheses ( ). In dissertations the university name is given, not that of the place of publication. A number of analyses were found in the Referate of the Neues Jahrbuch, which have been published in papers inaccessible to me, and which would, therefore, otherwise have escaped incorporation in the collection. The pages on which these analyses appear are not mentioned in the Referate of the Jahrbuch, so I give only the name of the author and a reference to the Neues Jahrbuch.

I have, unfortunately, been obliged to omit many analyses that have appeared in journals published in languages with which I am unacquainted, notably Russian, Bohemian, Magyar, and Japanese, for the impossibility of understanding the context left me in ignorance as to the occurrence or character of the rock. I have to thank Dr. H. Backlund for his help in obtaining a number of analyses of Russian and Siberian rocks through his kindness in translating the Russian text. I must also acknowledge the assistance of Dr. E. W. Posnjak, of the Geophysical Laboratory, in a similar way. To Dr. S. Kozu I am indebted for a series of analyses of Japanese rocks published about 1884.

In the interest of the general scientific world, whether geological, zoological, botanical, physical, chemical, or other, I desire to register a protest against the publication of scientific matter in such languages, whether by official enforcement or not, even though it be ameliorated by the addition of an abstract in one of the languages—English, French, German, or Italian—with which every scientific man is supposed to be acquainted. National pride or other feelings should not impose such extra and unnecessary burdens on the man of science. For my own part I am forced to regard analyses or other

[1] A page number in parentheses ( ) is that of a separate, not that of the original pagination.

scientific data that are published only in such languages, which are unknown to the great body of scientists, as so nearly unavailable and lost to science that they may be considered as unpublished.

The names of organizations and journals are given in abbreviated forms, which have been made as concise as seemed consistent with clearness, and it has been an aim to establish some standard forms of abbreviation for the use of petrographers. In this I have been aided by, and have partially followed, the lists in Dana's System of Mineralogy (1892) and the Geologisches Centralblatt (I, 1901), though I have modified their abbreviations in many particulars, chiefly in the direction of still further condensation. A list of the abbreviations generally adopted will be found on pages 45–46.[1]

Rock name.—The name of the rock which has been designated by the author of a paper cited is given under the heading "Rock name." A few minor changes have been made in these names, notably the replacement of eleolite or nepheline by nephelite, and the occasional shortening of some names composed of those of several minerals, as pyroxene-andesite for hypersthene-augite-andesite. A few different names that have been given to the same rock by others appear either under this heading or in the last column.

Remarks.—The column headed "Remarks" contains information for which there is no place elsewhere in the tables or remarks on certain features of the analysis of the rock. Here, also, attention may be called to features of the analysis which may be regarded with suspicion. This information is of necessity stated very concisely, or it may be omitted, since any discussion is out of the question in the small space available. An analysis that has appeared in the first collection is indicated here by the phrase "In W. T.," with page number, so that its earlier and present positions may be readily compared. If the date of the analysis is prior to 1901 and the analysis was not included in the first collection, the phrase "Not in W. T." is used.

COMMENTS ON NORMATIVE NAMES.

Since the publication of the first edition a considerable number of new names have been given to various subrangs and other divisions of the quantitative system, and a few more have been given and changes made in the present work. There has been some duplication of names, the systematic position of some newly named divisions has been incorrectly calculated, the specimens of rock on which other names were based have not been fresh, or the analyses have been inferior.

A short list of new names was published in 1912,[2] but without extended comment. In the original publication of the quantitative system only a few suggestions were made as to the formation of new systematic names. It may therefore be appropriate to discuss here briefly the general principles of nomenclature and the laws of priority applicable to the acceptance or rejection of new names. Comments will also be made on some systematic names, including some given in the original publication and some proposed subsequently. This matter has been discussed with the other authors of the quantitative system, and the views here expressed in general meet with their approval. It may be confessed that the subject is in places somewhat complex and that some inconsistencies may possibly appear in the choice of names in the present compilation.

The rules that were finally suggested for adoption and that are followed in the present work are stated below:

1. Names based on rocks which are obviously or have been shown to be nonigneous or metamorphic, or are certainly or possibly of meteoric origin, have no standing. This rule excludes such names as kodurose and boiranose, sitkose, and many names proposed by Summers, based on australites, moldavites, and other possibly or probably meteoric but not certainly igneous bodies. The subrang names applied to meteorites by Farrington,[3] though appropriate for them, should not be applied to corresponding *terrestrial* igneous rocks.

2. Names should not be applied to divisions regarded as negligible in the original publication of the quantitative system. This applies especially to subrangs of percalcic rangs, such as caledonose and ouenose.

3. If the assigned position of the rock on which the divisional name is based is incorrect because of faulty calculation of the norm or because of other errors, the name is to be regarded as doubtful. This has been found to be the most frequent cause of uncertainty in determining questions of nomenclature, and a certain amount of latitude must be left to the systematist in accepting or rejecting a name so assigned. If the assigned position is not already preempted, and no very serious error of calculation has been made, the name may be allowed to stand as originally applied. Such a case is that of palisadose or of kakoulimose. If, on the other hand, no very serious error in calculation has been made, and the correct position is not named, the new designation may be transferred to the division to which it properly applies, as was the name pienarose. If, however, a very serious error has been

[1] Owing to the considerable length of time over which the writing of the manuscript extended the use of the abbreviations is, unfortunately, not perfectly uniform.

[2] Cross, Whitman, Iddings, J. P., Pirsson, L. V., Washington, H. S., Modifications of the quantitative system of classification of igneous rocks: Jour. Geology, vol. 20, pp. 550–561, 1912.

[3] O. C. Farrington, Field Mus. Pub. 151, 1911.

made in the assignment, as by inadvertently stating that a rock is dopotassic when it is dosodic, and when its proper position is already named, the new name should be dropped. Craigmontose is a case in point. The names to which rule 3 applies are the most numerous, those which have caused most perplexity, and which have given rise to most inconsistencies. The attempt has been made in this publication to treat them with justice and with due regard to the stability of the terminology of the system, and the prevention of confusion, in so far as possible, to future systematic terminologists.

4. A new name should not be based on the analysis of a rock which is obviously not fresh, however good the analysis may be. Mainare, lermondose, and washingtonose are cases in point.

5. A name based on an analysis which is clearly seriously inferior, either in accuracy or completeness, as to the major constituents, is not entitled to recognition. Taurose and vulcanose are examples.

6. The application of names whose roots are taken from small localities to the larger divisions, such as class or subclass, is to be deprecated, as well as of names whose roots are likely to be misinterpreted. Examples of these are gorduniare, rhodare, and piedmontase.

7. Names should not be based on rocks that occupy a transitional position, that is, very close to the border of another division. This rule applies to many names already published within the original tabulation and subsequently, as study of the symbols given in the following pages will abundantly show. They have been allowed to stand, but it is to be hoped that in the future names thus based will not be bestowed. On the other hand, examination of the magmatic symbols in Part I will show the extreme rarity of rocks that are central as regards all the divisions. In practice, therefore, a name may be based on a rock whose symbol includes distal (cf. p. 31) signs (″), but not transitional, indicated by parentheses ( ).

8. The generally accepted laws of priority, such as are enunciated by Dana in his System of Mineralogy, are supposed to hold good as to duplicated names.

9. Other things being equal, it is preferable to base the name of a systematic division on the name of a rock according to that given it in the qualitative system, if such a name be available.

In Part I of the present edition, and in the tables given in Appendix 2, will be found, in their appropriate systematic positions, all the names which have been proposed up to the time of its compilation, and which are deemed worthy of acceptance under the rules stated. A number of these names will now be discussed. All known names have been collected and collated, and the questions of priority and of the acceptance or rejection of names have been discussed, so it is hoped that the present work may serve the future terminologist as a definitive point of departure.

In the following pages of commentary, which embraces only those names which seem to require comment, names that have been rejected are printed in *italics* and those that are recognized as valid are printed in SMALL CAPITALS. Names used in Part I but which are not discussed here are accepted.[1]

I. 2. 1. 1–2. *Radomiltzose.* (H. Summers, 1909). Name rejected because based on the analysis of a moldavite, possibly of meteoric origin. The subrang is here called ARIZONOSE from a quartz dike rock (arizonite) to be described by Spurr and Washington.

I. 2. 1. 3. CARDIFFOSE (Adams and Barlow, 1910). Name objectionable, being based on a "nodule in granite," but accepted.

I. 2. 2. *Moldavase* (H. Summers, 1909). Rejected as based on analyses of moldavites and also as covered by DARGASE (C. I. P. W., 1902).

I. 2. 2. 1–2. *Moldavose* (H. Summers, 1909). Cf. I. 2. 1. 1–2.

I. 2. 3. *Budweisase* and I. 2. 3. 1–2. *Budweisose* (H. Summers, 1909). Cf. I. 2. 1. 1–2.

I. 3. 1. 4. *Taurose* (H. S. Washington, 1904). Name badly chosen as based on an inferior analysis of a keratophyre of the Crimea (Tauric Chersonesus). Replaced by TORDRILLOSE.

I. 3. 3. *Piemanase* and I. 3. 3. 3. *Piemanose* (H. Summers, 1909). Cf. I. 2. 1. 1–2.

I. 3. 3. 4. SUSQUEHANNOSE (F. Bascom, 1905). Has priority over *orangose* (Harwood and Wade, 1906), which really falls in I. 3. 2. 4.

I. 3. 3. 5. *Vulcanose* (C. I. P. W., 1902). Rejected. Name objectionable as based on an inferior analysis.

I. 5. 1. 1. HETTOSE (C. W. Wright, 1915). Erroneously applied to I. 5. 1. 2.

I. 5. 1. 2. *Hettose.* Cf. I. 5. 1. 1.

I. 5. 2. 4. LARVIKOSE. Changed from original *laurvikose* to conform with Brögger's spelling of *larvikite* (Nyt Mag., vol. 44, p. 124, 1906).

I. 5. 3. PIEDMONTASE and I. 5. 3. 4. PIEDMONTOSE (Watson and Taber, 1913). Name objectionable as implying a rock from Piedmont, Italy.

I. 5. 5. 4–5. *Caledonose* (Lacroix, 1911). Rejected under rule 2, subrang name not needed.

I. 6. 1. 5. MARINUPOLOSE (C. I. P. W., 1902). Analysis in United States Geological Survey Professional Paper 14 (p. 213) inferior, but name justified as the typical marinupolite would fall here.

I. 6. 2. 3. *Procenose* (H. S. Washington, 1906). Name objectionable as based on a transitional rock, which really falls in I. 5. 2. 3. Rejected.

I. 6. 2. 4. VIEZZENOSE (C. I. P. W., 1902). Name poorly chosen. Predazzose would have been better.

I. 7. 1. 2. *Craigmontose* (Adams and Barlow, 1909). Rejected. By error called dopotassic when really dosodic. Rock falls in I. 7. 1. 4 (Laugenose).

[1] Additional comments will be found on p. 46.

II. 3. 3. 1. *Urallaose* (H. Summers, 1909). Rejected as based on a moldavite of possibly meteoric origin. Cf. I. 2. 1. 1–2.

II. 3. 3. 4. *Sitkose* (C. I. P. W., 1902). Rejected as based on the analysis of a grauwacke (A. Knopf, pers. com.).

II. 3. 5. 0. *Gordonase* (C. I. P. W., 1902). Rejected, rock not fresh.

II. 5. 1. 3. ILMENOSE (C. I. P. W., 1902). Name objectionable because suggesting Ilmen Mountains and ilmenite.

II. 5. 2. 1. *Boiranose* (L. L. Fermor, 1912) and II. 5. 3. 1. *Kodurose* (L. L. Fermor, 1912). Both of these are rejected as based on more or less hypothetical analyses of metamorphic rocks.[1]

II. 5. 3. 2. AURUNCOSE (H. S. Washington, 1906). Has priority over *Lincolnose* (Ida Ogilvie, 1907) and *baquiose* (W. D. Smith, 1907), which latter was applied to a rock which really falls in II. 5. 3. 3.

II. 5. 5. 5. *Luzonose* (W. D. Smith, 1907). Rejected under rule 2, subrang not needed. Analysis of diorite inferior.

II. 6. 1. LARDALASE and II. 6. 1. 4. LARDALOSE. Changed from original *laurdalase* and *laurdalose*. Cf. I. 5. 2. 4 above.

II. 6. 2. 5. *Neponsetose* (F. Bascom, 1912). Rejected as based on an incorrectly calculated norm and inferior analysis.

II. 7. 1. *Chibinase* and II. 7. 1. 4. *Chibinose* (V. Hackman, 1905). Suggested to replace LUJAVRASE and LUJAVROSE (C. I. P. W., 1902). Rejected on basis of priority of the latter, and because the type rock was originally called lujavrite.[2]

II. 7. 2. VULTURASE and II. 7. 2. 4. VULTUROSE (C. I. P. W., 1902). Based on an old analysis, but some Vulture hauynophyre would fall here. A new analysis of a type specimen falls in II. 8. 2. 4.

II. 8. 2. 2. VESUVOSE (C. I. P. W., 1902). This name should have been applied to II. 7. 2. 2 BRACCIANOSE, in which most of the analyses of Vesuvian lavas fall.

II. 8. 2. 4. MELFOSE. New name, represented by an unpublished analysis of typical hauynophyre of Melfi, Monte Vulture.

III. 3. ATLANTARE (C. I. P. W., 1902). Name very badly chosen and objectionable. Represented only by duplicate analyses of one small specimen. Hibernare would have been better, as Ireland is not represented.

III. 5. 1. 4. PIENAROSE (H. A. Brouwer, 1910). Name incorrectly assigned to III. 6. 1. 4 through erroneous calculation.

III. 5. 5. 4–5. *Ouenose* (A. Lacroix, 1911). Name rejected under rule 2, subrang name not needed.

III. 6. 1. 2. *Washingtonose* (F. L. Ransome, 1908). Name rejected, as the rock is not fresh.

III. 6. 1. 4. PILANDOSE (Washington, 1914). New name to replace Brouwers's pienarose, incorrectly applied, which really falls in III. 5. 1. 4.[3]

III. 6. 2. 2. KAJANOSE (H. A. Brouwer, 1909). Name omitted from list of C. I. P. W., 1902.

III. 6. 4. *Amargase* and III. 6. 4. 4–5. *Amargose*. (F. L. Ransome, 1910.) Names rejected, as the rock analyzed is not fresh (cf. p. 921).

III. 6. 4. 4–5. PAPENOOSE (Lacroix, 1910). The rock analyzed falls in IV. 2. 2. 2. 2 (MONTREALOSE, Adams) but is very close to the border of Class III (cf. p. 721), so that papenoose is accepted in place of *amargose* (F. L. Ransome, 1910), based on a weathered rock.

III. 8. 1. 5. *Tavose* (V. Hackman, 1905). Rejected as based on a very bad analysis (cf. p. 1133).

In the dofemane and perfemane classes, in accordance with a recent publication,[4] the rangs are now based on the ratio $MgO+FeO+Na_2O''$: CaO, instead of on the ratio $MgO+FeO+CaO'':Na_2O''$, as originally used.

In the present work, therefore, in these classes the rang name is consistently that of the earlier section of rang name (with the "i" omitted), which had the same name root.

IV. 1. 2. QUEBECIARE (J. A. Dresser, 1909). Has priority over *Hawaiiare* (R. A. Daly, 1911).

IV. 1. 2. 2. 2. PALISADOSE (J. V. Lewis, 1907). Lewis's olivine diabase falls transitionally in IV. 1. 2. 1. 2 (HILOSE, R. A. Daly, 1911), but the name is accepted as having priority over this and *hudsonose* (G. S. Rogers, 1911) and *thiose* (A. Lacroix, 1911), the last falling in IV. 1. 2. 2. 2.

IV. 2. 2. PAULIARE, IV. 2. 2. 3. PAULASE, and IV. 2. 2. 3. 2. PAULOSE (C. I. P. W., 1902). In original publications incorrectly spelled *paoliare*, *paolase*, and *paolose* (p. 583).

IV. 2. 3. 3. 2. NAKETOSE (A. Lacroix, 1911). Analysis incorrectly placed by Lacroix. In uvaldose, IV. 2. 3. 2. 2. *Tulamose* (C. Camsell, 1913) is rejected, as serious errors were made in the calculation, the rock falling in IV. 2. 2. 2. 2, and naketose has priority.

IV. 3. 3. UTEIARE (E. S. Bastin). Unpublished.

IV. 3. 3. 2. ELDORASE and IV. 3. 3. 2. 3. ELDOROSE (E. S. Bastin). Unpublished.

IV. 4. 1. 1. ARAPAHASE and IV. 4. 1. 1. 4. ARAPAHOSE (Washington and Larsen, 1913). In the original publication (p. 452) the symbol of arapahose was incompletely given as IV. 4. 1. 1, the subrang symbol having been omitted.

IV. 5. CORDILLERARE (E. S. Bastin). Unpublished.

IV. 5. 2. 1. POMERASE and IV. 5. 2. 1. 4. POMEROSE (E. S. Bastin). Unpublished.

V. 1. 3. SAXONIARE (H. S. Washington, 1916). Named in recognition of the name saxonite of Wads-

[1] Cf. Cross, Whitman, Jour. Geology, vol. 22, p. 791, 1914.
[2] Brogger, W. C., Zeitschr. Kryst. Min., vol. 14, p. 204, 1890.
[3] Cf. H. S. Washington, Jour. Geology, vol. 22, p. 751, 1914.
[4] Cross, Whitman, Iddings, J. P., Pirsson, L. V., Washington, H. S., Jour. Geology, vol. 20, p. 552, 1912.

worth, which has priority over the name harzburgite of Rosenbusch.

V. 1. 4. HELVETIARE (H. S. Washington, 1916). In accord with rule 6 this is adopted in place of Grubenmann's *gorduniare* (1908), which bases a subclass name on that of a small valley. It is also appropriate, as most of the known analyses falling here are of rocks in or near Switzerland, a country hitherto unrepresented in the nomenclature. Grubenmann's name root is preserved in rang V. 1. 4. 1. GORDUNASE, and subrang V. 1. 4. 1. 1. GORDUNOSE. The former name is objectionable as liable to confusion with *gordonase* II. 3. 5. 0, now rejected (cf. p. 35).

V. 1. 4. 1. 2. KAKOULIMOSE. The analysis falls transitionally in GUINEOSE V. 1. 5. 1. 2 (cf. p. 741).

V. 3. RHODARE (C. H. Warren, 1908). This name is accepted, though it is objectionable because it is based on the name of a State and because the name suggests the Island of Rhodes rather than the State of Rhode Island. Warren's name root is adopted in V. 3. 5. 1. RHODASE and V. 3. 5. 1. 3. RHODOSE.

V. II. 2. *Mainare*, V. II. 2. 3. *Mainiare*, and V. II. 2. 3. 1. 2. *Lermondose* (E. S. Bastin, 1908). These names are rejected as based on an analysis of a pyrrhotite peridotite which was not fresh and in which the two iron oxides had not been determined (cf. p. 925).

V. II. 5. 3. 3. *Lovingstonose* (Watson and Taber, 1913). The name is rejected as being only provisionally proposed and based on an analysis of a not fresh rock, which falls in a transitional position.[1]

THE MAKING OF THE COLLECTION.

It may be of interest to give a few details regarding the actual making of the collection, as it has grown to proportions so large that such an undertaking will not probably be attempted again in its entirety. For this reason, in forming the present collection, the aim has been to make it as complete as possible, within the time limits set—that is, from 1884 to 1913, inclusive.

For this purpose the excellent library of the United States Geological Survey was thoroughly examined. This library contains about 100,000 volumes and over 100,000 pamphlets, and has a growth of about 2,600 volumes a year, all relating to geology and allied sciences. "It has almost complete sets of the publications of national and State geological surveys, both of America and foreign countries, and sets of all serials devoted to geology. It contains practically all the literature of geology, paleontology, and mineralogy."[2] The only geological library that possibly surpasses it is that of the Geological Society of London.

Every serial,[3] whether published by a survey, society, or other organization, which might conceivably contain petrographic material was examined volume by volume. This examination embraced publications for the years from 1883 into 1914 or 1915, though the end of 1913 was decided on as the final limit. The last number of each one from which analyses were collected will be found in the list of publications examined.

Such nonpetrographical publications as the Paleontologica Indica and the reports of the geological surveys of such States as Ohio, Iowa, and Alabama, which would presumably contain no petrographic descriptions of igneous rocks, were neglected. Purely technical journals, like the Engineering and Mining Journal, Mining World, and Berg- und hüttemännische Zeitung, were only cursorily examined, as they would presumably contain little material of value for the purpose in view. The large collection of more recent separates, dissertations, and other pamphlets was also gone over, as well as my own collection of separates. In addition, many books on the geology of various regions, books of travel, and other volumes were searched for analyses.

The analyses found were copied on cards directly from the publications, with the requisite data as to reference and other necessary features. The make-up of these cards has varied from time to time, and the form finally adopted is shown in actual size in figure 1, giving the obverse and reverse of one as actually filled out and the calculation of the norm.

These cards were first arranged geographically, by countries and localities and percentage of silica. In this way duplication and different places of publication of the same analysis were detected. They were then gone over carefully to determine the rating and general quality, after which the norms of those which were deemed to be fresh and of superior quality were calculated and the symbols noted. All the cards of the superior analyses were then arranged according to the quantitative system, after which they were copied on large sheets which bore the column headings and ruling shown in the tables. A careful reexamination was made of the analyses rejected from Part I, to distribute them among Parts II, III, and IV, during which a few were restored to Part I. On the other hand, during the writing of the manuscript of Part I, reconsideration of a number of analyses led to their relegation to other parts.

Fortunately nearly all the cards used for the preparation of the first edition had been preserved, and these were carefully collated with the analyses published in the first edition and the missing ones copied off, so that all those there given are reproduced here. Appropriate changes were made in the references, especially for the analyses made in the Survey laboratory and published in Bulletins 148, 168, 228, and 419. Many of these have since been republished, in connection with the papers for which they were made, in other later Survey publications. Through the kindness of F. W. Clarke, chief chemist, I had access

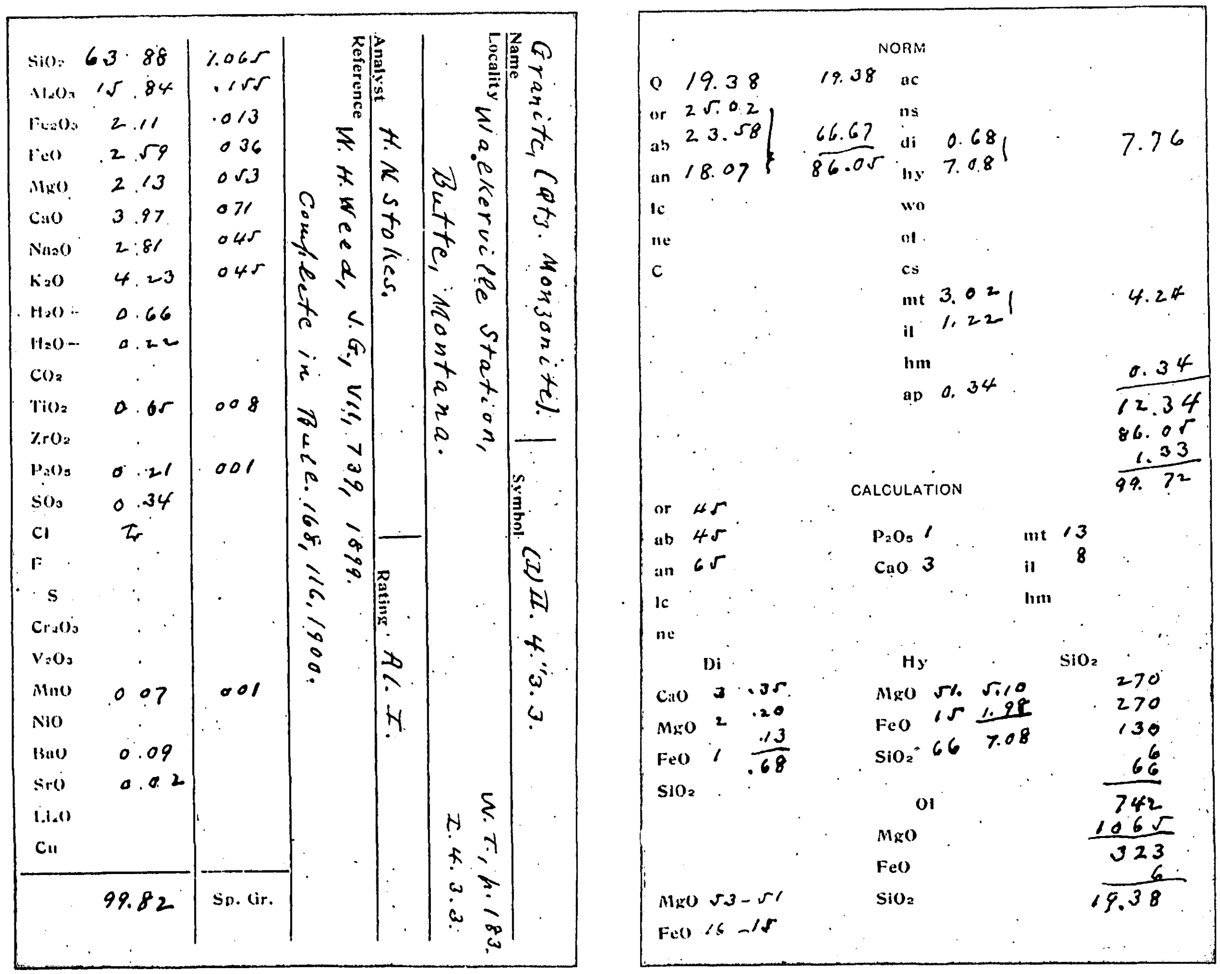
[1] Cf. Watson, T. L., and Taber, Stephen, Virginia Geol. Survey Bull. III-A, p. 127, 1913.

[2] Meyer, H. H. B., Handbook of the libraries in the District of Columbia, p. 23, Washington, 1914.

[3] The Erläuterungen zur geologischen Karte Preussen has not been examined since 1900 as the subsequent volumes all arrived together just as the work was being finished.

to the records of the laboratory, and, with the kind permission of the geologists of the Survey for whom they were made, I have incorporated in this collection many analyses which are not yet published or which are appearing from time to time. The records were examined up to January 1, 1915.

It may be of interest to give some figures regarding the time actively employed in making this collection, including that devoted to the search through the literature, copying off the analysis, calculating the norm, writing the actual manuscript, occasional verification, and other details. On an average the 4,980 analyses in Part I took 45 minutes apiece and those in Parts II, III, and IV took about 30 minutes or more apiece.



[Obverse.] [Reverse.]

FIGURE 1.—Facsimile of card showing form of record of analysis of rock.

LIST OF PUBLICATIONS EXAMINED.

The following lists of publications that have been examined in the search for analyses include both serials and books and papers. Among the serials are the official Government Survey publications, the transactions, proceedings, and other publications of geologic and other scientific societies, and the scientific journals that might contain analyses. All the countries that furnish such material are represented in the books and periodicals available in the libraries visited. In the list arranged by authors there are some papers in serial publications that contain so many analyses or are otherwise so important that they have been deemed worthy of separate citation by authors' names. Neither list is quite complete, for some serials and books have been omitted because they were of minor importance or for other reasons; but the two lists present practically all the existing literature (from 1883 to 1913, inclusive) which contains or might be expected to contain rock analyses.

The serials are arranged alphabetically by countries. Under each country the publications of the official surveys are given first and are followed by journals and publications of societies in general alphabetical order. In the second column is given the last number that has been examined, and in the third the abbreviation that has been adopted and generally used in the tables. The second list is arranged alphabetically by authors and the name of each book or paper is followed by the abbreviation used for it throughout the tables.

SERIAL PUBLICATIONS EXAMINED, ARRANGED BY COUNTRIES.

	Latest number examined.	Abbreviation.
ARGENTINA.		
Ministero de Agricultura, Anales	X, No. 1, 1914	Arg. Min. Agr. An.
Ministero de Agricultura, Boletin	(B); 9, 1914	Arg. Min. Agr. B.
AUSTRALIA.		
Report of the Australasian Association for the Advancement of Science	XIII, (1911), 1912	R. Aust. A. A. S.
Transactions of the Geological Society of Australasia	I, 1892 (all)	Tr. G. Soc. Aust.
New South Wales.		
Department of Mines, Annual Report	(1913), 1914	N. S. W. Dep. Min. A. R.
Geological Survey, Memoirs	No. 6, 1908	N. S. W. G. S. Mem.
Geological Survey, Mineral Resources	No. 17, 1913	N. S. W. G. S. Min. Res.
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Proceedings of the Linnean Society	XXXVIII, (3), 1913	Pr. Lin. Soc. N. S. W.
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Proceedings of the Royal Society of Tasmania	(1913), 1914	Pr. R. Soc. Tas.
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Denkschriften d. K. Akademie d. Wissenschaften (Wien)	LXXXIII, 1913	Ds. Ak. W. Wien.
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Ontario Mines Bureau, Report	XIX, (2), 1913	Ont. Bur. Min. R.
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Abhandlungen d. K. Preussischen Geologischen Anstalt	75, 1913	Ab. Pr. G.-A.
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Jahrbuch d. K. Preussischen Geologischen Anstalt	XXXIV, (I), 1913	Jb. Pr. G.-A.
Sachsen. Erläuterungen zur Geologischen Spezialkarte	1913	Erl. G. Kt. Sachs.
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California Mining Bureau, Bulletin	No. 67, 1914	Cal. M. Bur. B.
Colorado Geological Survey, Bulletin	No. 6, 1913	Col. G. S. B.
Connecticut State Geological and Natural History Survey, Bulletin	No. 20, 1913	Conn. G. S. B.
Georgia Geological Survey, Bulletin	No. 29, 1914	Ga. G. S. B.
Kentucky Geological Survey, Bulletin	No. 21, 1912	Ky. G. S. B.
Maryland Geological Survey, Publications	1913	Md. G. S. Pub.
Maryland Geological Survey, Report	1913	Md. G. S. R.
Michigan Geological Survey, Annual Report	(1908), 1909	Mich. G. S. A. R.
Michigan Geological Survey, Publications	IX, (1), 1903	Mich. G. S. Pub.
Michigan Geological and Biological Survey, Publications	15, 1914	Mich. G. B. S. Pub.
Minnesota Geological and Natural History Survey, Bulletin	X, 1894	Minn. G. Nh. S. B.
Minnesota Geological and Natural History Survey, Final Report	V, 1900	Minn. G. Nh. S. R.
Missouri Bureau of Geology and Mines, Report	XII, 1913	Mo. Bur. G. R.
Missouri Geological Survey, Report	XIII, 1900	Mo. G. S. R.
New Jersey Geological Survey, Annual Report	(1912), 1913	N. J. G. S. A. R.
New Jersey Geological Survey, Bulletin	No. 11, 1913	N. J. G. S. B.

SERIAL PUBLICATIONS EXAMINED, ARRANGED BY COUNTRIES—Continued.

	Latest number examined.	Abbreviation.
UNITED STATES—Continued.		
Official surveys—Continued.		
New York State Museum, Bulletin	No. 172, 1914	N. Y. St. Mus. B.
New York State Museum, Report	65, (2), 1913	N. Y. St. Mus. R.
North Carolina Geological Survey, Bulletin	XXIII, 1911	N. C. G. S. B.
North Carolina Geological Survey, Economic Papers	No. 36, 1914	N. C. G. S. Ec. P.
North Carolina Geological Survey, Publications	III, 1912	N. C. G. S. Pub.
Oklahoma Geological Survey, Bulletin	No. 17, 1914	Okl. G. S. B.
Pennyslvania Topographical and Geological Survey, Report	10, 1913	Penn. G. S. R.
South Carolina Geological Survey, Bulletin	(IV), 2, 1908	S. C. G. S. B.
Tennessee Geological Survey, Bulletin	No. 17, 1914	Tenn. G. S. B.
Texas Geological Survey, Bulletin	No. 9, 1904	Tex. G. S. B.
Vermont, Report of the State Geologist	VIII, 1912	Vt. G. S. R.
Virginia Geological Survey, Bulletin	VIII, 1913	Va. G. S. B.
Washington Geological Survey, Bulletin	No. 16, 1912	Wash. G. S. B.
West Virginia Geological Survey, Report	V(A), 1913	W. Va. G. S. R.
Wisconsin Geological and Natural History Survey, Bulletin	XXVII, 1914	Wisc. G. S. B.
Miscellaneous.		
Academy of Natural Sciences of Philadelphia, Proceedings	LXV, 1913	Pr. Ac. N. Sc.
American Academy of Arts and Sciences, (Boston), Proceedings		Pr. Am. Ac.
American Association for the Advancement of Science, Proceedings	1913	A. A. A. S., Pr.
American Geologist	XXXVI, 1905 (all)	A. G.
American Institute of Mining Engineers, Transactions	XLV, 1913	Tr. A. Inst. M. E.
American Journal of Science	(4), XXXVIII, 1914	A. J. S.
American Philosophical Society (Philadelphia), Proceedings	LII, 1913	Pr. Am. Ph. Soc
California Academy of Science, Proceedings	(4), III, 1913	Pr. Cal. Ac. Sc.
Colorado Scientific Society, Proceedings	X (1911), 1914	Pr. Col. Sc. Soc.
Connecticut Academy of Arts and Sciences, Transactions	XVI, 1911	Tr. Conn. Ac.
Economic Geology	IX, 1914	Ec. G.
Engineering and Mining Journal		Eng. Min. J.
Field Museum Publications, Geological Series	IV (3), 1913	Fld. Mus. Pub.
Geological Society of America, Bulletin	IX, 1913	B. G. S. A.
Journal of Geology	XXI, 1913	J. G.
Mining World		Min. World.
Museum of Comparative Zoology, Bulletin (Cambridge)	IX (2), 1913	B. M. C. Z.
New York Academy of Sciences, Annals	XXIII, 1913–14	An. N. Y. Ac.
Philosophical Society of Washington, Bulletin	XV, 1910	B. Ph. Soc. Wash.
School of Mines Quarterly (New York)	XXXV, 1914	Sch. M. Q.
Smithsonian Miscellaneous Collections	LXI, 1913–14	Smiths. M. C.
Technology Quarterly (Boston)	XXI, 1908	Tech. Q.
United States National Museum, Proceedings	XLV, 1913	Pr. Nat. Mus.
University of California, Publications, Bulletin of the Department of Geology	VII, 1913	Un. Cal. Dep. G. B.
University of Wisconsin, Science series, Bulletin	III, 1909	B. Un. Wisc.
Washington Academy of Sciences, Journal	IV, 1914	J. Wash. Ac.
Washington Academy of Sciences, Proceedings	XIII, 1911	Pr. Wash. Ac.

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	Abbreviation.
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Arsandaux, H., Contribution à l'Étude des Roches Alcalines de l'Est-Africain. Paris, 1906	R. Alc. Est-Afr.
Belowsky, M., in Reiss and Stübel, Hochgebirge d. Republik Ecuador, I, 1892	Hochg. Rep. Ec.
Bergeat, A., Die Aeolischen Inseln (Abh. Bay. Ak. W., XX, 1899)	Aeol. Ins.
Bergt, W., in Reiss and Stübel, Geologische Studien in d. Republik Colombia, Berlin, II, 1899	G. Stud. Rep. Col.
Bogdanovitch, K., Fundort des Marekanits (Russian), St. Petersburg, 1904	Fund. Marek.
Brögger, W. C., Die Eruptivgesteine d. Kristianiagebietes, Kristiania, I, 1894, II, 1895, III, 1898	Eg. Kg.
Brouwer, H. A., Oorsprong en Samenstelling d. Transvaalsche Nephelien Syenieten, Hague, 1910	Trans. Neph. Sy.
Bugge, C., in Report of 2d Norwegian Arctic Expedition in the Fram, Christiania, 1910	R. 2d Fram Exp.
Congrès Géologique Internationale, Comptes Rendus and Guides, XII, Canada, 1913	Cong. G. Int.
Duparc, L., and Mrazec, L., Récherches Géologiques et Petrographiques sur le Massif du Mont Blanc, Soc., Ph. Gen., Mem. XXXIII, 1900.	Mass. Mont Blanc.
Duparc, L., and Pearce, F., L'Oural du Nord, Soc. Ph. Gen. Mem., I, XXXIV (2), 1902; II, XXXIV (5), 1905; III, XXXVI (1), 1909.	Oural Nord.
Duparc, L., Pearce, F., and Ritter, E., Les Roches Eruptivés des Environs de Ménerville (Algerie), Soc. Ph. Gen., Mem. XXXIII, 1900.	Roch. Erup. Men.
Elich, E., in Reiss and Stübel, Hochgebirge d. Republik Ecuador, Berlin, I, 1893	Hochg. Rep. Ec.
Elich, E., in Reiss and Stübel, Vulkanische Gebirge d. Ost-Cordillere, Berlin, I, 1901	Vulk. Geb. Ost-Cord.
Esch, E., in Reiss and Stübel, Hochgebirge d. Republik Ecuador, Berlin, II, 1896	Hochg. Rep. Ec.
Felix, J., and Lenk, H., Beiträge zur Geologie d. Republic Mexico, Leipzig, 1889–1899	Btr. G. Mex.
Festschrift Harry Rosenbusch, Stuttgart, 1906	Ros. Fests.
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Geikie, A., The Ancient Volcanoes of Great Britain, London, 1897	Anc. Volc. G. B.
Gourdon, E., Expédition Antarctique Française, Geographie Physique, etc., Paris, 1908	Exp. Ant. Fr.
Gümbel, C., Geologie von Bayern, II, Munchen, 1894	G. Bayern.
Harada, T., Die Japanischen Inseln, Berlin, 1890	Jap. Ins.
Harker, A., The Bala Volcanic Series, Cambridge, 1889	Bala Volc. Ser.
Harker, A., The Tertiary Igneous Rocks of Skye (Mem. G. S. U. K.), Glasgow, 1904	Ig. R. Skye.
Harrison, J. B., Geology of the Goldfields of British Guiana, London, 1908	G. Goldf. Br. G.
Harrison, J. B., Rocks and Soils of Grenada and Carriacou, London, 1896	Rocks Gren.
Hatch, F. H., and Corstorphine, G. S., Geology of South Africa, London, 1905	G. So. Afr.
Herz, R., in Reiss and Stübel, Hochgebirge d. Republik Ecuador, Berlin, I, 1892	Hochg. Rep. Ec.
Hirschwald, Handbuch d. Bautechnischen Gesteinsprufung, Berlin, 1912	HB. Bautech. Gestp.
Iddings, J. P., Igneous Rocks, II, New York, 1913	Ign. R.
Judd, J. W., The Eruption of Krakatoa; Report of the Committee of the Royal Society of London, 1888	Er. Krak.
Klautzsch, A., in Reiss und Stübel, Hochgebirge d. Republik Ecuador, Berlin, I, 1893, 1898	Hochg. Rep. Ec.
Knop, A., Der Kaiserstuhl in Briesgau, Leipzig, 1892	D. Kaiserstuhl.
Kuch, R., in Reiss und Stübel, Geologische Studien in d. Republik Colombia, Berlin, I, 1892	G. Stud. Rep. Col.
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Lacroix, A., Syenites Nepheliniques de l'Archipel de Los, Nouv. Arch. du Museum, Paris, (5), III, 1911	Arch. Los.
de Lapparent, J., Étude Comparative de quelques Porphyroides Francaises, Paris, 1909	Porph. Fr.
Lepsius, R., Geologie von Attika, Berlin, 1893	G. Attika.
Loewinson-Lessing, F., Geologische Skizze der Besitzung Jushno-Saosersk, Jurjev (Dorpat), 1900	Jush. Saos.
Manasse, E., Contribuzioni allo Studio Petrografico della Colonia Eritrea, Siena, 1909	Stud. Pet. Erit.
Merzbacher, G., Aus der Hochregion des Kaukasus, Leipzig, 1901	Kaukasus.
Osann, A., Beiträge zur Chemischen Petrographie, Stuttgart, II, 1905; III (1), 1914	Osann.
Prior, G. T., National Antarctic Expedition; London, Natural History, I. 1907	Nat. Ant. Exp.
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Reinisch, R., in Deutsche Tiefsee Expedition	D. Tiefs. Exp.
Reinisch, R., in Deutsche Zentral-Afrika Expedition	D. Zentaf. Exp.
Renard, A., Petrology of Oceanic Islands; Reports of Challenger Expedition, Physics and Chemistry, II (VII), 1889.	Pet. Oc. Isl.
Roccati, A., in Duca degli Abruzzi, Il Ruwenzori, Geologia, Milano, II, 1909	Ruwenz.
Rosenbusch, H., Elemente der Gesteinslehre, Stuttgart, 3d edition, 1910	Elem. Gest.
Sabatini, V., I Monti Cimini; Mem. Com. G. Ital., Roma, XV, 1912	Mont. Cim.
Sabatini, V., Il Vulcano Laziale; Mem. Com. G. Ital., Roma, X, 1900	Vulc. Laz.
Schmidt, C., in Sarasin, P. and F., Entwurf einer Geographisch-Geologischen Beschreibung d. Insel Celebes, Wiesbaden, 1901.	Ins. Celeb.
Sobral, J. M., Contributions to the Geology of the Nordingra Region, Upsala, 1913	G. Nord. Reg.
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Verbeek, R. D. M., Verslagen over de Uitbarsting van Krakatau, Batavia, 1884	Krakatau.
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Wagner, P. A. Diamantführende Gesteine Südafrikas, Berlin, 1909	Diam. Gest. S. Afr.
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Washington, H. S., Roman Comagmatic Region, Carnegie Institution of Washington, Publication No. 57, 1906.	R. C. R.
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Williams, J. F., Igneous Rocks of Arkansas; G. S. Ark., A. R. (1890), Little Rock, 1891	Ign. R. Ark.
Von Wolff, F., in Reiss and Stübel, Vulkanische Gebirge d. Ost-Cordillere, Berlin, III, 1904	Vulk. Geb. Ost.-Cord.
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LIST OF ABBREVIATIONS.

Only the English form of words etymologically alike, but in different languages, is given. Some abbreviations of serial publications, which may not be readily self-explanatory, are also given here. These and the others will be found in the List of publications (p. 38).

REFERENCES.

A..........American.
A. A. A. S...American Association for the Advancement of Science.
Aarb.......Aarbog.
Aars.........Aarskrift.
Ab.........Abhandlung.
Ac.........Academy, etc.
Afh.........Afhandlingar.
Afr.........Africa.
A. G........American Geologist (Minneapolis).
Agr........Agriculture.
A. J. S......American Journal of Science (New Haven).
Ak.........Akädemie.
Am........American.
An.........Annals, etc.
Anh........Anhang.
Anz........Anzeiger.
A. R.......Annual Report.
As.........Association.
At.........Atti.
Aust.......Australia.
B..........Bulletin, etc.
Bad........Baden.
B. B........Beilage Band.
Ber........Berichte, Berlin.
B. G. S. A...Bulletin of the Geological Society of America.
Bl..........Blatt.
B. M. C. Z..Bulletin of the Museum of Comparative Zoology.
Btr........Beiträdge.
Bu., Bur...Bureau.
C..........Commission, etc.
Cb.........Centralblatt.
C. I. P. W..Cross, Iddings, Pirsson, Washington.
Com.......Commission, etc.
Cong.......Congress.
C. R.......Comptes Rendus de l'Academie Francaise.
Ct.........Carte.
D..........Deutsch.
Dep.........Department.
Dist.........District.
Ds...........Denkschrift.
Ec. G.......Econòmic Geology.
Ed..........Edinburgh.
Erdk.......Erdkunde.
Erl.........Erläuterungen, Erlangen.
Exc........Excursion.
Exp........Expedition.
Fh..........Forhandlingar.
Fin........Finland.
F. K.......Földtany Közlöny.
Fol........Folio.
Fr..........France, etc.
G..........Geology, etc.
G. B........Great Britain.
Ges........Gesellschaft.
G. F. F....Geologiske Förening i Stockholm Förhändlingar.
G. Kt.......Geologische Karte.
G. Mag......Geological Magazine.
G. S.......Geological Survey.
H..........History.
Hab. Schr..Habilitations Schrif
Hd.........Handlingar, etc.
Hes........Hessen.
Imp........Imperial.
Ind.........India.
In. Diss.....Inaugural Dissertation.
Inst........Institute.
Int.........International.
Ir..........Ireland, Irish.
It..........Italy, etc.
J...........Journal.
Jb..........Jahresbericht.
J. G.........Journal of Geology (Chicago).
Jh..........Jahresheft.
K..........Kaiserlich, Königlich, etc.
Kt.........Karte.
L-A.........Landes-Anstalt.
Lab.........Laboratory.
M..........Mineralogy, etc.
Mag........Magazine.
M. E........Mining Engineers.
Med........Meddelelser, Medical, etc.
Mem.......Memoir, Mémoire, etc.
Min.........Mining, etc.
Mon........Monograph.
Mus........Museum.
N..........New, etc.
Nat.........National, Nature, etc.
Nb..........Notizblatt.
Nf.........Naturforscher.
Nh..........Natural History, etc.
N. J........Neues Jahrbuch für Mineralogie, etc. (Stuttgart).
N. J. B. B..Neues Jahrbuch, Beilage Band.
N. J., Cb...Centralblatt für Mineralogie.
Nk..........Naturkundig, etc.
No..........Number, etc.
Nor.........Norge (Norway).
N. S. W....New South Wales.
Nw.........Naturwissenschaft.
N. Z.......New Zealand.
Ofv.........Ofversigt.
P...........Petrography, etc.
Ph..........Philosophy, etc.
Phys........Physical, etc.
P. P........Professional Paper.
Pr..........Proceedings, etc., Preussen.
Pt..........Part.
Pub.........Publication.
Q..........Quarterly.
Q. J. G. S...Quarterly Journal of the Geological Society (London).
Qld.........Queensland.
R...........Royal, Report.
R-A.........Reichs-Anstalt.
R. C. R....Roman Comagmatic Region (Carnegie Pub. 57, 1906).
Rec.........Records.
Rend......Rendiconti.
Rep.........Report, Republic.
Rev.........Review, etc.
S...........Survey, South.
Sb..........Sitzungsberichte.
Sc..........Science.
Schw.......Schweiz (Switzerland).
Sec.........Secretary.
Sh..........Sheet.
Soc.........Society.
Sp. K......Spezial Karte.
Sv.........Service, Sverige (Sweden).

T. M. P. M. . Tschermak's Mineralogische Petrographische Mittheilungen.
Tr. . . . . Transactions.
Un. . . . . University.
Und. . . . . Undersökning, etc.
Ung. . . . . Ungarn (Hungary).
Ups. . . . . Upsala.
U. S. . . . . United States of America.
U. S. G. S. . . United States Geological Survey.
V. . . . . Volume.
Ver. . . . . Verein.
Vh. . . . . Verhandlung.
Vid. . . . . Videnskab.
W. . . . . Wissenschaft.
Z. . . . . Zeitschrift.
Z. D. G. G. . Zeitschrift der Deutschen Geologischen Gesellschaft.
Z. K. . . . . Zeitschrift für Krystallographie.

NORMATIVE MOLECULES.

A. . . . . apatite subgroup (apatite, fluorite, calcite, pyrite, iron, etc.).
ab. . . . . albite.
ac. . . . . acmite.
an. . . . . anorthite.
ap. . . . . apatite.
C. . . . . corundum.
cc. . . . . calcite.
cm. . . . . chromite.
cs. . . . . Ca_2SiO_4.
di. . . . . diopside.
en. . . . . enstatite.
F. . . . . feldspar subgroup (orthoclase, albite, anorthite).
fa. . . . . fayalite.
fo. . . . . forsterite.
fr. . . . . fluorite.
fs. . . . . ferrosilite ($FeSiO_3$).
H. . . . . hemic subgroup (magnetite, chromite, hematite).
hl. . . . . halite, NaCl.
hm. . . . . hematite.
hy. . . . . hypersthene.
il. . . . . ilmenite.
ir. . . . . iron (metallic).
kp. . . . . kaliophilite.
ks. . . . . potassium metasilicate.
L. . . . . lenad subgroup (leucite, nephelite, halite, thenardite).
lc. . . . . leucite.
M. . . . . mitic subgroup (magnetite, chromite, hematite, ilmenite, titanite, perofskite, rutile).
mt. . . . . magnetite.
nc. . . . . sodium carbonate (Na_2CO_3).
ne. . . . . nephelite.
ns. . . . . sodium metasilicate.
O. . . . . olivine subgroup (fayalite, forsterite, Ca_2SiO_4).
ol. . . . . olivine.
or. . . . . orthoclase.
P. . . . . pyroxene subgroup (acmite, sodium metasilicate, potassium metasilicate, diopside, wollastonite, hypersthene).
pf. . . . . perofskite.
pr. . . . . pyrite.
Q. . . . . quartz.
ru. . . . . rutile.
sp. . . . . spinel.
T. . . . . tilic subgroup (ilmenite, titanite, perofskite, rutile).
th. . . . . thenardite, Na_2SO_4.
tn. . . . . titanite.
wo. . . . . wollastonite.
Z. . . . . zircon.

MISCELLANEOUS.

bet. . . . . between.
cor. . . . . corrected.
E. . . . . east.
ign. . . . . ignition.
lab. . . . . laboratory.
M. . . . . miles.
N. . . . . north.
n. . . . . near.
n. d. . . . . not determined.
org. . . . . organic matter.
p. . . . . page.
Pers. com. . . Personal communication in advance of publication.
R. . . . . rang.
rec. . . . . records.
Ref. . . . . reference.
S. . . . . south.
sp. gr. . . . . . . specific gravity.
SR. . . . . subrang.
tr. . . . . trace.
W. . . . . west.
X. . . . . rare earths, not identified, insoluble in melted $KHSO_4$.

ADDENDA TO NORMATIVE NAMES (page 35).

II.7.1.5. ANTANGAINOSE. Name proposed by A. Lacroix (personal communication); represented by a rock from Madagascar (p. 581).

II.7.2.3. BAWEANOSE. Name proposed by J. P. Iddings (personal communication); represented by a rock from Bawean Island (p. 581).

III.9.1.1. MADUPOSE. Name originally applied to III.9.1.2. The single analysis is transitional as to subrang (p. 701). Transferred to this position (perpotassic), as it actually falls here and because it thus harmonizes better with orendose (III.5.1.1) and wyomingose (III.6.1.1). Also, III.9.1.2 is not represented by an analysis.

IV.2.3.1. *Texase.* Rejected and replaced by UVALDOSE, to conform with a modification of rules for nomenclature suggested by C.I.P.W. (Jour. Geology, vol. 20, p. 553, 1912).

ANALYSES.

Part I.—SUPERIOR ANALYSES OF FRESH ROCKS.

CLASS I. PERSALANE. (C. I. P. W., 1902.)

RANG. NOT NEEDED.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	96. 16	1. 31	0. 02	0. 09	0. 03	trace	0. 56	0. 30	0. 51	0. 08					99. 06	
A3. III	1. 603	.013	—	.001	001	—	.009	.003								
2	98. 77	1. 05												Fe_3O_4 0. 19	100. 01	
A4. IV	1. 646															
3	97. 65	2. 01												Fe_3O_4 0. 34	100. 00	
A4. IV	1. 628															

CLASS I. PERSALANE.

RANG 1-2. PREALKALIC. DARGASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	93. 38	3. 09	0. 72	n. d.	0. 43	0. 34	0. 50	1. 32	n. d.		0. 12	none			99. 90	
A2. II	1. 556	.030	.004	(.008)	.011	.006	.008	.014			.002	—				
2	92. 59	3. 52	0. 38	0. 14	0. 18	0. 08	0. 25	2. 61	0. 28		0. 23		none		100. 26	
A2. II	1. 543	.034	.002	.002	.005	.001	.004	.028			.003		—			
3	75. 51	14. 28	1. 09	0. 38	0. 28	0. 34	0. 20	4. 69	3. 36		trace	trace	trace	Cl trace F 0. 20	100. 33	
A3. III	1. 259	.140	.007	.006	.007	.006	.002	.050			—	—	—			
4	81. 25	9. 03	0. 63	0. 40	2. 48	trace	0. 25	1. 82	2. 81	1. 09	0. 08	trace	trace	S 0. 35 BaO 0. 05	100. 24	
A1. I	1. 354	.088	.004	.006	.062	—	.004	.020			.001	—	—			
5	80. 99	12. 21	0. 038	0. 60	0. 40	0. 07	0. 31	2. 47	2. 29						99. 72	
A3. III	1. 350	.120	.002	.008	.010	.001	.005	.026								
6	74. 21	14. 44	2. 33	0. 56	0. 30	0. 30	0. 23	4. 56	2. 18	0. 63	0. 44	0. 14		FeS_2 0. 43	100. 66	
A 2. II	1. 237	.142	.014	.008	.008	.005	.004	.049			.005	.001				
7	75. 23	13. 58	1. 21	2. 59	0. 06	0. 28	0. 31	3. 68	1. 96			0. 30	0. 33	S 0. 05 CuO 0. 20	99. 78	2. 430
A. 2. II	1. 254	.133	.008	.036	.002	.005	.005	.039				.002	.005			
8	77. 69	12. 78	2. 05	1. 45	1. 15	1. 26	0. 78	2. 78							99. 94	
A3. III	1. 295	.125	.013	.020	.029	.022	.013	.030								
9	79. 69	13. 49	0. 14	2. 08	0. 66	0. 46	0. 08	2. 71							99. 31	
A3. III	1. 328	.132	.001	.030	.017	.009	.001	.028								

ORDER 1. PERQUARIC. VICTORARE. (C. I. P. W., 1902.)

SUBRANG. NOT NEEDED.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.1″.1.4.	Q 91.74 hy 0.23 or 1.67 ab 4.72	Hardrigg, Gill, Eskdale, Cumberland, England.	A. R. Dwerryhouse.	A. R. Dwerryhouse, Q. J. G. S., LXV, p. 64, 1909.	Granite.	Margin of No. 118, I.4.1.3.
2	I.1.0.0.	Not calculated	Adriaans Kop, Secucuni Land, Transvaal.	C. C. Gardthausen.	A. L. Hall, Tr. G. Soc. S. Afr., XIII, p. 14, 1911.	Quartz rock.	97.43 of SiO_2 is quartz.
3	I.1.0.0.	Not calculated	Signal Hill, Secucuni Land, Transvaal.	C. C. Gardthausen.	A. L. Hall, Tr. G. Soc. S. Afr., XIII, p. 14, 1911.	Quartz rock.	97.15 of SiO_2 is quartz.

ORDER 2. DOQUARIC. BELGARE. (C. I. P. W., 1902.)

SUBRANG 1-2. PREPOTASSIC. ARIZONOSE. (SPURR AND WASHINGTON, UNPUBLISHED.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.(1)2.″2.2(3).	Q 83.70 hy 1.89 or 7.78 il 0.30 ab 4.19 an 1.67 C 0.20	Mount Orient, Pelham, Hampshire County, Massachusetts.	E. T. Allen.	B. K. Emerson, A. J. S., XL, p. 215, 1915.	Northfieldite (quartz rock).	Pers. com.
2	I.″2.1.(1)2.	Q 80.64 hy 0.50 or 15.57 il 0.30 ab 2.10 hm 0.38 an 0.28 ru 0.08 C 0.10	Helvetia, Arizona.	H. S. Washington.	Spurr and Washington, not published.	Arizonite (quartz dike rock).	
3	I.2(3).1.1.	Q 55.62 hy 0.70 or 27.80 mt 1.39 ab 1.05 hm 0.16 an 1.67 C 8.36	Tonopah, Nevada.	W. F. Hillebrand.	J. E. Spurr, Ec. G., I, p. 375, 1906.	Muscovite granite.	No feldspar.
4	I″.″2.1.″2.	Q 68.82 hy 6.33 or 11.12 mt 0.93 ab 2.10 il 0.15 C 6.53	Bully Hill mine, Shasta County, California.	E. T. Allen.	J. S. Diller, U. S. G. S. B. 213, p. 127, 1903.	Metarhyolite.	
5	I.2.1.″2.	Q 68.76 hy 1.79 or 14.46 mt 0.46 ab 2.62 an 0.28 C 8.98	Heidenstein, Münsterthal, Schwarzwald.	Student of Bunsen.	A. Schmidt, Ref., N. J., 1889, I, p. 95.	Porphyry.	In W. T., p. 123.
6	I.2(3).1.1″.	Q 54.42 hy 0.80 or 27.24 mt 0.70 ab 2.10 il 0.76 an 0.56 hm 1.76 C 8.87 ap 0.34	Häuselberg, Hesse.	Surv. lab.	G. Klemm, Erl. G. Kt. Hes., Bl. Birkenau, p. 33, 1905.	Granite.	
7	I.″2.1.1(2).	Q 57.30 hy 4.56 or 21.68 mt 1.86 ab 2.62 ap 0.67 C 9.08	Kupferberg, Harz.	K. Eyme.	O. H. Erdmannsdoerfer, Jb. Pr. G. L.-A., XXXII, (2), p. 185, 1912.	Quartz-mica rock.	Border of granite.
8	I″.2″.2″.2.	Q 57.42 hy 3.82 or 16.68 mt 3.02 ab 6.81 an 6.12 C 6.12	Radomiltz, n. Budweis, Bohemia.	C. v. John.	C. v. John, Jb. G. R.-A., Wien, p. 473, 1889.	Moldavite.	Meteoric? Not in W. T.
9	I.2.2.1.⊙	Q 65.40 hy 5.53 or 15.57 mt 0.23 ab 0.52 an 2.50 C 9.59	Mount Bischoff, Tasmania.	H. Sommerlad.	A. v. Groddeck, Z. D. G. G., XXXIX, p. 80, 1887.	Porphyry.	In W. T., p. 123.

CLASS I. PERSALANE—Continued.

RANG 1-2. PREALKALIC. DARGASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	81.43	13.70	1.58	n. d.	0.06	0.37	1.02	1.28	0.92						100.36	
A4. IV	1.357	.134	.010	(.020)	.002	.006	.016	.014								
2	80.36	11.12	1.77	n. d.	0.56	0.67	1.82	2.47	1.96						100.73	
A3. III	1.339	.109	.011	(.022)	.014	.012	.030	026								
3	82.61	8.30	2.54	0.45	n. d.	0.26	1.44	2.98	0.75		0.20				99.53	
A3. III	1.377	.081	.016	.006	—	.005	.023	.032			.003					

RANG 1-2. PREALKALIC. DARGASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	84.15	9.67	0.51	0.07	0.04	0.53	2.65	1.57	0.74	0.21	trace		trace	F 0.02 SrO trace	100.14	
A3. III	1.403	.095	.003	.001	.001	.010	.043	.017			—		—			
2	76.71	12.81	0.80	1.72	0.40	1.90	1.76	1.48	0.77	0.33	0.14	0.48	0.27	ZrO_2 0.03 S 0.06	99.66	2.613
A1. I	1.279	.126	.005	.024	.010	.034	.028	.016			.002	.003	.004			
3	74.89	15.11	1.06	2.26	0.82	1.67	2.06	0.73	0.50	0.31		0.27	0.22		99.90	
A2. II	1.248	.148	.007	.031	.021	.030	.033	.008				.002	.003			

RANG 3. ALKALICALCIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	80.55	9.87	2.13	n. d.	0.81	2.21	0.42	2.43	1.06						99.48	
A4. IV	1.343	.096	.013	(.026)	.020	.039	.007	.025								
2	82.68	9.56	n. d.	1.13	1.52	2.06	0.63	2.28	n. d.				0.18		100.04	
A4. IV	1.378	.094	—	.015	.038	.037	.010	.024					.003			
3	82.28	10.08	n. d.	2.03	0.98	2.24	0.28	2.20	0.06						100.15	
A4. IV	1.371	.099	—	.028	.025	.040	.005	.023								
4	78.61	12.01	0.16	3.09	1.39	1.62	0.44	3.06	n. d.				0.11		100.49	
A3. III	1.310	.118	.001	.043	.035	.029	.007	.033					.002			
5	77.96	12.20	0.14	3.36	1.48	1.94	0.61	2.70	n. d.				0.10		100.49	
A3. III	1.299	.120	.001	.047	.037	.035	.010	.029					.001			

RANG 3. ALKALICALCIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	77.6	11.2	1.8	1.2	1.7	2.0	1.3	2.0	0.9						99.7	
B3. IV	1.293	.110	.011	.017	.043	.036	.021	.021								

ORDER 2. DOQUARIC. BELGARE—Continued.

SUBRANG 3. SODIPOTASSIC. CARDIFFOSE. (ADAMS AND BARLOW, 1910.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.2.″2.3.	Q 68.58 hy 2.84 or 7.78 ab 8.38 an 1.67 C 10.00	Pine Lake, Cardiff Township, Ontario.	N. N. Evans.	F. D. Adams, B. G. S. A., IX, p. 169, 1898.	Nodule in granite.	Also in Can. G. S., Mem. 6, p. 134, 1910. Cf. No. 1, I.3.1.2. In W. T., p. 123.
2	I.2(3).″2.3.	Q 56.58 hy 4.30 or 14.46 ab 15.72 an 3.34 C 4.18	Grainsgill, Carrock Fell, England.	L. J. Spencer.	A. Harker, Q. J. G. S., LI, p. 141, 1895.	Greisen.	In W. T., p. 123.
3	I.2″.1″.″3.	Q 62.22 mt 0.70 or 17.79 il 0.46 ab 12.05 hm 2.08 an 1.39 C 2.14	Chemin Auriasque, Esterel, France.	Pisani.	A. Michel Levy, B. Soc. G. Fr., XXI, p. 130, 1912.	Porphyry.	

SUBRANG 4-5. PRESODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.2(3).(1)2.4.	Q 61.38 hy 0.10 or 9.45 mt 0.53 ab 22.53 hm 0.32 an 2.78 C 2.55	Belmont, Nevada.	H. N. Stokes.	J. E. Spurr, A. J. S., X, p. 358, 1900.	Beresite.	In W. T., p. 375.
2	I.2(3).2(3).(3)4.	Q 56.16 hy 3.77 or 8.90 mt 1.16 ab 14.67 il 0.30 an 6.67 ap 1.01 C 5.92	Koshinzan, Sumiyoshi, Settsu, Japan.	N. Yoshida.	S. Kozu, pers. com.	Granite.	
3	I″.2″.2(3).4.	Q 54.48 hy 5.66 or 4.45 mt 1.62 ab 17.29 ap 0.67 an 6.39 C 8.57	Ballandean, Queensland.	G. R. Patten.	A. R. Agric, Chem. Qld., 1912.	Granite.	H. C. Richards, pers. com.

SUBRANG 1-2. PREPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.2″.3.2.	Q 61.62 hy 5.43 or 13.90 ab 3.67 an 10.84 C 2.55	Garrarus, County Waterford, Ireland.	Jones and Robinson.	F. W. C. Reed, Q. J. G. S., LVI, p. 679, 1900.	Felsite.	In W. T., p. 123.
2	I.2″.3.2.	Q 62.64 hy 6.18 or 13.34 ab 5.24 an 10.29 C 2.35	Budweis, Bohemia.	C. v. John.	C. v. John, Vh. G. R.-A. Wien, 1899, p. 179.	Moldavite.	Meteoric? Not in W. T.
3	I.2.3″.″2.	Q 64.26 hy 6.20 or 12.79 ab 2.62 an 11.12 C 3.16	Radomiltz, n. Budweis, Bohemia.	C. v. John.	C. v. John, Jb. G. R.-A. Wien, 1889, p. 473.	Moldavite.	Meteoric? Not in W. T.
4	I(II).2(3).″3.″2.	Q 55.98 hy 9.31 or 18.35 mt 0.23 ab 3.67 an 8.06 C 5.00	Trebitsch, Bohemia.	C. v. John.	C. v. John, Vh. G. R.-A., Wien, 1899, p. 179.	Moldavite.	Meteoric? Not in W. T.
5	I(II).2(3).3.2.	Q 54.66 hy 9.90 or 16.12 mt 0.23 ab 5.24 an 9.73 C 4.69	Trebitsch, Bohemia.	C. v. John.	C. v. John, Vh. G. R.-A., Wien, 1899, p. 179.	Moldavite.	Meteoric? Not in W. T.

SUBRANG 3. SODIPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I″.2(3).3.3.	Q 55.20 hy 5.09 or 11.68 mt 2.55 ab 11.00 an 10.01 C 3.26	Sturmhaube Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XV, p. 115, 1902.	Granite.	

CLASS I. PERSALANE—Continued.

RANG 4. ALKALICALCIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	77.21	15.38	0.72	0.93	0.42	2.18	2.26	0.50	0.39	0.02					100.01	
A3. III	1.287	.151	.004	.013	.011	.039	.036	.005								

RANG 4. DOCALCIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	77.75	12.90	n. d.	2.60	0.22	3.05	0.26	2.58	0.06						99.46	
A4. IV	1.296	.126	—	.036	.006	.055	.004	.028								

RANG 4. DOCALCIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	77.52	16.78	n. d.	0.84	0.32	2.56	1.21	0.62	0.33						100.18	
A4. IV	1.292	.165	—	.012	.008	.046	.019	.007								

CLASS I. PERSALANE.

RANG 1. PERALKALIC. ALASKASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	76.81	10.96	1.18	0.08	0.14	none	0.26	8.50	1.17	0.48	0.13	trace	none		99.71	
A2. II	1.280	.107	.008	.001	.004	—	.004	.090			.002	—	—			
2	76.77	12.63	1.13	0.27	0.07	0.21	0.30	6.43	1.55	0.49	0.18	0.04	none		100.07	
A2. II	1.280	.124	.007	.004	.002	.004	.005	.068			.002	—	—			
3	79.19	9.88	0.21	0.63	0.55	none	0.66	7.68	0.54	0.03	none	none	none	CO_2 0.64	100.01	
A2. II	1.320	.097	.001	.009	.014	—	.011	.082			—	—	—			
4	78.11	11.50	1.60	n. d.	0.25	0.51	0.54	6.26	1.90		0.08				100.75	
A4. IV	1.302	.113	.010	[.020]	.006	.009	.009	.067			.001					
5	77.90	11.61	0.86	n. d.	0.75	0.42	0.47	7.20	1.76						100.97	
A4. IV	1.298	.114	.005	[.010]	.019	.007	.008	.077								
6	75.71	13.50	0.85	n. d.	1.02	0.64	0.38	5.75	2.37						100.22	
A4. IV	1.262	.132	.005	[.010]	.026	.011	.006	.062								
7	72.92	13.70	0.93	1.10	0.25	0.29	0.19	9.10	0.69		0.36		0.25		99.78	
A2. II	1.215	.134	.006	.015	.006	.005	.003	.097			.005		.003			
8	82.59	9.81	0.10	0.42	0.20	0.17	0.49	5.86	0.23			0.13		CO_2 0.05 SO_3 0.05 Org. 0.07	100.17	2.641
A2. II	1.377	.096	.001	.006	.005	.003	.008	.063				.001				
9	78.16	11.01	0.10	0.63	0.15	0.30	0.36	7.97	0.17	0.21	0.32	0.07	trace	CO_2 none ZrO_2 none SO_3 none Cl 0.04 FeS_2 0.45 Cr_2O_3 none NiO none BaO 0.18 SrO none CuO trace	100.12	2.589
A1. I	1.303	.109	.001	.009	.004	.005	.006	.085			.004	—	—			

ORDER 2. DOQUARIC. BELGARE—Continued.

SUBRANG 4-5. PRESODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.2(3).3.(4)5.	Q 56.58 hy 2.29 or 2.78 mt 0.93 ab 18.86 an 10.84 C 7.24	Bagan, Luzon, Philippine Islands.	Govt. lab.	A. J. Eveland, Min. Bureau Manila. B. 4, p. 41, 1905.	Granite.	

SUBRANG 1-2. PREPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.2(3).(3)4.(1)2.	Q 57.12 hy 5.35 or 15.57 ab 2.10 an 15.29 C 3.98	Radomiltz, n. Budweis, Bohemia.	C. v. John.	C. von John, Jb. G. R-A. Wien, 1889, 473.	Moldavite.	Igneous? Not in W. T.

SUBRANG 4-5. PRESODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
I	I.2.(3)4.4.	Q 61.44 hy 2.38 or 3.89 ab 9.96 an 12.79 C 9.49	Bethel, Vermont.	C. F. McKenna	T. N. Dale, U. S. G. S. B. 404, p. 111, 1909.	Granite.	

ORDER 3. QUARFELIC. COLUMBARE. (C. I. P. W., 1902).

SUBRANG 1. PERPOTASSIC. BISBOSE. (H. S. WASHINGTON, 1916.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.3.1.1.⊙	Q 42.72 hy 0.40 or 50.04 il 0.30 ab 2.10 hm 1.18 C 1.33	Near Waco Junction, Bisbee Quadrangle, Arizona.	G. Steiger.	F. L. Ransome, U. S. G. S. P. P. 21, p. 77, 1904.	Granite porphyry.	Also in U.S.G.S. Fol. 112, p. 7, 1904.
2	I.3.1.1″.	Q 49.92 hy 0.20 or 37.81 mt 0.46 ab 2.62 il 0.30 an 1.11 hm 0.80 C 4.79	Jarbridge District, Nevada.	G. Steiger.	F. C. Schrader, U. S. G. S. rec. lab.	Rhyolite.	
3	I.3.1.1(2).	Q 44.40 hy 2.46 or 45.59 mt 0.23 ab 5.76 C 0.41	Bahia Rodriguez, Skyring Water, Patagonia.	M. Dittrich.	P. Quensel, B. G. Inst. Ups., XII, p. 28, 1913.	Felsite porphyry.	"Very fresh."
4	I.3.1(2).1(2).	Q 48.18 hy 3.11 or 37.25 il 0.15 ab 4.72 an 2.50 C 3.06	Col des Sacs, Esterel, France.	Pisani.	A. Michel-Levy, B. Serv. Cte. G. Fr., XXI, No. 130, p. 40, 1912.	Pyromeride.	
5	I.3.1″.1(2).	Q 44.70 hy 3.22 or 42.81 ab 4.19 an 1.95 C 2.24	Villetelle, La Creuse, France.	Pisani.	L. de Launay, B. Sv. Ct. G. Fr. XI, No. 83, p. 76, 1902.	Quartz porphyry.	
6	I.3.1.1″.	Q 47.76 hy 3.92 or 34.47 ab 3.14 an 3.06 C 5.41	Gueret, La Creuse, France.	Pisani.	L. de Launay, B. Sv. Ct. G. Fr., XI, No. 83, p. 76, 1902.	Porphyry.	
7	I.3(4).1.1.	Q 35.52 hy 1.52 or 53.93 mt 1.39 ab 1.57 il 0.76 an 1.39 C 2.96	Suppatsch, Jukkasjarvi, Lapland.	H. Santesson.	F. Svenonius, Sver. G. Unds., No. 183, p. 15, 1900.	Porphyry.	Not in W. T.
8	I.″3.1.1(2).	Q 56.46 hy 1.16 or 35.03 mt 0.23 ab 4.19 ap 0.34 C 2.55	Wormkethal, Brocken, Harz.	Pufahl.	O. H. Erdmannsdoerfer, Jb. Pr. G. L.-A., XXVII, p. 352, 1906.	Porphyroid.	Border of granite.
9	I. 3.1.1″.	Q 44.34 hy 0.93 or 47.26 mt 0.23 ab 3.14 il 0.61 an 1.39 C 1.33	Bee Mountain Gap, Cobar, New South Wales.	W. A. Greig.	E. C. Andrews, N. S. W. G. S., Min. Res. No. 17, p. 65, 1913.	Quartz-orthoclase porphyry.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. ALASKASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	78.83	10.88	1.63	n. d.	0.35	0.22	2.13	5.31	0.32						99.67	
A4. IV	1.314	.106	.010	(.020)	.009	.004	.034	.057								
2	79.75	10.47	0.64	0.92	0.13	0.15	1.36	6.01	0.60	0.08	0.15	trace	trace	ZrO_2 0.05 S none NiO none BaO 0.06 SrO trace Li_2O trace	100.37	
A1. I	1.329	.103	.004	.013	.003	.003	.022	.064			.002	—	—			
3	76.10	12.95	0.65	0.09	0.14	0.12	2.36	6.50	0.48	0.17	0.07	0.02	trace	CO_2 none NiO none	99.65	
A2. II	1.268	.127	.004	.001	.004	.002	0.38	0.69			.001	—	—			
4	75.67	12.43	2.27	0.15	none	trace	2.01	6.73	0.41				trace		99.67	
A3. III	1.261	.122	.014	.002	—	—	.032	.071					—			
5	77.36	11.37	0.31	0.36	0.14	0.30	1.38	7.28	0.26	0.55	0.16	0.03	0.03	CO_2 0.06 S 0.33 Cr_2O_3 none BaO 0.05	99.97	
A1. I	1.289	.111	.002	.005	.004	.005	.023	.078			.002	—	—			
6	75.39	13.65	0.38	0.18	0.15	0.51	1.84	6.81	1.13		trace	trace	0.14		100.18	
A2. II	1.257	.134	.002	.003	.004	.009	.030	.072			—	—	.002			
7	74.72	12.80	0.59	0.83	0.04	0.62	2.20	6.32	0.94	0.55	0.44	0.02	0.13	CO_2 0.21 ZrO_2 0.02 S 0.02 BaO 0.01 SrO 0.01	100.47	
A1. I	1.245	.125	.004	.011	.001	.011	.035	.067			.006	—	.002			
8	74.40	14.43	0.22	0.89	0.07	0.58	1.76	6.56	0.92	0.15	0.12	0.22	trace	F 0.04 BaO trace SrO none Li_2O trace	100.36	
A2. II	1.240	.142	.001	.012	.002	.010	.028	.070			.002	.002	—			
9	73.23	12.73	0.99	0.16	0.22	0.61	1.91	5.17	4.51	0.53	0.09	0.02	trace	BaO 0.02 SrO none	100.19	
A2. II	1.221	.125	.006	.002	.006	.011	.030	.056			.001	—	—			
10	76.71	11.68	1.01	1.50	0.16	0.44	0.80	6.65	0.61				0.09		99.65	
A3. III	1.279	.115	.006	.021	.004	.008	.013	.071					.001			
11	77.10	10.64	1.55	n. d.	1.05	none	0.64	5.98	2.50						99.46	
A4. IV	1.285	.104	.010	(.020)	.026	—	.010	.064								
12	76.40	10.60	1.40	n. d.	0.38	none	2.57	7.45	1.60		0.06				100.46	
A3. III	1.273	.104	.009	—	.010	—	.042	.080			.001					
13	76.25	11.10	1.68	0.45	0.26	0.39	1.16	7.85	1.00		0.13				100.27	
A3. III	1.271	.109	.011	.006	.007	.007	.019	.084			.002					
14	75.90	11.43	1.70	0.30	0.26	none	2.47	6.40	0.89		0.06				99.41	
A3. III	1.265	.112	.011	.004	.007	—	.040	.068			.001					
15	79.21	9.93	0.98	trace	0.40	0.10	2.05	5.25	1.51						99.43	
A30. III	1.320	.097	.006	—	.010	.002	.033	.056								
16	75.69	11.64	1.30	0.84	0.20	0.75	2.42	6.16	0.66		0.16	0.04	0.21		100.07	
A2. II	1.262	.114	.008	.012	.005	.014	.039	.066			.002	—	.003			

ORDER 3. QUARFELIC. COLUMBARE—Continued.

SUBRANG 2. DOPOTASSIC. MAGDEBURGOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.3.1.2(3).	Q 43.86 hy 3.54 or 31.69 ab 17.82 an 1.11 C 1.12	Pine Lake, Ontario.	Norton-Evans.	F. D. Adams, B. G. S. A., IX, p. 169, 1898.	Granite.	Cf. No. 1. I.2.2.3. In W. T., p. 125.
2	I.3.1.2.⊙	Q 47.82 hy 1.22 or 35.58 mt 0.93 ab 11.53 il 0.30 an 0.83 C 1.43	Blowing Rock, Watauga County, North Carolina.	W. F. Hillebrand.	T. L. Watson, J. G., XII, p. 223, 1904.	Quartz porphyry.	Also in U. S. G. S. B. 168, p. 52, 1900. In W. T., p. 125.
3	I.3(4).1.2(3).	Q 37.08 hy 0.40 or 38.36 il 0.15 ab 19.91 hm 0.65 an 0.56 C 1.84	Felch Mountain, Michigan.	H. N. Stokes.	H. L. Smyth, U. S. G. S. Mon. 36, p. 389, 1899.	Granite.	In W. T., p. 125.
4	I.3''.1.2.	Q 38.58 mt 0.46 or 39.48 hm 1.92 ab 16.77 C 1.94	Little Montreal River, Keweenaw Point, Michigan.	F. P. Burrall.	L. L. Hubbard, Mich. G. S., VI, pt. 2, p. 28, 1898.	Felsite.	Not in W. T.
5	I.3''.1.2.	Q 40.08 hy 0.53 or 43.37 mt 0.46 ab 12.05 il 0.30 an 1.39 C 0.51	Bachelor Mine, Creede, Colorado.	W. C. Wheeler.	W. H. Emmons, U. S. G. S. Rec. lab.	Rhyolite.	
6	I.3(4).1''.2.	Q 37.38 hy 0.40 or 40.03 mt 0.23 ab 15.72 il 0.30 an 2.50 hm 0.16 C 2.35	Silver Cliff, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. A. R. 17, II, p. 324, 1896.	Rhyolite.	In W. T., p. 125.
7	I.3(4).1(2).2''.	Q 36.42 hy 0.50 or 37.25 mt 0.93 ab 18.34 il 0.91 an 3.06 C 1.22	Lake Fork, San Cristobal quadrangle, Colorado.	R. C. Wells.	W. Cross, U. S. G. S. rec. lab.	Rhyolite.	
8	I.3''.1.2.	Q 38.10 hy 1.39 or 38.92 mt 0.23 ab 14.67 il 0.30 an 0.83 ap 0.67 C 4.18	Currant Creek, Pikes Peak, Colorado.	W. F. Hillebrand.	E. B. Mathews, U. S. G. S. B. 148, p. 160, 1897.	Granite (sheared).	In W. T., p. 125.
9	I.3.1(2).2(3).	Q 40.62 hy 0.60 or 31.14 mt 0.23 ab 15.72 il 0.15 an 3.06 hm 0.80 C 2.96	Buena Vista Peak, Amador County, California.	W. F. Hillebrand.	H. W. Turner, J. G., III, p. 407, 1897.	Rhyolite.	Also in U. S. G. S. A. R. 17, II, p. 721, 1896. In W. T., p. 125.
10	I.3.1''.(1)2.	Q 44.34 hy 2.51 or 39.48 mt 1.39 ab 6.81 an 2.22 C 2.35	Banavie, Argyllshire, Scotland.	G. Wilson.	G. S. Un. K., Sum. Prog., 1898, p. 43.	Granite.	Not in W. T.
11	I.3.1.(1)2.	Q 47.70 hy 5.24 or 35.58 ab 5.24 C 3.06	Collet Redon, Estèrel, France.	Pisani.	A. Michel Levy, B. Sv. Ct. G. Fr., XXI, No. 130, p. 40, 1912.	Pitchstone.	
12	I.3(4).1.2.	Q 35.82 ac 3.70 or 44.48 ns 1.22 ab 12.58 hy 1.00 il 0.15	Colle de la Motte, Esterel, France.	Pisani.	A. Michel Levy, B. Sv. Ct. G. Fr., XXI, No. 130, p. 41, 1912.	Pitchstone.	
13	I.3(4).1.''2.	Q 37.98 di 0.22 or 46.70 hy 0.60 ab 9.96 mt 0.93 an 1.67 il 0.30 hm 1.06	Mont Vinaigre, Esterel, France.	Pisani.	A. Michel Levy, B. Sv. Ct. G. Fr., XXI, No. 130, p. 40, 1912.	Porphyry.	
14	I.3(4).1.2(3).	Q 36.60 hy 0.70 or 37.81 mt 0.70 ab 20.96 il 0.15 C 0.41 hm 1.28	Mont Vinaigre, Esterel, France.	Pisani.	A. Michel Levy, B. Sv. Ct. G. Fr., XXI, No. 130, p. 44, 1912.	Pyromeride.	
15	I.3.1.2(3).	Q 46.32 hy 1.00 or 31.14 hm 0.98 ab 17.29 an 0.56 C 0.61	Monte Tombalo, Kruzzino, Corsica.	J. Deprat.	J. Deprat, B. Sv. Ct. G. Fr., XVII, No. 117, p. 59. 1907.	Rhyolite.	
16	I.3(4).1''.2(3).	Q 35.94 di 1.18 or 36.70 hy 0.56 ab 20.44 mt 1.86 an 2.50 il 0.30	Vegagatan, Göteborg, Sweden.	Mauzelius and Berg.	P. J. Holmquist, B. Un. Ups., VII, p. 268, 1906.	Granite.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. ALASKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
17	75.34	12.51	0.62	1.52	0.20	0.40	2.00	6.55	0.36		0.15		0.23		99.88	
A2. II	1.256	.123	.004	.021	.005	.007	.032	.070			.002		.003			
18	76.43	11.69	0.57	0.62	0.30	trace	1.62	6.96	0.84		trace	0.09		CO_2 0.08 SO_3 0.10	99.30	2.600
B2. III	1.274	.114	.004	.008	.008	—	.026	.074			—	—				
19	76.06	11.36	2.23	n. d.	0.12	0.58	1.17	7.27	0.90		0.12				99.81	2.613
A4. IV	1.268	.111	.014	(.028)	.003	.010	.019	.078			.002					
20	76.80	10.77	1.32	0.05	0.18	0.55	2.00	6.99	0.98		0.17			CO_2 0.08	99.98	2.559
A3. III	1.280	.106	.008	.001	.005	.010	.032	.074			.002					
21	75.76	12.68	0.49	0.99	0.14	0.49	1.11	7.42	0.62			0.07		SO_3 0.38	100.15	2.615
A3. III	1.263	.124	.003	.014	.004	.009	.018	.079				—				
22	75.25	12.25	1.45	0.50	0.25	0.30	2.20	5.67	0.64	0.47	0.82	0.12			99.92	
A2. II	1.254	.120	.009	.007	.006	.005	.035	.061			.010	.001				
23	75.16	10.50	3.19	0.45	0.72	0.10	0.78	6.52	1.20	1.03	0.30	0.06			100.01	
A2. II	1.253	.103	.020	.006	.018	.002	.013	.069			.004	—				
24	76.44	12.39	0.20	1.80	0.32	0.46	0.63	6.52	1.09						99.85	
A3. III	1.274	.121	.001	.025	.008	.008	.010	.069							(100.10)	
25	75.57	12.74	0.49	1.39	1.01	0.23	1.96	5.56	0.67					CO_2 0.07	99.69	
A3. III	1.260	.125	.003	.019	.025	.004	.032	.060								
26	75.41	13.81	0.34	1.22	trace	0.67	1.20	6.42	0.44					Li_2O 0.21	99.72	
A3. III	1.257	.135	.002	.017	—	.012	.019	.068								
27	80.94	10.05	0.50	0.47	0.10	0.30	1.73	5.08	0.85						100.02	
A3. III	1.349	.098	.003	.007	.003	.005	.027	.054								
28	77.46	9.36	1.50	0.85	0.12	0.17	1.36	5.15	3.40		trace				99.37	
A3. III	1.291	.092	.009	.012	.003	.003	.022	.055								
29	78.64	9.85	0.54	2.00	0.10	0.80	2.03	5.16	0.40	0.14	0.67	trace			100.33	
A2. II	1.311	.097	.003	.028	.003	.014	.032	.055			.008					
30	77.82	11.46	0.30	0.09	0.23	0.22	0.86	7.19	1.40	0.36	0.02	0.04	trace	CO_2 0.02 SO_3 0.07 BaO 0.02 Li_2O trace	100.11	2.596
A1. I	1.297	.112	.002	.001	.006	.004	.014	0.77			—	—	—			
31	77.39	9.50	0.30	1.08	0.17	0.42	1.72	6.54	2.14	0.08	0.45	0.06	trace	CO_2 trace ZrO_2 none C trace S none Cr_2O_3 none V_2O_3 none NiO none BaO 0.04 SrO none	99.89	2.625
A1. I	1.290	0.93	.002	.015	.004	.007	.027	.069			.006	—	—			

ORDER 3. QUARFELIC. COLUMBARE—Continued.

SUBRANG 2. DOPOTASSIC. MAGDEBURGOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
17	I.3(4).1″.2″.	Q 36.42 hy 2.88 or 38.92 mt 0.93 ab 16.77 il 0.30 an 1.95 C 1.43	Johanniskirche, Göteborg, Sweden.	E. Östlund.	P. J. Holmquist, B. Un. Ups., VII, p. 268, 1906.	Granite.	
18	I.3″.1.2.	Q 39.72 hy 1.33 or 41.14 mt 0.93 ab 13.62 C 1.43	Alvensleben, n. Magdeburg, Russia.	Hampe.	F. Klockmann, Jb. Pr. G. L.-A., XI, p. 192, 1892.	Quartz porphyry.	In W. T., p. 125.
19	I.3(4).1(2).2.	Q 38.10 hy 4.00 or 43.37 ab 9.96 an 2.78 C 0.41	Klinzerberg, n. Magdeburg, Saxony.	Bodländer.	F. Klockmann, Jb. Pr. G. L.-A., XI, p. 180, 1892.	Quartz porphyry.	In W. T., p. 125.
20	I.3(4).1.2.	Q 37.74 di 1.08 or 41.14 wo 0.46 ab 16.77 il 0.15 hm 1.32 tn 0.20	Hazelberg, n. Ammelshain, Saxony.	C. Ambronn.	C. Ambronn, In. Diss. Leipz., p. 56, 1907.	Schliere in porphyry.	
21	I.3″.1″.2.	Q 38.88 hy 1.85 or 43.92 mt 0.70 ab 9.43 an 2.50 C 1.84	Eckerthal, Brocken, Harz.	Eyme.	O. H. Erdmannsdoerfer. Jb. Pr. G. L.-A., XXVII, p. 345, 1906.	Granite (aplitic).	
22	I.3″.1.2(3).	Q 40.08 hy 0.60 or 33.92 il 1.06 ab 18.34 hm 1.45 an 0.56 ru 0.24 C 2.24 ap 0.34	Ampanobé, Sakalave District, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVII, p. 18, 1913.	Rhyolite.	
23	I.3.1″.2.	Q 44.34 hy 1.80 or 38.36 mt 0.46 ab 6.81 il 0.61 an 0.56 hm 2.88 C 1.94	Mount Ivohitsombé, Sakalave District, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVII, p. 18, 1913.	Rhyolite.	
24	I.3.1″.(1)2.	Q 45.12 hy 3.97 or 38.36 mt 0.23 ab 5.24 an 2.22 C 3.47	Bolshoj Pit River, Jenissei District, Siberia.	A. Nikitinsky.	A. Meister, Reg. Aurif. Siber., IX, p. 245, 1910.	Granite.	
25	I.3″.1.2″.	Q 39.54 hy 4.61 or 33.36 mt 0.70 ab 16.77 an 1.11 C 2.96	Bolshoj Pit River, Jenissei District, Siberia.	N. Podkopajev.	A. Meister, Reg. Aurif. Siber., IX, p. 245, 1910.	Granite.	
26	I.3.1(2).2.	Q 41.76 hy 1.98 or 37.81 mt 0.46 ab 9.96 an 3.34 C 3.67	Angara River, Jenissei District, Siberia.	A. Karpov.	A. Meister, Reg. Aurif. Sib., IX, p. 193, 1910.	Granite.	Border of dike. Cf. No. 257, I.4.1.3.
27	I.3.1.2″.	Q 50.76 hy 0.83 or 30.02 mt 0.70 ab 14.15 an 1.39 C 1.22	Taisoni River, Hitou, Ambon Island, Moluccas.	D. Funk.	R. D. M. Verbeek, Jaarb. Mijnw., XXXIV, p. 181, 1905.	Quartz porphyry.	
28	I.3.1.2.⊙	Q 49.02 hy 0.70 or 30.58 mt 2.09 ab 11.53 an 0.83 C 1.22	Leitimor, Ambon Island, Moluccas.	O. Brunck.	R. D. M. Verbeck, Jb. Mijnw., XXXIV, p. 85, 1905.	Quartz porphyry.	
29	I.3.1(2).2(3).	Q 44.70 di 0.96 or 30.58 hy 2.05 ab 16.77 mt 0.70 an 2.78 il 1.22	Mount Wellington, N. Gippsland, Victoria.	Ampt.	E. O. Thiele, Pr. R. Soc. Vict., XXI, p. 266, 1908.	Rhyolite.	
30	I.3.1.(1)2.	Q 44.22 hy 0.60 or 42.81 mt 0.23 ab 7.34 hm 0.16 an 1.11 C 1.73	Mount Bright, Pokolbin, New South Wales.	J. C. H. Mingaye.	Browne and Walker, Proc. R. Soc. N. S. W., XLIV, 398, 1911.	Rhyolite.	
31	I.3.1.2.⊙	Q 42.18 ac 0.92 or 38.36 ns 0.12 ab 12.58 di 1.67 hy 0.73 il 0.91	Canbelego, New South Wales.	H. P. White.	G. W. Card, pers. com.	Rhyolite.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. ALASKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	75. 62	11. 02	3. 17	1. 29	0. 26	0. 58	3. 11	5. 33	0. 10		0. 16		0. 12		100. 76	2. 59
A2. II	1. 260	. 108	. 020	. 018	. 007	. 010	. 050	. 056			. 002		. 002			
2	77. 28	11. 24	1. 74	none	0. 21	trace	3. 10	4. 55	1. 16		trace	0. 02		CO_2 0. 17	99. 47	
B2. III	1. 288	. 110	. 011	—	. 005	—	. 050	. 049			—	—				
3	78. 37	10. 85	1. 33	0. 44	none	0. 40	2. 68	5. 52	0. 59	0. 04			0. 06		100. 28	2. 614
A3. III	1. 306	. 106	. 008	. 006	—	. 007	. 044	. 059					—			
4	76. 37	12. 15	1. 65	1. 06	0. 10	0. 17	3. 64	4. 68	0. 08	0. 13	0. 18		0. 07		100. 28	2. 645
A2. II	1. 273	. 119	. 010	. 015	. 003	. 003	. 059	. 050			. 002		. 001			20°
5	76. 41	12. 41	1. 01	0. 50	0. 46	0. 78	3. 34	4. 33	0. 34	0. 13	0. 03	none	0. 06	ZrO_2 0. 02 Cl none	99. 84	
A1. I	1. 274	. 122	. 006	. 007	. 012	. 014	. 054	. 046			—		. 001	F 0. 01 S 0. 01 BaO none		
6	74. 36	12. 75	2. 09	1. 35	0. 11	0. 82	3. 44	3. 76	0. 20		0. 45	0. 26	0. 04	CO_2 0. 02 ZrO_2 0. 04	99. 86	
A1. I	1. 239	. 125	. 013	. 019	. 003	. 014	. 055	. 040			. 006	. 002	—	SO_3 0. 09 BaO 0. 09		
7	77. 13	10. 65	2. 85	0. 39	trace	0. 08	3. 29	4. 66	0. 13	0. 06	0. 22	trace	0. 33	CO_2 0. 12	99. 91	
A2. II	1. 286	. 104	. 018	. 005	—	. 001	. 053	. 050			. 003		. 005			
8	76. 06	11. 24	1. 97	1. 36	none	0. 58	2. 80	4. 95	0. 22	0. 37	0. 30	trace	0. 20		100. 05	
A2. II	1. 268	. 110	. 012	. 019	—	. 010	. 050	. 053			. 004		. 003			
9	75. 85	11. 39	3. 10	0. 40	0. 14	trace	2. 73	5. 50	none	0. 20	0. 30	0. 10	0. 01	CO_2 0. 14	99. 86	
A2. II	1. 264	. 112	. 019	. 006	. 004		. 044	. 059			. 004	. 001	—			
10	74. 87	14. 27	trace	0. 51	0. 16	0. 48	3. 06	5. 36	0. 66	0. 26	0. 05	0. 21	trace	Li_2O trace	99. 89	
A2. II	1. 248	. 140	—	. 007	. 004	. 009	. 049	. 058			—	. 001				
11	79. 57	11. 41	0. 20	0. 70	trace	0. 21	3. 46	3. 52	0. 61	0. 18	0. 11	trace	none	BaO 0. 05 SrO trace	100. 02	
A1. I	1. 326	. 112	. 001	. 010	—	. 003	. 056	. 037	0. 18			—	—			
12	78. 23	11. 11	1. 73	1. 03	trace	0. 28	3. 44	4. 08	0. 15	0. 10					100. 15	
A3. III	1. 304	. 109	. 011	. 014	—	. 005	. 055	. 044							(100. 05)	
13	74. 62	10. 01	3. 85	1. 72	0. 33	2. 43	3. 33	3. 38	0. 24						99. 91	
A3. III	1. 244	. 098	. 024	. 024	. 008	. 043	. 053	. 036								
14	77. 05	12. 84	0. 56	0. 14	trace	0. 57	2. 81	5. 52	0. 48	0. 22	0. 12	none	none	BaO none SrO none	100. 31	
A1. I	1. 284	. 126	. 004	. 002	—	. 010	. 045	. 059			. 002	—	—	Li_2O trace		
15	76. 87	12. 52	0. 67	none	0. 09	0. 49	2. 47	5. 78	0. 52	0. 25	0. 11	0. 05	trace	Cl none BaO none	99. 82	
A1. I	1. 281	. 123	. 004	—	. 002	. 009	. 040	. 062			. 001	—	—	SrO none Li_2O trace		
16	77. 65	11. 50	1. 21	0. 26	none	0. 59	3. 33	4. 83	0. 20	0. 08	0. 14	0. 02	none	CO_2 none ZrO_2 0. 03	99. 84	
A1. I	1. 294	. 113	. 008	. 004	—	. 011	. 053	. 051			. 002	—	—	SO_3 none		

ORDER 3. QUARFELIC. COLUMBARE—Continued.

SUBRANG 3. SODIPOTASSIC. ALASKOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I''.3(4).1.3.	Q 35.52 di 1.83 or 31.14 mt 3.71 ab 27.25 il 0.30 an 0.56 hm 0.64	Sudbury, Ontario.	J. Horton.	A. P. Coleman, J. G., XV, p. 776, 1907.	Granite.	
2	I.3''.1.3.	Q 41.34 hy 0.50 or 27.24 hm 1.74 ab 26.20 C 1.12	Fox Islands, Maine.	Magruder and Jones.	G. O. Smith, In. Diss. Johns Hopkins Univ., p. 51, 1896.	Aporhyolite.	In W. T., p. 127.
3	I.3''.1.''3.	Q 40.68 di 0.46 or 32.80 mt 1.39 ab 23.06 hm 0.32 an 0.83	Mount Kearsarge, New Hampshire.	J. H. Perry.	J. H. Perry, J. G., XI, p. 408, 1903.	Quartz-porphyry.	
4	I.3(4).1.3.	Q 36.36 hy 0.83 or 27.80 mt 2.32 ab 30.92 il 0.30 an 0.83 C 0.71	Wampatuck Hill, Blue Hills, Massachusetts.	C. H. Warren.	C. H. Warren, Proc. Am. Ac. Sci. Phila., XLIX, p. 289, 1913.	Aporhyolite.	
5	I.3(4).1(2).3.	Q 38.16 hy 1.46 or 25.58 mt 1.39 ab 28.30 an 3.89 C 0.82	Long Lake, Adirondack Mountains, New York.	E. W. Morley.	H. P. Cushing, N. Y. St. Mus. A. R., LX, (2), p. 511, 1907.	Granite.	
6	I.3''.1''.3''.	Q 39.12 hy 0.30 or 22.24 mt 3.02 ab 28.82 il 0.91 an 1.95 ap 0.67 C 2.35	Haskell, New Jersey.	R. B. Gage.	J. V. Lewis, N. J. G. S. A. R. (1908) 1909, p. 67.	Granite gneiss.	
7	I.3''.1.3.	Q 39.96 mt 1.62 or 27.80 il 0.46 ab 27.77 hm 1.67 an 0.28	South Mountain, Fairfield quadrangle, Pennsylvania.	W. T. Schaller.	F. Bascom, U. S. G. S. rec. lab.	Aporhyolite.	
8	I.3(4).1''.3.	Q 37.62 di 0.75 or 29.47 hy 0.40 ab 26.20 mt 2.78 an 1.95 il 0.61	South Mountain, Fairfield County, Pennsylvania.	G. Steiger.	F. Bascom, U. S. G. S. rec. lab.	Aporhyolite.	
9	I.3''.1.''3.	Q 38.52 hy 0.40 or 32.80 mt 0.70 ab 23.06 il 0.61 C 0.92 hm 2.43 ap 0.34	South Mountain, Fairfield quadrangle, Pennsylvania.	W. T. Schaller.	F. Bascom, U. S. G. S. rec. lab.	Aporhyolite.	
10	I.3(4).1.3.	Q 34.98 hy 1.23 or 32.24 ap 0.34 ab 25.67 an 1.67 C 2.75	Brookville, Montgomery County, Maryland.	W. F. Hillebrand.	G. H. Williams, U. S. G. S. A. R. 15, p. 672, 1895.	Granite.	In W. T., p. 147.
11	I.3.1.3(4).	Q 45.24 hy 1.06 or 20.57 mt 0.23 ab 29.34 il 0.15 an 0.83 C 1.63	Sam Christian Mine, Montgomery County, North Carolina.	W. F. Hillebrand.	J. S. Diller, A. J. S., VII, p. 341, 1899.	Rhyolite.	In W. T., p. 127.
12	I.3''.1.3.	Q 41.82 hy 0.40 or 24.46 mt 2.55 ab 28.82 an 1.39 C 0.51	Taylor's farm, Fox River Valley, Wisconsin.	W. W. Daniells.	Hobbs and Leith, Un. Wisc. B. 158, p. 262, 1907.	Soda aporhyolite.	
13	I(II).3.1(2).3(4).	Q 39.00 di 1.73 or 20.02 wo 3.02 ab 27.77 mt 5.57 an 2.50	Waushara, Wisconsin.	S. Weidman.	S. Weidman, G. N. H. S. Wisc. Bull. 3, p. 2, 1898.	Granite.	In W. T., p. 127.
14	I.3(4).1''.''3.	Q 38.40 il 0.28 or 32.80 hm 0.56 ab 23.58 an 2.78 C 1.22	Nettie Mine, Butte, Montana.	W. F. Hillebrand.	W. H. Weed, J. G., VII, p. 739, 1899.	Aplite.	In W. T., p. 127.
15	I.3(4).1''.(2)3.	Q 38.94 hy 0.20 or 34.47 hm 0.67 ab 20.96 an 2.50 C 1.20	Nettie Mine, Butte, Montana.	H. N. Stokes.	W. H. Weed, J. G., VII, p. 739, 1899.	Aplite.	In W. T., p. 127.
16	I.3(4).1''.3.	Q 39.00 wo 0.23 or 28.36 mt 0.46 ab 27.77 il 0.30 an 2.50 hm 0.96	Sheridan Volcano, Yellowstone National Park.	G. Steiger.	U. S. G. S. B. 419, p. 71, 1910.	Rhyolite.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. ALASKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
17	75.52	14.11	1.74	0.08	0.10	0.78	3.92	3.63	0.39		none		none	FeS_2 0.11	100.38	
A2. II	1.255	.138	.011	.001	.003	.014	.063	.039			—		—			
18	74.70	13.72	1.01	0.62	0.14	0.78	3.90	4.02	0.62		none	none	trace	FeS_2 0.40	99.91	2.345
A2. II	1.245	.134	.006	.008	.004	.014	.063	.042			—	—	—			
19	77.03	12.00	0.76	0.86	0.04	0.80	3.21	4.92	0.30	0.14	0.13	trace	trace	F 0.36 BaO trace Li_2O trace	100.55	
A1. I	1.284	.118	.010	.012	.001	.014	.051	.052			.002	—	—			
20	77.02	11.63	0.32	1.09	0.14	1.24	2.85	5.21	0.35				trace		99.85	
A3. III	1.284	.114	.002	.015	.004	.022	.046	.055					—			
21	73.11	13.16	0.62	0.23	0.19	0.54	2.85	5.10	4.05				0.14		99.99	
A3. III	1.219	.129	.004	.003	.005	.010	.046	.055					.002			
22	77.33	12.55	0.91	n. d.	0.10	0.17	3.19	4.80	0.53	0.15	0.09	trace	trace	CO_2 none BaO trace SrO trace Li_2O trace	99.82	
A3. III	1.289	.123	.006	(.012)	.003	.003	.051	.051			.001	—	—			
23	75.84	13.38	1.45	n. d.	0.10	0.07	3.33	4.73	0.71	0.18	0.09	trace	trace	CO_2 none BaO trace SrO trace Li_2O trace	99.88	
A3. III	1.264	.131	.009	(.018)	.003	.002	.053	.050			.001	—	—			
24	77.09	13.04	0.82	0.26	0.12	0.63	3.11	4.50	0.07	0.03	0.05	0.10	trace	BaO none SrO none	99.82	2.600
A2. II	1.284	.128	.005	.004	.003	.011	.050	.048			—	.001				
25	76.17	12.32	1.47	0.20	none	0.17	3.94	4.27	0.79	0.23	0.20	0.04	none	CO_2 none ZrO_2 0.03 S none NiO none BaO 0.10	99.93	
A1. I	1.270	.121	.009	.003	—	.003	.064	.046			.003	—	—			
26	77.68	11.81	0.72	0.51	0.18	0.72	2.96	5.00	0.27	0.04	0.14	0.10	trace		100.13	
A2. II	1.295	.116	.005	.007	.005	.013	.048	.053			.002	.001				
27	74.24	14.50	1.27	0.67	0.25	0.11	3.00	3.66	2.04		0.20	0.07	0.06	SO_3 0.03 BaO 0.18 SrO trace Li_2O none	100.28	
A1. I	1.237	.142	.008	.008	.006	.002	.048	.039			.003	—	.001			
28	77.26	11.54	0.85	0.13	0.20	0.58	2.96	4.65	0.96	1.03	0.18	trace	0.03	CO_2 none BaO none SrO none	100.37	
A1. I	1.286	.113	.005	.002	.005	.010	.048	.050			.002	—	—			
29	75.17	15.83	n. d.	0.90	0.39	0.46	2.08	3.18	2.16					CO_2 0.61 FeS_2 0.17	100.95	
A3. IV	1.253	.155	—	.013	.010	.008	.034	.034								
30	81.08	11.45	n. d.	0.21	trace	0.46	2.30	3.64	0.60						99.74	
A3. III	1.351	.112	—	.003	—	.009	.037	.039								
31	76.54	14.09	1.47	n. d.	0.10	0.19	2.32	4.64	0.74						100.09	
A3. III	1.276	.138	.009	(.018)	.003	.004	.037	.049								

ORDER 3. QUARFELIC. COLUMBARE—Continued.

SUBRANG 3. SODIPOTASSIC. ALASKOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
17	I.3(4).1(2).3(4).	Q 36.72 hy 0.30 or 21.68 mt 0.23 ab 33.01 hm 1.60 an 3.89 C 2.24	Obsidian Cliff, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. A. R. 7, p. 282, 1888.	Obsidian (red).	Also in U. S. G. S. Mon. 32, p. 426, 1899. In W. T., p. 127.
18	I.3(4).1(2).3(4).	Q 34.86 hy 0.66 or 23.35 mt 1.39 ab 33.01 an 3.89 C 1.53	Obsidian Cliff, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. A. R. 7, p. 282, 1888.	Obsidian (black).	Also in U. S. G. S. Mon. 32, p. 426, 1899. In W. T., p. 149.
19	I.3(4).1(2).3.	Q 37.68 hy 0.10 or 28.91 mt 2.32 ab 26.72 il 0.30 an 3.89	Sentinel Point, Pikes Peak, Colorado.	W. F. Hillebrand.	E. B. Mathews, U. S. G. S. B. 150, p. 177, 1898.	Biotite granite.	Also in J. G., VIII, p. 237, 1900. In W. T., p. 127.
20	I.3(4).1(2).3.	Q 37.62 di 2.42 or 30.58 hy 0.79 ab 24.10 mt 0.46 an 3.34	Platte Canyon, Jefferson County, Colorado.	H. N. Stokes.	E. B. Mathews, U. S. G. S. B. 148, p. 179, 1897.	Granite.	In W. T., p. 127.
21	I.3(4).1″.3.	Q 35.22 hy 0.63 or 30.58 mt 0.93 ab 24.10 an 2.78 C 1.84	Rosita, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. A. R. 17, (II), p. 324, 1896.	Pitchstone.	In W. T., p. 127.
22	I.3″.1.3.	Q 39.42 hy 1.75 or 28.36 il 0.15 ab 26.72 an 0.83 C 1.84	Tordrillo Mountains, Alaska.	H. N. Stokes.	J. E. Spurr, Am. G., XXV, p. 231, 1900.	Alaskite.	In W. T., p. 127.
23	I.3(4).1.3.	Q 37.32 hy 2.54 or 27.80 il 0.10 ab 27.77 an 0.56 C 2.65	Tordrillo Mountains, Alaska.	H. N. Stokes.	J. E. Spurr, Am. G., XXV, p. 231, 1900.	Tordrillite.	In W. T., p. 127.
24	I.3″.1″.3.	Q 41.16 hy 0.30 or 26.69 mt 1.16 ab 26.20 ap 0.34 an 2.22 C 2.24	Sheppard Creek, Rossland District, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38, (1), p. 355, 1912.	Granite.	
25	I.3(4).1.3″.	Q 36.24 il 0.46 or 25.58 hm 1.47 ab 33.54 an 0.83 C 0.82	Easton, Snoqualmie quadrangle, Washington.	G. Steiger.	Smith and Calkins, U. S. G. S. Fol. 139, p. 5, 1906.	Rhyolite.	
26	I.3″.1″.3.	Q 39.84 hy 0.50 or 29.47 mt 1.16 ab 25.15 il 0.30 an 2.78 ap 0.34 C 0.51	Pyramid Peak, Eldorado County, California.	G. Steiger.	W. Lindgren, A. J. S., III, p. 306, 1897.	Granite.	In W. T., p. 127.
27	I.3.1.3.⊙	Q 42.30 hy 0.60 or 21.68 mt 1.39 ab 25.15 il 0.46 an 0.56 hm 0.32 C 5.41	Willow Lake, Plumas County, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 148, p. 192, 1897.	Rhyolite.	In W. T., p. 127.
28	I.3″.1″.3.	Q 40.38 hy 0.50 or 27.80 il 0.31 ab 25.15 hm 0.85 an 2.78 C 0.51	Bush Peak, Bullfrog District, Nevada.	G. Steiger.	F. L. Ransome, U. S. G. S. B. 419, p. 43, 1910.	Rhyolite.	
29	I.3.1(2).3.	Q 48.36 hy 2.72 or 18.90 ab 17.82 an 2.22 C 8.06	Mizpah Shaft, Tonopah, Nevada.	G. J. Young.	J. A. Burgess, Ec. Geol., IV, p. 690, 1909.	Rhyolite.	
30	I.3.1(2).3.	Q 52.44 hy 0.40 or 21.68 ab 19.39 an 2.50 C 2.75	Berufjordskard, Iceland.	C. W. Schmidt.	C. W. Schmidt, Z. D. G. G., XXXVII, p. 776, 1885.	Liparite.	In W. T., p. 127.
31	I.3.1.″3.	Q 43.86 hy 2.68 or 27.24 ab 19.39 an 1.11 C 4.90	Kinlochewe, Scotland.	W. Mackie.	W. Mackie, Tr. G. Soc., Edin., VIII, p. 54, 1901.	Granite.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. ALASKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
32	76.01	13.47	1.54	n. d.	0.06	0.54	2.32	5.57	0.56			0.12			100.19	
A4. IV	1.267	.132	.009	(.018)	.002	.010	.037	.060				.001				
33	75.09	13.46	0.74	1.05	0.74	0.66	3.10	3.78	0.77	0.14	0.25	0.19	0.14	CO_2 0.02 S none NiO none BaO none Li_2O none	100.13	
A1. I	1.252	.132	.005	.015	.019	.012	.050	.040			.003	.001	.002			
34	74.54	14.86	2.53	0.23	trace	0.29	3.49	3.73	0.87				trace	Li_2O trace	100.54	2.66
A3. III	1.242	.146	.016	.003	—	.005	.056	.039					—			
35	77.10	13.10	0.64	0.69	1.03	0.37	3.05	4.58	0.50		0.07				101.13	
B3. III	1.285	.128	.004	.010	.026	.007	.049	.049			.001					
36	76.81	12.35	0.21	0.69	1.66	none	2.55	4.95	0.20						99.42	
A3. III	1.280	.121	.001	.010	.042	—	.040	.053								
37	74.81	13.62	0.52	0.69	1.03	0.44	3.19	4.28	1.00						99.58	
A3. III	1.247	.134	.003	.010	.026	.008	.052	.046								
38	76.10	13.45	1.34	n. d.	0.64	0.42	2.55	5.01	1.00						100.48	
A4. IV	1.268	.132	.008	(.016)	.016	.007	.041	.053								
39	76.85	12.20	1.75	n. d.	1.27	0.30	2.22	4.55	1.12						100.26	
A4. IV	1.281	.120	.011	(.022)	.032	.005	.035	.049								
40	74.10	15.61	0.85	n. d.	1.12	0.38	3.32	3.18	1.30						99.86	
A4. IV	1.235	.153	.005	(.010)	.028	.007	.053	.034								
41	75.30	13.82	n. d.	1.08	0.90	0.45	3.40	4.07	0.80						99.82	
A4. IV	1.255	.135	—	.015	.023	.008	.055	.043								
42	75.50	13.73	n. d.	0.66	0.77	0.32	3.41	4.10	0.90		0.13	0.07			99.59	
A3. III	1.258	.135	—	.009	.019	.006	.055	.043			.002	—				
43	75.6	13.2	1.3	n. d.	0.6	0.6	2.5	5.4	1.0						100.1	
B3. IV	1.260	.129	.008	(.016)	.015	.011	.040	.057								
44	77.77	11.64	1.56	n. d.	0.15	0.50	3.80	4.20	0.61						100.23	
A4. IV	1.296	.114	.010	(.020)	.004	.009	.061	.044								
45	81.80	7.65	1.88	0.70	0.64	none	2.97	2.75	1.01		0.13				99.53	
A3. III	1.363	.075	.012	.010	.016	—	.048	.030			.002					
46	81.20	9.40	1.35	n. d.	0.77	none	2.45	4.55	0.70						100.42	
A4. IV	1.353	.092	.008	(.016)	.019	—	.040	.049								
47	74.70	12.81	2.23	n. d.	0.56	trace	2.44	5.70	1.12		0.35				99.91	
A4. IV	1.245	.125	.014	(.028)	.014	—	.039	.061			.004					

ORDER 3. QUARFELIC. COLUMBARE—Continued.

SUBRANG 3. SODIPOTASSIC. ALASKOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
32	I.3″.1″.(2)3.	Q 39.06 hy 2.58 or 33.36 ap 0.34 ab 19.39 an 1.95 C 2.86	Cairngorm, Scotland.	W. Mackie.	W. Mackie, Tr. G. Soc., Edin., VIII, p. 54, 1901.	Granite.	
33	I.3.1″.3.	Q 39.96 hy 3.09 or 22.24 mt 1.16 ab 26.20 il 0.46 an 2.50 ap 0.34 C 3.37	Hay Tor, Dartmoor, England.	E. G. Radley.	Flett and Dewey, G. S. Eng. Mem., sheet 338, p. 42, 1912.	Granite.	
34	I.3.1.3″.	Q 39.72 mt 0.70 or 21.68 hm 2.08 ab 29.34 an 1.39 C 4.69	Botallack, Cornwall.	Phillips.	J. J. H. Teall, Brit. Petr., p. 314, 1888.	Granite.	In W. T., p. 127.
35	I.3″.1″.3.	Q 39.12 hy 3.26 or 27.24 mt 0.93 ab 25.68 il 0.15 an 1.95 C 2.24	Le Clou, Brittany, France.	Pisani.	L. Vandernotte, Mass. Armor., p. 48, 1913.	Rhyolite.	
36	I.3″.1.3.	Q 40.26 hy 5.39 or 29.47 mt 0.23 ab 20.96 C 2.24	La Pouliniere, Brittany, France.	Pisani.	L. Vandernotte, Mass. Armor., p. 48, 1913.	Microgranite.	
37	I.3(4).1″.3.	Q 36.60 hy 3.52 or 25.58 mt 0.70 ab 27.25 an 2.22 C 2.83	Louvigné-Gorron, Brittany, France.	Pisani.	L. Vandernotte, Mass. Armor., p. 41, 1913.	Microgranite.	
38	I.3″.1.3.	Q 39.48 hy 3.71 or 29.47 ab 21.48 an 1.95 C 3.16	Marcillat, La Creuse, France.	Pisani.	L. de Launay, B. Sv. Ct. G. Fr., XI, No. 83, p. 76, 1902.	Porphyry.	
39	I.3.1.″3.	Q 42.78 hy 6.10 or 27.24 ab 18.34 an 1.39 C 3.16	Poux, La Creuse, France.	Pisani.	L. de Launay, B. Sv. Ct. G. Fr., XI, No. 83, p. 76, 1901.	Porphyry.	
40	I.3.1″.3(4).	Q 39.66 hy 4.12 or 18.90 ab 27.77 an 1.95 C 6.22	Gouzou, La Creuse, France.	Pisani.	L. de Launay, B. Sv. Ct. G. Fr., XI, No. 83, p. 76, 1901.	Microgran-ulite.	
41	I.3(4).1″.3.	Q 36.78 hy 4.28 or 23.91 ab 28.82 an 2.22 C 2.96	Charbonniéres, Lyonnais, France.	Pisani.	A. Michel-Levy, C. R., CLVI, p. 718, 1913.	Granite.	
42	I.3″.1.3.	Q 37.92 hy 2.82 or 23.91 il 0.30 ab 28.82 an 1.67 C 3.16	Mont Salomon, Lyonnais, France.	Pisani.	A. Michel-Levy, C. R., CLVI, p. 718, 1913.	Granite.	
43	I.3(4).1(2).3.	Q 37.50 hy 3.61 or 31.69 ab 20.96 an 3.06 C 2.14	Genis, Corrèze, France.	J. de Lapparent.	J. de Lapparent, B. Soc. Min. Fr., XXXII, p. 267, 1909.	Microgranite.	
44	I.3(4).1″.3″.	Q 37.44 hy 3.04 or 24.46 ab 31.96 an 2.50	Pelvoux, Dauphiny, France.	Rüst.	P. Termier, B. Soc. G. Fr., XXVII, p. 404, 1899.	Aplite.	Not in W. T.
45	I.″3.1.3(4).	Q 53.10 ac 1.39 or 16.68 hy 1.60 ab 23.58 mt 1.86 il 0.30 hm 0.64	Esterel, France.	Pisani.	A. Michel-Levy, B. Sv. Ct. G. Fr., XXI, No. 130, p. 40, 1912.	Pyromeride.	
46	I.3.1.3.⊙.	Q 46.32 ac 1.39 an 27.24 hy 4.01 ab 20.96	Colle Motte, Esterel, France.	Pisani.	A. Michel-Levy, B. Sv. Ct. G. Fr., XXI, No. 130, p. 40, 1912.	Pyromeride.	
47	I.3(4).1.(2)3.	Q 36.42 hy 4.57 or 33.92 il 0.61 ab 20.44 C 2.45	Arditurri, La Haya, Guipuzcoa, Spain.	Pisani.	P. Termier, B. Soc. G. Fr., VII, p. 13, 1907.	Granite.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. ALASKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
48	77.50	11.80	0.41	0.72	0.65	0.39	3.10	4.18	1.90		0.06				100.71	
A3. III	1.292	.116	.003	.010	.016	.007	.050	.044			—					
49	75.50	11.27	2.13	0.23	1.21	0.47	3.41	3.38	1.60						99.20	
B3. IV	1.258	.111	.013	.003	.030	.008	.055	.036								
50	77.20	12.11	1.61	n. d.	trace	0.14	3.87	4.07	0.36		0.10				99.46	
A4. IV	1.287	.119	.010	(.020)	—	.002	.062	.043			.001					
51	76.05	11.68	0.34	1.05	0.29	0.42	3.79	5.09	1.36		0.05		trace	ZrO_2 0.42 F trace Li_2O trace	100.54	2.636
A2. II	1.268	.114	.002	.015	.007	.008	.060	.054			—		—			
52	76.73	12.70	1.38	n. d.	0.12	0.50	3.17	4.55	0.57		0.24				99.96	
A3. III	1.279	.125	.009	(.018)	.003	.009	.051	.048			.003					
53	74.30	12.20	2.22	0.88	0.27	1.09	2.82	5.00	1.00		0.24	0.24	0.08		100.34	
A2. II	1.238	.120	.014	.013	.007	.020	.045	.053			.003	.002	.001			
54	76.94	12.89	1.72	n. d.	0.26	0.55	3.13	4.43	0.61				trace		100.53	
A4 IV	1.282	.127	.011	(.022)	.007	.010	.050	.046								
55	76.82	11.59	0.69	1.17	0.37	1.03	3.44	4.74	0.36		0.17	0.05	0.10		100.53	
A2. II	1.280	.114	.004	.017	.009	.018	.055	.050			.002	—	.001			
56	78.50	10.95	0.36	0.70	0.18	1.00	3.15	4.97	0.40		0.08	0.02	0.06		100.37	
A2. II	1.308	.108	.002	.010	.005	.018	.051	.053			.001	—	.001			
57	76.26	12.06	1.14	0.66	0.06	0.69	2.89	4.50	0.71		0.40		0.25		99.62	
A2. II	1.271	.118	.007	.009	.002	012	.047	.048			.005		.004			
58	72.93	13.87	1.94	0.79	0.51	0.74	3.68	3.74	1.18		0.50		0.14		100.02	
A2. II	1.216	.136	.012	.011	.013	.013	.060	.039			.006		.002			
59	75.44	10.99	2.33	0.93	0.25	1.24	2.72	4.98	1.06				0.47		100.41	
A3. III	1.257	.108	.014	.013	.006	.022	.043	.054					.007			
60	77.71	10.13	1.41	2.15	1.13	0.21	1.85	4.50	0.46		0.48		trace		100.03	
A3. III	1.295	.099	.009	.030	.028	.004	.030	.048			.006					
61	75.26	12.71	0.97	1.11	0.29	0.66	2.65	5.56	0.89		0.25	0.04	0.02		100.41	
A2. II	1.254	.125	.006	.015	.007	.012	.043	.060			.003	—	—			
62	77.68	12.95	0.96	0.37	0.21	0.30	3.18	4.37	0.71			trace			100.73	2.615
A3. III	1.295	.127	.006	.005	.005	.005	.051	.047				—				
63	76.56	12.75	0.21	0.61	0.14	0.46	3.38	4.85	0.68						99.64	
A3. III	1.276	.125	.001	.008	.004	.008	.055	.052								

ORDER 3. QUARFELIC. COLUMBARE—Continued.

SUBRANG 3. SODIPOTASSIC. ALASKOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
48	I.3.1.3.⊙.	Q 41.46 hy 2.52 or 24.46 mt 0.70 ab 26.20 an 1.95 C 1.53	Restonica, Corsica.	Pisani.	Termier and Deprat, C. R., CXLVII, p. 207, 1908.	Granite.	
49	I.3.1″.3(4).	Q 39.96 hy 3.00 or 20.02 mt 0.70 ab 28.82 hm 1.60 an 2.22 C 1.21	Fornia, n. Bastia, Corsica.	J. Deprat.	J. Deprat. B. Sv. Ct. G. Fr., XVII, No. 117, p. 59, 1907.	Microgranite.	
50	I.3(4).1.3″.	Q 38.04 hy 2.51 or 23.91 il 0.15 ab 32.49 an 0.56 C 1.22	Kroftkollen, Drammen, Norway.	Mauzelius.	W. C. Brögger, Z. K., XVI, p. 77, 1890.	Quartz porphyry.	In W. T., p. 129.
51	I.3(4).1.3.	Q 33.36 di 1.89 or 30.02 hy 1.46 ab 31.44 mt 0.46	Drammen, Norway.	P. Jannasch.	H. O. Lang, Nyt. Mag., XXX, p. 40, 1886.	Quartz porphyry.	Also, Brögger, Z. K., XVI, p. 77, 1890. In W. T., p. 151.
52	I.3(4).1″.3.	Q 38.94 hy 2.28 or 26.69 il 0.46 ab 26.72 an 2.50 C 0.71	Hennum, Norway.	Mauzelius.	W. C. Brögger, Z. K., XVI, p 77, 1890.	Aplitic granophyre.	In W. T., p. 129.
53	I.3(4).1(2).3.	Q 37.02 hy 0.70 or 29.47 mt 2.55 ab 23.58 il 0.46 an 3.61 hm 0.48 C 0.92 ap 0.67	Gellivara, Lapland, Sweden,	Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 266, 1906.	Granite.	
54	I.3″.1(2).3.	Q 39.42 hy 3.60 or 25.58 ab 26.20 an 2.78 C 2.14	Hällebacken, Nora, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 260, 1906.	Granite.	
55	I.3(4).1″.3.	Q 36.12 di 2.10 or 27.80 hy 1.42 ab 28.82 mt 0.93 an 2.50 il 0.30	Ankarsrum, Smaland, Sweden.	Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 262, 1906.	Granite.	
56	I.3″.1.3.	Q 39.00 di 3.07 or 29.47 mt 0.46 ab 26.72 il 0.15 an 1.11	Hummelstad, Smaland, Sweden.	Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 262, 1906.	Granite.	
57	I.3.1(2).3.	Q 40.50 hy 0.20 or 26.69 mt 1.62 ab 24.63 il 0.76 an 3.34 C 0.10	Sundsvall, Rödö, Sweden.	Santesson.	P. J. Holmquist, Afh. Sv. G. Und., No. 181, p. 45, 1899.	Granite porphyry.	In W. T., p. 129.
58	I.3(4).1(2).3(4).	Q 34.98 hy 1.30 or 21.68 mt 1.62 ab 31.44 il 0.91 an 3.61 hm 0.80 C 2.45	Rödö, Sweden.	Santesson.	P. J. Holmquist, Afh. Sv. G. Und., No. 181, p. 14, 1899.	Rapakiwi granite.	In W. T., p. 129.
59	I.3(4).1(2).3.	Q 37.68 di 2.57 or 30.02 hy 0.36 ab 22.53 mt 3.02 an 3.06	Kastagropen, n. Karlshamn, Scania, Sweden.	Santesson.	H. Bäckström, K. Sv. Vet. Ak. Hand., XXIX, p. 18, 1897.	Granulite (crushed granite).	In W. T., p. 129.
60	I″.3.1.(2)3.	Q 46.56 hy 4.78 or 26.69 mt 2.09 ab 15.72 il 0.91 an 1.11 C 1.73	Pytterlaks, Finland.	Struve.	V. Hackmann, B. C. G. Finl., No. 15, p. 17, 1905.	Rapakiwi granite.	
61	I.(2)3.1(2).3.	Q 35.94 hy 1.49 or 33.36 mt 1.39 ab 22.53 il 0.46 an 3.34 C 1.02	Pitkäranta, Finland.	I. G. Sundell.	V. Hackmann, B. C. G. Finl., No. 15, p. 25, 1905.	Rapakiwi granite.	Alkalies interchanged.
62	I.3″.1.3.	Q 41.52 hy 0.50 or 26.13 mt 1.16 ab 26.72 hm 0.16 an 1.39 C 2.45	Tryberg, Schwartzwald, Baden.	L. McCay.	G. H. Williams, N. J. B. B. II, p. 609, 1883.	Quartz porphyry.	In W. T., p. 129.
63	I.3(4).1″.3.	Q 36.42 hy 1.32 or 28.93 mt 0.23 ab 28.82 an 2.22 C 1.02	Grosssachsener, Thal, Baden.	P. Phookan.	K. Futterer, Mt. Bad. G. L.-A., II, p. 41, (1890), 1893.	Granite.	In W. T., p. 129.

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. ALASKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
64	74.82	13.63	0.97	0.83	0.08	0.87	3.03	4.81	0.82						99.86	
A3. III	1.247	.134	.006	.011	.002	.006	.048	.051								
65	76.75	12.42	0.43	0.87	trace	0.45	2.52	5.81	0.39			trace		SO_3 0.12	99.76	2.615
A3. III	1.279	.122	.003	.013	—	.008	.040	.062				—				
66	74.71	13.05	1.55	0.72	0.16	0.49	2.47	5.52	0.87			0.09		CO_2 0.32 SO_3 0.19	100.30	2.610
A2. II	1.245	.128	.010	.010	.004	.009	.040	.059				—				
67	79.90	12.16	0.88	0.22	0.28	0.26	2.45	2.51	1.01		0.26	0.16	0.20	CO_2 0.11	100.40	
A2. II	1.332	.119	.006	.003	.007	.005	.040	.026			.003	.001	.003			
68	77.48	11.61	0.57	1.63	0.27	0.43	2.48	3.73	1.56			0.23		F trace Li_2O trace	100.22	2.663
A3. III	1.291	.114	.004	.022	.007	.008	.040	.039				.002				
69	74.25	13.68	0.31	1.38	0.32	0.85	2.94	4.65	0.65		trace	0.18			99.21	
B2. III	1.238	.134	.002	.019	.008	.015	.047	.050			—	.001				
70	74.63	10.54	3.59	0.45	1.23	0.84	2.22	5.33	0.63		0.43				99.89	
A2. II	1.244	.103	.023	.007	.031	.015	.035	.056			.005					
71	74.24	15.00	1.14	n. d.	trace	0.68	3.11	3.93	1.74						99.84	
A4. IV	1.237	.147	.007	(.014)	—	.012	.050	.041								
72	73.70	13.60	0.56	1.76	0.36	0.96	2.64	4.31	1.22			0.30		BaO trace Li_2O trace Cu trace	99.41	2.672
A3. III	1.228	.133	.004	.024	.009	.017	.043	.046				.002				
73	76.47	11.61	0.21	0.72	trace	1.26	3.29	4.48	1.21		0.18	trace			99.43	
B2. III	1.265	.114	.001	.010	—	.022	.053	.048			.002	—				
74	77.26	11.66	1.18	1.42	0.40	0.46	3.10	4.64	0.42			0.31		S 0.02	100.87	
A2. II	1.288	.114	.008	.019	.010	.008	.050	.049				.002				
75	73.84	13.60	1.47	1.47	0.43	1.00	2.16	5.25	0.90			0.22		S 0.04	100.38	
A2. II	1.231	.133	.009	.021	.011	.018	.035	.056				.002				
76	75.62	14.01	0.56	0.26	0.39	0.53	2.88	5.59	0.57	0.08	trace	0.09	0.02		100.60	2.62
A2. II	1.260	.137	.004	.004	.010	.009	.047	.060			—	—	—			
77	75.45	10.39	2.16	1.12	0.34	1.58	3.42	4.53	0.47	0.08	0.13	0.06	0.04		99.77	2.65
A2. II	1.258	.102	.014	.015	.009	.029	.055	.048			.002	—	—			
78	74.30	13.77	1.76	0.30	0.85	0.30	2.71	4.96	1.25	0.02		0.20	0.02		100.44	2.67
A2. II	1.238	.135	.011	.004	.021	.005	.044	.053				.001	—			

ORDER 3. QUARFELIC. COLUMBARE—Continued.

SUBRANG 3. SODIPOTASSIC. ALASKOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
64	I.3″.1.3.	Q 38.04 or 28.36 ab 25.15 an 1.67 C 2.96 hy 0.86 mt 1.39	Staudenbuhl, n. Heiligkreuz, Baden.	Beckmann.	K. Futterer, Mt. Bad. G. L.-A., II, p. 41, 1893.	Granite.	In W. T., p. 129.
65	I.3(4).1″.(2)3.	Q 38.44 or 34.47 ab 20.96 an 2.22 C 1.22 hy 1.32 mt 0.70	Heifeisenhäu, Brocken, Harz.	Kluss.	O. H. Erdmannsdoerfer, Jb. Pr. G. L.-A., XXIX, (II), p. 204, 1908.	Aplitic granite.	
66	I.3(4).1″.″3.	Q 37.74 or 32.80 ab 20.96 an 2.50 C 2.04 hy 0.40 mt 2.32	Frankenthal, Brocken, Harz.	Eyme.	O. H. Erdmannsdoerfer. Jb. Pr. G. L.-A., XXVII, p. 344, 1906.	Granite.	
67	I.(2)3.1.3(4).	Q 55.50 or 14.46 ab 20.96 an 0.56 C 5.20 hy 0.70 mt 0.70 il 0.46 hm 0.48 ap 0.34	Königsberg, Wolfstein, Blatt Kusel, Bavaria.	A. Schwager.	M. Schuster, Erl. G. Kte. Bay., XX, p. 34, 1910.	Quartz porphyry.	
68	I.3.1″.3.	Q 47.40 or 21.68 ab 20.96 an 0.28 C 2.75 hy 3.08 mt 0.93 ap 0.67	Epprechtstein, Fichtelgebirge, Bavaria.	A. Böttger.	F. v. Sandberger, Sb. Münch. Ak., XVIII, p. 466, 1888.	Lithionite granite.	Also, Böttger, In. Diss., München, p. 14, 1889. In W. T., p. 129.
69	I.3(4).1(2).3.	Q 36.42 or 27.80 ab 24.63 an 3.34 C 2.55 hy 3.04 mt 0.46 ap 0.34	Schneeberg, n. Wunsiedel, Fichtelgebirge, Bavaria.	H. Oberembt.	H. Oberembt, In. Diss. Erl., p. 19, 1905.	Granite.	
70	I″.3″.1(2).(2)3.	Q 38.40 or 31.14 ab 18.34 an 3.34 di 0.65 hy 2.80 mt 0.46 il 0.76 hm 3.36	Near Pfreimt, Bayrischer Wald, Bavaria.	Not stated.	K. W. v. Gümbel, G. v. Bayern, II, p. 436, 1894.	Granite.	Not in W. T.
71	I.3″.1(2).3.	Q 39.12 or 22.80 ab 26.20 an 3.34 C 4.49 hy 1.85	Hochbuchet, Passau, Bayrischer Wald, Bavaria.	Techn. Anal.	A. Frentzel, Geogn. Jhft., XXIV, p. 176, 1911.	Aplite.	
72	I.3″.1(2).3.	Q 38.70 or 25.58 ab 22.53 an 2.78 C 3.47 hy 3.54 mt 0.93 ap 0.67	Platten, Bohemia.	Not stated.	Böttger, Mt. Phar. Inst. Erl., 1889.	Granite.	Osann, II, p. 10.
73	I.3(4).1(2).3.	Q 36.84 or 26.69 ab 27.77 an 3.61 di 2.23 hy 0.13 mt 0.23 il 0.30	Nemetbogsan, Krasso-Szöreny, Dognacska, Hungary.	K. Emszt.	Rozlozsnik and Emszt, Mt. Ung. G.-A., XVI, p. 191, 1908.	Aplite.	
74	I.3″.1.3.	Q 40.26 or 27.24 ab 26.20 an 0.28 C 1.43 hy 2.55 mt 1.86 ap 0.67	Plawen, Vintschgau, Tyrol.	C. von John.	Hammer and von John, Jb. G. R.-A., Wien, LIX, p. 707, 1910.	Granite porphyry.	
75	I.3″.1(2).(2)3.	Q 38.40 or 31.14 ab 18.34 an 3.06 C 3.16 hy 2.68 mt 2.09 ap 0.67	Piz Sesvenna, Vintschgau, Tyrol.	C. von John.	Hammer and v. John, Jb. G. R.-A., Wien, LIX, p. 707, 1910.	Granite porphyry.	
76	I.3(4).1″.3.	Q 35.40 or 33.36 ab 24.63 an 2.50 C 2.14 hy 1.00 mt 0.93	Skopi, Gottard Massif, Bernese Alps, Switzerland.	L. Hezner.	U. Grubenmann, pers. com., 1913.	Aplite.	
77	I″.3(4).1.3.	Q 36.24 or 26.69 ab 28.30 ac 0.46 di 1.94 wo 2.32 mt 3.02 il 0.30	Pontresina, Bernina Gebiet, Switzerland.	L. Hezner.	U. Grubenmann, pers. com., 1913.	Paisanite porphyry.	
78	I.3″.1.3.	Q 37.86 or 29.47 ab 23.06 an 0.56 C 3.67 hy 2.10 mt 0.93 hm 1.12 ap 0.34	Muraunbach, Gotthard Massif, Bernese Alps, Switzerland.	L. Hezner.	U. Grubenmann, pers. com., 1913.	Quartz porphyry.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC—ALASKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
79	77.26	11.52	n. d.	1.47	trace	1.06	3.69	4.35	0.46		trace	trace	trace		99.81	2.60
A4. IV	1.288	.113	—	.021	—	.019	.060	.047								
80	76.62	12.65	0.09	0.88	0.19	0.32	3.13	4.55	1.65						100.08	
A3. III	1.277	.124	.001	.013	.005	.006	.050	.049								
81	75.25	10.39	1.57	2.43	0.08	0.25	4.39	4.35	0.61		0.50				99.82	
A3. III	1.254	.102	.010	.033	.002	.005	.071	.047			.006					
82	74.73	10.39	4.47	0.70	0.21	0.18	4.12	4.38	1.13						100.31	
A3. III	1.246	.102	.028	.010	.005	.003	.066	.047								
83	74.75	14.70	0.97	n. d.	1.07	none	3.42	4.31	0.75						99.97	
A4. IV	1.246	.144	.006	(.012)	.027	—	.055	.046								
84	74.51	15.70	0.77	n. d.	0.99	none	3.25	4.45	0.60						100.27	
A4. IV	1.242	.154	.005	(.010)	.025	—	.052	.048								
85	78.49	9.99	1.94	1.18	0.09	0.30	3.74	3.84	0.72				trace	Li_2O trace	100.29	
A3. III	1.308	.098	.012	.017	.002	.005	.060	.040								
86	77.39	13.16	0.81	n. d.	trace	0.75	3.60	4.32				trace			100.73	
A4. IV	1.290	.129	.005	(.010)	—	.013	.058	.045				—				
87	75.70	11.65	2.27	0.33	0.07	0.40	2.79	4.36	1.26	0.27	0.57	0.13			99.80	
A2. II	1.262	.114	.014	.005	.002	.007	.045	.047			.007	.001				
88	75.68	14.74	0.57	0.95	trace	0.15	3.13	4.58	1.00				0.13		100.93	
A3. III	1.261	.145	.004	.013	—	.003	.050	.049					.002			
89	76.19	11.53	0.84	1.25	0.60	1.14	3.80	4.14	0.28	none	0.09	0.25	0.16		100.27	
A2. II	1.270	.113	.005	.017	.015	.020	.061	.044			.001	.002	.002			
90	78.14	11.89	0.60	0.27	0.15	0.44	3.51	4.62	0.28	0.32	0.06	0.02	0.02	ZrO_2 0.03 SO_3 0.05 S none BaO trace SrO trace	100.40	
A1. I	1.302	.117	.004	.004	.004	.008	.056	.049			.001	—	—			
91	77.28	11.90	1.30	0.18	0.10	0.80	3.01	5.26	0.38	0.07	0.12	0.04	trace	CO_2 none ZrO_2 none SO_3 none Cl trace F none Cr_2O_3 none NiO none BaO none	100.44	2.622
A1. I	1.288	.117	.008	.003	.003	.014	048	.056			.002	—	—			
92	73.54	10.95	1.08	4.39	0.08	1.68	2.79	4.80	0.21	0.08	0.60				100.20	
A2. II	1.226	.108	.007	.061	.002	.030	.045	.051			.008					
93	78.47	10.68	0.18	2.23	trace	0.66	3.29	4.15	0.20	0.09	0.59	trace			100.54	
A2. II	1.308	.105	.001	.031	—	.012	.053	.044			.007	—				
94	76.10	15.95	trace	n. d.	0.11	0.23	2.90	3.27	1.16						99.72	2.673
A3. III	1.268	.156	—	—	.003	.004	.047	.035								

ORDER 3. QUARFELIC. COLUMBARE—Continued.

SUBRANG 3. SODIPOTASSIC. ALASKOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
79	I.3(4).1.3.	Q 36.00, or 26.13, ab 31.44, an 1.67; di 3.23, hy 1.06	Valle del Baganza, n. Parma, Italy.	M. Ferrari.	M. Ferrari, Mem. Ac. Linc. (5), VIII, No. 21, p. 730, 1911.	Granite pegmatite.	
80	I.3″.1.3.	Q 39.24, or 27.24, ab 26.20, an 1.67, C 1.94; hy 2.08, mt 0.23	Monte Alto, Euganean Hills, Italy.	G. Zender.	M. Stark, T. M. P. M., XXV, p. 321, 1906.	Rhyolite.	
81	I(II).3(4).1.3.	Q 33.72, or 26.13, ab 28.82; ac 4.62, ns 0.73, di 1.24, hy 3.10, il 0.91	Mercureddu, San Antonio, Sardinia.	A. Johnsen.	A. Johnsen, Abh. Pr. Ak. Wiss., Anh. No. 2, p. 15, 1912.	Comendite.	Also in N. J. Cb., p. 738, 1912.
82	I(II).3(4).1.3.	Q 34.92, or 26.13, ab 28.82; ac 5.08, di 0.65, hy 0.20, mt 2.32, hm 1.12	Mercureddu, San Antonio, Sardinia.	A. Johnsen.	A. Johnsen, Abh. Pr. Ak. W., Anh. 2, p. 22, 1912.	Comendite.	Also in N. J. Cb., p. 738, 1912.
83	I.3(4).1.3.	Q 36.06, or 25.58, ab 28.82, C 4.39; hy 4.28	Filfila, n. Philippeville, Algeria.	P. Termier.	P. Termier, C. R., CXXXIV, p. 373, 1902.	Granite (fine).	
84	I.3(4).1.3.	Q 36.42, or 26.69, ab 27.25, C 5.51; hy 3.82	Filfila, n. Philippeville, Algeria.	P. Termier.	P. Termier, C. R., CXXXIV, p. 373, 1902.	Granite (coarse).	
85	I.3.1.3″.	Q 41.88, or 22.24, ab 30.39; ac 0.92, di 1.21, hy 0.50, mt 2.32	Dahamis, Socotra Island, Red Sea.	E. Ludwig.	A. Pelikan, Ds. Ak. Wiss., Wien, LXXI, p. 67, 1902.	Riebeckite granite.	
86	I.3(4).1(2).3″.	Q 38.16, or 25.02, ab 30.39, an 3.61, C 1.33; hy 1.32	Saganeiti, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 93, 1909.	Aplite.	
87	I.3.1.3.⊙	Q 42.00, or 26.13, ab 23.58, an 1.11, C 1.84; hy 0.20, il 0.76, hm 2.27, ru 0.16, ap 0.34	Tsivory, Sakalave District, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVII, p. 18, 1913.	Microgranite.	
88	I.3″.1.3.	Q 39.12, or 27.24, ab 26.20, an 0.83; hy 0.90, mt 0.93	Near Mok-pho, Chosen (Korea).	S. Shimidzu.	B. Koto, J. Coll. Sci. Tok., XXVI, p. 189, 1909.	Masanophyre (rhyolite).	
89	I.3(4).1″.3″.	Q 35.46, or 24.46, ab 31.96, an 2.22; di 1.14, hy 2.65, mt 1.16, il 0.15, ap 0.67	Stanthorpe, Queensland.	G. R. Patten.	A. R. Agric. Chem. Qld., 1912.	Granite.	H. C. Richards, pers. com.
90	I.3(4).1″.3.	Q 39.12, or 27.24, ab 29.34, an 2.22, C 0.41; hy 0.40, mt 0.70, il 0.15, hm 0.16	Butcharts Reef, Tingha, New South Wales.	Not stated.	A. R. Dep. Min. N. S.W. (1907), p. 185, 1908.	Granite.	
91	I.3(4).1(2).3.	Q 38.10, or 31.14, ab 25.15, an 3.61; hy 0.30, mt 0.23, il 0.30, hm 1.12	Cove River, Bowenfels, New South Wales.	Not stated.	A. R. Dep. Min. N. S. W. (1909), p. 198, 1910.	Aplitic granite.	
92	I(II).3(4).1(2).3.	Q 33.30, or 28.36, ab 23.58, an 3.34; di 4.47, hy 3.90, mt 1.62, il 1.22	Merulam, New South Wales.	L. A. Cotton.	W. G. Woolnough, Pr. Linn. Soc. N. S. W., XXXVI, p. 799, 1909.	Dacite.	
93	I.3″.1″.3.	Q 40.98, or 24.46, ab 27.77, an 2.22; di 0.99, hy 2.51, mt 0.23, il 1.06	Lake Karng, Mount Wellington, North Gippsland, Victoria.	Ampt.	E. O. Thiele, Pr. R. Soc. Vict., XXI, p. 266, 1908.	Quartz porphyry.	
94	I.3.1.3″.	Q 46.38, or 19.46, ab 24.63, an 1.11, C 7.14; hy 0.30	Omeo, Victoria.	A. W. Howitt.	A. W. Howitt, Tr. R. Soc. Vict., XXIV, p. 110, 1888.	Muscovite granite.	In W. T., p. 129.

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. ALASKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
95	75.58	13.66	0.85	0.26	0.16	0.28	3.64	4.44	0.26	0.10	0.20	0.08	0.22	CO_2 0.04 Cl 0.02 FeS_2 0.16	99.95	
A1. I	1.260	.134	.005	.004	.004	.005	.059	.047			0.03	—	.003			
96	74.02	14.83	0.95	0.40	0.16	0.70	3.16	4.68	0.12	0.08	0.19	0.05	0.11	CO_2 0.02 Cl 0.02 FeS_2 0.07	99.56	
A1. I	1.234	.146	.006	.006	.004	.013	.051	.059			.002	—	.002			
97	78.35	11.56	0.61	0.90	0.61	0.02	2.86	3.97	0.12	0.24	0.18		0.03	CO_2 0.19 FeS_2 0.11	99.75	2.64
A2. II	1.306	.113	.004	.013	.015	—	.046	.042			.002		—			
98	75.83	14.11	0.49	0.12	0.25	0.55	3.12	5.32	0.41	0.13	0.08	0.20	trace	CO_2 none S trace	100.61	
A2. II	1.264	.138	.003	.002	.006	.010	.050	.056			.001	.001	—			
99	77.59	12.75	0.67	none	0.16	0.04	2.56	3.99	1.54		0.63	trace	trace	SO_3 0.07 BaO 0.10	100.10	2.511
A2. II	1.293	.125	.004	—	.004	—	.041	.042			.008	—	—			
100	76.89	12.72	0.43	0.70	0.17	0.57	3.48	4.39	0.47	0.02	0.08	none	0.07	CO_2 none Cl trace NiO none Li_2O trace	99.99	2.343
A2. II	1.282	.125	.003	.010	.004	.010	.056	.047			.001	—	.001			
101	74.73	10.82	2.46	0.58	0.20	0.80	2.68	4.40	2.94	0.27	0.12	0.12	0.03	CO_2 none	100.15	
A2. II	1.246	.106	.016	.008	.005	.014	.044	.047			.002	.001	—			

RANG 1. PERALKALIC. ALASKASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	66.91	19.01	3.70	1.79	0.59	0.35	4.62	1.44	0.64	0.20	0.27			CO_2 0.26	99.78	
A2. II	1.115	.186	.023	.025	.015	.006	.074	.015			.003					
2	74.52	10.07	3.74	2.81	0.01	0.86	3.88	3.46	0.86	0.07			0.20		100.48	
A3. III	1.242	.099	.023	.039	—	.015	.063	.037					.003			
3	79.03	13.23	0.34	0.18	0.07	0.25	3.95	2.28	0.18	0.01					99.52	
A3. III	1.317	.129	.002	.003	.002	.005	.064	.024								
4	73.84	16.44	0.50	0.68	trace	0.65	4.23	3.07	0.44						99.85	
A3. III	1.231	.161	.003	.009	—	.012	.068	.033								
5	75.19	13.77	0.61	1.37	0.09	0.68	3.83	3.33	0.65		none	none	trace	SO_3 0.29 Li_2O 0.02	99.83	
A2. II	1.253	.135	.004	.019	.002	.012	.061	.035			—	—	—			
6	74.51	14.83	1.09	trace	0.47	0.81	4.38	2.72	0.92		none	trace	none	SO_3 0.24 Li_2O 0.02	99.99	
A2. II	1.242	.145	.007	—	.012	.014	.071	.029			—	—	—			
7	76.00	14.88	0.65	0.10	0.06	0.19	3.52	2.77	1.42	0.20	0.04	0.11	trace	CO_2 none SO_3 trace Cl trace F trace BaO trace	99.94	
A1. I	1.266	.146	.004	.001	.002	.003	.056	.030			—	.001	—			
8	74.29	14.93	0.77	0.79	none	0.41	4.67	2.38	0.56				0.89		99.69	
A3. III	1.238	.146	.005	.011	—	.007	.076	.025					.013			
9	77.84	13.20	0.80	0.25	0.11	0.20	4.06	1.55	1.21	0.37	none	0.04	none	CO_2 none Cl trace S 0.10 BaO none SrO none	99.73	
A1. I	1.297	.129	.005	.004	.003	.004	.066	.017			—	—	—			

ORDER 3. QUARFELIC. COLUMBARE—Continued.

SUBRANG 3. SODIPOTASSIC. ALASKOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
95	I.3(4).1.3.	Q 36.60 hy 0.40 or 26.13 mt 0.93 ab 30.92 il 0.46 an 1.39 hm 0.16 C 2.35	Cocata, South Australia.	W. S. Chapman.	R. L. Jack, G. S. S. Aust. B. 1, p. 12, 1912.	Granite.	
96	I.3(4).1(2).3.	Q 35.88 hy 0.40 or 27.80 mt 1.39 ab 26.72 il 0.30 an 3.61 C 3.26	Kolbolla, South Australia.	W. S. Chapman.	R. L. Jack, G. S. S. Aust. B. 1, p. 12, 1912.	Granite.	
97	I.3.1.3.⊙	Q 45.36 hy 2.42 or 23.35 mt 0.93 ab 24.10 il 0.30 C 2.55	Norseman, West Australia.	E. S. Simpson.	W. D. Campbell, W. Aust. G. S., B. 21, p. 119, 1906.	Granite.	
98	I.3(4).1.3.	Q 36.48 hy 0.60 or 31.14 mt 0.23 ab 26.20 il 0.15 an 1.95 hm 0.32 C 2.55 ap 0.34	Southern Cross, Yilgarn Goldfield, West Australia.	Surv. lab.	R. A. Farquharson, W. Aust. G. S., B. 49, p. 57, 1913.	Granite.	
99	I.3.1.3.⊙	Q 47.46 hy 0.40 or 23.35 hm 0.67 ab 21.48 ru 0.63 C 4.28	Omahu, Hauraki, New Zealand.	P. Holland.	P. Holland, Q. J. G. S., LV, p. 467, 1899.	Rhyolite.	In W. T., p. 129.
100	I.3(4).1″.3.	Q 37.98 hy 1.32 or 26.13 mt 0.70 ab 29.34 il 0.15 an 2.78 C 1.22	Tairua River, New Zealand.	E. J. Dunn.	A. R. Secy. Min. Vict. (1911), p. 62, 1912.	Obsidian "marekanite."	
101	I.3″.1(2).3.	Q 40.38 hy 0.50 or 26.13 mt 1.39 ab 23.06 il 0.30 an 3.06 hm 1.60 C 1.43	Waiau Valley, Aroha, Hauraki, New Zealand.	Surv. lab.	Henderson and Bartrum, N. Z. G. S. B. 16, p. 69, 1913.	Rhyolite perlite.	

SUBRANG 4. DOSODIC. TORDRILLOSE. (H. S. WASHINGTON, 1917.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I″.3.1.4″.	Q 33.24 hy 1.50 or 8.34 mt 5.10 ab 38.77 il 0.46 an 1.67 hm 0.16 C 9.28	Lake Dufresnoy, Kewagama Lake, Quebec.	S. J. Lloyd.	M. E. Wilson, Can. G. S. Mem. 39 p. 47, 1913.	Dacite.	
2	I(II).3″.1.(3)4.	Q 36.90 ac 0.46 or 20.57 di 3.72 ab 32.49 hy 0.40 mt 5.57	East Greenwich, Rhode Island.	J. H. Perry.	Emerson and Perry, U. S. G. S. B. 311, p. 66, 1907.	Graphic micro-granite.	
3	I.3.1.4.⊙	Q 46.56 hy 0.33 or 13.34 mt 0.46 ab 33.54 an 1.39 C 3.67	Marcellon, Fox River Valley, Wisconsin.	W. W. Daniells.	Hobbs and Leith, B. Un. Wisc. 158, p. 262, 1907.	Aporhyolite.	
4	I.3(4).1(2).″4.	Q 35.70 hy 0.79 or 18.35 mt 0.70 ab 35.63 an 3.34 C 4.90	Marquette, Fox River Valley, Wisconsin.	W. W. Daniells,	Hobbs and Leith, B. Un. Wisc. 158, p. 262, 1907.	Aporhyolite.	
5	I.3″.1(2).(3)4.	Q 38.16 hy 2.18 or 19.46 mt 0.93 ab 31.96 an 3.34 C 2.75	Madison Plateau, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 426, 1899.	Rhyolite.	In W. T., p. 131.
6	I.3(4).1(2).4.	Q 36.12 hy 1.20 or 16.12 hm 1.09 ab 37.20 an 3.89 C 3.16	Echo Peak, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 65, 1899.	Dacite porphyry.	In W. T., p. 131.
7	I.3.1.(3)4.	Q 44.88 hy 0.20 or 16.68 mt 0.23 ab 29.34 hm 0.48 C 6.12 ap 0.34	Grizzly Hill, Plumas County, California.	H. N. Stokes.	H. W. Turner, U. S. G. S. A. R. 17, (I), p. 721, 1896.	Granite.	In W. T., p. 131.
8	I.3(4).1″.4.	Q 35.94 hy 2.51 or 13.90 mt 1.16 ab 39.82 an 1.95 C 3.88	Catherine Mine, Pala, San Diego County, California.	W. T. Schaller.	U. S. G. S. rec. lab.	Pegmatite.	
9	I.3.1.4.⊙	Q 47.46 mt 1.05 or 9.45 ab 34.58 an 1.11 C 4.28	Tybo, Hot Creek Range, Nevada.	G. Steiger.	J. E. Spurr, U. S. G. S. B. 228, p. 207, 1904.	Tordrillite.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. ALASKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
10	80.79	11.13	0.35	n. d.	none	0.21	4.22	1.85	1.26						99.81	2.64
A3. III	1.347	.109	.002	(.004)	—	.004	.068	.020								
11	77.18	13.78	1.07	n. d.	0.05	0.12	3.68	3.27	0.63		trace	0.17		Cl 0.06	100.01	
A4. IV	1.286	.135	.007	(.014)	.001	.002	.060	.035			—	.001				
12	74.39	15.55	1.35	n. d.	0.33	0.48	3.79	2.14	1.18				0.22		99.43	2.72
A4. IV	1.240	.152	.009	(.018)	.008	.009	.061	.022					.003			
13	74.35	14.70	0.79	0.62	0.81	0.70	5.29	1.67	0.72	0.11	0.18	0.12	0.07	NiO trace? BaO 0.02 Li_2O trace	100.15	
A2. II	1.239	.144	.005	.008	.020	.013	.085	.018			.002	.001	.001			
14	78.8	10.9	1.5	n. d.	0.8	0.5	4.1	3.4	0.6						100.6	
B3. IV	1.313	.107	.009	(.018)	.020	.009	.006	.036								
15	73.80	14.60	n. d.	2.35	1.17	0.06	4.15	2.85	1.50		0.25				100.73	
A4. IV	1.230	.143	—	.033	.029	.001	.067	.031			.003					
16	72.20	10.75	0.89	0.80	0.65	0.45	3.95	3.17	7.32		0.06				100.24	
A3. III	1.203	.105	.006	.011	.016	.008	.064	.034			.001					
17	79.80	10.57	0.93	trace	0.99	0.24	4.40	1.91	0.70						99.54	
A3. III	1.330	.104	.006	—	.025	.004	.071	.020								
18	79.71	11.78	0.77	trace	0.30	0.12	5.31	2.00	0.29						100.28	
A3. III	1.329	.116	.005	—	.008	.002	.085	.021								
19	75.13	14.04	1.24	0.29	0.35	0.60	4.06	3.03	0.70	0.11	0.25			CO_2 0.22	100.02	
A2. II	1.252	.138	.008	.004	.009	.011	.066	.032			.003					
20	76.76	12.34	1.55	0.37	0.77	0.07	4.36	2.15	0.99	0.12	0.14				99.62	2.665
A3. III	1.279	.121	.010	.005	.019	.001	.070	.023			.002					
21	76.72	12.25	1.54	0.57	0.24	0.16	4.45	2.90	0.95	0.09	trace				99.87	2.690
B3. III	1.279	.120	.010	.008	.006	.003	.072	.031			—					
22	77.61	12.47	n. d.	0.97	0.11	0.22	4.10	3.58	0.72		trace	trace	trace		99.78	2.59
A3. III	1.294	.122	—	.014	.003	.004	.066	.038			—	—	—			
23	79.86	11.53	1.91	n. d.	0.04	0.44	2.66	2.24	0.80				0.50		99.98	2.55
A4. IV	1.331	.113	.012	(.024)	.001	.008	.043	.024					.007			
24	80.76	10.61	0.75	0.15	0.21	0.28	4.62	1.89	0.96		trace				100.23	2.38
A3. III	1.346	.104	.005	.002	.005	.005	.074	.020								
25	76.55	10.68	0.86	0.54	0.50	0.80	4.94	3.33	1.36				0.04		99.60	2.648
A3. III	1.276	.105	.005	.008	.013	.014	.080	.035					—			

ORDER 3. QUARFELIC. COLUMBARE—Continued.

SUBRANG 4. DOSODIC. TORDRILLOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
10	I.3.1.4.⊙	Q 48.42 hy 0.53 or 11.12 ab 35.63 an 1.11 C 1.73	Red Point, St. Thomas, West Indies.	P. T. Cleve.	P. T. Cleve, Sver. Vet. A. K. Hand., IX, No. 12, p. 34, 1871.	Quartz porphyry.	Cf. Högbom, B. G. Inst. Ups., VI, p. 230, (1903), 1905.
11	I.3.1.(3)4.	Q 42.06 hy 1.95 or 19.46 ap 0.34 ab 31.44 C 4.08	Fiddich Bridge, Craig Machie, Scotland.	W. Mackie.	W. Mackie, Tr. Edin. G. Soc., VIII, pt. 1, p. 54, 1901.	Granite.	
12	I.3.1(2).4.	Q 41.70 hy 3.57 or 12.23 ab 31.96 an 2.50 C 6.12	St. Johns, Isle of Man.	P. Holland.	Dickson and Holland, Pr. Liv. G. Soc., VI, p. 126, 1889.	Elvanite.	In W. T., p. 131
13	I.3(4).1″.4″.	Q 34.80 hy 2.13 or 10.01 mt 0.66 ab 44.54 il 0.30 an 2.78 ap 0.34 C 3.16	East Porthallow, Cornwall.	W. Pollard.	Flett and Hill, Mem. G. S. Eng., Sheet 359, p. 59, 1912.	Granite gneiss.	
14	I.3″.1.(3)4.	Q 38.94 di 0.92 or 20.02 hy 3.91 ab 34.58 an 1.39	Ravin des Dames, Meuse, France.	J. de Lapparent	J. de Lapparent, B. Soc. Min. Fr., XXXII, p. 257, 1909.	Microgranite.	Also in Étude Comp. Porph. France, p. 84, 1909.
15	I″.3(4).1″.4.	Q 34.86 hy 6.86 or 17.24 il 0.46 ab 35.11 an 0.28 C 4.49	St. Clement, Lyonnais, France.	Pisani.	A. Michel-Levy, C. R., CLVI, p. 718, 1913.	Orthophyre.	
16	I.3(4).1″.(3)4.	Q 34.74 hy 2.13 or 18.90 mt 1.39 ab 33.54 il 0.15 an 2.22	Colle de la Motte, Esterel, France.	Pisani.	A. Michel-Levy, B. Sv. Ct. G. Fr., XXI, No. 130, p. 40, 1912.	Pitchstone.	Incomplete in C. R., CL, p. 750, 1910.
17	I.3.1.4.⊙	Q 45.06 hy 2.50 or 11.12 hm 0.93 ab 37.20 an 1.11 C 0.92	Between Canne and Pirio, Corsica.	J. Deprat,	J. Deprat, B. Sv. Ct. G. Fr., XVII, No. 117, p. 61, 1907.	Micropegmatite.	
18	I.3″.1.4.	Q 40.86 hy 0.80 or 11.68 hm 0.77 ab 44.54 an 0.56 C 0.82	Tula Ravine, Corsica.	J. Deprat.	J. Deprat, B. Sv. Ct. G. Fr., XVII, No. 117, p. 61, 1907.	Micropegmatite.	
19	I.3″.1″.″4.	Q 37.98 hy 0.90 or 17.79 mt 0.23 ab 34.58 il 0.46 an 3.06 hm 1.12 C 2.96	Dornbach, Blatt Rossdorf, Hesse.	K. M. Jene.	G. Klemm, Erl. G. Kt. Hesse, Bl. Rossdorf, p. 46, 1912.	Aplite.	
20	I.3.1.4.⊙	Q 42.00 hy 1.90 or 12.79 mt 0.70 ab 36.68 il 0.30 an 0.28 hm 1.12 C 2.75	Platta Mala, Lower Engadine, Switzerland.	L. Hezner.	U. Grubenmann, Btr. G. Kte. Schw., XXIII, p. 192, 1909.	Aplitic granite.	
21	I.3″.1.4.	Q 38.94 hy 0.60 or 17.24 mt 1.86 ab 37.73 il 0.32 an 0.83 C 1.43	Sur Eu, Lower Engadine, Switzerland.	M. Dittrich.	O. Züst, In. Diss. Zür., p. 20, 1905.	Aplite.	
22	I.3″.1.(3)4.	Q 38.88 hy 2.15 or 21.13 ab 34.58 an 1.11 C 1.43	Groppo del Vescovo, n. Parma, Italy.	M. Ferrari.	M. Ferrari, Mem. Ac. Linc. (5), VIII, No. 21, p. 730, 1911.	Quartz porphyry.	
23	I.″3.1(2).(3)4.	Q 52.86 hy 4.19 or 13.34 ab 22.53 an 2.22 C 3.84	Ku Kli, Amur River, East Siberia.	(?)	K. E. Bogdanovitch, Fund. Marek., p. 57, 1904.	Liparite.	MnO high?
24	I.3.1.4.⊙	Q 46.08 hy 0.40 or 11.12 mt 0.46 ab 38.77 hm 0.48 an 1.39 C 0.51	Thsin-ling Mountains above Lan-Kiao, China.	C. Pfeil.	K. Futterer, Durch Asien, II, (2), p. 266, 1909.	Granite.	
25	I″.3(4).1.″4.	Q 35.16 ac 2.31 or 19.46 ns 0.61 ab 36.68 di 3.19 hy 0.80	Siboem boem, Sumatra.	L. Serrurier.	R. D. M. Verbeek, Sum. Westk., p. 232, 1883.	Quartz porphyry.	Not in W. T.

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. ALASKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
26	77.81	12.89	n. d.	0.90	0.88	0.05	4.18	2.39	0.44	0.09	0.41		0.08	FeS_2 0.21	100.33	2.68
A2. II	1.297	.126	—	.013	.022	.001	.068	.026			.005		.001			
27	74.87	14.14	1.30	0.50	0.25	0.70	5.06	2.18	0.40	0.04	0.05	0.21	0.08	CO_2 none SO_3 0.05 B_2O_3 0.52	100.35	
A2. II	1.248	.139	.008	.007	.006	.013	.082	.023			—	.001	.001			

RANG 1. ALASKASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	78.28	12.00	n. d.	1.19	0.37	0.29	6.89	none	0.61		0.34			CO_2 none	99.97	
A3. III	1.305	.118	—	.017	.009	.005	.111	—			.004					
2	80.09	10.80	1.07	0.83	0.58	0.38	5.60	none	0.52	0.24	0.16	0.04	0.02	CO_2 none ZrO_2 0.01 S none BaO none SrO none	100.34	
A1. I	1.335	.106	.007	.011	.015	.007	.090	—			.002	—	—			
3	78.50	11.50	0.11	1.82	0.46	0.50	6.04	none	0.82	0.30	0.27	0.03	0.03	CO_2 none ZrO_2 none S 0.13 BaO none SrO none	100.51	
A1. I	1.308	.113	.001	.025	.012	.009	.097	—			.003	—	—			
4	79.64	11.44	0.11	0.30	0.15	0.71	6.40	0.38	0.30	0.16	0.50	0.08	0.08	CO_2 0.02	100.27	
A2. II	1.327	.112	.001	.004	.004	.013	.103	.004			.006	—	.001			
5	81.1	10.8	1.2	n. d.	0.1	0.5	5.9	0.5	0.4						100.5	
B3. IV	1.352	.106	.008	(.016)	.003	.009	.095	.005								
6	78.1	12.8	1.7	n. d.	0.7	0.6	5.4	0.7	0.5						100.5	
B3. IV	1.302	.125	.011	(.022)	.018	.011	.087	.008								
7	77.32	11.62	1.57	0.69	0.80	0.62	5.81	0.99	0.65		0.34		0.10		100.51	
A2. II	1.289	.114	.010	.010	.020	.011	.093	.011			.004		.001			
8	83.57	8.01	2.04	n. d.	trace	0.50	4.53	0.16	1.10					S trace	99.91	2.624
A4. IV	1.393	.078	.013	(.026)	—	.009	.072	.002								
9	75.78	11.41	2.31	2.29	0.75	0.87	4.76	0.73	n. d.		0.23	0.81		CO_2 0.34 S 0.16	100.44	
A2. II	1.263	.112	.014	.032	.019	.016	.077	.008			.003	.006				
10	78.48	10.26	1.81	0.25	0.53	1.07	5.39	0.37	0.96	0.30	0.52	trace		CO_2 0.08	100.02	
A2. II	1.308	.100	.011	.004	.023	.020	.087	.004			.007					
11	77.45	10.16	3.04	0.53	0.47	1.75	5.53	0.40	1.04		0.55	0.06	trace	CO_2 0.31 S 0.14	99.43	2.620
A2. II	1.291	.100	.019	.007	.012	.031	.089	.004			.007	—				
12	77.83	10.79	2.35	1.16	0.33	0.19	5.61	0.88	0.67			trace			99.81	
A3. III	1.297	.106	.015	.016	.008	.003	.090	.009								
13	77.44	10.55	2.24	0.34	0.09	0.99	6.23	0.71	0.58	0.33	0.20	0.17	trace		99.91	
A2. II	1.291	.103	.015	.005	.002	.018	.100	.008			.003	.001				
14	78.64	12.79	n. d.	1.14	trace	trace	6.10	0.80	0.41			0.14	trace	CO_2 trace SO_3 0.22	100.24	2.51
A.4 IV	1.311	.125	—	.016	—	—	.098	.009				.001	—			

ORDER 3. QUARFELIC. COLUMBARE—Continued.

SUBRANG 4. DOSODIC. TORDRILLOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
26	I.3.1.4.⊙	Q 42.00 hy 3.39 or 14.46 il 0.76 ab 35.63 an 0.28 C 3.16	Norseman, West Australia.	E. S. Simpson.	W. D. Campbell, W. Aust. G. S. B. 21, p. 119, 1906.	Felsite.	
27	I.3(4).1″.4.	Q 35.52 hy 0.60 or 12.79 mt 1.86 ab 42.97 ap 0.34 an 2.78 C 2.45	Pensini Creek, Orikaka District, New Zealand.	Not stated.	P. G. Morgan, pers. com.	Tourmaline pegmatite.	

SUBRANG 5. WESTPHALOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.3(4).1.5.	Q 36.42 hy 2.62 ab 58.16 il 0.61 an 1.39 C 0.20	James Township, Cobalt, Ontario.	N. L. Bowen.	N. L. Bowen, Jour. Can. Min. Inst., XII, p. 523 (1909), 1910.	Aplite.	
2	I.3.1″.5.	Q 45.84 hy 1.76 ab 47.16 mt 1.62 an 1.95 il 0.30 C 0.92	Shasta King Mine, Shasta County, California.	G. Steiger.	B. S. Butler, A. J. S., XXVIII, p. 29, 1909.	Granite porphyry.	Epidote primary?
3	I.3″.1(2).5.	Q 40.50 hy 3.97 ab 50.83 mt 0.23 an 2.50 il 0.46 C 0.71	Bully Hill, Shasta County, California.	G. Steiger.	B. S. Butler, U. S. G. S. B. 419, p. 137, 1910.	Granite porphyry.	
4	I.3″.1.5.	Q 39.72 di 0.86 or 2.22 wo 0.46 ab 53.97 il 0.76 an 1.39 hm 0.16 tn 0.20	Skomer Island, Pembrokeshire, Wales.	E. G. Radley.	H. H. Thomas, Q. J. G. S., LXVII, p. 189, 1911.	Soda rhyolite.	Also in Dewey and Flett, G. Mag., (V), VIII, p. 209, 1911.
5	I.3.1.5.⊙	Q 43.08 di 0.71 or 2.78 hy 2.05 ab 49.78 an 1.67	Ravin de Mairus, Ardennes, France.	J. de Lapparent.	J. de Lapparent, B. Soc. Min. Fr., XXXII, p. 257, 1909.	Microgranite.	
6	I.3″.1(2).″5.	Q 40.20 hy 4.70 or 4.45 ab 45.59 an 3.06 C 1.94	Dames de Meuse, Ardennes, France.	J. de Lapparent.	J. de Lapparent, B. Soc. M. Fr., XXXII, p. 257, 1909.	Microgranite.	
7	I.3(4).1(2).(4).5.	Q 37.68 hy 2.00 or 6.12 mt 1.62 ab 48.73 il 0.61 an 3.06 hm 0.48	Gubben, Rödö, Sweden.	Santesson.	P. J. Holmquist, Afh. Sver. G. Und., No. 181, p. 83, 1899.	Granite (albite pegmatite).	In W. T., p. 131. Dike.
8	I.″3.1.5.	Q 54.60 di 1.24 or 1.11 hy 2.77 ab 37.73 an 1.11	Wiébelsaal, Westphalia.	Bömer.	O. Mügge, N. J. B. B., VIII, p. 616, 1893.	Quartz keratophyre.	In W. T., p. 131.
9	I.″3.1.″5.	Q 43.02 hy 3.88 or 4.45 mt 3.25 ab 40.35 il 0.46 C 2.75 ap 1.68	Rossdorf, Hesse.	Butzbach.	G. Klemm, Erl. G. Kt. Hes., Bl. Rossdorf, p. 48, 1912.	Granophyre.	P_2O_5 high?
10	I.3.1″.5.	Q 43.20 di 1.73 or 2.22 hy 0.50 ab 45.59 il 0.61 an 2.50 hm 1.81 tn 0.59	Epidauros, Argolis, Greece.	M. Dittrich.	Milch and Reuz, N. J. B. B., XXXI, p. 509, 1911.	Quartz keratophyre.	
11	I″.3.1″.5.	Q 40.98 di 2.59 or 2.22 wo 1.39 ab 46.11 il 1.06 an 1.95 hm 3.04	Epidauros, Argolis, Greece.	A. Lindner.	Milch and Reuz, N. J. B. B., XXXI, p. 512, 1911.	Quartz keratophyre.	
12	I.3.1.″5.	Q 41.28 hy 0.93 or 5.00 mt 3.48 ab 47.16 an 0.83 C 0.41	Marahano, Debaroa, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 110, 1909.	Quartz keratophyre.	
13	I″.3″.1.″5.	Q 38.16 ac 2.31 or 4.45 di 0.43 ab 49.78 wo 1.51 mt 0.46 il 0.46 hm 1.28 ap 0.34	Copper Island, Commander Islands, Bering Sea.	W. Zydmuntonska.	W. Zygmuntonska, B. Ac. Sc. Crac., 1912, p. 684.	Soda rhyolite.	
14	I.3″.1.″5.	Q 39.18 hy 2.11 or 5.00 ab 51.35 C 1.84	Nuthernugie, Barrier Range, New South Wales.	J. C. H. Mingaye.	J. B. Jaquet, Mem. G. S. N. S. W., No. 5, p. 39, 1894.	Felsite.	Not in W. T.

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. ALSBACHASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	78.04	11.98	0.23	0.60	0.04	0.62	0.24	6.83	1.41						100.01	
A? 3. III	1.301	.117	.001	.008	.001	.011	.004	.072								
2	75.57	10.57	3.30	0.96	0.27	0.67	trace	6.75	1.60			trace	0.23	SO_3 none	99.92	2.62
A2. II	1.260	.104	.021	.014	.007	.012	—	.072				—	.003			

RANG 2. DOMALKALIC. ALSBACHASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	77.59	10.53	0.21	1.74	1.01	0.76	1.58	5.30	0.60		0.60	0.05	0.03	CO_2 0.13 SO_3 0.05 BaO 0.06	99.24	
B1. II	1.293	.103	.001	.024	.025	.014	.026	.056			.008	—	—			
2	80.99	10.15	1.38	n. d.	0.33	1.69	1.40	4.24	n. d.				trace		100.18	
A4. IV	1.350	.100	.009	(.018)	.008	.030	.023	.044								
3	72.65	14.23	1.72	1.56	0.42	1.42	1.80	5.35	0.46				0.63		100.24	
A3. III	1.211	.140	.011	.022	.011	.025	.029	.057					.009			
4	69.89	15.20	1.43	1.19	0.82	2.12	1.86	4.89	0.75	0.28	0.01	0.66		SO_3 0.85	99.95	
A2. II	1.165	.149	.009	.017	.020	.038	.030	.052			—	.005				
5	73.15	16.74	0.78	n. d.	0.21	0.90	1.13	4.58	2.58					SO_3 0.12 FeS_2 0.73	100.92	2.436
A4. IV	1.219	.164	.005	(.010)	.005	.016	.018	.049								
6	70.59	17.62	1.74	n. d.	trace	1.96	0.80	5.10	1.61					SO_3 0.07 FeS_2 0.15	99.64	2.292
A4. IV	1.177	.173	.011	(.022)	—	.035	.013	.055								
7	74.93	11.37	1.34	1.32	0.54	1.24	1.18	6.72	0.75		0.28	0.15	0.09	BaO 0.28	100.19	
A2. II	1.249	.112	.008	.018	.014	.022	.019	.071			.004	.001	.001			
8	72.51	13.47	2.63	0.94	0.52	0.97	0.87	6.59	1.06			0.06	0.15	SO_3 none NiO none CuO 0.06	99.83	
A2. II	1 209	.132	.016	.013	.013	.017	.014	.070				—	.002			

RANG 2. ALSBACHASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	75.14	12.50	1.20	0.87	0.43	0.83	3.00	3.50	2.55		0.16		trace		100.18	
A3. III	1.252	.123	.008	.012	.011	.015	.048	.037			.002		—			
2	71.85	15.25	1.04	2.56	0.63	2.46	3.18	3.04	0.17		0.58	trace	trace		100.76	
A2. II	1.198	.150	.007	.036	.016	.044	.051	.032			.007	—	—			
3	76.99	12.45	1.03	0.49	0.21	0.98	3.46	4.29	0.26				trace		100.16	
A3. III	1.283	.122	.006	.007	.005	.018	.056	.046								
4	74.47	14.15	1.16	1.21	0.63	1.70	1.97	4.14	0.20	0.06				CO_2 0.25 S 0.27	100.21	2.65
A3. III	1.241	.139	.007	.017	.016	.030	.032	.043								

ORDER 3. QUARFELIC. COLUMBARE—Continued.

SUBRANG 1. PERPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.3.(1)2.1.	Q 48.90 hy 1.02 or 40.03 mt 0.23 ab 2.10 an 3.05 C 3.06	Riggenbachthal-Schwarzwald, Baden.	Bunsen's laboratory.	H. Schmidt, Ref, N. J. 1889, I, p. 95.	Porphyry.	In W. T., p. 125.
2	I.3.(1)2.1.	Q 47.82 hy 0.70 or 40.03 mt 3.94 an 3.34 hm 0.64 C 2.04	Nuthernugie, Barrier Range, New South Wales.	H. P. White.	J. B. Jaquet, Mem. G. S. N. S. W., No. 5, p. 40, 1894.	Pitchstone.	Not in W. T.

SUBRANG 2. DOPOTASSIC. MIHALOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.3.(1)2.2″.	Q 43.98 hy 4.48 or 31.14 mt 0.23 ab 13.62 il 1.22 an 3.89 C 0.71	Pompton Junction, New Jersey.	R. B. Gage.	J. V. Lewis, N. J. G. S. A. R., (1908), p. 66, 1909.	Gneiss.	Included in granite.
2	I.3.2.2″.	Q 51.72 hy 3.18 or 24.46 ab 12.05 an 8.34 C 0.31	Ulfhällarne, Skattmansö, Sweden.	D. Hummel.	P. J. Holmquist, B. Un. Ups., VII, p. 266, 1906.	Granite.	
3	I″.3″.2.2″.	Q 36.84 hy 3.74 or 31.69 mt 2.55 ab 15.20 an 6.95 C 2.96	Solhem, Fjällbacka, Bohuslän, Sweden.	H. I. P. Hilding.	P. J. Holmquist, B. Un. Ups., VII, p. 260, 1906.	Granite.	Same rock as No. 2, I.4.2.2.
4	I″.3″.2.2(3).	Q 36.18 hy 3.06 or 28.91 mt 2.09 ab 15.72 ap 1.68 an 5.84 C 4.69	Birkenauerthal, Hessen.	Surv. lab.	G. Klemm, Erl. G. Kte. Hess., Bl. Birkenau, p. 33, 1905.	Granite.	
5	I.3.2.2.⊙	Q 46.20 hy 1.82 or 27.24 ab 9.43 an 4.45 C 8.26	Nagy Mihaly, Hungary.	K. v. Muraközy.	K. v. Muraközy, F. K., XXII, p. 54, 1892.	Rhyolite.	In W. T., p. 131.
6	I.3.2″.2.	Q 40.62 hy 2.90 or 30.58 ab 6.81 an 9.73 C 7.14	Nagy Mihaly, Hungary.	K. v. Muraközy.	K. v. Muraközy, F. K., XXII, p. 54, 1892.	Rhyolite.	In W. T., p. 131.
7	I.3″.″2.2.	Q 39.00 hy 2.32 or 39.48 mt 1.86 ab 9.96 il 0.61 an 5.28 ap 0.34 C 0.31	Schtscheliki, Olonez, Russia.	W. Wahl.	W. Wahl, Fennia, XXIV, No. 3, p. 54. 1908.	Granite.	
8	I.3″.″2.″2.	Q 39.48 hy 1.30 or 38.92 mt 3.48 ab 7.34 hm 0.16 an 4.73 C 3.16	Werkh Issetsk, Mursinsk, Ural Mountains.	G. Katerfeld.	W. Nikitin, Mem. Com. G. Russ., XXII, p. 95, 1907.	Granite.	

SUBRANG 3. SODIPOTASSIC. TEHAMOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.3.(1)2.3″.	Q 41.94 hy 1.36 or 20.57 mt 1.86 ab 25.15 il 0.30 an 4.17 C 2.35	Cape Fletcher, Canning Peninsula, East Greenland.	N. Sahlbom.	O. Nordenskjöld, Medd. Grönl., XXVII, p. 199, 1908.	Quartz porphyry.	
2	I″.3(4).2″.3(4).	Q 34.44 hy 4.50 or 17.79 mt 1.62 ab 26.72 il 1.06 an 12.23 C 2.35	Havnefjord, Jones. Sound, Ellesmere Land.	P. Schei.	C. Bugge, Rep. 2d Fram Exped., No. 22, p. 18, 1910.	Hypersthene adamellite.	
3	I.3(4).(1)2.3.	Q 37.74 hy 0.63 or 25.58 mt 1.39 ab 29.34 an 5.00 C 0.20	Livingstone Township, Ontario.	N. N. Evans.	Adams and Barlow, Can. G. S., Mem. No. 6, p. 54, 1910.	Granite gneiss.	
4	I.3.2.″3.	Q 42.30 hy 2.92 or 23.91 mt 1.62 ab 16.77 an 8.34 C 3.47	Rattlesnake Hill, Concord, New Hampshire.	Sherman and Edwards.	T. N. Dale, U. S. G. S. B. 354, p. 150, 1908.	Granite.	

CLASS I. PERSALANE—Continued.

RANG 2. ALSBACHASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
5	75.56	12.61	0.64	1.16	0.05	0.84	2.35	5.93	0.42		0.22	0.05	0.03	CO_2 0.19 SO_3 0.11 BaO 0.12	100.27	
A1. I	1.259	.124	.004	.016	.001	.015	.038	.063			.003	—	—			
6	75.17	12.55	1.54	1.41	0.21	1.15	3.07	4.62	0.22		0.31	0.04	0.04	ZrO_2 0.05 SO_3 0.02 BaO 0.10	100.50	
A1. I	1.253	.123	.010	.019	.005	.020	.050	.049			.004	—	—			
7	73.85	13.15	3.27	0.36	0.32	0.82	2.29	5.42	0.71			0.06	0.09		100.34	
A2. II	1.231	.129	.020	.005	.008	.014	.037	.058				—	.001			
8	71.45	14.36	2.07	2.78	1.17	1.58	1.95	3.28	1.30					[illegible]O trace	99.94	
A3. III	1.191	.142	.013	.039	.029	.029	.031	.035								
9	69.29	14.07	2.59	2.03	1.32	2.76	2.89	2.87	0.37	0.06	0.50	0.26	0.08	CO_2 trace	99.09	
B2. III	1.153	.138	.016	.028	.033	.049	.047	.031			.008	.002	.001			
10	75.55	14.59	0.46	2.25	0.03	1.10	3.79	2.16	0.40	0.15				CO_2 0.03	100.51	
A3. III	1.259	.143	.003	.031	.001	.020	.061	.023								
11	74.46	15.28	1.95	0.74	0.08	0.92	2.57	3.01	0.58						99.59	
A3. III	1.241	.150	.012	.010	.002	.016	.042	.032								
12	74.00	12.04	0.78	2.61	0.42	0.85	3.47	4.33	0.86		0.34	0.06	0.05	Cl trace BaO 0.12 Li_2O trace	99.93	2.565
A2. II	1.233	.118	.005	.036	.011	.015	.056	.046			.004	—	—			
13	76.26	12.94	0.69	0.13	0.17	1.10	2.73	5.26	0.43	0.17	0.11	0.06	trace	CO_2 none S 0.01 Cr_2O_3 none NiO none BaO 0.07 SrO none	100.13	
A1. I	1.271	.127	.004	.002	.004	.020	.044	.056			.001	—	—			
14	74.34	12.97	0.75	0.54	0.86	0.85	2.49	4.72	1.11	1.03	0.18	0.07	trace	CO_2 none ZrO_2 0.05 SO_3 0.03 BaO 0.07 SrO trace Li_2O trace	100.06	
A1. I	1.239	.127	.005	.007	.022	.015	.040	.050			.002	—	—			
15	75.89	12.27	1.12	1.37	0.29	0.86	3.23	3.42	0.82		0.50	none	none	SO_3 0.28 Li_2O 0.01	100.06	
A2. II	1.265	.120	.007	.019	.007	.015	.052	.036			.006	—	—			
16	75.34	12.51	0.42	1.55	0.32	1.07	3.31	4.17	0.86		none	none	0.07	SO_3 0.42 Li_2O trace	100.04	
A2. II	1.256	.122	.003	.022	.008	.020	.053	.045			—	—	.001			
17	71.69	13.29	0.83	4.23	1.28	1.66	2.48	2.37	1.31	0.14	0.59	0.07	0.09	CO_2 0.13	100.16	2.773
A2. II	1.195	.130	.005	.058	.032	.029	.040	.025			.007		.001			
18	74.65	14.11	1.08	0.29	0.20	0.80	2.81	4.59	1.40		0.21	trace	0.11	BaO 0.08 SrO trace Li_2O none	100.33	
A2. II	1.244	.138	.007	.004	.005	.014	.045	.049			.003	—	.001			

ORDER 3. QUARFELIC. COLUMBARE—Continued.

SUBRANG 3. SODIPOTASSIC. TEHAMOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
5	I.3(4).(1)2.(2)3.	Q 36.78 hy 1.29 or 35.03 mt 0.93 ab 19.91 il 0.46 an 4.17 C 0.82	Charlotteburg, New Jersey.	R. B. Gage.	J. V. Lewis, N. J. G. S. A. R. (1908), p. 68, 1909.	Granite gneiss.	
6	I.3(4).″2.3.	Q 36.54 hy 1.16 or 27.24 mt 2.32 ab 26.20 il 0.61 an 5.56 C 0.41	German Valley, Schooley's Mountain, New Jersey.	R. B. Gage.	J. V. Lewis, N. J. G. S. A. R. (1908), p.77, 1909.	Granite gneiss.	
7	I.3(4).(1)2.(2)3.	Q 37.50 hy 0.80 or 32.25 mt 1.39 ab 19.39 hm 2.24 an 3.89 C 2.04	Monterey, Franklin County, Pennsylvania.	L. G. Eakins.	G. H. Williams, U. S. G. S. B. 148, p. 81, 1897.	Quartz porphyry.	In W. T., p. 127.
8	I″.3.2″.3.	Q 40.52 hy 6.33 or 19.46 mt 3.02 ab 16.24 an 8.06 C 4.79	Sykesville, Carroll County, Maryland.	W. F. Hillebrand.	G. H. Williams, U. S. G. S. A. R. 15, p. 672, 1895.	Granite.	Cf. C. R. Keyes, op. cit., p. 697. In W. T., p. 133.
9	I(II).3(4).2(3).3(4).	Q 33.78 hy 3.96 or 17.24 mt 3.71 ab 24.63 il 1.22 an 11.68 ap 0.67 C 1.84	Manchester, Chesterfield County, Virginia.	W. M. Thornton.	T. L. Watson, Va. G. S. B. 1A, p. 81, 1909.	Granite gneiss.	
10	I.3.2.3.⊙	Q 41.16 hy 3.80 or 12.79 mt 0.30 ab 31.96 an 5.56 C 3.98	Observatory Hill, Fox River Valley, Wisconsin.	W. W. Daniells.	Hobbs and Leith, B. Un. Wisc., 158, p. 262, 1907.	Granite porphyry.	
11	I.3.″2.3″.	Q 45.78 hy 0.20 or 17.79 mt 2.32 ab 22.01 hm 0.32 an 4.45 C 6.12	Observatory Hill, Fox River Valley, Wisconsin.	W. W. Daniells.	Hobbs and Leith, B. Un. Wisc., 158, p. 262, 1907.	Aporhyolite.	
12	I″.3(4).(1)2.3.	Q 33.18 hy 4.66 or 25.58 mt 1.16 ab 29.34 il 0.61 an 4.17 C 0.10	Pigeon Point, Minnesota.	W. F. Hillebrand.	W. S. Bayley, A. J. S., XXXVII, p. 59, 1889.	Quartz keratophyre.	Also in U. S. G. S. B. 109, p. 56, 1893. In W. T., p. 161.
13	I.3(4).″2.3.	Q 37.62 hy 0.40 or 31.14 mt 0.23 ab 23.06 il 0.15 an 5.56 hm 0.48 C 0.71	Black Butte, Elkhorn District, Montana.	H. N. Stokes.	J. S. Barrell, U. S. G. S. A. R. 22, (II), p. 540, 1901.	Aplite.	
14	I.3″.(1)2.3.	Q 38.82 hy 2.20 or 27.80 mt 1.16 ab 20.96 il 0.30 an 4.17 C 2.24	Hyde Park Dike, Butte District, Montana.	H. N. Stokes.	W. H. Weed, U. S. G. S. P. P. 74, p. 44, 1912.	Rhyolite.	In W. T., p. 133.
15	I.3.(1)2.3″.	Q 41.64 hy 1.49 or 20.02 mt 1.62 ab 27.25 il 0.91 an 4.17 C 1.73	Mount Sheridan, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 426, 1899.	Rhyolite.	In W. T., p. 133.
16	I.3(4).″2.3.	Q 36.00 hy 3.44 or 25.02 mt 0.70 ab 27.77 an 5.56 C 0.41	Elephants Back, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S., Mon. 32, (II), p. 426, 1899.	Rhyolite.	In W. T., p. 133.
17	I(II).3.2″.3(4).	Q 40.04 hy 9.40 or 13.90 mt 1.16 ab 20.96 il 1.06 an 8.06 C 3.67	Moyie Sill, Purcell Mountains, British Columbia.	M. Dittrich.	R. A. Daly, A. J. S., XX, p. 193, 1905.	Granite.	Also in Rosenb. Fests., p. 213, 1906; Can. G. S., Mem. 38, (1), p. 229, 1912.
18	I.3″.(1)2.3.	Q 38.82 hy 0.50 or 27.24 mt 0.46 ab 23.58 il 0.46 an 3.89 hm 0.80 C 3.06	Deer Creek Meadows, Tehama County, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 148, p. 192, 1897.	Rhyolite.	In W. T., p. 133.

CLASS I. PERSALANE—Continued.

RANG 2. ALSBACHASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
19	73.62	14.24	0.93	0.67	0.33	1.07	3.25	4.28	1.29		0.21	0.02	0.08	BaO 0.10 SrO trace Li_2O none	100.09	
A2. II	1.227	.140	.006	.009	.008	.020	.052	.046			.003	—	.001			
20	72.31	13.79	1.54	0.26	0.56	1.08	2.56	4.66	n. d.		0.27	0.07			97.10	
A3. III	1.205	.135	.010	.004	.014	.019	.041	.050			.003	—				
21	73.81	13.93	0.93	0.46	0.72	0.88	2.80	4.81	0.74		0.62	0.06	0.24	ZrO_2 trace Cl 0.02 FeS_2 0.02 CoO 0.28 BaO 0.01 Cu trace Pb none	100.33	
A1. I	1.230	.136	.006	.006	.018	.016	.045	.051			.008	—	.003			
22	75.39	13.62	0.70	n. d.	trace	1.84	2.77	4.39	1.21						99.92	
A4. IV	1.256	.133	.004	(.008)	—	.033	.045	.047								
23	72.78	12.86	3.14	0.26	0.83	0.92	2.31	4.14	1.89	1.05	0.19	0.14	0.09	ZrO_2 0.03 BaO 0.05 Li_2O trace	100.68	
A1. I	1.213	.126	.020	.004	.021	.016	.037	.044			.002	.001	.001			
24	71.42	15.32	3.48	0.21	0.71	1.75	2.77	3.65	0.74					Cl 0.07	100.12	
A3. III	1.190	.150	.022	.003	.018	.031	.045	.039								
25	73.90	12.50	0.62	1.80	1.33	1.26	2.95	3.70	1.10		0.73	trace			99.89	
A2. II	1.232	.123	.004	.025	.033	.022	.048	.039			.009	—				
26	75.20	14.40	0.85	n. d.	1.02	1.02	2.68	3.32	1.12						99.61	
A4. IV	1.253	.141	.005	(.010)	.026	.018	.044	.035								
27	76.21	12.66	2.98	1.46	0.10	1.15	1.64	3.27	0.18	0.35			0.08	CO_2 0.09	100.17	
A3. III	1.270	.124	.019	.020	.003	.021	.026	.035					.001			
28	72.11	13.71	0.29	0.90	0.44	1.44	3.22	3.33	4.19						99.63	2.346
A3. III	1.202	.134	.002	.012	.011	.026	.051	.035								
29	81.17	8.16	1.56	0.77	0.71	1.40	2.17	2.94	0.62		0.30		0.41		100.21	
A2. II	1.353	.080	.010	.011	.018	.025	.035	.031			.004		.006			
30	77.40	13.48	0.98	n. d.	0.14	0.91	3.27	4.28	0.30						100.76	
A4. IV	1.290	.132	.006	(.012)	.004	.016	.053	.045								
31	76.90	12.53	0.99	0.66	0.17	0.86	2.36	4.92	0.43		0.50		0.08		100.40	
A2. II	1.282	.123	.006	.009	.004	.015	.038	.052			.006		.001			
32	76.45	11.64	0.98	1.03	0.38	1.30	2.40	4.85	0.56		0.12	0.07	0.06	BaO 0.07	99.91	
A2. II	1.274	.114	.006	.014	.010	.023	.039	.052			.002	—	.001			
33	75.72	10.77	1.71	1.62	1.12	2.14	1.75	3.86	0.98		0.26	0.08	0.13	BaO 0.06	100.20	
A2. II	1.262	.106	.011	.022	.028	.038	.028	.041			.003	—	.002			
34	75.67	13.74	0.67	0.72	0.25	0.90	2.60	4.85	0.64		0.29		none		100.33	
A2. II	1.261	.134	.004	.010	.006	.016	.042	.052			.004		—			

ORDER 3. QUARFELIC. COLUMBARE—Continued.

SUBRANG 3. SODIPOTASSIC. TEHAMOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
19	I.3(4).″2.3.	Q 35.40 hy 0.93 or 25.58 mt 1.39 ab 27.25 il 0.46 an 5.56 C 2.24	Slate Creek, Tehama County, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 148, p. 192, 1897.	Rhyolite.	In W. T., p. 133.
20	I.3(4).″2.3.	Q 36.42 hy 1.40 or 27.80 mt 0.23 ab 21.48 il 0.46 an 5.28 hm 1.44 C 2.55	Tonopah, Nevada.	G. Steiger.	J. E. Spurr, U. S. G. S. P. P. 42, p. 57, 1905.	Rhyolite-dacite.	Low sum due to water.
21	I.3(4).(1)2.3.	Q 36.24 hy 1.80 or 28.36 mt 0.23 ab 23.58 il 1.22 an 4.85 hm 0.80 C 2.45	Mazaruni District, British Guiana.	J. B. Harrison.	J. B. Harrison, G. Gold f. Brit. Guiana, p. 76, 1908.	Granite.	In W. T., p. 133.
22	I.3(4).2.3.	Q 37.80 hy 1.06 or 26.13 ab 23.58 an 9.17 C 0.82	Craigellachie Bridge, Scotland.	W. Mackie.	W. Mackie, Tr. Edin. G. Soc., VIII, (1), p. 54, 1901.	Granite.	
23	I.3.(1)2.3.	Q 40.80 hy 2.10 or 24.46 mt 0.70 ab 19.39 il 0.30 an 3.61 hm 2.72 C 3.26 ap 0.34	Woodhouselee, Pentland Hills, Scotland.	W. Pollard.	J. S. Flett, Mem. G. S. Scotl., G. Edinb., p. 39, 1910.	Rhyolite.	
24	I.3(4).2.3.	Q 36.36 hy 1.80 or 21.68 mt 0.70 ab 23.58 hm 3.04 an 8.62 C 3.57	Loch Moy, Invernessshire, Scotland.	W. Mackie.	W. Mackie, Tr. Edin. G. Soc., VIII, p. 54, 1901.	Granite.	
25	I″.3″.2.3.	Q 37.26 hy 4.88 or 21.68 mt 0.93 ab 25.15 il 1.37 an 6.12 C 1.43	Pooté, Brittany, France.	Pisani.	L. Vandernotte, Mass. Armor., p. 41, 1913.	Microgranite.	
26	I.3.″2.3.	Q 42.42 hy 3.92 or 19.46 ab 23.06 an 5.00 C 4.49	Between Sannat and Reterre, La Creuse, France.	Pisani.	L. de Launay, B. Sv. Ct. G. Fr., XI, No. 83, p. 76, 1902.	Microgranite.	
27	I.″3.2.″3.	Q 51.48 hy 0.43 or 19.46 mt 4.41 ab 13.62 an 5.84 C 4.28	San Dionisio, Huelva, Spain.	Not stated.	A. M. Finlayson, Ec. Geol., V, p. 407, 1910.	Porphyry.	
28	I.3″.2.3″.	Q 36.78 hy 2.42 or 19.46 mt 0.46 ab 26.72 an 7.23 C 2.24	Faro del Caralete, Cabo de Gata, Spain.	A. Osann.	A. Osann, Z. D. G. G., XLIII, p. 693, 1891.	Liparite.	In W. T., p. 133.
29	I″.″3.″2.3.	Q 53.82 di 2.44 or 17.24 hy 1.03 ab 18.34 mt 2.32 an 3.89 il 0.61	Stora Bergen, Oskarshamn, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 262, 1906.	Granite.	
30	I.3″.(1)2.3.	Q 39.24 hy 1.98 or 25.02 ab 27.77 an 4.45 C 1.84	Greksasars, Nora, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 260, 1906.	Granite.	
31	I.3.(1)2.″3.	Q 42.48 hy 0.40 or 28.91 mt 0.93 ab 19.91 il 0.91 an 4.17 hm 0.32 C 1.84	Grafversfors, Stofsjö, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 264, 1906.	Granite.	
32	I.3″.2.″3.	Q 39.90 hy 1.92 or 28.91 mt 1.39 ab 20.44 il 0.30 an 6.39	Mörtsjön, Skattmansö, Sweden.	Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 266, 1906.	Granite.	
33	I″.3.2″.(2)3.	Q 44.10 hy 4.25 or 22.80 mt 2.55 ab 14.67 il 0.46 an 10.29	Kifsta, Sala, Westmanland, Sweden.	Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 264, 1906.	Granite.	
34	I.3″.(1)2.3.	Q 39.42 hy 0.86 or 28.91 mt 0.93 ab 22.01 il 0.61 an 4.45 C 2.55	Örnsköldsvik, Angermanland, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 260, 1906.	Granite.	

CLASS I. PERSALANE—Continued.

RANG 2. ALSBACHASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
35	75.64	12.46	0.41	0.80	0.44	1.32	2.35	5.47	0.66		0.12		0.55		100.22	
A2. II	1.261	.122	.003	.011	.011	.023	.038	.059			.002		.008			
36	75.48	12.22	1.70	0.63	0.57	2.01	2.73	3.19	0.64		0.14		0.29		99.60	
A2. II	1.258	.120	.011	.009	.014	.036	.044	.034			.002		.004			
37	75.07	12.24	1.65	1.04	0.45	0.99	3.13	4.57	0.87		0.26	0.19	0.09		100.55	
A2. II	1.251	.120	.010	.014	.011	.018	.050	.049			.003	.001	.001			
38	74.73	13.73	2.04	n. d.	0.52	1.45	2.60	4.93	0.59						100.59	
A4. IV	1.246	.135	.013	(.026)	.013	.026	.042	.052								
39	74.17	12.78	1.62	1.12	0.27	1.67	2.87	4.02	0.77		0.91		0.17		100.37	
A2. II	1.236	.125	.010	.015	.007	.030	.047	.042			.011		.002			
40	72.33	15.90	1.58	0.55	0.33	1.45	2.44	4.02	0.75		0.45		0.12		99.92	
A2. II	1.206	.156	.010	.008	.008	.026	.039	.042			.006		.002			
41	72.85	13.79	0.69	1.63	0.79	1.76	2.56	4.54	0.91						99.52	
A3. III	1.214	.135	.004	.022	.020	.031	.041	.048								
42	75.81	11.22	0.86	1.91	0.34	1.25	2.27	5.49	0.40		0.32	trace	trace		99.87	
A2. II	1.264	.110	.005	.026	.009	.022	.037	.059			.004	—	—			
43	70.33	11.82	3.73	2.38	0.20	2.55	2.41	3.08	1.38		1.03	0.53		CO_2 0.13 CaF_2 0.28	99.85	
A2. II	1.172	.116	.023	.033	.005	.046	.039	.033			.013	.004				
44	76.91	12.52	0.45	1.04	0.32	0.75	3.21	3.50	0.72						99.42	
B3. IV	1.282	.123	.003	.014	.008	.013	.052	.037								
45	76.95	13.26	1.38	n. d.	0.48	1.22	2.18	4.17	0.35				trace		99.99	2.516
A3. III	1.283	.130	.009	(.018)	.012	.021	.035	.045								
46	76.44	13.78	0.97	0.07	0.34	0.75	2.76	3.50	0.35	0.33	none	0.51		SO_3 0.25	100.08	
A2. II	1.274	.135	.012	.001	.009	.014	.045	.037			—	.004				
47	76.12	12.18	1.21	0.72	1.12	1.54	2.55	3.21	1.51						100.16	
A3. III	1.269	.119	.007	.010	.028	.028	.041	.034								
48	75.21	12.15	1.74	0.38	0.89	1.23	2.88	4.25	0.92						99.65	
A3. III	1.254	.119	.011	.005	.022	.021	.047	.046								
49	74.41	13.65	0.65	0.95	0.87	1.16	2.56	3.98	1.50						99.73	
A3. III	1.240	.134	.004	.014	.022	.021	.041	.042								
50	72.37	15.18	1.75	0.71	1.54	2.01	2.12	3.54	1.11						100.33	
A3. III	1.206	.148	.011	.010	.039	.036	.034	.037								

ORDER 3. QUARFELIC. COLUMBARE—Continued.

SUBRANG 3. SODIPOTASSIC. TEHAMOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
35	I.3(4).2.(2)3.	Q 36.48 hy 2.95 or 32.80 mt 0.70 ab 19.91 il 0.30 an 6.39 C 0.20	Lien, Strömstad, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 258, 1906.	Granite.	
36	I.3.2″.″3.	Q 42.24 hy 1.40 or 18.90 mt 2.55 ab 23.06 il 0.30 an 10.01 C 0.61	Öja, Huseby, Smaland, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 258, 1906.	Granite.	
37	I.3(4).(1)2.3.	Q 36.84 hy 1.36 or 27.24 mt 2.32 ab 26.20 il 0.46 an 4.17 ap 0.34 C 0.61	Slirud, Svanskog, Wermland, Sweden.	R. Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 264, 1906.	Granite.	
38	I.3(4).2.3.	Q 35.46 hy 4.73 or 28.91 ab 22.01 an 7.23 C 1.53	Ölsjön, Nora, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 260, 1906.	Granite.	
39	I.3(4).2.3.	Q 38.10 hy 0.70 or 23.35 mt 1.39 ab 24.63 il 1.67 an 8.34 hm 0.64 C 0.61	Dyne, Strömstad, Bohuslän, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 258, 1906.	Granite.	
40	I.3″.2.3.	Q 39.60 hy 0.80 or 23.35 mt 0.93 ab 20.44 il 0.91 an 7.23 hm 0.96 C 5.00	Ledingberget, Granninge, Akermanland, Sweden.	H. Santesson.	P. J. Holmquist. B. Un. Ups., VII, p. 260, 1906.	Granite.	
41	I.3(4).2.3.	Q 34.80 hy 4.38 or 26.69 mt 0.93 ab 21.48 an 8.62 C 1.53	Ornö, Hufvud, Sweden.	O. Bäckström.	A. G. Högbom, B. G. Inst. Ups., X, p. 166, 1911.	Granite.	
42	I.3(4).(1)2.(2)3.	Q 37.56 di 1.89 or 32.80 hy 2.18 ab 19.39 mt 1.16 an 3.89 il 0.61	Pytterlaks, Finland.	N. Sahlbom.	V. Hackmann, B. C. G. Finl., No. 15, p. 18, 1905.	Rapakiwi granite.	
43	I″.3.2″.3.	Q 40.14 hy 0.50 or 18.35 mt 4.64 ab 20.44 il 1.98 an 9.17 hm 0.48 C 1.12 ap 1.34	Dagö, Esthonia.	Ungern-Sternberg.	V. Hackmann, B. C. G. Finl., No. 15, p. 22, 1905.	Rapakiwi granite.	
44	I.3.(1)2.3″.	Q 42.18 hy 2.25 or 20.57 mt 0.70 ab 27.25 an 3.61 C 2.14	Grosssachsener Thal, Odenwald.	Dieckmann.	K. Futterer, Mt. Bad. G. L.-A., II, p. 41 (1890), 1893.	Granite.	In W. T., p. 133.
45	I.3.2.3.⊙	Q 43.86 hy 3.58 or 25.02 ab 18.34 an 5.84 C 2.96	Bohnstädtberg, Hessen.	F. W. Schmidt.	C. Chelius, Erl. G. Kte. Hess., Bl. Rossdorf, p. 54, 1886.	Granite.	In W. T., p. 135.
46	I.3.(1)2.3.	Q 46.38 hy 0.90 or 20.57 mt 0.23 ab 23.58 hm 1.76 C 5.41 ap 1.34	Lindenstein, Hessen.	R. Marzahn.	Chelius and Klemm, Erl. G. Kte. Hess., IV, p. 42, 1896.	Granite.	In W. T., p. 129.
47	I.3.2.3.⊙	Q 43.92 hy 3.20 or 18.90 mt 1.62 ab 21.48 an 7.78 C 1.63	Abruzzen, n. Cunersdorf, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XII, p. 191, 1889.	Granite.	In W. T., p. 135.
48	I.3(4).″2.3.	Q 37.92 hy 2.20 or 25.58 mt 1.16 ab 24.63 hm 0.96 an 5.84 C 0.51	Abruzzen, n. Cunersdorf, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XII, p. 191, 1889.	Granite.	In W. T., p. 135.
49	I.3.2.3.⊙	Q 40.08 hy 3.52 or 23.35 mt 0.93 ab 21.48 an 5.84 C 3.06	Hohesrad, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XII, p. 190, 1889.	Granite.	In W. T., p. 135.
50	I.3.2″.3.	Q 40.14 hy 3.90 or 20.57 mt 2.32 ab 17.82 hm 0.16 an 10.01 C 4.18	Abruzzen, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XII, p. 163, 1889.	Granitite.	In W. T., p. 135.

CLASS I. PERSALANE—Continued.

RANG 2. ALSBACHASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
51	72.15	13.56	1.29	1.48	1.52	2.25	2.74	3.55	1.11						99.65	
A3. III	1.203	.133	.008	.021	.038	.040	.044	.038								
52	72.04	15.98	1.08	1.70	1.08	2.11	2.22	3.45	0.66						100.32	
A3. III	1.201	.157	.007	.024	.027	.038	.035	.037								
53	71.4	14.3	2.2	1.8	1.9	2.2	2.1	3.2	0.9						100.0	
B3. IV	1.190	.140	.014	.025	.048	.039	.034	.034								
54	74.19	13.45	1.28	2.72	0.35	1.01	2.77	4.45	0.16		0.02	0.19			100.59	
A2. II	1.237	.132	.008	.038	.009	.018	.045	.048			—	.001				
55	73.80	10.82	2.45	3.19	0.87	1.90	2.92	3.85	0.33		trace	0.16			100.29	
A2. II	1.230	.106	.015	.044	.022	.034	.047	.041				.001				
56	74.56	13.70	1.31	0.97	0.58	0.95	2.69	4.82	1.02						100.60	
A3. III	1.243	.134	.008	.014	.015	.017	.044	.051								
57	73.23	14.37	0.18	1.87	0.62	2.29	2.15	3.09	1.30		0.42	0.26	trace		99.78	
A2. II	1.221	.141	.001	.026	.016	.041	.035	.033			.005	.002	—			
58	77.15	13.03	2.05	0.31	0.23	1.17	3.03	3.19	0.05						100.21	
A3. III	1.286	.128	.013	.004	.006	.021	.048	.033								
59	74.72	13.82	1.42	1.07	0.18	0.91	2.48	4.82	0.93			0.01		S 0.28	100.64	
A3. III	1.245	.136	.009	.015	.005	.016	.040	.051				—				
60	74.66	13.59	0.08	0.68	0.24	2.47	3.32	3.52	0.36		trace	1.43			100.35	2.626
A3. III	1.244	.133	.001	.009	.006	.045	.053	.037			—	.010				
61	72.26	15.20	0.97	1.67	0.61	2.41	2.99	2.65	0.91		0.02		trace		99.69	2.711
A3. III	1.204	.149	.006	.023	.015	.043	.048	.029			—		—			
62	74.40	12.85	1.60	1.60	0.70	1.10	3.40	3.55	0.55		0.05	0.15	0.10	ZrO_2 0.10	100.15	
A2. II	1.240	.126	.010	.022	.018	.020	.055	.038			—	.001	.001			
63	70.62	15.14	0.75	2.48	1.39	1.27	2.53	4.37	1.55	0.05	0.30				100.45	
A3. III	1.177	.148	.005	.035	.035	.023	.040	.047			.004					
64	78.44	11.87	0.59	1.12	0.10	0.80	3.19	3.36	1.04	0.02	0.20				100.73	2.68
A3. III	1.307	.116	.004	.015	.003	.014	.052	.036			.003					
65	72.33	13.16	0.95	1.09	0.14	3.23	3.65	3.41	1.20	trace	0.18	0.70	0.02		100.06	2.67
A2. II	1.206	.129	.006	.015	.004	.057	.059	.036			.002	.005	—			
66	74.51	13.75	1.53	n. d.	0.65	2.41	3.22	3.01	1.05	0.41	0.18	trace		S trace	100.72	
A3. III	1.242	.135	.010	(.020)	.016	.043	.052	.032			.002	—				

ORDER 3. QUARFELIC. COLUMBARE—Continued.

SUBRANG 3. SODIPOTASSIC. TEHAMOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
51	I''.3(4).2''.3.	Q 34.80 hy 5.52 or 21.13 mt 1.86 ab 23.06 an 11.12 C 1.12	Heidelberg, n. Krümmhübel, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XII, p. 164, 1889.	Granitite.	In W. T., p. 135.
52	I.3.2''.3.	Q 38.94 hy 4.94 or 20.57 mt 1.62 ab 18.34 an 10.56 C 4.79	Sauberg, n. Schmiedeberg, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XII, p. 167, 1889.	Granitite.	In W. T., p. 135.
53	I(11).3.2(3).3.	Q 38.70 hy 6.25 or 18.90 mt 3.25 ab 17.82 an 10.84 C 3.37	Gablonz, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XV, p. 164, 1902.	Granite.	
54	I''.3(4).(1)2.3.	Q 36.60 hy 4.86 or 26.69 mt 1.86 ab 23.58 ap 0.34 an 4.17 C 2.45	Nossert, n. Wunsiedel, Fichtelgebirge.	H. Oberembt.	H. Oberembt, In. Diss. Erl., p. 33, 1905.	Granite gneiss.	
55	I(11).3''.''2.3.	Q 36.12 di 3.03 or 22.80 hy 4.50 ab 24.63 mt 3.48 an 5.00 ap 0.34	Vordorf, n. Wunsiedel, Fichtelgebirge.	H. Oberembt.	H. Oberembt, In. Diss. Erl., p. 33.	Granite gneiss.	
56	I.3(4).(1)2.3.	Q 37.08 hy 2.29 or 28.36 mt 1.86 ab 23.06 an 4.73 C 2.24	Vockenhausen, Taunus Mountains.	R. Reinisch.	R. Reinisch, Habil. Schrift, Leipz., p. 28, 1902.	Quartz porphyry.	
57	I.3.2''.3.	Q 42.54 hy 4.24 or 18.35 mt 0.23 ab 18.34 il 0.76 an 9.45 ap 0.67 C 3.98	Maissau, Lower Austria.	F. Mocker.	F. Mocker, T. M. P. M., p. 342, 1910.	Granite.	
58	I.3.2.3''.	Q 45.12 hy 0.60 or 18.35 mt 0.93 ab 25.15 hm 1.44 an 5.84 C 2.65	Vlegyasza Mountains, Hungary.	R. Lunzer.	G. Szadeczky, Ref. N. J., 1903, II, p. 72.	Rhyolite.	
59	I.3''.(1)2.3.	Q 39.36 hy 1.29 or 28.36 mt 2.09 ab 20.96 an 4.45 C 2.96	Avignatal, Vintschgau; Tyrol.	C. v. John.	Hammer and v. John, Jb. G. R.-A. Wien, LIX, p. 714, 1910.	Granite.	
60	I.3''.(1)2.3''.	Q 39.96 hy 1.66 or 20.57 mt 0.23 ab 27.77 ap 3.36 an 3.34 C 3.16	Burg Kopel, n. Tanbers, Rieserferner, Tyrol.	R. Pfohl.	F. Becke, Ds. Ak. W. Wien, LXXV (1), p. 160, 1913.	Tonalite aplite.	
61	I.3''.2(3).3(4).	Q 37.44 hy 3.74 or 16.12 mt 1.39 ab 25.15 an 11.95 C 2.96	Brugger Alp, Rieserferner, Tyrol.	E. Zdarek.	F. Becke, Ds. Ak. W. Wien, LXXV (1), p. 160, 1913.	Tonalite porphyrite.	
62	I''.3(4).(1)2.3''.	Q 37.02 hy 3.52 or 21.13 mt 2.32 ab 28.82 ap 0.34 an 4.73 C 1.63	Nünistock, Aarmassif, Switzerland.	J. Königsberger.	J. Königsberger, N. J. B. B., XIV, p. 55, 1901.	Protogine granite.	
63	I''.3(4).2.3.	Q 32.88 hy 6.93 or 26.13 mt 1.16 ab 20.96 il 0.61 an 6.39 C 3.88	Suretta Massif, Switzerland.	N. Sahlbom.	H. Meyer, In. Diss. Freib., p. 14, 1909.	Porphyry.	
64	I.3.(1)2.3''.	Q 44.40 hy 1.36 or 20.02 mt 0.93 ab 27.25 il 0.46 an 3.89 C 1.43	Margun Sura, Bernina Gebiet, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Granite.	
65	I.3(4).2.3(4).	Q 33.06 di 1.43 or 20.02 hy 0.60 ab 30.92 mt 1.39 an 9.45 il 0.30 ap 1.68	Pontresina, Bernina Gebiet, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Adamellite.	
66	I.3(4).2''.3(4).	Q 37.08 hy 3.98 or 17.79 il 0.46 ab 27.25 an 11.95 C 0.82	San Piero in Campo, Elba.	G. d'Achiardi.	G. d'Achiardi, Mem. A. d'Archiardi, p. 112, 1903.	Granite.	

CLASS I. PERSALANE—Continued.

RANG 2. ALSBACHASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
67	81.08	11.23	none?	none?	trace	0.95	3.50	3.25	0.60						100.61	
A?4. IV	1.351	.110	—	—	—	.017	.056	.035								
68	73.87	15.00	1.30	n. d.	0.19	1.46	3.02	4.33	0.66						99.83	
A4. IV	1.231	.147	.008	(.016)	.005	.027	.048	.046								
69	72.61	11.35	1.19	0.44	0.20	1.03	1.88	4.00	5.13	1.37	0.23	0.15			99.58	
A2. II	1.210	.111	.008	.006	.005	.018	.030	.043			.003	.001				
70	70.75	11.39	2.48	1.09	0.14	1.43	3.10	3.98	4.41	0.30	0.46	0.07			99.60	
A2. II	1.179	.112	.016	.015	.004	.025	.050	.042			.006	—				
71	75.84	11.14	4.68	0.01	0.27	1.04	2.69	3.92	0.64	0.02					100.25	2.626
A?3. III	1.264	.109	.029	—	.007	.019	.044	.041								
72	75.04	14.88	0.41	0.68	0.70	1.02	2.32	3.84	0.30	0.06	none	0.63	0.22	CO_2 none	100.13	2.63
A2. II	1.251	.146	.003	.009	.018	.018	.037	.040			—	—	0.03	FeS_2 0.03		
73	75.23	14.25	0.78	1.50	0.29	1.45	2.10	2.32	0.34	0.26	0.20	0.05	0.36	ZrO_2 0.07 S 0.12	99.32	2.650
B1. II	1.254	.140	.005	.021	.007	.026	.034	.024			.003	—	.005			
74	74.78	13.66	0.30	0.96	1.34	1.90	2.74	2.75	0.55	0.15	0.13	0.19	0.33	ZrO_2 0.02 S 0.08	99.88	2.620
A1. I	1.246	.134	.002	.014	.034	.034	.044	.030			.002	.001	.005			
75	74.42	13.97	0.30	1.80	0.29	2.05	3.05	3.40	0.52		0.27	0.21	0.07	ZrO_2 0.02 S 0.04	100.41	
A1. I	1.240	.137	.002	.025	.007	.037	.049	.036			.004	.002	.001			
76	74.38	14.33	0.26	1.40	0.17	1.80	3.10	3.48	0.91		0.18	0.15	0.11	ZrO_2 0.05 S 0.03	100.35	
A1. I	1.240	.140	.002	.019	.004	.032	.050	.037			.002	.001	.002			
77	73.17	15.24	0.28	1.43	0.28	1.82	3.15	3.54	0.70		0.20	0.17	0.13	ZrO_2 0.02 S 0.03	100.21	
A1. I	1.220	.149	.002	.019	.007	.032	.051	.037			.003	.001	.002			
78	74.41	13.81	0.75	1.19	0.83	2.38	2.08	2.01	0.68	0.22	0.20	0.36	0.18	ZrO_2 0.05 S 0.12	99.27	2.623
B1. II	1.240	.135	.005	.017	.021	.043	.034	.022			.003	.003	.003			
79	72.65	14.20	0.73	2.38	0.30	2.22	2.63	2.69	0.75	0.15	0.40	0.15	0.48	ZrO_2 0.05 S 0.05	99.86	2.653
A1. I	1.211	.139	.005	.033	.008	.039	.042	.029			.005	.001	.007			
80	77.47	11.00	1.04	2.02	0.43	1.02	2.86	4.14	0.20	0.05	0.26	none	none		100.59	
A2. II	1.291	.108	.007	.028	.011	.018	.046	.044			.003	—	—			
81	75.72	12.55	0.44	1.43	trace	1.41	2.73	4.81	0.36		0.20		trace		99.65	
A3. III	1.261	.123	.003	.019	—	.025	.044	.051			.003					
82	74.80	14.32	0.88	1.00	trace	1.26	3.38	3.28	1.24		0.21				100.37	
A3. III	1.247	.140	.006	.014	—	.022	.055	.035			.003					

ORDER 3. QUARFELIC. COLUMBARE—Continued.

SUBRANG 3. SODIPOTASSIC. TEHAMOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
67	I.3.″2.3(4).	Q 46.26 or 19.46 ab 29.34 an 4.73 C 0.20	Dych-Ssu Glacier, Caucasus.	D. Beljankin.	F. Loewinson-Lessing, Vh. Russ. Min. Ges., XLII, p. 268, 1905.	Greisen.	
68	I.3(4).2.3.	Q 35.52 hy 2.61 or 25.58 ab 25.15 an 7.51 C 2.65	Sidi Zerzor, n. Menerville, Algeria.	Not stated.	Dupare, Pearse, and Ritter, Mem. Soc. Phys. Gen., XXXIII, p. 115, 1900.	Liparite.	In W.T., p. 135.
69	I.3.″2.″3.	Q 44.22 hy 0.50 or 23.91 mt 0.70 ab 15.72 il 0.46 an 4.17 hm 0.80 C 2.35 ap 0.34	Manambaho, Sakalave District, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVII, p. 18, 1913.	Pitchstone.	
70	I.3(4).″2.3.	Q 34.74 di 0.93 or 23.35 mt 2.09 ab 26.20 il 0.91 an 5.56 hm 1.06	Itsonovondro, Sakalave District, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVII, p. 18, 1913.	Pitchstone.	
71	I.3.″2.3.	Q 42.66 hy 0.70 or 22.80 hm 4.68 ab 23.06 an 5.28 C 0.51	Roodepoortje, Transvaal.	H. Eckstein & Co.	Horwood and Wade, Geol. Mag. (V), VI, No. 12, p. 551, 1909.	Granite.	
72	I.3.2.3.⊙	Q 43.56 hy 2.99 or 22.24 mt 0.70 ab 19.91 ap 0.63 an 5.00 C 5.20	Zeia River, Amur District, Siberia.	P. Todakis.	E. Ahmert, Reg. Aurif. Sib., X, Tab. VII, 1910.	Garnet pegmatite.	P_2O_5 is $Ca_4(PO_4)_3$.
73	I.″3.2.3″.	Q 49.74 hy 3.22 or 13.34 mt 1.16 ab 17.82 il 0.46 an 7.23 C 5.71	Kurahashijima, Aki, Japan.	N. Yoshioka.	S. Kozu, pers. com.	Granite.	
74	I″.3.2″.3″.	Q 41.46 hy 5.38 or 16.68 mt 0.46 ab 23.06 il 0.30 an 8.62 ap 0.34 C 2.96	Inushima, Asahi, Japan.	N. Yoshioka.	S. Kozu, pers. com.	Granite.	
75	I.3″.2.3″.	Q 38.58 hy 3.34 or 20.02 mt 0.46 ab 25.68 il 0.61 an 8.34 ap 0.67 C 2.24	Ikegame, Nishi-ibaraki, Hitachi, Japan.	T. Ohashi.	S. Kozu, pers. com.	Granite.	
76	I.3″.2.3.	Q 38.34 hy 2.64 or 20.57 mt 0.46 ab 26.20 il 0.30 an 8.06 ap 0.34 C 2.45	Inada, Nishi-ibaraki, Hitachi, Japan.	T. Ohashi.	S. Kozu, pers. com.	Granite.	
77	I.3(4).2.3″.	Q 36.66 hy 2.81 or 20.57 mt 0.46 ab 26.72 il 0.46 an 8.06 ap 0.34 C 3.26	Inada, Nishi-ibaraki, Hitachi, Japan.	T. Ohashi.	S. Kozu, pers. com.	Granite.	
78	I″.3.2(3).3(4).	Q 48.30 hy 3.68 or 12.23 mt 1.16 ab 17.82 il 0.46 an 9.17 ap 1.01 C 4.69	Yashima, Harima, Japan.	N. Yoshioka.	S. Kozu, pers. com.	Granite.	
79	I″.3.2″.3″.	Q 40.50 hy 4.76 or 16.12 mt 1.16 ab 22.01 il 0.76 an 10.01 ap 0.34 C 3.26	Kaerushima, Suo, Japan.	N. Yoshioka.	S. Kozu, pers. com.	Granite.	
80	I.3″.″2.3.	Q 41.22 hy 3.34 or 24.46 mt 1.62 ab 24.10 il 0.46 an 5.00	St. Thomas Mount, Madras, India.	H. S. Washington.	H. S. Washington, A. J. S., XLI, p. 325, 1916.	Charnockite (hypersthene granite).	
81	I.3(4).2.3.	Q 37.68 hy 1.72 or 28.36 mt 0.70 ab 23.06 il 0.46 an 6.95 C 0.31	Kawah-manoek Volcano, Preanger District, Java.	Ledeboer.	R. D. M. Verbeek, Jb. Mijnw., XXXVII, p. 93, 1908.	Obsidian.	
82	I.3″.2.3(4).	Q 39.48 hy 0.50 or 19.46 mt 1.39 ab 28.82 il 0.46 an 6.12 C 2.86	Kawa-manoek Volcano, Preanger District, Java.	Ledeboer.	R. D. M. Verbeek, Jb. Mijnw., XXXVII, p. 93, 1908.	Obsidian.	

CLASS I. PERSALANE—Continued.

RANG 2. ALSBACHASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
83	78.01	12.10	0.77	0.93	0.20	0.70	2.82	3.66	0.65		trace				99.84	
A3. III	1.300	.119	.005	.013	.005	.013	.045	.039								
84	75.78	12.42	0.55	1.08	0.50	1.06	3.20	4.60	0.44	0.14	0.29	0.10	0.07	CO_2 0.01 ZrO_2 none SO_3 0.08 Cl trace F, S, none Cr_2O_3 none V_2O_3 none NiO none BaO 0.03 SrO, tr.	100.35	2.626
A1. I	1.263	.122	.003	.015	.013	.019	.052	.049			.004	.001	.001			
85	71.35	12.80	0.80	0.36	0.13	0.68	2.26	3.54	6.54	1.87	none	0.03	0.04	SO_3 none Cr_2O_3 none V_2O_3 none BaO, SrO, no. Li_2O none	100.40	2.282
A1. I	1.189	.126	.005	.005	.003	.013	.036	.037			—	—	—			
86	77.15	13.45	0.40	1.26	0.72	1.22	2.72	3.26	0.30	0.08		0.10	0.32		100.88	
A2. II	1.286	.131	.003	.018	.018	.021	.044	.035				.001	.005			
87	74.28	11.27	1.93	0.58	0.44	1.15	2.74	4.77	1.01	0.70	0.25	0.07	0.02		99.21	2.37
B2. III	1.238	.111	.011	.008	.011	.020	.044	.051			.003	—	—			
88	71.50	14.13	0.60	3.23	1.17	2.70	2.97	2.86	0.32	0.10	0.41	0.35	trace		100.34	2.59
A2. II	1.192	.138	.004	.044	.029	.048	.048	.031			.005	.002	—			
89	71.65	14.56	1.13	1.56	0.84	1.27	2.76	4.14	0.15	1.20	0.35	0.12	0.04	CO_2 none Cl trace NiO none Li_2O trace	99.77	2.630
A1. I	1.194	.143	.007	.022	.021	.023	.045	.044			.004	.001	—			
90	78.98	13.02	0.17	0.18	0.18	0.90	2.63	3.23	0.40	none	0.08	0.09	0.02	CO_2 0.17 Cl 0.03 FeS_2 0.10	100.18	
A1. I	1.316	.127	.001	.003	.005	.016	.042	.034			.001	—	—			
91	72.22	14.35	1.22	1.69	0.30	1.22	2.50	5.12	0.68	0.12	0.42	0.07	0.02	CO_2 0.22 Cl 0.02 FeS_2 0.06	100.23	
A1. I	1.204	.141	.008	.024	.008	.021	.040	.054			.006	—	—			
92	71.88	13.75	2.32	0.61	0.21	1.25	3.02	3.91	1.43	0.73	0.18	0.25	0.02	CO_2 none	99.56	
A2. II	1.198	.135	.014	.008	.005	.022	.048	.041			.002	.002				
93	70.80	14.44	1.76	1.44	0.20	2.30	2.89	3.45	2.37				0.43	CO_2 0.38	100.46	2.015
A3. III	1.180	.142	.011	.020	.005	.041	.047	.037					.006			
94	76.25	14.06	0.48	0.58	0.18	1.75	3.12	2.97	0.53	0.12	0.12	none	0.02	CO_2 none SO_3 0.15	100.33	
A2. II	1.271	.138	.003	.008	.005	.031	.050	.032			.002	—	—			
95	73.76	12.96	2.20	0.36	0.75	1.42	2.06	4.50	2.00		0.14		none	CO_2 none	100.15	
A2. II	1.229	.127	.014	.005	.019	.025	.033	.048			.002		—			
96	72.30	12.50	2.12	0.47	0.10	1.35	3.25	3.58	3.54	0.46	0.12	0.31	0.03		100.13	
A2. II	1.205	.123	.013	.007	.003	.024	.053	.038			.002	.002	—			

ORDER 3. QUARFELIC. COLUMBARE—Continued.

SUBRANG 3. SODIPOTASSIC. TEHAMOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
83	I.3.(1)2.3.	Q 45.42, or 21.68, ab 23.58, an 3.61, C 2.24, hy 1.56, mt 1.16	Wai Polang, Leitimor, Ambon Island, Moluccas.	D. Funk.	R. D. M. Verbeek, Jb. Mijnw., XXXIV, p. 230, 1905.	Ambonite (liparite).	
84	I.3(4).(1)2.3.	Q 36.18, or 27.24, ab 27.25, an 4.45, C 0.51, hy 2.49, mt 0.70, il 0.61, ap 0.34	Bolivia, New England, New South Wales.	J. C. H. Mingaye.	E. C. Andrews, Rec. G. S. N. S. W., VIII, (3), p. 220, 1907.	Granite.	
85	I.3.(1)2.3.	Q 43.32, or 20.57, ab 18.86, an 3.61, C 4.08, hy 0.30, mt 1.16	Buladelah, New South Wales.	White and Greig.	A. R. Dept. Min. N. S. W. (1903), p. 143, 1904.	Rhyolite glass.	
86	I.3''.2.3.	Q 44.28, or 19.46, ab 23.06, an 5.00, C 3.47, hy 4.44, mt 0.70, ap 0.34	Stanthorpe, Queensland.	G. R. Patten.	A. R. Agric. Chem. Qld., 1912.	Granite.	H. C. Richards, pers. com.
87	I.3(4).(1)2.3.	Q 37.26, or 28.36, ab 23.06, an 4.45, di 0.86, hy 0.70, mt 1.16, il 0.46, hm 0.96	Chinghee Creek, Queensland.	A. T. Jefferis.	A. R. Agric. Chem. Qld., 1913.	Rhyolite.	H. C. Richards, pers. com.
88	I(II).3(4).2''.3(4).	Q 34.32, or 16.24, ab 25.15, an 11.40, C 1.84, hy 8.52, mt 0.93, il 0.76, ap 0.67	Enoggera, n. Brisbane, Queensland.	N. H. Christensen.	A. R. Agric. Chem. Qld., 1914.	Granite.	H. C. Richards, pers. com.
89	I.3(4).2.3.	Q 35.28, or 24.46, ab 23.58, an 5.56, C 3.47, hy 3.65, mt 1.62, il 0.61, ap 0.34	Barringo Creek, Macedon, Victoria.	A. G. Hall.	Skeats and Summers, G. S. Vict. B. 24, p. 20, 1912.	Granodiorite porphyry.	
90	I.3.''2.3.	Q 49.32, or 18.90, ab 22.01, an 4.45, C 3.57, hy 0.63, mt 0.23, il 0.15	Thompsons Well, South Australia.	W. S. Chapman.	R. L. Jack, G. S. So. Austr., B. 1, p. 12, 1912.	Granite.	
91	I.3(4).''2.''3.	Q 34.80, or 30.02, ab 20.96, an 5.84, C 2.65, hy 2.12, mt 1.86, il 0.91	Paney Bluff, South Australia.	W. S. Chapman.	R. L. Jack, G. S. So. Austr., B. 1, p. 15, 1912.	Feldspar porphyry.	
92	I.3''.(1)2.3.	Q 37.74, or 22.80, ab 25.15, an 4.17, C 3.16, hy 0.50, mt 1.39, il 0.30, hm 1.28, ap 0.67	Gibraltar Rocks, Te Puke District, New Zealand.	Not stated.	J. A. Bartrum, Mines Statement N. Z., 1913, p. 139.	Rhyolite.	
93	I.3(4).2.3.	Q 34.38, or 20.57, ab 24.63, an 11.40, C 1.73, hy 2.48, mt 2.55	Putaruru, New Zealand.	J. S. Maclaurin.	J. S. Maclaurin, N. Z. A. R. Dom. Lab., 1908, p. 24.	Rhyolite.	Sp. gr. low?
94	I.3.2.3(4).	Q 42.54, or 17.79, ab 26.20, an 8.62, C 2.55, hy 0.90, mt 0.70, il 0.30	Mabel Bay, Brighton, Reefton District, New Zealand.	Not stated.	P. G. Morgan, pers. com.	Pegmatite.	
95	I.3.2.''3.	Q 40.44, or 26.69, ab 17.29, an 6.95, C 2.14, hy 1.90, mt 0.70, il 0.30, hm 1.76	Puketui, Tairua, Hauraki, New Zealand.	Surv. lab.	Bell and Fraser, N. Z. G. S. B. 15, p. 48, 1912.	Rhyolite.	
96	I.3''.''2.3''.	Q 37.32, or 21.13, ab 27.77, an 4.73, C 1.53, hy 0.30, mt 1.16, il 0.30, hm 1.28, ap 0.67	Tieri Creek, Aroha, Hauraki, New Zealand.	Surv. lab.	Henderson and Bartrum, N. Z. G. S. B. 16, p. 73, 1913.	Wilsonite (rhyolite).	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. ALSBACHASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	73.09	13.42	1.44	1.13	0.35	1.89	4.52	1.59	1.41	0.47	0.26	0.05	0.10		99.72	
A2. II	1.218	.131	.009	.015	.009	.034	.073	.017			.003	—	.001			
2	74.97	10.39	1.56	1.47	1.18	1.83	3.68	2.34	0.92	0.59	0.70	0.14	0.07	CO_2 0.11	99.97	
A2. II	1.250	.102	.010	.021	.030	.032	.060	.025			.009	.001	.001	BaO 0.02		
3	76.89	11.47	1.77	0.87	0.36	1.63	4.42	2.50	0.16	none	0.11		0.05	S none	100.23	
A2. II	1.282	.112	.011	.012	.009	.029	.071	.027			.001		—			
4	69.54	17.95	2.50	0.22	0.50	1.80	4.30	1.21	1.96		none	none	none	SO_3 0.37	100.35	
A2. II	1.159	.176	.015	.003	.013	.032	.069	.013			—	—	—			
5	74.84	14.05	0.17	0.31	trace	1.57	3.66	3.14	2.33						100.07	2.38
A3. III	1.247	.138	.001	.004	—	.029	.059	.033								
6	76.91	12.18	0.48	0.92	none	0.92	4.17	3.15	0.66	0.24	0.18	none		S none	99.81	
A2. II	1.282	.120	.003	.013	—	.016	.068	.034			.002	—				
7	79.49	11.60	0.32	0.49	0.09	1.64	4.04	1.52	0.68				none		99.88	
A4. III	1.325	.114	.002	.007	.002	.029	.065	.016								
8	76.68	14.49	n d	1.09	0.84	1.53	3.92	1.20	0.36				trace		100.11	
A4. IV	1.278	.142	—	.015	.021	.027	.063	.013								
9	75.25	14.60	0.54	1.60	0.51	1.06	4.28	1.72	n. d.		0.06				99.62	
A3. III	1.258	.143	.003	.022	.013	.019	.069	.018			.001					
10	73.25	15.70	0.25	1.90	0.51	0.92	3.38	1.94	2.25		0.14				100.24	
A2. II	1.221	.154	.002	.026	.013	.016	.055	.021			.002					
11	75.88	14.75	trace	trace	0.16	2.08	3.78	2.60	0.20		0.50	trace	0.04	CO_2 none S trace	99.99	
A2. II	1.266	.145	—	—	.004	.038	.061	.027			.006	—	—			
12	72.49	15.82	1.18	0.15	0.76	2.02	4.03	2.26	0.35		0.56	0.01	0.05	CO_2 0.14 S none	99.82	
A2. II	1.208	.155	.007	.002	.019	.036	.064	.024			.007	—	—			
13	75.87	13.09	n d	1.80	0.35	0.87	4.21	2.83	0.41	0.19	trace	trace			99.62	
A4. IV	1.265	.128	—	.025	.009	.016	.068	.030								
14	75.01	12.27	0.80	2.78	0.08	1.87	3.36	2.80	0.25	0.13	0.33	0.02	0.06	CO_2 none ZrO_2 none SO_3 0.07 Cl 0.13 F none S 0.02 Cr_2O_3 none V_2O_3 none NiO none BaO none MoO_3 none	99.98	2.387
A1. I	1.250	.120	.005	.039	.002	.033	.054	.030			.004	—	.001			
15	73.32	12.25	2.77	2.20	0.11	1.65	3.92	2.34	0.35	.035	0.51	0.10	0.12	CO_2 0.06 S none NiO none BaO 0.09	100.14	
A1. I	1.222	.120	.018	.031	.003	.030	.063	.024			.006	.001	.002			

ORDER 3. QUARFELIC. COLUMBARE—Continued.

SUBRANG 4. DOSODIC. ALSBACHOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.3(4).2.4.	Q 35.88, or 9.45, ab 38.25, an 9.45, C 0.71, hy 1.30, mt 2.09, il 0.46	Fallon Hill, Enfield, Massachusetts.	G. Steiger.	B. K. Emerson, U. S. G. S. B. 228, p. 40, 1904.	Aplite (alsbachite)	
2	I″.3.″2.4.	Q 39.66, or 13.90, ab 31.44, an 4.73, di 2.62, hy 2.16, mt 2.32, il 1.37, ap 0.34	Marion Station, Jersey City, New Jersey.	W. T. Schaller.	J. V. Lewis, U. S. G. S. B. 419, p. 29, 1910.	Quartz-augite-orthoclase rock.	Igneous?
3	I.3″.(1)2.4.	Q 38.46, or 15.01, ab 37.20, an 3.89, di 2.16, wo 0.58, mt 2.55, il 0.15	Gold Hill District, Rowan County, North Carolina.	F. B. Laney.	F. B. Laney, N. C. G. S. B. 21, p. 54, 1910.	Granite.	
4	I.3(4).2.4″.	Q 35.40, or 7.23, ab 36.16, an 8.90, C 6.32, hy 1.30, mt 0.70, hm 1.92	Mount Holmes, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32 (II), p. 65, 1899.	Dacite porphyry.	In W. T., p. 137.
5	I.3(4).2.(3)4.	Q 38.04, or 18.35, ab 30.92, an 8.06, C 1.73, hy 0.40, mt 0.23	East Mountain, Crested Butte District, Elk Mountains, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. B. 148, p. 177, 1897.	Rhyolite.	In W. T., p. 137.
6	I.3(4).(1)2.″4.	Q 37.80, or 18.90, ab 35.63, an 4.45, C 0.20, hy 1.06, mt 0.70, il 0.30	Katmai Volcano, Alaska.	G. Steiger.	G. C. Martin, U. S. G. S. rec. lab.	Pumice.	
7	I.3.2.4.⊙	Q 46.44, or 8.90, ab 34.06, an 8.06, C 0.41, hy 0.86, mt 0.46	Cinder Cone, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 79, p. 29, 1891.	Pumice (inclosure in basalt).	In W. T., p. 137.
8	I.3.2.4″.	Q 43.92, or 7.23, ab 33.01, an 7.51, C 3.98, hy 4.08	Corinto, Nicaragua.	J. Petersen.	J. Petersen, N. J., 1898, II, p. 157.	Obsidian.	In W. T., p. 137.
9	I.3″.2.4.	Q 39.78, or 10.01, ab 36.15, an 5.28, C 3.77, hy 3.68, mt 0.70, il 0.15	Riviere des Vieux Habitants, Guadeloupe, West Indies.	Pisani.	A. Lacroix, Mont Pelée, p. 588, 1904.	Dacite obsidian.	
10	I.3.″2.4.	Q 41.88, or 11.68, ab 28.82, an 4.45, C 6.32, hy 4.20, mt 0.46, il 0.30	Riviere St. Thomas, Guadeloupe, West Indies.	Pisani.	A. Lacroix, Mont Pelée, p. 588, 1904.	Dacite.	
11	I.3″.2″.4.	Q 39.42, or 15.01, ab 31.96, an 10.56, C 1.94, hy 0.40, ru 0.50	Average sample, Essequibo and Demerara rivers, British Guiana.	J. B. Harrison.	J. B. Harrison, G. Goldf. Brit. Guiana, p. 76, 1908.	Aplite.	In W. T., p. 137.
12	I.3(4).2.4.	Q 35.34, or 13.34, ab 33.54, an 10.01, C 3.16, hy 1.90, il 0.30, hm 1.12, ru 0.40	Average sample, Essequibo River, British Guiana.	J. B. Harrison.	J. B. Harrison. G. Goldf. Brit. Guiana, p. 76, 1908.	Granitite.	In W. T., p. 137.
13	I.3(4).(1)2.4.	Q 36.66, or 16.68, ab 35.63, an 4.45, C 1.43, hy 4.20	Zanja Moroti, Paraguay.	M. Goldschlag.	M. Goldschlag, In. Diss. Jena, p. 13, 1913.	Aplite.	
14	I.3″.2.(3)4.	Q 38.82, or 16.68, ab 28.30, an 9.17, C 0.31, hy 4.29, mt 1.16, il 0.61	Hraftinnuhryggur, n. Krafla, Iceland.	J. B. Ferguson.	F. E. Wright, B. G. S. A., XXVI, p. 260, 1915.	Obsidian.	
15	I″.3″.2.4.	Q 38.04, or 13.34, ab 33.01, an 7.51, C 0.61, hy 1.49, mt 4.18, il 0.91, ap 0.34	Beinn Bheag, Gruline, Mull Island, Scotland.	E. G. Radley.	G. S. Grt. Brit., Sum. Prog., (1912), p. 68, 1913.	Granophyre.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. ALSBACHASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
16	72.63	13.49	2.17	1.04	0.89	1.65	3.86	2.62	0.31	0.23	0.07	0.26		SO_3 0.34	99.26	
B2. III	1.211	.132	.014	.014	.022	.030	.062	.028			.001	.002				
17	65.15	15.03	5.65	2.58	0.86	2.65	4.33	0.74	1.20	0.47	0.38	0.47		FeS_2 0.08	99.59	
A2. II	1.086	.147	.036	.036	.022	.047	.069	.008			.005	.003				
18	74.13	12.61	2.87	0.86	0.23	1.60	4.55	2.13	0.66				0.16		99.80	
A3. III	1.236	.123	.018	.012	.006	.029	.074	.022					.002			
19	77.35	13.16	0.73	0.78	0.99	1.09	2.67	2.35	1.40						100.52	
A3. III	1.289	.129	.004	.011	.025	.020	.043	.025								
20	75.7	13.1	1.0	1.1	0.7	1.4	2.9	2.2	1.6						99.7	
B3. IV	1.262	.128	.006	.015	.018	.025	.047	.023								
21	74.65	12.64	2.26	0.85	1.01	2.12	3.41	2.37	1.14						100.45	
A3. III	1.244	.124	.014	.012	.025	0.38	.055	.025								
22	72.89	15.83	1.89	0.10	1.31	2.04	2.81	2.29	1.21						100.37	
A3. III	1.215	.155	.012	.001	.033	.037	.045	.024								
23	76.03	13.34	2.14	1.39	0.57	0.90	3.71	2.62	0.12			0.14			100.96	
A3. III	1.267	.131	.013	.019	.014	.016	.060	.028				.002				
24	68.22	16.58	1.86	3.01	0.56	2.40	3.19	2.78	1.16		trace	0.42	trace	S trace	100.18	
A2. II	1.137	.163	.012	.042	.014	0.43	.052				—	.003				
25	75.13	14.61	0.32	0.54	0.63	1.43	3.77	2.95	0.16						99.54	
B3. IV	1.252	.143	.002	.008	.016	.025	.061	.032								
26	77.36	11.03	0.44	n. d.	2.54	2.20	3.58	1.52	1.27	0.93	0.11	trace		S trace	100.98	
B2. III	1.289	.108	.003	(.006)	.064	.039	.058	.016			.001	—				
27	73.97	12.88	1.39	n. d.	2.20	1.80	3.38	2.45	1.25	1.10	0.27	trace		S trace	100.69	
A3. III	1.233	126	.009	(.018)	.055	.032	.055	.027			.003	—				
28	70.49	14.24	4.15	0.79	0.62	2.38	3.63	1.31	1.79		0.72		trace		100.12	
A2. II	1.175	.140	.026	.011	.016	.043	.058	.014			.009		—			
29	73.02	13.70	2.00	1.14	2.04	1.51	3.91	1.52	1.72	0.26	trace	0.14		CO_2 trace	100.96	2.69
B2. III	1.217	.134	.013	.016	.051	.027	.063	.016			—	.001				
30	70.41	11.44	2.45	2.37	0.72	3.02	3.74	2.88	1.00	0.31	1.55	0.39			100.28	
A2. II	1.174	.112	.015	.033	.018	.054	.060	.030			.019	.003				
31	80.00	10.87	2.57	trace	0.79	1.05	2.51	2.05	n. d.			trace	trace		99.84	2.599
A?. 4. IV	1.333	.107	.016	—	.020	.019	.040	.022				—	—			

ORDER 3. QUARFELIC. COLUMBARE—Continued.

SUBRANG 4. DOSODIC. ALSBACHOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
16	I.3(4).2.4.	Q 36.06 or 15.57 ab 32.49 an 6.67 C 1.84 hy 2.20 mt 3.25 ap 0.67	Hermesbuckel, n. Aschaffenburg, Hessen.	Survey lab.	Chelius and Klemm, Erl. G. Kte. Hess., Bl. Schafheim, p. 19, 1894.	Granite.	In W. T., p. 137.
17	I(II).3(4).2″.4(5).	Q 31.08 or 4.45 ab 36.15 an 10.29 C 3.37 hy 2.20 mt 7.19 il 0.76 hm 0.80 ap 1.01	Messel, Hesse.	K. M. Jene.	G. Klemm, Erl. G. Kte. Hess., Bl. Messel, p. 12. 1910.	Malchite.	
18	I.3(4).2.4.	Q 35.88 or 12.23 ab 38.78 an 7.51 di 0.43 hy 0.40 mt 3.25 hm 0.64	Melibocus, Odenwald, Hesse Darmstadt.	F. Kutscher.	C. Chelius, Notbl. Vr. Erdk., (4), XIII, p. 8, 1892.	Alsbachite.	In W. T., p. 137.
19	I.3.2.(3)4.	Q 48.54 or 13.90 ab 22.53 an 5.56 C 4.18 hy 3.42 mt 0.93	Schneegrube, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XII, p. 189, 1899.	Graphic granite.	In W. T., p. 137.
20	I.3.2.″4.	Q 45.90 or 12.79 ab 24.63 an 6.95 C 3.37 hy 2.99 mt 1.39	Schwartzbrunn-kamm, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XV, p. 172, 1902.	Granite.	
21	I.3″.2″.″4.	Q 39.78 or 13.90 ab 28.82 an 10.56 C 0.61 hy 2.50 mt 2.78 hm 0.32	Arnsdorf, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XII, p. 176, 1899.	Granite.	In W. T., p. 137.
22	I.3.2.(3)4.	Q 41.64 or 13.34 ab 23.58 an 10.29 C 5.00 hy 3.30 mt 0.23 hm 1.76	Schneekoppe, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XII, p. 165, 1899.	Granitite.	In W. T., p. 137.
23	I.3.(1)2.″4.	Q 41.58 or 15.57 ab 31.44 an 3.61 C 3.06 hy 2.19 mt 3.02 ap 0.34	Seehaus, n. Wunsiedel, Fichtelgebirge.	H. Oberembt.	H. Oberembt, In. Diss. Erl., p. 38, 1905.	Granite gneiss.	
24	I″.3(4).2.(3)4.	Q 32.10 or 16.68 ab 27.25 an 9.17 C 4.90 hy 5.36 mt 2.78 ap 1.01	Königsfeld, Brünn, Moravia.	C. v. John.	v. John and Suess, Jb. G. R-A. Wien, LVIII, (1), p. 249, 1908.	Granitite.	
25	I.3(4).2.″4.	Q 37.32 or 17.79 ab 31.96 an 6.95 C 2.55 hy 2.39 mt 0.46	Zenoviczstollen, Aranyida, Hungary.	B. Horvarth.	Emszt and Horvarth, Jb. Ung. G. R-A., XIX, p. 286, 1912.	Granite.	
26	I″.3.2″.4.	Q 42.18 or 8.90 ab 30.39 an 9.45 di 1.08 hy 6.56 il 0.15	Cava d'Oggi, San Piero in Campo, Elba.	G. d'Achiardi.	G. d'Achiardi, Mem. A. d'Achiardi, p. 117, 1903.	Granite.	
27	I″.3″.2.″4.	Q 36.42 or 15.01 ab 28.82 an 8.90 C 1.22 hy 7.48 il 0.46	Cava d'Oggi, San Piero in Campo, Elba.	G. d'Achiardi.	G. d'Achiardi, Mem. A. d'Achiardi, p. 118, 1903.	Granite (dikelet).	
28	I″.3″.2(3).4.	Q 38.46 or 7.78 ab 30.39 an 11.95 C 2.55 hy 1.60 mt 0.46 il 1.37 hm 3.84	Monte Maiori, Putifigari, Sardinia.	F. Millosevitch.	F. Millosevitch, Mem. Ac. Linc., (5), VIII, No. 15, p. 611, 1911.	Dacite.	
29	I″.3.2.4.	Q 38.46 or 8.90 ab 33.01 an 6.67 C 3.16 hy 5.50 mt 3.02 ap 0.34	Kolascin, Montenegro.	E. Manasse.	E. Manasse, Proc. Verb. Soc. Tosc. Sc. Nat., XIII, p. 160, 1903.	Quartz diorite porphyry.	
30	I(II).3(4).2.″4.	Q 33.00 or 16.68 ab 31.44 an 6.12 di 3.89 wo 0.46 mt 3.25 il 2.89 hm 0.16 ap 1.01	Antsenavolo, Sakalave District, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVII, p. 19, 1913.	Rhyolite.	
31	I.″3.2.(3)4.	Q 54.18 or 12.23 ab 20.96 an 5.28 C 1.63 hy 2.00 hm 2.57	Balmoral, 50 miles east of Pretoria, Transvaal.	H. Eckstein & Co.	C. B. Horwood, Tr. G. Soc. S. Afr., XIII, p. 47, 1911.	Granite.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. ALSBACHASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
32	78.61	7.76	4.51	1.69	0.90	2.60	2.10	1.74							99.91	2.712
A?.3. III	1.310	.076	.028	.024	.023	.046	.034									
33	76.06	14.94	0.07	0.33	1.12	1.84	4.70	1.02	0.32	0.10	0.06	trace			100.56	
A3. III	1.268	.146	—	.005	.028	.033	.076	.011			—					
34	72.48	12.93	2.30	n. d.	0.26	0.88	3.71	2.23	5.12						99.91	2.28
A4. IV	1.208	.127	.014	(.028)	.007	.016	.060	.023								
35	70.74	15.21	2.35	0.04	0.72	1.64	3.06	2.54	3.16				trace		99.46	2.59
B3. IV	1.179	.149	.015	—	.018	.029	.049	.027								
36	69.36	15.56	0.50	1.71	1.31	2.77	3.28	2.34	1.06	0.14	1.00	0.57	0.18	FeS_2 0.21	99.99	2.71
A2. II	1.156	.152	.003	.024	.033	.050	.053	.025			.013	—	.003			
37	72.74	15.64	1.82	0.18	0.55	1.86	3.87	2.61	0.44				trace		99.71	2.5
A3. III	1.212	.153	.011	.003	.014	.033	.063	.028								
38	74.60	13.87	0.15	1.55	0.34	2.25	3.14	2.51	0.73	0.12	0.21	0.41	0.72	ZrO_2 0.06 S 0.06	100.72	2.640
A1. I	1.243	.136	.001	.022	.009	.040	.051	.027			.003	.003	.010			
39	73.03	12.97	0.65	0.79	0.53	0.98	3.79	3.38	3.49		0.05	trace	0.13	S 0.04	99.83	
A2. II	1.217	.127	.004	.011	.013	.018	.061	.036			.001	—	.002			
40	70.91	14.36	0.40	2.54	0.28	2.60	3.30	2.59	0.89	0.25	0.36	0.32	0.32	ZrO_2 0.02 S 0.29	99.43	
B1. II	1.182	.141	.003	.035	.007	.046	.053	.028			.005	.002	.005			
41	72.68	15.99	0.65	0.21	0.41	1.66	3.26	2.19	1.38	1.18	0.09	none	0.16	ZrO_2 none Cl 0.02 F 0.01 S 0.05 Cr_2O_3 none BaO 0.02 SrO 0.03	99.79	
A1. I	1.211	.157	.004	.003	.010	.030	0.53	.023			.001	—	.002			
42	70.62	11.54	1.20	0.18	0.26	1.72	3.52	1.45	7.24	2.42	0.04	0.08	0.01	CO_2 0.02 SO_3 trace Cr_2O_3 none V_2O_3 none NiO none BaO 0.05 SrO trace Li_2O none	100.35	2.262
A1. I	1.177	.113	.008	.003	.007	.030	.056	.016			—	—	—			
43	77.08	11.59	0.20	1.44	0.64	0.84	4.63	1.57	1.04	0.24	0.35	0.01	0.13	CO_2 0.48 ZrO_2 0.02 SO_3 none Cl none FeS_2 0.05 Cr_2O_3 none V_2O_3 none NiO none BaO 0.04 SrO trace Li_2O none	100.35	2.633
A1. I	1.265	.114	.001	.020	.016	.015	.074	.017			.004	—	.002			
44	75.73	12.70	2.25	n. d.	0.60	2.00	3.48	2.04	1.20						100.00	
A4. IV	1.262	.124	.014	(.028)	.015	.036	.056	.021								
45	73.08	13.50	2.60	0.13	0.15	1.07	3.95	3.19	1.33		0.62	trace	trace	SO_3 0.12 BaO 0.06	99.80	2.514
A2. II	1.218	.132	.016	.002	.004	.020	.064	.034			.008					

ORDER 3. QUARFELIC. COLUMBARE—Continued.

SUBRANG 4. DOSODIC. ALSBACHOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
32	I(II).(2)3.2″.″4.	Q 53.70 di 4.85 or 10.01 mt 5.57 ab 17.82 hm 0.64 an 6.67	Orange Grove, Transvaal.	H. Eckstein & Co.	Horwood and Wade, Geol. Mag., (V), VI, p. 551, 1909.	Granite.	
33	I.3″.2.4(5).	Q 38.82 hy 3.46 or 6.12 ab 39.82 an 9.17 C 2.65	Anabar River, Northern Siberia.	H. Backlund.	H. Backlund, Trav. Mus. G. St. Pet., I, p. 128, 1907.	Granite.	
34	I.3.″2.4.	Q 38.58 hy 4.40 or 12.79 ab 31.44 an 4.45 C 2.86	Okhotsk, Siberia.	Not stated.	K. E. Bogdanovitch, Fund. Marek., p. 57, 1904.	Marekanite.	
35	I.3.2.(3)4.	Q 38.82 hy 1.80 or 15.01 mt 0.23 ab 25.68 hm 2.24 an 8.06 C 4.49	Kivangra River, n. Okhotsk, Siberia.	Not stated.	K. E. Bogdanovitch, Fund. Marck., p. 55, 1904.	Felsite porphyry.	
36	I″.3(4).2″.4″.	Q 34.20 hy 4.75 or 13.90 mt 0.70 ab 27.77 il 1.98 an 10.29 ap 1.34 C 3.77	Zeia River, Amur District, Siberia.	P. Todakis.	E. Ahnert, Reg. Aurif. Sib., X, Tab. VII, 1910.	Granite.	$P_2O_5=Ca_3(PO_4)_2$.
37	I.3(4).2.4.	Q 35.16 hy 1.40 or 15.57 mt 0.70 ab 33.01 hm 1.28 an 9.17 C 2.96	Wilnischik, Kamchatka.	Not stated.	K. E. Bogdanovitch, Pet. Mitth., LII, p. 196, 1906.	Dacite.	
38	I″.3.2.(3)4.	Q 40.68 hy 4.64 or 15.01 mt 0.23 ab 26.72 il 0.46 an 8.34 ap 1.01 C 2.86	Kukuda, Shodoshima, Sanuki, Japan.	N. Yoshioka.	S. Kozu, pers. com.	Granite.	
39	I.3(4).″2.(3)4.	Q 34.68 hy 2.36 or 20.02 mt 0.93 ab 31.96 il 0.15 an 5.00 C 1.22	Shimoda, Izu, Japan.	T. Ohashi.	S. Kozu, pers. com.	Rhyolite.	
40	I″.3(4).2″.(3)4.	Q 34.74 hy 4.92 or 15.57 mt 0.70 ab 27.77 il 0.76 an 10.84 ap 0.67 C 2.14	Shirai, Makabe, Hitachi, Japan.	T. Ohashi.	S. Kozu, pers. com.	Granite.	
41	I.3.2.4.⊙	Q 41.10 hy 1.00 or 12.79 mt 0.93 ab 27.77 il 0.15 an 8.34 C 5.20	Corregidor Island, Manila Harbor, Luzon, Philippine Islands.	E. W. Morley.	J. P. Iddings, pers. com.	Dacite.	
42	I.3.2.4.⊙	Q 40.68 hy 0.70 or 8.90 mt 0.70 ab 29.34 hm 0.80 an 8.34 C 1.12	Gloucester Buckets, New South Wales.	Not stated.	A. R. Dep. Min. N. S. W. (1908), p. 184, 1909.	Rhyolite glass.	
43	I″.3″.(1)2.4″.	Q 39.36 hy 6.43 or 9.45 mt 0.23 ab 38.77 il 0.61 an 4.17 C 0.82	Gemeroo, New South Wales.	J. C. H. Mingaye.	G. W. Card, pers. com.	Quartz keratophyre.	
44	I.3.2″.4.	Q 41.10 hy 5.20 or 11.68 ab 29.34 an 10.01 C 1.12	Mount Read, Tasmania.	W. F. Ward.	Twelvetrees and Petterd, Proc. R. Soc. Tasm., (1898–9), p. 46, 1900.	Quartz keratophyre.	Not in W. T.
45	I.3(4).″2.(3)4.	Q 35.16 hy 0.40 or 18.90 il 0.30 ab 33.54 hm 2.60 an 5.56 ru 0.48 C 1.43	Waihi, Hauraki, New Zealand.	P. Holland.	P. Holland. Q. J. G. S., LV, p. 467, 1899.	Rhyolite.	In W. T., p. 137.

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. ALSBACHASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	74.79	12.59	1.19	n. d.	0.31	3.58	5.10	0.21	1.03	0.09	0.17	trace	trace	CO_2 0.58 BaO none SrO none Li_2O none	99.64	
A2. II	1.247	.123	.007	(.014)	.008	.064	.082	.002								
2	76.52	12.08	0.92	0.93	none	1.21	6.19	none	0.62	0.34	0.18	0.06	0.03	CO_2 0.46 ZrO_2 none S 0.57	100.11	
A1. I	1.275	.118	.006	.013	—	.021	.100	—			.002	—	—			
3	72.77	13.00	1.28	2.65	0.67	2.47	4.95	0.34	1.16	0.07	0.22	0.04	0.08	CO_2 0.47 BaO trace SrO trace Li_2O trace	100.17	
A1. I	1.213	.127	.008	.037	.017	.045	.080	.003								
4	77.58	13.96	0.54	0.45	0.30	0.83	4.97	0.90	0.20		0.40	trace	none	CO_2 none	100.13	
A2. II	1.293	.137	.003	.006	.008	.014	.080	0.10			.005	—	—			
5	71.80	15.60	n. d.	2.25	1.66	1.16	4.80	0.60	1.60		0.07	0.06			99.60	
A3. III	1.197	.153	—	.031	.042	.042	.077	.007			.001	—				
6	76.67	14.20	0.14	n. d.	0.04	2.67	5.33	0.52	0.48						100.04	2.64
A3. III	1.278	.139	.001	(.002)	.001	.048	.085	.005								
7	75.80	12.65	1.87	1.16	0.43	2.11	4.83	0.42	0.24	0.02	0.21	0.19		CO_2 0.01 SO_3 0.17	100.11	
A2. II	1.263	.124	.012	.016	.011	.038	.077	.004			.003	.001				
8	75.61	12.62	1.10	1.00	0.98	2.18	5.10	0.68	0.38	0.04	0.35	0.32			100.36	2.67
A2. II	1.260	.124	.007	.014	.025	.039	.082	.007								
9	80.66	10.91	—	—	0.44	2.22	4.24	0.66	0.35						99.48	
A?. 4. IV	1.344	.107	—	—	.011	.039	.068	.007								
10	76.01	13.89	0.20	0.70	0.39	2.03	5.32	0.32	0.72	0.14	0.09	none	0.13	ZrO_2 none Cl 0.08 F 0.05 S 0.09 Cr_2O_3 none BaO 0.05 SrO 0.06	100.27	
A1. I	1.267	.136	.001	.010	.010	.036	.085	.003			.001	—	.002			
11	70.27	16.11	0.97	1.22	1.87	1.76	4.64	0.64	1.08	0.10	0.12	0.12	0.20	CO_2 0.20 FeS_2 0.09	99.39	2.70
B2. III	1.171	.158	.006	.017	.047	.031	.075	.007			.003	.001	.003			

RANG 3. ALKALICALCIC. RIESENASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	70.91	16.18	0.51	1.09	0.37	2.92	1.33	5.53	0.12	0.13	0.20	0.11	0.04	BaO 0.10	99.44	2.654
A2. II	1.182	.159	.003	.015	.009	.052	.021	.059			.003	.001	—			
2	70.20	15.48	0.86	1.07	0.93	2.36	1.24	4.38	1.80		trace	trace	trace	S 0.03 ZnO 2.14	100.49	2.662
A2. II	1.170	.152	.005	.015	.023	.042	.020	.046			—	—	—			15°

ORDER 3. QUARFELIC. COLUMBARE—Continued.

SUBRANG 5. PERSODIC. YUKONOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.3(4).2″.5.	Q 37.20 di 4.70 or 1.11 wo 0.58 ab 42.97 il 0.30 an 10.84	Near Fort Hamlin, Yukon River, Alaska.	H. N. Stokes.	J. E. Spurr, U. S. G. S. B. 168, p. 229, 1900.	Tonalite-aplite (yukonite).	Named yukonite in U. S. G. S. B. 228, p. 270, 1904. In W. T., p. 139.
2	I.3(4).(1)2.5.	Q 37.86 di 0.75 ab 52.40 hy 0.26 an 5.00 mt 1.39 il 0.30	Afterthought District, Shasta County, California.	G. Steiger.	B. S. Butler, U. S. G. S. B. 419, p. 137, 1910.	Granite porphyry.	
3	I″.3(4).2(3).5.	Q 34.86 hy 5.26 or 1.67 mt 1.86 ab 41.92 il 0.46 an 12.51	Greenville, Plumas County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. B. 148, p. 201, 1897.	Quartz porphyry.	In W. T., p. 139.
4	I.3.(1)2.(4)5.	Q 43.02 hy 0.80 or 5.56 mt 0.23 ab 41.92 il 0.76 an 3.89 hm 0.32 C 3.37	Towakaima Falls, Barama River, British Guiana.	J. B. Harrison.	J. B. Harrison, Rep. G. N. W. Dist., II, p. 10, 1898.	Aplite.	In W. T., p. 139.
5	I″.3″.2.″5.	Q 34.62 hy 8.16 or 3.89 il 0.15 ab 40.35 an 5.84 C 4.90	Deux Evailles, Brittany, France.	Pisani.	L. Vandernotte, Mass. Armor., p. 41, 1913.	Microgranite.	
6	I.3(4).2(3).5.	Q 38.34 hy 0.36 or 2.78 ab 44.54 an 13.34 C 0.10	Ytterby, Sweden.	A. Bygden,	A. Bygden, B. G. Inst. Ups., VII, p. 8 (1905), 1906.	Oligoclase graphic granite.	
7	I.3.2.5.⊙	Q 41.70 hy 1.23 or 2.22 mt 2.78 ab 40.35 il 0.46 an 9.73 ap 0.34 C 0.82	Darmstadt, Hossen.	Stadler.	G. Klemm, Erl. G. Kte. Hess., Bl. Rossdorf, p. 43, 1912.	Granite.	
8	I.3″.2.″5.	Q 38.04 hy 2.90 or 3.89 mt 1.62 ab 42.97 il 0.61 an 8.90 ap 0.67 C 0.31	Ruseinschlucht, Ponteglia Gebiet, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Alsbachite.	
9	I.3.2.(4)5.	Q 48.72 di 1.51 or 3.89 hy 0.40 ab 35.63 an 8.90	Tumagorkaja, Caucasus.	D. Beljankin.	F. Loewinson-Lessing, Vh. Russ. Min. Ges., XLII, p. 280, 1905.	Greisen.	
10	I.3″.2.5.	Q 38.82 hy 2.32 or 1.67 mt 0.23 ab 44.54 il 0.15 an 10.01 C 1.22	Timor Island, Moluccas.	E. W. Morley.	J. P. Iddings, pers. com.	Not named.	
11	I″.3(4).2.″5.	Q 33.84 hy 6.28 or 3.89 mt 1.39 ab 39.30 il 0.30 an 7.78 ap 0.34 C 4.90	Ravensthorpe, Phillips River District, West Australia.	E. S. Simpson.	Simpson and Glanert, W. Aust. G. S. B. 35, p. 21, 1909.	Granite.	

SUBRANG 2. DOPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.3(4).(2)3.2.	Q 35.16 hy 2.09 or 32.80 mt 0.70 ab 11.00 il 0.46 an 13.62 ap 0.34 C 3.06	Remmel Laccolith, Okanagan Range, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38, (1), p. 446, 1912.	Biotite granite.	Metamorphosed. Cf. No. 29, I.4.3.4.
2	I.3.(2)3.2.	Q 39.42 hy 3.62 or 25.58 mt 1.16 ab 10.48 an 11.68 C 4.49	Kamaresa, n. Laurion, Attica, Greece.	R. Lepsius.	R. Lepsius, G. von Attika, p. 93, 1893.	Granite.	Dike. ZnO high. In W. T., p. 139.

CLASS I. PERSALANE—Continued.

RANG 3. ALKALICALCIC. RIESENASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	66.39	18.16	2.50	1.13	0.85	3.71	1.96	3.56	0.56	0.66	0.50	0.06	0.06	CO_2 none ZrO 0.03 S 0.03 BaO 0.07 SrO 0.02	100.55	
A1. I	1.107	.178	.016	.016	.021	.066	.032	.038			.006	.003	—			
2	65.67	13.48	1.51	n. d.	0.31	2.41	1.52	2.42	12.27			trace	trace	SO_3 0.28 BaO 0.32	100.19	
A3. III	1.095	.132	.009	(.018)	.008	.043	.024	.025				—	—			
3	72.42	10.47	0.83	5.50	0.41	2.53	1.93	2.94	1.11	0.06	0.68	0.11	0.16	CO_2 0.61	99.76	2.784
A2. II	1.207	.103	.005	.076	.010	.045	.031	.031			.009	.001	.002			
4	71.25	18.03	1.29	0.34	0.38	2.61	2.25	3.09	0.82			0.13	trace		100.19	
A3. III	1.187	.176	.008	.005	.010	.046	.036	.033				.001	—			
5	74.13	14.09	2.27	0.30	0.58	2.95	3.08	2.99	0.11						100.50	
A3. III	1.236	.138	.014	.004	.015	.053	.050	.032								
6	76.82	13.68	1.75	0.32	0.51	2.83	1.55	2.10	0.74						100.30	
A3. III	1.280	.134	.011	.004	.013	.050	.025	.022								
7	76.4	10.8	1.4	1.0	1.9	2.4	1.9	2.7	1.3						99.8	
B3. IV	1.273	.106	.009	.014	.048	.043	.031	.029								
8	75.6	12.2	2.2	1.4	1.4	2.7	1.3	2.8	1.0						100.6	
B3. IV	1.260	.120	.014	.019	.035	.048	.021	.030								
9	75.27	13.98	1.90	1.00	1.44	2.16	1.54	2.01	0.91						100.21	
A3. III	1.255	.136	.012	.014	.036	.039	.025	.021								
10	75.21	14.18	0.75	1.05	0.44	2.40	1.74	3.12	1.01						99.90	
A3. III	1.254	.139	.005	.015	.011	.043	.028	.033								
11	74.5	12.2	3.1	1.3	1.6	3.2	1.3	1.9	1.1						100.2	
B3. IV	1.242	.120	.019	.018	.040	.057	.021	.020								
12	72.92	17.77	0.20	1.09	0.79	2.17	1.24	2.65	1.35						100.18	
A3. III	1.215	.174	.001	.015	.020	.039	.020	.028								
13	72.71	14.59	1.78	0.92	2.17	2.57	1.65	1.99	1.67						100.05	
A3. III	1.212	.143	.011	.012	.054	.047	.027	.021								
14	72.5	17.2	1.0	0.6	1.2	2.9	1.6	2.1	1.0						100.1	
B3. IV	1.208	.169	.006	.008	.030	.052	.026	.022								
15	72.11	16.74	0.89	1.28	1.04	2.24	1.20	2.88	1.75						100.13	
A3. III	1.202	.164	.006	.018	.026	.040	.019	.030								
16	69.04	16.91	2.22	1.36	1.86	3.16	1.76	2.44	1.01						99.76	
A3. III	1.151	.166	.014	.019	.047	.056	.028	.025								

ORDER 3. QUARFELIC. COLUMBARE—Continued.

SUBRANG 3. SODIPOTASSIC. RIESENOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I''.3(4).3.3.	Q 33.48 hy 2.10 or 21.13 mt 2.32 ab 16.77 il 0.91 an 15.57 hm 0.96 C 5.30 ap 1.01	Texas Creek, San Cristobal, quadrangle, Colorado.	W. T. Schaller.	W. Cross, U. S. G. S. rec. lab.	Quartz latite.	
2	I.3.3.3.⊙	Q 41.34 hy 3.18 or 13.90 ab 12.57 an 11.95 C 4.08	Silver Cliff, Custer County, Colorado.	L. G. Eakins.	Cross and Eakins, A. J. S., XLIV, p. 101, 1892.	Pitchstone.	In W. T., p. 139.
3	I(II).3.(2)3.3.	Q 40.86 hy 9.18 or 17.24 mt 1.16 ab 16.24 il 1.37 an 11.40 ap 0.34	Moyie Sill, Purcell Mountains, British Columbia.	M. Dittrich.	R. A. Daly, Rosenb. Fests., p. 214, 1906.	Granite.	Fresh?
4	I.3.(2)3.3.	Q 40.68 hy 0.90 or 18.35 mt 1.16 ab 18.86 hm 0.48 an 11.95 ap 0.34 C 6.53	Abriachan, Loch Ness, Scotland.	W. Mackie.	W. Mackie, Tr. Edin. G. Soc., VIII, (1), p. 54, 1901.	Granite.	
5	I.3(4).(2)3.3(4).	Q 37.38 hy 1.50 or 17.79 mt 0.93 ab 26.20 hm 1.60 an 14.73 C 0.31	Punta Suariccione, Corsica.	J. Deprat.	J. Deprat, B. Sv. Ct. G. Fr., XVII, No. 114, p. 35, 1906.	Granite.	
6	I.''3.3.3.	Q 53.10 hy 1.30 or 12.23 mt 0.93 ab 13.10 hm 1.12 an 13.90 C 3.77	Schlüsselberg, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XII, p. 180, 1899.	Granite.	In W. T., p. 141.
7	I''.3.''3.3.	Q 46.44 hy 5.46 or 16.12 mt 2.09 ab 16.24 an 11.95 C 0.31	Schwarzbrun, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XV, p. 175, 1902.	Granite.	
8	I''.3.3.''3.	Q 49.08 hy 4.16 or 16.68 mt 3.25 ab 11.00 an 13.34 C 2.14	Landeshuterkamm, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XV, p. 113, 1902.	Granite.	
9	I''.''3.3.3.	Q 51.78 hy 3.87 or 11.68 mt 2.78 ab 13.10 an 10.84 C 5.20	Grünbusch, n. Hirschberg, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XII, p. 194, 1899.	Granite.	In W. T., p. 141.
10	I.3.''3.3.	Q 46.86 hy 2.42 or 18.35 mt 1.16 ab 14.67 an 11.25 C 3.57	Bolzenschloss Berg, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XII, p. 186, 1899.	Aplite.	In W. T., p. 141.
11	I''.''3.3''.3.	Q 50.52 hy 4.00 or 11.12 mt 4.18 ab 11.00 hm 0.16 an 15.85 C 2.24	Landeshuterkamm, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XV, p. 176, 1902.	Granitite.	
12	I.''3.3.''3.	Q 48.90 hy 3.85 or 15.57 mt 0.23 ab 10.48 an 10.84 C 8.87	Schmiedeberg, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XII, p. 168, 1899.	Granitite.	In W. T., p. 141.
13	I''.3.3.3.	Q 46.56 hy 5.40 or 11.67 mt 2.55 ab 14.14 an 13.06 C 4.90	Grünbusch, n. Hirschberg, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XII, p. 169, 1899.	Granitite.	In W. T., p. 141.
14	I.3.3.3.⊙	Q 47.04 hy 3.26 or 12.23 mt 1.39 ab 13.62 an 14.46 C 7.04	Muchow, Isergebirge, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XV, p. 167, 1902.	Granite.	
15	I.3.3.(2)3.	Q 47.40 hy 4.18 or 16.68 mt 1.39 ab 9.96 an 11.12 C 7.65	Bärndorfer Berg, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XII, p. 222, 1899.	Schliere in granite.	In W. T., p. 139.
16	I''.3.3.3.	Q 40.14 hy 5.36 or 13.90 mt 3.25 ab 14.67 an 15.57 C 5.81	Grünbusch, n. Hirschberg, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XII, p. 210, 1899.	Granodiorite.	In W. T., p. 141.

CLASS I. PERSALANE—Continued.

RANG 3. ALKALICALCIC. RIESENASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
17	73.34	14.43	0.59	0.77	0.72	3.52	2.58	2.61	1.07		0.44	0.13	0.24	CO_2 0.04	100.48	2.669
A2. II	1.222	.142	.004	.011	.018	.063	.042	.028			.006	.001	.003			
18	71.62	12.81	1.64	1.76	1.08	3.14	2.73	3.02	1.93						99.73	
A3. III	1.194	.125	.010	.025	.027	.056	.044	.032								
19	75.9	10.5	1.8	1.9	1.7	3.4	1.7	2.2	1.2						100.3	
B3. IV	1.265	.103	.011	.026	.042	.061	.027	.023								
20	73.9	11.3	3.2	1.2	1.6	4.2	1.2	2.6	1.0						100.2	
B3. IV	1.232	.111	.020	.017	.040	.075	.019	.028								
21	71.4	14.5	2.4	1.4	1.1	2.7	2.4	3.1	0.9						99.9	
B3. IV	1.190	.142	.015	.019	.028	.048	.039	.033								
22	69.36	16.93	1.27	1.25	0.92	3.66	2.16	3.20	1.10		none	trace			99.85	2.680
A3. III	1.156	.166	.008	.017	.023	.065	.035	.034			——	——				
23	73.62	14.86	0.29	1.24	0.75	3.45	2.26	2.39	0.71	0.16	0.21	0.19	0.18	ZrO_2 0.08 S 0.06	100.45	2.652
A1. I	1.227	.146	.002	.017	.019	.062	.036	.026			.003	.001	.003			
24	72.75	14.39	0.41	2.43	1.21	2.95	2.11	2.08	0.13	0.37	0.42	0.51	0.18	ZrO_2 0.07 S 0.09	100.10	2.669
A1. I	1.213	.141	.003	.033	.030	.053	.034	.022			.005	.004	.003			
25	69.44	12.10	4.65	2.13	1.52	3.03	2.57	3.00	0.65	0.19	0.55	0.32			100.15	
A2. II	1.157	.119	.029	.029	.038	.054	.042	.032			.007	.002				
26	66.68	13.39	0.91	0.21	none	2.72	2.23	2.51	10.05		0.38			CO_2 trace	99.08	
B2. III	1.111	.131	.006	.003		.048	.035	.027			.010					
27	76.25	11.30	0.35	3.88	1.48	2.60	1.23	1.82	0.32	0.02	0.65	none	0.06	CO_2 none SO_3 none Cl none Cr_2O_3 none NiO 0.03 BaO none SrO none	99.99	2.398
A1. I	1.271	.111	.002	.054	.037	.046	.019	.019			.008		.001			
28	77.72	9.97	0.32	3.75	1.59	2.40	1.29	1.96	0.15	0.04	0.86	none	trace	CO_2 none SO_3 none Ce none NiO trace BaO none SrO none Li_2O trace	100.05	2.385
A1. I	1.294	.098	.002	.052	.040	.043	.021	.021			.011	——	——			

RANG 3. ALKALICALCIC. RIESENASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	67.33	16.20	1.40	2.73	1.31	2.81	3.15	2.14	1.84		0.80	0.16	trace	BaO 0.05		99.92
A2. II	1.122	.159	.009	.038	.033	.050	.051	.022			.010	.001				
2	73.69	12.89	1.02	2.58	0.50	3.74	2.81	1.48	1.06						99.77	
A3. III	1.228	.126	.006	.036	.013	.067	.045	.016								

ORDER 3. QUARFELIC. COLUMBARE—Continued.

SUBRANG 3. SODIPOTASSIC. RIESENOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
17	I.3″.3.3(4).	Q 39.60 hy 2.33 or 15.57 mt 0.93 ab 22.01 il 0.91 an 16.68 ap 0.34 C 1.22	Appmansberg, Bayrischer Wald, Bavaria.	A. Schwager.	Oebbeke and Schwager, Geogn. Jhft., XIV, p. 249, 1901.	Granite-diorite (aplitic).	
18	I″.3(4).(2)3.3″.	Q 35.46 di 1.57 or 17.79 hy 3.92 ab 23.06 mt 2.32 an 13.62	Steinwiesenthal, Schladminger Tauern, Styria.	J. A. Ippen.	J. A. Ippen, Mt. Nw. Ver. Steierm., p. 131, 1901.	Granite.	
19	I(II).3.3.3.	Q 47.64 di 1.79 or 12.79 hy 5.32 ab 14.15 mt 2.55 an 14.73	Roc Noir, Dent Blanche, Wallis, Switzerland.	Student of Herz.	L. Milch, N. J., 1901, I, p. 87.	Aplite.	
20	I(II).3.3″.(2)3.	Q 46.26 di 2.38 or 15.57 hy 2.90 ab 9.96 mt 3.94 an 17.79 il 0.46	Roc Noir, Dent Blanche, Wallis, Switzerland.	Student of Herz.	L. Milch, N. J., 1901, I, p. 69.	Granite gneiss.	
21	I″.3″.(2)3.3.	Q 37.80 hy 3.33 or 18.35 mt 3.48 ab 20.44 an 13.34 C 2.24	Roc Noir, Dent Blanche, Wallis, Switzerland.	Student of Herz.	L. Milch, N. J., 1901, I, p. 72.	Granite gneiss.	
22	I.3(4).3.3.	Q 34.80 hy 3.49 or 18.90 mt 1.86 ab 18.34 an 18.07 C 3.26	Plaka, n. Laurion, Attica, Greece.	R. Lepsius.	R. Lepsius, G. von Attika, p. 89, 1893.	Granite.	In W. T., **p. 141.**
23	I.3.3.3(4).	Q 42.18 hy 3.88 or 14.46 mt 0.46 ab 18.86 il 0.46 an 16.40 ap 0.34 C 2.55	Kitakijima, Bitchu, Japan.	N. Yoshioka.	S. Kozu, pers. com.	Granite.	
24	I(II).3.″3.3(4).	Q 43.62 hy 6.70 or 12.23 mt 0.70 ab 18.86 il 0.76 an 11.12 ap 1.34 C 4.39	Shiou, Honjyo, Bizen, Japan.	N. Yoshioka.	S. Kozu, pers. com.	Granite.	
25	I″.3″.(2)3.3″.	Q 36.78 di 0.43 or 17.79 hy 0.60 ab 22.01 mt 5.10 an 12.51 il 1.06 hm 1.12 ap 0.67	Brogo, New South Wales.	A. Pain.	W. N. Benson, pers. com.	Granite.	
26	I.3.″3.3.	Q 38.58 il 0.46 or 15.01 hm 0.91 ab 18.34 ru 0.56 an 13.34 C 2.14	Boggabri, Nandewar Mountains, New South Wales.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXII, p. 904, 1908.	Pitchstone.	
27	I(II).(2)3.3.3.	Q 52.14 hy 9.64 or 10.56 mt 0.46 ab 9.96 il 1.22 an 12.79 C 2.75	Hamilton, Victoria.	G. Ampt.	H. E. Summers, Pr. R. Soc. Vict., XXI, (2), p. 425, 1909.	Obsidianite.	"Button." Igneous?
28	I(II).(2)3.3.3.	Q 52.62 hy 9.15 or 11.68 mt 0.46 ab 11.00 il 1.67 an 11.95 C 1.33	Peake Station, n. Lake Eyre, South Australia.	G. Ampt.	H. E. Summers, P. R. Soc. Vict., XXI, (2), p. 425, 1909.	Obsidianite.	"Button." Igneous?

SUBRANG 4. DOSODIC. SUSQUEHANNOSE. (F. BASCOM, 1905.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I(II).3(4).(2)3.4.	Q 32.28 hy 5.81 or 12.23 mt 2.09 ab 26.72 il 1.52 an 13.07 ap 0.34 C 3.98	East Clarendon, Vermont.	H. N. Stokes.	B. K. Emerson, U. S. G. S. B. 148, p. 71, 1897.	Granite.	In W. T., **p. 185.**
2	I″.3.3.4.	Q 41.22 di 0.49 or 8.90 hy 5.00 ab 23.58 mt 1.39 an 18.07	Port Deposit, Cecil County, Maryland.	W. Bromwell.	G. P. Grimsley, J. Cinn. Soc. Nh., XVII, 1894.	Granite.	Cf. F. Bascom, Md. G. S. Rep. Cecil Co., **p.** 118, 1902. In W. T., **p. 141.**

CLASS I. PERSALANE—Continued.

RANG 3. ALKALICALCIC. RIESENASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
3	72.43	13.93	0.90	2.45	0.58	3.38	3.20	2.14	0.54	0.11	0.21	0.44	0.02	CO_2 0.09 S 0.01 BaO 0.01 SrO trace Li_2O trace	100.04	
A1. I	1.207	.136	.006	.034	.015	.061	.052	.023			.003	.003	—			
4	76.01	10.98	0.37	3.35	0.28	3.21	2.76	1.32	0.51	none	0.50	0.10	0.55	CO_2 none S 0.31	100.25	
A2. II	1.267	.108	.002	.047	.007	.057	.045	.014			.006	.001	.008			
5	71.60	18.90	0.46	1.86	1.95	2.38	1.57	0.96	0.25		0.13				100.06	
A3. III	1.193	.185	.003	.026	.049	.043	.026	.010								
6	71.50	17.44	0.45	1.96	1.03	3.00	2.45	1.53	0.68		0.10	trace	trace	CO_2 0.42 S trace	100.56	2.705
A2. II	1.192	.171	.003	.028	.026	.053	.040	.016			.001	—	—			
7	76.13	12.44	0.74	n. d.	0.83	3.25	3.34	1.50	1.52						99.75	
A4. IV	1.269	.122	.005	(.010)	.021	.058	.054	.016								
8	72.81	15.22	1.88	1.40	1.10	2.77	2.10	1.54	1.66						100.48	
A3. III	1.214	.149	.012	.019	.027	.050	.034	.016								
9	70.55	13.27	3.72	0.82	0.32	3.58	3.66	1.28	1.65	0.28	trace				99.13	2.67
B3. IV	1.176	.130	.023	.011	.008	.064	.059	.014								
10	72.65	14.55	0.37	1.55	0.85	3.57	3.15	2.02	0.48	0.17	0.29	0.25	0.36	ZrO_2 0.07 S 0.07	100.40	2.633
A1. I	1.211	.143	.002	.022	.021	.064	.051	.021			.004	.002	.005			
11	69.10	16.32	3.70	1.37	1.12	5.10	2.91	1.06							100.68	2.456
A3. III	1.152	.160	.023	.019	.028	.091	.047	.012								

RANG 3. ALKALICALCIC. RIESENASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	75.67	12.28	0.85	2.59	0.37	2.65	3.63	0.78	0.29	0.12	0.29	0.05	0.18	CO_2 trace S 0.11 BaO 0.07	99.93	
A1. I	1.261	.120	.005	.036	.009	.047	.058	.008			.004	—	.003			
2	74.32	12.08	0.54	1.51	0.03	4.17	4.15	0.32	2.31	0.20	0.22			CO_2 none	99.85	
A2. II	1.239	.118	.003	.021	.001	.075	.067	.003			.003					
3	72.24	13.84	1.45	1.86	1.10	3.40	4.43	0.39	0.69	0.17	0.41	0.10	0.12	BaO 0.08 SrO trace	100.28	
A2. II	1.204	.136	.009	.026	.028	.060	.071	.004			.005	.001	.002			
4	71.48	13.24	0.94	3.30	1.42	3.75	3.84	0.44	1.51	0.22	0.32	0.05	0.06	CO_2 none	100.57	
A2. II	1.191	.130	.006	.046	.036	.067	.062	.005			.004	—	.001			
5	72.54	16.19	1.16	1.17	0.65	3.25	4.47	0.23	0.05		0.20	0.12	trace	CO_2 none	100.03	
A2. II	1.209	.159	.007	.017	.016	.058	.072	.002			.003	.001	—			
6	76.94	12.60	0.68	1.14	0.23	3.50	4.23	0.25	0.36		0.10	trace	trace		100.03	
A2. II	1.282	.123	.004	.016	.006	.063	.068	.003			.001	—	—			

ORDER 3. QUARFELIC. COLUMBARE—Continued.

SUBRANG 4. DOSODIC. SUSQUEHANNOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
3	I″.3″.(2)3.4.	Q 36.90 hy 4.80 or 12.79 mt 1.39 ab 27.25 il 0.46 an 14.18 ap 1.01 C 1.02	Columbia, Virginia.	R. C. Wells.	S. Taber, Va. G. S. B. VII, p. 65, 1913.	Granite.	
4	I″.3.3.4.	Q 45.36 di 1.21 or 7.78 hy 6.28 ab 23.58 mt 0.46 an 13.62 il 0.91 ap 0.34	Ducktown, Tennessee.	C. Palmer.	Laney, U. S. G .S. rec. lab.	Border of pseudo-diorite.	Igneous?
5	I″.(2)3.3.4.	Q 49.26 hy 7.67 or 5.56 mt 0.70 ab 13.62 il 0.30 an 11.95 C 10.81	St. Vincent, West Indies.	Pisani.	A. Lacroix, Mont Pelée, p. 599, 1904.	Cordierite dacite.	Bomb.
6	I″.3.3.4.	Q 42.00 hy 5.77 or 8.90 mt 0.70 ab 20.96 il 0.15 an 14.73 C 6.32	Average sample, Potaro, etc., rivers, British Guiana.	Assistant of J. B. Harrison.	J. B. Harrison, G. Goldf. Brit. Gui., p. 60, 1908.	Quartz porphyrite.	In W. T., p. 141.
7	I.3.″3.4.	Q 42.60 di 1.83 or 8.90 hy 2.52 ab 28.30 an 13.90	Bolzenschloss, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XII, p. 184, 1899.	Aplite.	In W. T., p. 141.
8	I″.3.3.″4.	Q 46.80 hy 3.62 or 8.90 mt 2.78 ab 17.82 an 13.90 C 5.00	Koppenkegel, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XII, p. 152, 1899.	Granitite.	In W. T., p. 141.
9	I″.3(4).3.4.	Q 36.48 di 1.73 or 7.78 mt 2.55 ab 30.92 hm 1.92 an 15.85	Plattspitzkar, n. Maul, Tyrol.	G. Hradil.	G. Hradil, Sb. Ak. W. Wien, CXXI, p. 876, 1912.	Tonalite porphyrite.	
10	I″.3″.3.4.	Q 37.38 hy 4.87 or 11.68 mt 0.46 ab 26.72 il 0.61 an 15.85 ap 0.67 C 1.43	Kitakijima, Bitchu, Japan.	N. Yoshioka.	S. Kozu, pers. com.	Granite.	
11	I″.3(4).3(4).4.	Q 35.28 hy 2.80 or 6.67 mt 4.41 ab 24.62 hm 0.64 an 25.29 C 1.02	Izu-San, Japan.	B. Koto.	B. Koto. Q. J. G. S., XL, p. 445, 1884.	Andesite.	In W. T., p. 141.

SUBRANG 5. PERSODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I″.3.″3(4)5.	Q 44.10 hy 4.46 or 4.45 mt 1.16 ab 30.39 il 0.61 an 13.07 C 0.92	Port Deposit, Cecil County, Maryland.	W. F. Hillebrand.	F. Bascom, Md. G. S., Rep. Cecil Co., p. 138, 1902.	Metarhyolite.	
2	I″.3.″3.5.	Q 40.80 di 3.94 or 1.67 wo 1.28 ab 35.11 mt 0.70 an 13.34 il 0.46	Little Backbone Mountain, Shasta County, California.	R. C. Wells.	B. S. Butler, U. S. G. S. B. 419, p. 137, 1910.	Granite.	
3	I″.3(4).″3.5.	Q 35.52 hy 4.65 or 2.22 mt 2.09 ab 37.20 il 0.76 an 15.85 ap 0.34 C 0.41	Near Milton, Calaveras County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 14, (II), p. 484, 1894.	Quartz porphyrite.	In W. T., p. 143.
4	I(II),3″.3.″5.	Q 35.22 di 0.92 or 2.78 hy 7.89 ab 32.49 mt 1.39 an 17.51 il 0.61	Spring Creek, Shasta County, California.	G. Steiger.	B. S. Butler, U. S. G. S. B. 419, p. 137, 1910.	Monzonite.	
5	I.3″.″3.5.	Q 37.92 hy 2.52 or 1.11 mt 1.62 ab 37.73 il 0.46 an 15.29 ap 0.34 C 3.06	Towakaima Falls, Barama River, British Guiana.	J. B. Harrison,	J. B. Harrison, Rep. G. N. W. Dist., Pt. II, p. 10, 1898.	Granite gneiss.	Also in G. Goldf. Br. Gui., p. 39, 1908. In W. T., p. 143.
6	I.3.″3.5.	Q 43.38 di 2.85 or 1.67 hy 0.60 ab 35.63 mt 0.93 an 14.46 il 0.15	Utsire Island, Haugesund, Norway.	Lab. Berg. Tech. Schule.	C. F. Kolderup, Berg. Mus. Aarb., 1911, No. 17, p. 14.	Granodiorite.	

CLASS I. PERSALANE—Continued.

RANG 3. ALKALICALCIC. RIESENASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
7	76.10	13.40	0.87	0.89	0.41	3.56	3.58	0.32	0.50			0.96	trace	S 0.33	100.92	
B2. III	1.268	.131	.005	.013	.010	.064	.058	.003				.007	—			
8	75.39	13.15	0.83	0.60	0.88	3.57	4.64	0.23	0.09		trace	0.18	0.02		99.79	2.63
A2. II	1.257	.129	.005	.008	.022	.064	.075	.002			—	.001	—			

RANG 4. DOCALCIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	73.3	13.0	3.9	1.0	2.1	3.9	1.2	1.6	0.7						100.7	
B3. IV	1.222	.127	.024	.014	.053	.070	.019	.017								
2	73.59	12.35	0.38	3.79	1.80	3.76	1.03	1.93	0.53	0.27	0.70		0.15	ZrO_2 0.01 NiO none BaO trace SrO trace Li_2O trace	100.29	2.428
A1. I	1.227	.121	.002	.053	.045	.067	.016	.021			.009		.002			22°
3	73.76	12.96	2.20	0.36	0.75	1.42	2.06	4.50	2.00		0.14		none	CO_2 none	100.15	
A2. II	1.229	.127	.014	.005	.019	.025	.033	.048			.002		—			

RANG 4. DOCALCIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	69.30	15.91	3.20	0.18	0.21	5.92	3.35	0.14	1.80	0.52	0.48	none	0.11	S 0.03	101.15	
B2. III	1.155	.156	.020	.003	.005	.105	.054	.001			.006	—	.002			
2	68.87	16.42	1.91	2.06	2.54	4.64	1.25	1.10	1.12						99.91	
A3. III	1.148	.161	.012	.029	.064	.083	.020	.012								
3	75.60	14.11	0.64	n. d.	0.29	5.72	2.81	0.48	0.46	0.09	0.27	trace			100.47	2.643
A3. III	1.260	.138	.004	(.008)	.007	.102	.045	.005			.003					

CLASS I. PERSALANE.

RANG 1. PERALKALIC. LIPARASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	69.76	13.14	1.44	0.66	0.18	0.36	2.52	11.90	0.42						100.38	
A?3. III	1.163	.129	.009	.009	.005	.006	0.40	.127								
2	70.26	14.38	trace	—	0.45	0.63	0.40	12.12	0.99				0.06	FeS_2 1.60	100.89	
A?3. III	1.171	.141	—	—	.011	.011	.007	.129					.001			
3	68.10	14.42	0.80	n. d.	none	0.68	0.32	12.13	1.15	0.19			0.06	FeS_2 2.16	99.97	2.559
A?3. III	1.135	.141	.005	(.010)	—	.012	.005	.129					.001			
4	73.53	12.87	0.88	0.64	0.56	0.07	0.63	8.92	0.70	0.40	0.19	trace	0.09	CO_2 0.23 S 0.02 Cr_2O_3 none BaO 0.05	99.78	
A1. I	1.226	.126	.006	.009	.014	.001	.010	.095			.002	—	.001			
5	70.65	16.16	1.53	0.52	trace	0.55	0.54	8.66	1.22				trace		99.83	2.62
A3. III	1.178	.159	.009	.007	—	.010	.009	.092					—			
6	71.53	13.51	1.55	1.16	0.22	0.26	0.46	10.50	0.49		0.22	0.05	0.01	S 0.06	100.07	
A2. II	1.192	.133	.010	.016	.006	.005	.007	.112			.003	—	—		(100.02)	

ORDER 3. QUARFELIC. COLUMBARE—Continued.

SUBRANG 5. PERSODIC. VULCANOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
7	I.3.(2)3.5.	Q 48.54 hy 1.13 or 1.67 mt 1.16 ab 30.30 il 1.06 an 11.40 ap 2.35 C 2.96	Zdirec, Eisengebirge, Bohemia.	C. v. John.	Hinterlechner and von John, Jb. G. R.-A. Wien, LIX, p. 136, 1909.	Granite gneiss.	P_2O_5 high?
8	I.3″.(2)3.5.	Q 39.42 di 1.97 or 1.11 hy 1.66 ab 39.30 mt 1.16 an 14.46 ap 0.34	Tschingelflüh, Haslithal, Bernese Alps, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Quartz porphyry. (schistose).	

SUBRANG 3. SODIPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I(II).3.″4.3.	Q 48.78 hy 5.30 or 9.45 mt 3.25 ab 9.96 hm 1.60 an 19.46 C 2.14	Proschwitz, Isergebirge, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XV, p. 124, 1902.	Granite.	
2	I(II).3.(3)4.″3.	Q 46.92 hy 10.31 or 11.68 mt 0.46 ab 8.38 il 1.37 an 18.63 C 1.73	Pieman, Tasmania.	W. F. Hillebrand.	U. S. G. S. B. 228, p. 276, 1904.	Moldavite.	"Buttons." Igneous?
3	I.3.4.″3.	Q 40.44 hy 1.90 or 26.69 mt 0.70 ab 17.29 il 0.30 an 6.95 hm 1.76 C 2.14	Puketin, Tairua, Hauraki, New Zealand.	Survey lab.	Bell and Fraser, N. Z. G. S. B. 15, p. 45, 1912.	Rhyolite.	

SUBRANG 4-5. PRESODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.3(4).(3)4.5.	Q 36.90 hy 0.50 or 0.56 il 0.46 ab 28.30 hm 3.20 an 28.08 tn 0.59	Seminole Mine, Lincoln County, Georgia.	E. Everhardt.	S. P. Jones, G. S. Ga. B. 19, p. 59, 1909.	Granite porphyry.	
2	I(II).3.4.(3)4.	Q 42.54 hy 8.64 or 6.67 mt 2.78 ab 10.48 an 23.07 C 4.69	Vorderberg, n. Lomnitz, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XII, p. 214, 1899.	Quartz porphyry.	In W. T., p. 143.
3	I.3.(3)4.(4)5.	Q 45.48 di 2.75 or 2.78 wo 0.23 ab 23.58 il 0.46 an 24.46	Posto di Cavoli, S. Piero in Campo, Elba.	Author.	G. d'Achiardi, Mem. Soc. Tosc. Sc. N., XIX, p. 121, 1903.	Granite.	Contact with limestone.

ORDER 4. QUARDOFELIC. BRITANNARE. (C. I. P. W., 1902.)

SUBRANG 1. PERPOTASSIC. LEBACHOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I(11).4.1.1.	Q 18.24 ac 4.16 or 70.61 ns 3.54 ab 1.05 di 1.43 hy 0.96	Mt. Houghton, Keweenaw Point, Michigan.	F. P. Burrall.	L. L. Howard, G. S. Mich., VI (II), p. 42, 1898.	Felsite.	Not in W. T.
2	I.4.1.1.⊙	Q 19.62 di 1.30 or 71.72 hy 0.63 ab 3.67 pr 1.60 an 1.39	Homestake Mine, Lead, South Dakota.	W. J. Sharwood.	W. J. Sharwood, Ec. Geol., VI, p. 734, 1911.	Rhyolite.	Altered?
3	I.4.1.1.⊙	Q 18.06 di 1.24 or 71.72 hy 0.79 ab 2.62 pr 2.16 an 1.95	Homestake Mine, Lead, South Dakota.	W. J. Sharwood.	W. J. Sharwood, Ec. Geol., VI, p. 734, 1911.	Rhyolite.	Altered?
4	I.″4.1.1(2).	Q 34.68 hy 1.66 or 52.82 mt 1.39 ab 5.24 il 0.30 an 0.28 C 2.04	Solomon Mine, Creede, Colorado.	W. C. Wheeler.	W. H. Emmons, U. S. G. S. rec. lab.	Rhyolite.	
5	I.(3)4.1″.1″.	Q 33.12 mt 1.62 or 51.15 hm 0.32 ab 4.72 an 2.78 C 4.90	Chywoon Morvah, Cornwall.	J. A. Phillips.	J. J. H. Teall, Brit. Petr., p. 314, 1888.	Granite.	In W. T., p. 143.
6	I.4.1.1.⊙	Q 27.54 hy 1.00 or 62.27 mt 2.32 ab 3.67 il 0.46 an 1.39 C 0.92	Stampers, Sala, Sweden.	G. Nyblom.	H. J. Sjogren, G. F. F., XXXII, p. 1370, 1910.	Hälleflinta.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. LIPARASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
7	74.8	13.4	—	—	0.3	1.3	0.9	9.7	0.3						100.7	
B3. IV	1.247	.131	—	—	.008	.023	.015	.103								
8	68.13	15.75	1.60	0.74	0.45	0.27	0.61	10.54	1.90		0.31	trace		SO_3 0.07	100.37	2.573
A2. II	1.136	.154	.010	.010	.011	.005	.010	.112			.004	—				
9	69.06	14.41	1.89	0.54	0.39	trace	0.24	12.33	0.96		0.24	0.08		CO_2 0.09 SO_3 0.28	100.51	2.553
A2. II	1.151	.141	.012	.007	.010	—	.004	.131			.003	—				
10	69.13	15.33	0.42	1.24	0.07	0.48	0.96	11.30	0.75	0.08				S 0.12	99.88	
A3. III	1.152	.150	.003	.017	.002	.009	.016	.120								
11	70.75	12.44	2.66	0.79	0.08	0.39	0.39	11.51	0.84		0.53	0.10	0.09		100.57	
A2. II	1.179	.122	.017	.011	.002	.007	.006	.122			.007	.001	.001			
12	67.37	12.53	6.37	0.49	0.97	trace	0.03	10.01	1.36	0.56	0.69		trace	CO_2 trace	100.38	2.623
A2. II	1.123	.123	.040	.007	.024	—	—	.106			.009		—			

RANG 1. LIPARASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	73.92	14.26	0.30	n. d.	none	none	2.06	8.99	0.11		none	trace			99.64	
A3. III	1.232	.140	.002	(.004)	—	—	.033	.096			—	—				
2	73.89	13.75	0.26	n. d.	none	none	2.10	9.00	1.21		none	trace			100.21	
A3. III	1.232	.135	.002	(.004)	—	—	.034	.096			—	—				
3	72.76	15.47	—	—	none	0.19	2.35	9.28	0.15						100.20	
A3. III	1.213	1.51	—	—	—	.003	.038	.099								
4	71.00	16.31	—	—	none	.022	3.44	8.66	0.12						99.75	
A3. III	1.183	.160	—	—	—	.004	.055	.092								
5	72.76	15.47	n. d.	n. d.	none	0.19	2.35	9.28	0.15						100.20	
A3. III	1.213	.151	—	—	—	.004	.038	.099								
6	68.66	12.98	2.89	1.26	0.76	2.63	2.05	7.50	0.48	0.09	0.19	0.07	0.24	F 0.01 S 0.08 BaO 0.07	99.96	
A1. I	1.144	.127	.018	.018	.019	.046	.033	.080			.002	—	.003			
7	71.91	15.71	0.21	0.13	0.03	0.70	2.61	8.60	0.27		0.03	0.11	0.02	CO_2 0.22 SO_3 0.05 BaO 0.14	100.71	
A1. I	1.199	.154	.001	.002	.001	.013	.042	.091			—	.001	—			
8	76.26	11.30	0.52	0.34	0.02	0.23	2.81	6.77	0.14	0.39	0.15	0.01	0.05	CO_2 0.19 S 0.26 BaO 0.49	99.93	
A1. I	1.271	.111	.003	.005	—	.004	.045	.072			.002	—	—			
9	75.20	12.96	0.37	0.27	0.12	0.29	2.02	8.38	0.58			trace	0.03		100.22	
A3. III	1.253	.127	.002	.004	.003	.005	.032	.089				—	—			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 1. PERPOTASSIC. LEBACHOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
7	I.4.1″.1(2).	Q 29.70, or 57.27, ab 7.86, an 3.61, di 1.73, wo 0.23	Kangasniemi, Finland.	M. Jaatinen.	B. Frosterus, B. Com. G. Finl., No. 4, p. 22, 1896.	Kugel granite (microcline zone).	Not in W. T.
8	I.4.1.1″.	Q 22.98, or 62.27, ab 5.24, an 1.39, C 2.75, hy 1.10, mt 0.93, il 0.91, hm 0.64	Himmelbach, Bl. Lebach, Prussia.	K. Boettcher.	Weiss and Grebe, Erl. G. Kte. Pr., Bl. Lebach., p. 30, 1889.	Quartz porphyry.	In W. T., p. 143.
9	I.4.1.1.⊙	Q 19.86, or 72.83, ab 2.10, C 0.61, hy 1.00, mt 0.93, il 0.46, hm 1.28	Mutterbach, Masserthal, Thuringerwald.	Hampe.	H. Loretz, Jb. Pr. G. L-A., (1888), p. 295, 1889.	Quartz porphyry.	In W. T., p. 143.
10	I.4.1.1(2).	Q 18.12, or 66.72, ab 8.38, an 2.50, C 0.51, hy 1.66, mt 0.70	Vajdoja, Verespatak, Hungary.	B. Ruzitska.	G. v. Szadeczky, F. K., XXIX, p. 450, 1909.	Rhyolite.	
11	I″.4.1.1.	Q 24.96, or 67.83, ac 2.77, di 0.76, mt 0.93, il 1.06, hm 1.12, ap 0.34	Manzoyama, Shimoda Bay, Izu, Nippon, Japan.	K. Yokoyama.	S. Kozu, J. G., XX, p. 47, 1912.	Rhyolite.	
12	I(II).″4.1.1.	Q 27.78, or 58.94, C 1.73, hy 2.40, il 1.06, hm 6.37, ru 0.16	Pelapis Islands, northwest of Borneo.	M. Dittrich.	C. E. A. Wichmann, K. Ak. Weteus. Amst., p. 348, 1912.	Rhyolite.	

SUBRANG 2. DOPOTASSIC. OMEOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.4.1.2.⊙	Q 27.24, or 53.38, ab 17.29, C 1.12, hy 0.53	Topsham, Maine.	G. Steiger.	E. S. Bastin, U. S. G. S. B. 420, p. 14, 1910.	Graphic granite.	
2	I.4.1.2.⊙	Q 26.88, or 53.38, ab 17.82, C 0.51, hy 0.53	Topsham, Maine.	G. Steiger.	E. S. Bastin, U. S. G. S. B. 420, p. 14, 1910.	Graphic granite.	
3	I.4.1.2.⊙	Q 23.10, or 55.04, ab 19.91, an 0.83, C 1.12	Auburn, Maine.	G. Steiger.	E. S. Bastin, U. S. G. S. rec. lab.	Graphic granite.	
4	I.4″.1.2(3).	Q 17.58, or 51.15, ab 28.82, an 1.11, C 0.92	Portland, Connecticut.	G. Steiger.	E. S. Bastin, U. S. G. S. B. 420, p. 14, 1910.	Graphic granite.	
5	I.4.1.2.⊙	Q 22.98, or 55.04, ab 19.91, an 1.11, C 1.02	Bedford, Westchester County, New York.	G. Steiger.	E. S. Bastin, U. S. G. S. B. 420, p. 14, 1910.	Graphic granite.	
6	I(II).4.1(2).2.	Q 23.22, or 44.48, ab 17.29, an 3.89, di 4.85, wo 1.16, mt 3.71, il 0.30, hm 0.32	Lake Catlin, Adirondack Mountains, New York.	E. W. Morley.	H. P. Cushing, N. Y. St. Mus. A. R., LX, (2), p. 526, (1906) 1907.	Quartz syenite.	
7	I.4.1″.2″.	Q 22.74, or 50.60, ab 22.01, an 2.78, C 1.12, hy 0.23, mt 0.23, ap 0.34	Pompton Junction, New Jersey.	R. B. Gage.	J. V. Lewis, N. J. G. S. A. R. (1908), p. 65, 1909.	Granite (pegmatite).	
8	I.(3)4.1.2(3).	Q 34.80, or 40.03, ab 20.44, ac 1.39, ns 0.37, di 0.75, wo 0.46, il 0.30	Creede, Colorado.	W. C. Wheeler.	W. H. Emmons, U. S. G. S. rec. lab.	Rhyolite.	
9	I.4.1.2.⊙	Q 30.72, or 49.48, ab 16.77, an 1.39, hy 0.43, mt 0.56	Round Mountain, Rosita Hills, Colorado.	L. G. Eakins.	W. Cross. Pr. Colo. Sc. Soc., II, p. 233, 1887.	Rhyolite.	Also in U. S. G. S. A. R. 17, (II), p. 234, 1896. In W. T., p. 143.

CLASS I. PERSALANE—Continued.

RANG 1. LIPARASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
10	73.90	13.65	0.28	0.42	0.14	0.23	2.53	7.99	0.33	0.16	0.07	0.05	trace	BaO trace SrO none Li_2O trace	99.75	
A1. I	1.232	.134	.002	.005	.004	.004	.040	.085			.001	—	—			
11	68.91	14.27	0.90	0.23	0.67	.060	1.96	7.15	1.12	0.43	0.41	0.16	0.02	CO_2 0.26 FeS_2 3.32 BaO 0.08	100.49	
A1. I	1.149	.140	.006	.003	.017	.011	.032	.077			.005	.001	—			
12	66.46	14.14	4.07	0.40	0.67	0.78	1.26	9.26	1.28	0.78	0.83	0.25	0.03	CO_2 none ZrO_2 0.05 S none BaO 0.06 SrO 0.03	100.35	
A1. I	1.108	.139	.025	.006	.017	.014	.020	.099			.010	.002	—			
13	73.93	13.77	0.25	0.19	0.08	0.48	2.00	9.16	0.16			none	0.03	CO_2 trace Li_2O trace	100.05	
A3. III	1.232	.135	.002	.003	.002	.009	.032	.098				—	—			
14	64.11	16.52	0.41	1.07	1.85	1.00	1.64	8.26	1.71	0.58	0.75	0.40	0.01	CO_2 0.48 ZrO_2 0.03 SO_3 none FeS_2 0.32 BaO 0.07 SrO 0.04 $CuFeS_2$ 0.95	100.20	
A1. I	1.069	.162	.003	.015	.048	.018	.027	.088			.009	.003	—			
15	77.0	12.5	0.5	n. d.	0.1	none	2.8	7.6	0.3						100.8	
B3. IV	1.283	.122	.003		.003	—	.045	.081								
16	74.60	11.23	1.52	n. d.	0.25	0.45	1.61	8.71	1.70		0.05				100.12	
A3. III	1.243	.110	.009	—	.006	.008	.026	.093			—					
17	71.12	13.35	1.37	1.28	0.47	0.32	2.02	9.82	1.13						100.88	
A3. III	1.185	.131	.009	.018	.012	.005	.032	.104								
18	70.36	12.20	1.59	2.44	0.55	1.15	2.41	6.85	0.93		0.70	0.28	trace		99.56	
A2. II	1.173	.120	.010	.034	.014	.021	.039	.073			.009	.002				
19	74.58	13.37	0.24	n. d.	none	0.32	1.16	9.80	0.57						100.04	2.59
A3. III	1.243	.131	.002	(.004)	—	.006	.019	.104								
20	72.41	14.55	0.30	n. d.	none	0.13	2.19	10.09	0.28						99.95	2.58
A3. III	1.207	.143	.002	(.004)	—	.002	.035	.107							(99.91)	
21	74.66	11.49	2.02	n. d.	0.10	0.44	1.69	8.68	0.74			0.07	0.08		99.97	2.598
A3. III	1.244	.113	.013	(.012)	.003	.008	.027	.093				—	.001			20°
22	71.61	13.85	1.51	0.37	1.14	0.29	1.24	7.46	1.59	0.93	0.23	0.05		CO_2 0.13 SO_3 0.08	100.48	
A2. II	1.194	.136	.009	.005	.029	.005	.020	.080			.003	—				
23	63.25	16.53	3.10	0.26	0.53	0.26	1.19	11.00	2.71		0.52	0.27		CO_2 none SO_3 0.12	99.74	2.559
A2. II	1.054	.162	.020	.004	.013	.004	.018	.117			.007	.002				
24	70.33	14.29	1.35	1.59	0.72	0.27	2.50	7.46	1.38			trace		SO_3 0.05	99.94	2.568
A3. III	1.172	.140	.009	.022	.018	.005	.040	.080				—				
25	69.98	14.52	2.35	0.90	0.52	0.11	1.93	7.80	1.68			trace		SO_3 0.06	99.85	2.565
A3. III	1.166	.142	.015	.013	.013	.002	.031	.083				—				

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 2. DOPOTASSIC. OMEOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
10	I.4.1.2″.	Q 28.08 or 47.26 ab 20.96 an 1.11 C 0.51 hy 0.63 mt 0.46 il 0.15	Currant Creek, Pikes Peak, Colorado.	W. F. Hillebrand.	E. B. Mathews, J. G., VIII, p. 237, 1900.	Granite.	In W. T., p. 143.
11	I″.4.1″.2.	Q 27.72 or 42.81 ab 16.77 an 2.22 C 2.35 hy 1.70 il 0.46 hm 0.96 ru 0.16 ap 0.34 pr 3.32	Leadville, Colorado.	C. Palmer.	J. D. Irving, U. S. G. S. rec. lab.	Porphyry.	
12	I″.4.1.″2.	Q 22.26 or 55.04 ab 10.48 an 0.83 C 1.63 hy 1.70 il 1.06 hm 4.07 ap 0.67 tn 0.78	Goldroad Mine, Mojave County, Arizona.	G. Steiger.	F. C. Schrader, U. S. G. S. B. 397, p. 39, 1909.	Trachyte.	
13	I.4.1.2.⊙	Q 26.22 or 54.49 ab 16.77 an 0.83 di 0.68 wo 0.35 mt 0.46	Anita Mine, Riverside County, California.	W. T. Schaller.	W. T. Schaller, U. S. G. S. rec. lab.	Graphic granite.	
14	I″.4.1″.2.	Q 18.72 or 48.93 ab 14.15 an 2.22 C 3.06 hy 5.20 mt 0.70 il 1.37 ap 1.01	Ely, Nevada.	G. Steiger.	A. C. Spencer, U. S. G. S. rec. lab.	Monzonite.	
15	I.″4.1.2″.	Q 31.92 or 45.04 ab 21.48 ac 1.85 hy 0.30	Greve des Fontaines, St. Quay, Brittany, France.	J. de Lapparent.	J. de Lapparent, B. Soc. Min. Fr., XXXIII, p. 265, 1910	Graphic pegmatite.	
16	I.(3)4.1.(1)2.	Q 31.98 or 51.71 ab 8.91 ac 4.16 di 1.30 wo 0.23	Mont Pelet, Esterel, France.	Pisani.	A. Michel-Levy, B. Sv. Ct. G. Fr., XXI, No. 130, p. 40, 1912.	Pitchstone.	
17	I″.4.1.2.	Q 20.98 or 57.82 ab 14.15 ac 2.31 di 1.18 hy 2.45 mt 0.93	Torre de la Testa, Cabo de Gata, Spain.	A. Osann.	A. Osann, Z. D. G. G., XLIII, p. 695, 1891.	Liparite.	In W. T., p. 143.
18	I″.4.1″.2(3).	Q 27.00 or 40.59 ab 20.41 an 2.22 di 1.40 hy 2.68 mt 2.32 il 1.37 ap 0.67	Kuntivara, Kuuosamo, Finland.	N. Sahlbom.	V. Hackmann, B. Com. G. Finl., No. 15, p. 41, 1905.	Quartz porphyry.	
19	I.4.1.″2.	Q 29.34 or 57.82 ab 9.96 an 1.67 C 0.20 hy 0.53	Skarpö, n. Vaxholm, Sweden.	A. Bygden.	A. Bygden, B. G., Inst. Ups., VII, p. 5 (1905), 1906.	Graphic granite.	
20	I.4.1.2.⊙	Q 20.88 or 58.94 ab 18.34 an 0.28 di 0.25 hy 0.40	Elfkarleo, Uppland, Sweden.	A. Bygden.	A. Bygden, B. G., Inst. Ups., VII, p. 5 (1905), 1906.	Graphic granite.	
21	I.″4.1.″2.	Q 30.84 or 51.71 ab 10.48 ac 3.23 di 1.92 hy 1.02	Gross Umstadt, Odenwald.	C. Vogel.	C. Vogel, In. Diss. Gies., p. 49, 1891.	Quartz porphyry.	Not in W. T.
22	I.(3)4.1.2.	Q 33.30 or 44.48 ab 10.48 an 1.39 C 3.16 hy 2.90 mt 0.46 il 0.46 hm 1.12	Wingertsberg, Bl. Furfeld, Rheinhesse.	Not stated.	H. Schopp, Erl. G. Kt. Hess., Bl. Furfeld, p. 48, 1913.	Quartz porphyry.	
23	I.4″.1.(1)2.	Q 13.86 or 65.05 ab 9.43 C 2.75 hy 1.30 il 0.61 hm 3.10 ru 0.24 ap 0.34	Heckmannsloch, Bl. Wahlen, Prussia.	K. Gremse.	H. Grebe, Erl. G. Kte. Pr., Bl. Wahlen, p. 29, 1889.	Quartz porphyry.	In W. T., p. 145.
24	I.4.1.2″.	Q 24.66 or 44.48 ab 20.96 an 1.39 C 1.53 hy 3.52 mt 2.09	Bet. Schomberg and Libau, Sudetische Mulde, Bohemia.	Pfeiffer.	G. Berg, Jb. Pr. G. L.-A., XXVIII, p. 239, (1907), 1910.	Felsite.	
25	I.4.1.2.⊙	Q 27.90 or 46.15 ab 16.24 an 0.56 C 2.65 hy 1.30 mt 3.02 hm 0.32	Heilige Berg, Libau, Sudetische Mulde, Bohemia.	Eyme.	G. Berg, Jb. Pr. G. L.-A., XXVIII, p. 239, (1907), 1910.	Felsite.	

CLASS I. PERSALANE—Continued.

RANG 1. LIPARASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
26	67.08	15.04	4.16	0.73	0.92	0.20	2.74	6.96	2.31			0.19		SO_3 0.06	100.39	2.53
A2. II	1.118	.147	.026	.010	.023	.004	.044	.074				.001				
27	71.52	15.44	0.72	0.94	0.29	0.73	1.54	7.19	0.52	0.94					99.83	
A3. III	1.192	.151	.005	.013	.007	.013	.025	.077								
28	71.09	15.48	trace	trace	0.72	0.70	2.58	8.62	0.79		trace				99.98	
A3. III	1.185	.152	—	—	.018	.013	.042	.091								
29	74.63	11.29	1.48	0.44	0.70	1.14	2.70	6.81	0.57	0.13	0.20				100.09	2.64
A2. II	1.244	.111	.009	.006	.018	.020	.044	.072			.003					
30	70.91	15.32	trace	n. d.	0.07	0.58	2.31	10.07	0.51						99.77	2.564
A3. III	1.182	.150	—	—	.002	.010	.037	.107								
31	68.87	16.62	0.43	2.72	1.60	0.71	1.80	6.48	0.74			0.05			100.02	2.762
A3. III	1.148	.163	.003	.038	.040	.012	.029	.069				—				
32	72.42	15.61	none	0.79	0.11	0.27	1.92	8.53	0.60	0.04	0.02	none	0.01	CO_2 none SO_3 0.13	100.45	
A2. II	1.207	.153	—	.011	.003	.005	.031	.090								
33	67.08	17.87	1.12	0.43	0.22	0.61	2.34	9.43	0.97	0.07	0.07	0.19	0.28	CO_2 none SO_3 0.08	100.76	
A2. II	1.118	.175	.007	.006	.006	.011	.038	.100			.001	.001	.004			

RANG 1. PERALKALIC. LIPARASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	76.03	12.02	0.69	0.68	0.18	1.61	2.97	5.72	0.20		0.28				100.38	
A3. III	1.267	.118	.004	.009	.005	.029	.048	.061			.004					
2	71.24	13.78	1.30	2.83	trace	0.38	5.32	5.10	n. d.		0.68		0.15		100.78	2.64
A2. II	1.187	.135	.008	.039	—	.007	.085	.054			.008		.002			
3	75.98	12.34	0.85	0.93	0.15	0.13	4.02	4.44	0.64	0.24	0.17	0.03	trace	CO_2 none ZrO_2 0.03 S none NiO none BaO 0.07 SrO trace Li_2O trace	100.02	
A1. I	1.266	.121	.005	.012	.004	.002	.064	.047			.002	—	—			
4	73.69	12.46	1.21	1.75	0.17	0.36	4.47	4.92	0.24	0.14	0.28	0.04	0.15	CO_2 trace ZrO_2 0.14 FeS_2 none Cl 0.02 F 0.05 BaO none	100.09	
A1. I	1.228	.122	.007	.024	.004	.007	.072	.052			.004	—	.002			
5	73.03	13.43	0.40	1.49	0.14	0.79	4.91	4.54	0.35	0.18	0.30	0.06	0.15	ZrO_2 0.06 Cl 0.03 F 0.08 FeS_2 0.09 BaO trace	100.03	
A1. I	1.217	.132	.003	.020	.004	.014	.079	.048			.004	—	.002			
6	71.90	14.12	1.20	0.86	0.33	1.13	4.52	4.81	0.42	0.18	0.35	0.11	0.05	ZrO_2 0.04 CO_2 0.21 Cl 0.02 F 0.06 S trace BaO 0.04 NiO none	100.35	
A1. I	1.198	.138	.008	.012	.008	.020	.072	.051			.004	.001	—			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 2. DOPOTASSIC. OMEOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
26	I″.4.1.2(3).	Q 23.22 hy 2.30 or 41.14 mt 2.32 ab 23.06 hm 4.16 C 2.96 ap 0.34	Gottschenberg, n. Libau, Sudetische Mulde, Bohemia.	Eyme.	G. Berg, Jb. Pr. G. L.-A., XXVIII, p. 239, (1907), 1909.	Felsite.	
27	I.(3)4.1(2).2.	Q 32.34 hy 1.76 or 42.81 mt 1.16 ab 13.10 an 3.61 C 3.73	Mt. Vapa, Persanyer Gebirge, Hungary.	Not stated.	S. von Szentpetery, Nw. Mus. Hft. Kolosv., IV, p. 21, 1910.	Orthoclase porphyry.	
28	I.4.1″.2.	Q 20.58 hy 1.80 or 51.15 ab 21.48 an 3.61 C 0.61	Monte Mulatto, Tyrol.	J. A. Ippen.	J. A. Ippen, Sb. Wien. Akad., CXI, p. 266, 1906, I.	Granite aplite.	
29	I.″4.1.2″.	Q 31.92 ac 2.31 or 40.03 di 3.89 ab 19.39 wo 0.23 mt 0.70 il 0.46 hm 0.16	Voralp, Aarmassif, Switzerland.	O. Fischer.	O. Fischer, T. M. P. M., XXIV, p. 72, 1905.	Granite porphyry.	**Center of dike. Cf. I.4.1.3. No. 199.**
30	I.4″.1.2.	Q 18.00 di 0.43 or 59.49 hy 0.23 ab 19.39 an 1.67	Wilsons Creek, Omeo, Victoria.	A. W. Howitt.	A. W. Howitt, Tr. R. Soc. Vict., XXIV, p. 120, 1888.	Graphic granite.	In W. T., p. **145**.
31	I″.″4.1(2).2.	Q 27.66 hy 8.62 or 38.36 mt 0.70 ab 15.20 an 3.34 C 5.41	Wilsons Creek, Omeo, Victoria.	A. W. Howitt.	Tr. R. Soc. Vict., XXIV, p. 122, 1888.	Granite.	In W. T., p. **145**.
32	I.4.1.2. ⊙	Q 27.42 hy 1.75 or 50.04 ab 16.24 an 1.39 C 2.75	Rough River, Maimai, Reefton District, New Zealand.	Not stated.	P. G. Morgan, pers. com.	Pegmatite.	
33	I.4″.1.2.	Q 15.96 hy 0.86 or 55.60 mt 1.62 ab 19.91 il 0.15 an 4.19 ap 0.34 C 2.96	Charleston, Westport District, New Zealand.	Not stated.	P. G. Morgan, pers. com.	Pegmatite.	

SUBRANG 3. SODIPOTASSIC. LIPAROSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.(3)4.1″.3.	Q 34.14 di 1.33 or 33.92 wo 1.63 ab 25.15 mt 0.93 an 2.50 il 0.61	Umanak Island, Nugsuaks Peninsula, Greenland.	W. C. Phalen.	W. C. Phalen, Smiths. Misc. Coll., XLV, p. 187, 1904.	Granite.	
2	I″.4.1.3(4).	Q 19.50 ac 1.85 or 30.02 di 1.73 ab 42.44 hy 2.90 mt 0.93 il 1.22	Iviangusat, Kangerdluarsuk, Greenland.	C. Detlefsen.	N. V. Ussing, G. Julhb., p. 114, 1911.	Soda granite.	
3	I.(3)4.1.3.	Q 35.22 hy 1.04 or 26.16 mt 1.16 ab 33.54 il 0.30 an 0.56 C 0.82	Haystack Mountain, Aroostook County, Maine.	W. F. Hillebrand.	H. E. Gregory, U. S. G. S. B. 165, p. 155, 1900.	Rhyolite.	In W. T., p. **145**.
4	I.4.1.3″.	Q 26.88 ac 0.92 or 28.91 di 1.67 ab 37.73 hy 1.78 mt 1.16 il 0.61	Mount Ascutney, Vermont.	W. F. Hillebrand.	R. A. Daly, U. S. G. S. B. 209, p. 75, 1903.	Paisanite.	In W. T., p. **145**.
5	I.4.1.3(4).	Q 25.02 di 2.16 or 26.69 hy 1.26 ab 41.40 mt 0.70 an 1.39 il 0.61	Mount Ascutney, Vermont.	W. F. Hillebrand.	R. A. Daly, U. S. G. S. B. 209, p. 75, 1903.	Paisanite.	In W. T., p. **145**.
6	I.4.1(2).3″.	Q 21.20 di 0.43 or 28.36 hy 0.60 ab 37.73 mt 1.86 an 4.17 il 0.61 ap 0.34	Mount Ascutney, Vermont.	W. F. Hillebrand.	R. A. Daly, U. S. G. S. B. 209, p. 84, 1903.	Granite.	In W. T., p. **145**.

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. LIPARASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
7	72.26	13.59	1.16	2.18	0.06	1.13	3.85	5.58	0.47		0.45		trace		100.73	2.65
A2. II	1.204	.133	.007	.031	.002	.020	.062	.060			.006		—			
8	73.09	12.76	1.07	4.28	0.09	0.30	3.16	5.10	0.73		0.45		0.08		101.06	2.66
B2. III	1.218	1.25	.007	.060	.002	.005	.051	.054			.006		.001			
9	71.07	12.34	2.25	4.92	0.19	.055	2.84	5.53	0.72		0.27		trace		100.68	2.68
A2. II	1.185	.121	.014	.068	.005	.010	.046	.059			.003		—			
10	75.38	11.85	1.78	0.88	none	0.33	3.68	5.37	0.50	0.15			0.10		100.02	2.62
A3. III	1.256	.116	.011	.013	—	.005	.060	0.57					.001			
11	73.33	12.95	0.98	1.66	none	0.98	3.46	5.61	0.30	0.11			0.13		99.51	
A3. III	1.222	.127	.006	.024	—	.018	.056	.060					.002			
12	72.25	13.40	1.10	1.53	none	0.74	4.27	5.56	0.31	0.10			0.11		99.37	2.643
B3. IV	1.204	.121	.007	.021	—	.013	.069	.060					.001			
13	75.65	12.89	0.89	1.11	0.20	0.48	3.71	5.50	0.15	0.08	0.05				100.71	
A3. III	1.261	.126	.006	.015	.005	.009	.060	.059			—					
14	69.51	15.06	1.25	1.63	0.05	0.31	5.48	6.02	0.23	0.11	0.29	trace	trace	CO_2 none BaO none	99.95	
A2. II	1.159	.148	.008	.022	.001	.005	.097	.059			.004	—	—			
15	77.08	12.54	none	0.95	0.01	0.75	3.64	4.99	n. d.						99.96	
A3. III	1.285	.123	—	.013	—	.013	.059	.053								
16	77.61	11.94	0.55	0.87	trace	0.31	3.80	4.98	0.23	trace	0.25		trace		100.54	2.618
A3. III	1.294	.117	.004	.012	—	.006	.061	.053			.003		—			18°
17	77.49	11.89	0.34	1.12	0.09	0.45	4.58	4.26	0.16				trace		100.63	
A3. III	1.292	.117	.002	.015	.002	.008	.074	.045					—			
18	76.44	12.95	0.19	0.89	trace	0.15	4.76	4.95	0.09		0.37		trace		100.79	
A3. III	1.274	.127	.001	.012	—	.003	.077	.053			.005		—			
19	76.49	11.89	1.16	1.56	trace	0.14	4.03	5.00	0.38	0.12	trace		trace		100.77	2.650
A3. III	1.275	.117	.007	.022	—	.002	.064	.053			—		—			13°
20	71.40	14.76	1.68	0.72	0.55	0.10	4.79	5.16	1.46				trace		100.62	
A3. III	1.190	.145	.011	.010	.014	.002	.077	.055					—			
21	70.23	15.00	1.99	n. d.	0.38	0.33	4.98	4.99	1.28	0.91	0.03	0.06	0.24		100.42	
A2. II	1.171	.147	.012	(.024)	.010	.006	.080	.053				—	.003			
22	67.35	15.05	1.23	4.76	0.03	0.55	4.42	6.08	0.17	0.16	0.60		0.05		100.45	2.69
A3. III	1.123	.148	.008	.066	.001	.010	.071	.065			.008		—			17°
23	71.90	12.98	0.81	2.85	0.02	1.04	4.19	5.60	0.20	0.20	0.34	0.04	0.08	ZrO_2 0.12 BaO trace SrO trace	99.87	2.651
A1. I	1.198	.127	.005	.040	—	.019	0.68	.060			.004	—	.001			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. LIPAROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
7	I.4.1″.3.	Q 25.26 di 2.20 or 33.36 hy 1.42 ab 32.49 mt 1.62 an 3.06 il 0.91	Mount Willard, New Hampshire.	G. W. Hawes.	G. W. Hawes, A. J. S., XXI, p. 25, 1881.	Granite.	Normal. Not in W. T.
8	I.(3)4.1.3.	Q 31.68 hy 6.54 or 30.02 mt 1.62 ab 26.72 il 0.91 an 1.39 C 1.53	Mount Willard, New Hampshire.	G. W. Hawes.	G. W. Hawes, A. J. S., XXI, p. 25, 1881.	Granite.	3 feet from contact. Not in W. T.
9	I″.″4.1″.3.	Q 28.74 hy 7.23 or 32.80 mt 3.25 ab 24.10 il 0.46 an 2.78 C 0.61	Mount Willard, New Hampshire.	G. W. Hawes.	G. W. Hawes, A. J. S., XXI, p. 25, 1881.	Granite.	2 inches from contact. Not in W. T.
10	I.″4.1.3.	Q 32.76 di 0.49 or 31.69 hy 0.53 ab 31.44 mt 2.15	Mount Kearsarge, New Hampshire.	J. H. Perry.	J. H. Perry, J. G., XI, p. 408, 1903.	Quartz porphyry.	
11	I.4.1″.3.	Q 28.62 di 1.73 or 33.34 hy 1.72 ab 29.34 mt 1.39 an 3.06	Mount Kearsarge, New Hampshire.	J. H. Perry.	J. H. Perry, J. G., XI, p. 409, 1903.	Quartz porphyry.	
12	I.4.1.3.⊙	Q 23.94 di 2.97 or 33.34 hy 0.40 ab 36.15 mt 1.62 an 0.56	Mount Kearsarge, New Hampshire.	J. H. Perry.	J. H. Perry, J. G., XI, p. 409, 1903.	Quartz porphyry.	
13	I.″4.1.3.	Q 31.02 di 0.46 or 32.80 hy 1.46 ab 31.44 mt 1.39 an 1.95	Mount Gunstock, Belknap Mountains, New Hampshire.	H. S. Washington.	Pirsson and Washington, A. J. S., XXII, p. 440, 1906	Quartz syenite aplite.	
14	I″.4(5).1.3(4).	Q 12.90 ac 3.70 or 32.80 di 1.21 ab 46.63 hy 1.40 il 0.61	Red Hill, New Hampshire.	H. S. Washington.	Pirsson and Washington, A. J. S., XXIII, p. 441, 1907.	Paisanite.	Dike in No. 3, I.6.1.4.
15	I.(3)4.1″.3.	Q 34.56 di 0.49 or 29.47 hy 1.45 ab 30.92 an 3.06	Milford, Massachusetts.	L. P. Kinnicut.	T. N. Dale, U. S. G. S. B. 354, p. 79, 1908.	Granite.	
16	I.(3)4.1.3.	Q 35.76 di 0.65 or 29.47 hy 0.26 ab 31.96 mt 0.93 an 0.83 il 0.46	Rockport, Cape Ann, Essex County, Massachusetts.	H. S. Washington.	H. S. Washington, J. G., VI, p. 793, 1898.	Granite.	In W. T., p. 145.
17	I.″4.1.3(4).	Q 33.42 ac 0.92 or 25.02 di 1.95 ab 37.73 hy 1.16	Bass Rocks, Cape Ann, Essex County, Massachusetts.	H. S. Washington.	H. S. Washington, J. G., VII, p. 107, 1899.	Aplite.	Border of dike. In W. T., p. 145.
18	I.4.1.3″.	Q 29.16 ac 0.46 or 29.47 di 0.75 ab 39.82 hy 0.53 il 0.76	Bass Rocks, Cape Ann, Essex County, Massachusetts.	H. S. Washington.	H. S. Washington, J. G., VII, p. 107, 1899.	Aplite.	Center of dike. In W. T., p. 145.
19	I.(3)4.1.3.	Q 33.12 ac 0.46 or 29.46 di 0.49 ab 33.54 hy 1.72 mt 1.62	Magnolia, Essex County, Massachusetts.	H. S. Washington.	H. S. Washington, J. G., VII, p. 113, 1899.	Paisanite.	In W. T., p. 145.
20	I.4.1.3″.	Q 22.80 hy 1.40 or 30.58 mt 2.32 ab 40.35 hm 0.16 an 0.56 C 1.12	Marblehead Neck, Essex County, Massachusetts.	H. S. Washington.	H. S. Washington, J. G., VII, p. 293, 1899.	Keratophyre (bostonite).	In W. T., p. 145.
21	I.4.1.3(4).	Q 19.62 hy 4.17 or 29.47 il 0.46 ab 41.92 an 1.67 C 0.82	Marblehead Neck, Essex County, Massachusetts.	T. M. Chatard.	J. H. Sears, B. Mus. Comp. Zool., XVI, p. 170, 1890.	Keratophyre (bostonite).	In W. T., p. 147.
22	I″.4″.1″.3.	Q 14.06 hy 6.70 or 36.14 mt 1.86 ab 37.20 il 1.22 an 2.78 C 0.20	Rockport, Cape Ann, Essex County, Massachusetts.	H. S. Washington.	H. S. Washington, J. G., VI, p. 795, 1898.	Quartz syenite.	Inclusion in granite, No. 16 above. In W. T., p. 145.
23	I″.4.1.3.	Q 22.80 ac 0.46 or 33.36 di 4.71 ab 35.11 hy 1.85 mt 0.93 il 0.61	South Lynnfield, Massahusetts. c	M. F. Connor.	C. H. Clapp, pers. com., to be publ. in U. S. G. S. B.	Granite.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. LIPARASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
24	76.52	12.30	0.70	0.56	0.16	0.31	5.19	4.58	0.41	0.11	0.12		trace		100.96	
B2. III	1.275	.127	.004	.008	.004	.005	.084	.049			.002		—			
25	75.58	11.17	1.71	1.26	0.04	0.49	4.03	4.68	0.34	0.10	0.22	trace	0.05	ZrO_2 0.20	99.87	2.661
A2. II	1.260	.110	.001	.018	.001	.009	.065	.050			.003	—	—			
26	75.08	11.57	2.25	0.93	0.03	0.44	4.21	4.62	0.19	0.04	0.20	trace	trace	ZrO_2 0.20	99.76	2.661
A2. II	1.251	.113	.014	.013	.001	.008	.068	.049			.003	—	—			
27	73.93	12.29	2.91	1.55	0.04	0.31	4.66	4.63	0.41		0.18	trace		BaO none	100.91	2.642
A3. III	1.232	.120	.018	.022	.001	.006	.075	.049			.002	—				22°
28	72.97	12.13	2.77	1.09	0.20	0.74	4.61	4.79	0.35	0.10	0.30	0.20	trace	ZrO_2 0.20	100.25	
A2. II	1.216	.119	.018	.015	.005	.013	.074	.051			.004	001				
29	72.88	12.30	1.67	2.10	0.09	0.87	4.43	4.90	0.31	0.15	0.35	trace	0.10	CO_2 0.30 ZrO_2 0.10	100.55	2.667
A2. II	1.215	.121	.010	.029	.002	.016	.071	.052			.004		.001			20°
30	71.41	12.74	1.75	2.33	0.06	0.85	4.59	5.00	0.56	0.10	0.38	0.22	0.10	CO_2 0.40 ZrO_2 0.10	100.59	2.66
A2. II	1.190	.125	.011	.032	.002	.015	.074	.053			.005	.002	.001			20°
31	76.81	10.57	none	3.74	0.05	0.32	3.42	5.30	0.25	none			0.13	Li_2O none	100.59	
A3. III	1.280	.004	—	.052	.001	.006	.055	.056					.002			
32	76.94	12.59	1.37	0.14	0.25	trace	3.56	5.33	0.22	none	0.08	none	trace	CO_2 none	100.40	
A2. II	1.282	.123	.009	.002	.006	—	.057	.056			.001	—	—			
33	72.47	14.73	0.96	0.97	trace	0.81	3.69	5.61	0.72			0.04		CO_2 0.10	100.10	
A2. II	1.208	.144	.006	.014	—	.014	.060	.060				—				
34	72.06	14.83	1.28	0.64	0.13	1.20	4.31	5.64	0.65				trace	S 0.12	100.86	2.640
B3. IV	1.201	.145	.008	.009	.003	.021	.069	.060								
35	68.96	15.25	3.28	none	0.20	0.76	5.45	5.01	0.91				0.23		100.05	
A3. III	1.149	.150	.021	—	.005	.014	.088	.053					.003			
36	68.50	14.69	1.34	3.25	0.26	2.20	3.50	5.90	0.42			0.03	0.10	BaO 0.05	100.22	
A2. II	1.142	.144	.008	.045	.007	.039	.056	.063				—	.001			
37	76.00	13.11	0.92	n. d.	0.27	1.06	3.88	4.69	0.31						100.24	
A4. IV	1.267	.128	.006	(.012)	.007	.019	.063	.050								
38	75.89	14.02	0.71	n. d.	0.12	0.70	3.64	5.56	0.28						100.92	
A4. IV	1.265	.137	.004	(.008)	.003	.013	.059	.060								
39	75.16	13.74	0.91	n. d.	0.17	0.91	3.76	5.05	0.32						100.02	
A4. IV	1.253	.135	.006	(.012)	.004	.016	.061	.053								

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. LIPAROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
24	I.4.1.3(4).	Q 28.80, or 27.24, ab 40.87, ac 1.85, ns 0.24, di 1.18, hy 0.60, il 0.30	Neponset Valley, Massachusetts.	W. T. Hall.	F. Bascom, J. Ac. N. Sci. Phil., (2), XV, p.135, 1912.	Microgranite.	
25	I''.(3)4.1.3.	Q 33.54, or 27.80, ab 31.44, Z 0.37, ac 2.31, di 2.20, hy 0.13, mt 1.39, il 0.46	West Quincy, Massachusetts.	C. H. Warren.	C. H. Warren, Proc. Am. Acad., XLIX, p. 227, 1913.	Granite.	
26	I.(3)4.1.3''.	Q 32.76, or 27.24, ab 33.54, Z 0.37, ac 1.85, di 0.22, wo 0.81, mt 2.32, il 0.46	n. Common Hill, Quincy, Massachusetts.	C. H. Warren.	C. H. Warren, Proc. Am. Acad., XLIX, p. 227, 1913.	Granite.	
27	I''.4.1.3''.	Q 28.98, or 27.24, ab 37.20, ac 1.85, di 1.46, hy 0.13, mt 3.25, il 0.30	Hardwicke Quarry, Quincy, Massachusetts.	H. S. Washington.	H. S. Washington, A. J. S., VI, p. 181, 1898.	Granite.	In W. T., p. 145.
28	I''.4.1.3''.	Q 27.42, or 28.36, ab 35.63, Z 0.37, ac 2.77, di 2.35, hy 0.50, mt 0.46, il 0.61, ap 0.34	Rattlesnake Hill, Blue Hills, Massachusetts.	C. H. Warren.	C. H. Warren, Pr. Am. Acad., XLIX, p. 227, 1913.	Granite.	
29	I''.4.1.3''.	Q 26.82, or 28.91, ab 36.15, ac 0.92, di 3.91, hy 0.26, mt 1.86, il 0.61	Rattlesnake Hill, Blue Hills, Massachusetts.	C. H. Warren.	C. H. Warren, Pr. Am. Acad., XLIX, p. 260, 1913.	Granite porphyry.	
30	I''.4.1.3''.	Q 24.24, or 29.47, ab 37.73, ac 0.92, di 1.95, hy 1.55, mt 2.09, il 0.76, ap 0.67	Ruggles Creek, Quincy, Massachusetts.	C. H. Warren.	C. H. Warren, Pr. Am. Acad., XLIX, p. 235, 1913.	Granite.	
31	I''.(3)4.1.3.	Q 34.98, or 31.14, ab 25.15, ac 3.23, di 1.49, hy 4.32	East Greenwich, Rhode Island.	J. H. Perry.	Emerson and Perry, U. S. G. S. B. 311, p. 66, 1907.	Microgranite.	
32	I.(3)4.1.3.	Q 35.88, or 31.14, ab 29.87, C 1.02, hy 0.60, mt 0.23, il 0.15, hm 1.28	Ledyard, Connecticut.	G. F. Loughlin.	G. F. Loughlin, U. S. G. S. B. 492, p. 123, 1912.	Alaskite.	
33	I.4.1(2).3.	Q 27.12, or 33.36, ab 31.44, an 3.89, C 1.02, hy 1.06, mt 1.39	Lighthouse Point, New Haven, Connecticut.	F. Ward.	F. Ward, A. J. S., XXVIII, p. 137, 1909.	Granite.	
34	I.4.1(2).3.	Q 23.10, or 33.36, ab 36.16, an 4.45, di 1.11, mt 1.86	Stony Creek, Connecticut.	H. T. Vulté.	J. F. Kemp, B. G. S. A., X, p. 375, 1899.	Granite.	In W. T., p. 147.
35	I.4''.1.3(4).	Q 16.26, or 29.47, ab 46.11, an 2.50, di 1.30, hy 0.26, hm 3.28	Rand Hill, Beekmantown, Clinton County, New York.	E. W. Morley.	H. P. Cushing, B. G. S. A., IX, p. 248, 1898.	Quartz, syenite porphyry.	In W. T., p. 147.
36	I.4.1(2).3.	Q 19.14, or 35.03, ab 29.34, an 6.95, di 3.41, hy 3.93, mt 1.86	Altamont, Franklin County, New York.	E. W. Morley.	H. P. Cushing, N. Y. St. Mus. A. R. LIV, p. R 69, (1900), 1902.	Quartz-augite syenite.	
37	I.''4.1.3.	Q 32.16, or 27.80, ab 33.01, an 4.17, d 0.92, hy 1.82	Lithonia, De Kalb County, Georgia.	T. L. Watson.	T. L. Watson, A. G., XXVII, p. 213, 1901.	Granite gneiss.	
38	I.''4.1(2).3.	Q 30.84, or 33.36, ab 30.92, an 3.61, C 0.51, hy 1.36	Snellville, Gwinnett County, Georgia.	T. L. Watson.	T. L. Watson. Ga. G. S. B. 9 A., p. 145, 1902.	Granite.	
39	I.''4.1(2).3.	Q 31.26, or 29.47, ab 31.96, an 4.45, C 0.51, hy 1.98	Lithonia, De Kalb County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9 A, p. 145, 1902.	Granite gneiss.	Also in A. G., XXVII, p. 213, 1901.

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. LIPARASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
40	74.96	13.71	0.90	n. d.	0.24	1.02	4.68	4.79	0.44						100.74	
A4. IV	1.249	.134	.006	(.012)	.006	.018	.076	.051								
41	74.30	14.73	0.78	n. d.	trace	0.90	4.61	4.52	0.21		none	trace	trace	BaO none SrO none	100.05	
A3. III	1.238	.144	.005	(.010)	—	.016	.074	.048			—	—	—			
42	72.56	14.81	0.94	n. d.	0.20	1.19	4.94	5.30	0.70						100.64	2.684
A4. IV	1.209	.145	.006	(.012)	.005	.021	.080	.056								
43	73.95	14.23	1.29	n. d.	0.23	1.07	4.61	5.29	0.25						100.92	
A4. IV	1.233	.139	.008	(.016)	.006	.019	.074	.056								
44	71.20	15.46	1.17	n. d.	0.33	1.36	4.96	5.30	0.52						100.30	
A4. IV	1.187	.151	.007	(.014)	.008	.024	.080	.056								
45	70.38	16.47	1.17	n. d.	0.31	1.72	4.98	5.62	0.31						100.96	
A4. IV	1.173	.161	.007	(.014)	.008	.030	.081	.060								
46	70.03	15.62	1.31	n. d.	0.52	2.45	4.82	5.42	0.77						100.94	2.666
A4. IV	1.167	.153	.008	(.016)	.013	.044	.077	.057								
47	72.17	14.44	1.02	0.99	0.70	0.69	3.65	4.84	n. d.						98.77	
A3. III	1.203	.142	.006	.014	.018	.012	.059	.051								
48	73.70	12.87	3.76	0.31	0.11	0.14	3.63	4.56	0.57			trace	0.07		99.84	
A3. III	1.228	.126	.024	.004	.003	.002	.058	.049				—	.001			
49	72.42	13.04	0.68	2.49	0.58	0.66	3.44	4.97	1.21		0.40	0.20	0.09	Cl trace BaO 0.15 Li_2O trace	100.37	2.620
A2. II	1.207	.128	.004	.035	.015	.012	.055	.053			.005	.001	.001			
50	72.35	13.78	1.87	0.36	0.42	0.87	4.44	4.49	0.54	0.22	0.44	0.13	0.06	NiO 0.20	99.87	
A2. II	1.206	.135	.012	.005	.010	.016	.071	.048			.006	.001	.001			
51	71.88	12.88	3.05	1.05	0.33	1.13	4.21	4.46	0.26	0.17	0.22	0.15	trace	NiO 0.02	99.81	
A2. II	1.198	.126	.019	.015	.008	.020	.068	.048			.003	.001				
52	71.33	12.55	3.75	0.85	0.58	0.94	4.52	4.20	0.30	0.12	0.55	0.16	0.04	NiO 0.15	100.04	
A2. II	1.189	.123	.024	.012	.015	.017	.072	.045			.007	.001	—			
53	74.14	12.97	1.07	1.20	trace	0.48	4.61	5.30	0.19	0.12	0.25	trace	0.03	S trace	100.36	
A2. II	1.236	.127	.007	.017	—	.009	.074	.056			.003	—	—			
54	73.61	11.97	2.34	1.51	0.19	1.38	3.76	4.32	0.35	0.32	0.46	0.15	0.09	CO_2 none ZrO_2 none BaO 0.04 SrO 0.02	100.51	
A1. I	1.227	.117	.015	.021	.005	.025	.061	.046			.006	.001	.001			
55	75.90	12.07	1.01	1.45	0.22	0.65	3.08	5.32	0.41	0.06	0.38	0.15		CO_2 none	100.70	
A2. II	1.265	.118	.006	.020	.006	.012	.050	.056			.005	.001				

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. LIPAROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
40	I.4.1.3(4).	Q 26.64, or 28.36, ab 39.82, an 1.95; di 2.60, hy 0.86	Franklin, Heard County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9 A, p. 67, 1902.	Granite.	
41	I.4.1(2).3(4).	Q 27.84, or 26.69, ab 38.77, an 4.45, C 0.61; hy 1.32	Stone Mountain, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9 A, p. 276, 1902.	Aplite.	Also in J. G., X, p. 188, 1902.
42	I.4.1.3″.	Q 20.76, or 31.14, ab 41.92, an 2.50; di 2.85, hy 0.63	Stone Mountain, Georgia.	T. L. Watson.	T. L. Watson, A. G. XXVII, p. 216, 1901.	Granite.	Also in Ga. G. S. B. 9 A, p. 117, 1902.
43	I.4.1″.3.	Q 24.18, or 30.02, ab 38.77, an 2.50; di 2.38, hy 1.49	Near Newnan, Coweta County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9 A, p. 95, 1902.	Granite gneiss.	
44	I.4.1(2).3″.	Q 18.60, or 31.14, ab 41.92, an 4.17; di 2.03, hy 1.56	Covington, Newton County, Georgia.	T. L. Watson,	T. L. Watson, Ga. G. S. B. 9 A, p. 163, 1902.	Granite gneiss.	
45	I.4″.1(2).3″.	Q 14.70, or 33.36, ab 42.44, an 5.56; di 4.97	Elberton, Georgia.	T. L. Watson.	T. L. Watson, A. G., XXVII, p. 203, 1901.	Granite.	Also in Ga. G. S. B. 9 A, p. 215, 1902.
46	I.4″.1(2).3(4).	Q 16.26, or 31.69, ab 40.35, an 5.28; di 5.82, hy 0.50	Lexington, Oglethorpe County, Georgia.	T. L. Watson.	T. L. Watson, A. G., XXVII, p. 203, 1901.	Granite.	Also in Ga. G. S. B. 9 A, p. 189, 1902.
47	I.″4.1(2).3.	Q 29.76, or 28.36, ab 30.92, an 3.34, C 2.04; hy 2.46, mt 1.39, il 0.46	Felch Mountain, Michigan.	H. N. Stokes.	H. L. Smyth, U. S. G. S. Mon. 36, p. 389, 1899.	Granite.	Low sum due to H_2O. In W. T., p. 147.
48	I.(3)4.1.3.	Q 34.74, or 27.24, ab 30.39, an 0.56, C 1.73; hy 0.30, mt 1.16, hm 3.04	Little Brick Island, Pigeon Point, Minnesota.	L. G. Eakins.	W. S. Bayley, U. S. G. S. B. 109, p. 58, 1893.	Quartz kerato-phyre.	In W. T., p. 147.
49	I″.″4.1″.3.	Q 30.06, or 29.47, ab 28.82, an 2.22, C 1.22; hy 5.06, mt 0.93, il 0.76	Pigeon Point, Minnesota.	W. F. Hille-brand.	W. S. Bayley, A. J. S., XXXVII, p. 59, 1889.	Soda granite.	Also in U. S. G. S. B. 109, p. 56, 1893. In W. T., p. 147.
50	I.4.1(2).3″.	Q 27.30, or 26.69, ab 37.20, an 3.61, C 0.31; hy 1.10, il 0.76, hm 1.87, ap 0.34	Near Ironton, Missouri.	W. H. Mel-ville.	E. Haworth, Mo. G. S. A. R. VIII, p. 213, 1895.	Quartz porphyry.	In W. T., p. 147.
51	I″.4.1(2).3″.	Q 28.02, or 26.69, ab 35.63, an 2.78; di 1.51, hy 0.10, mt 2.78, hm 1.12, ap 0.34	Near Ironton, Missouri.	W. H. Mel-ville.	E. Haworth, Mo. G. S. A. R. VIII, p. 213, 1895.	Quartz porphyry.	In W. T., p. 147.
52	I″.4.1″.3(4).	Q 26.82, or 25.02, ab 37.73, an 3.06; di 0.65, hy 1.20, mt 1.16, il 1.06, hm 3.04, ap 0.34	Near Ironton, Missouri.	W. H. Mel-ville.	E. Haworth, Mo. G. S. A. R. VIII, p. 213, 1895.	Quartz porphyry.	In W. T., p. 147.
53	I.4.1.3.⊙	Q 26.58, or 31.14, ab 37.20; ac 1.39, di 2.23, hy 0.13, mt 0.93, il 0.46	Mountain Park, Oklahoma.	Fairchild.	C. H. Taylor, U. S. G. S. rec. lab.	Granite.	
54	I″.″4.1″.3″.	Q 32.82, or 25.58, ab 31.96, an 2.78; di 1.30, wo 0.70, mt 3.48, il 0.91, ap 0.34	Near Mount Sheri-dan, Wichita Mountains, Okla-homa.	G. Steiger.	J. P. Iddings, U. S. G. S. B. 419, p. 41, 1910.	Granite.	
55	I.(3)4.1″.3.	Q 35.76, or 31.14, ab 26.20, an 2.50, C 0.31; hy 1.79, mt 1.39, il 0.76, ap 0.34	Llano, Texas.	H. S. Washing-ton.	J. P. Iddings, J. G., XII, p. 228, 1904.	Quartz porphyry.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. LIPARASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
56	76.30	11.53	1.83	0.76	0.03	0.16	4.01	4.70	0.34	0.19	0.16	none	trace	CO_2 trace ZrO_2 0.11 S trace BaO none SrO none Ce_2O_3 0.02	100.14	2.602
A1. I	1.272	.113	.011	.011	.001	.003	.065	.050			.002	—	—			
57	75.12	10.94	2.88	0.86	0.07	0.20	4.46	4.54	0.19	0.18	0.20	none	0.08	CO_2 0.04 ZrO_2 0.13 SO_3 none S 0.05 BaO none SrO none Ce_2O_3 0.04	99.98	2.617
A1. I	1.252	.107	.018	.012	.002	.004	.072	.048			.003	—	.001			
58	74.85	12.83	1.40	0.37	0.04	0.48	4.24	5.12	0.30	0.24	0.15		trace	ZrO_2 0.09 S trace BaO none SrO none Ce_2O_3 0.07	100.18	2.611
A1. I	1.248	1.248	.009	.005	.001	.009	.068	.054			.002		—			
59	72.86	11.74	2.71	1.66	0.06	0.24	4.63	4.92	0.40	0.51	0.20	trace	0.07	CO_2 trace ZrO_2 0.28 S trace BaO none SrO none Ce_2O_3 0.05	100.33	2.635
A1. I	1.214	.115	.017	.023	.002	.004	.074	.052			.003	—	.001			
60	68.25	13.60	3.66	1.43	0.02	0.54	6.52	4.73	0.32	0.16	0.26	0.02	0.04	CO_2 trace ZrO_2 0.25 S trace BaO trace SrO trace Ce_2O_3 0.08	99.88	2.648
A1. I	1.138	.133	.023	.019	—	.010	.105	.050			.003	—	—			
61	73.35	14.38	1.96	0.34	0.09	0.26	4.33	5.66							100.37	
A3. III	1.223	.141	.012	.005	.002	.005	.070	.060								
62	68.71	13.45	5.31	0.75	0.19	0.96	4.63	5.51	0.36	0.13	0.21	0.04	0.14	SO_3 0.05 BaO none SrO none Li_2O none	100.44	
A1. I	1.145	.132	.033	.010	.005	.017	.075	.059			.003	—	.002			
63	75.30	11.95	2.17	n. d.	0.05	0.62	3.09	4.96	0.61	0.36	0.17	trace	trace	CO_2 none SO_3 0.44 Cl trace BaO trace SrO trace Org. 0.45	100.17	
A2. II	1.255	.117	.014	(.028)	.001	.011	.050	.054			.002	—	—			
64	74.90	13.64	0.66	.050	trace	0.61	4.22	4.64	0.33		0.15		trace		99.65	2.61
A3. III	1.248	.134	.004	.007	—	.011	.068	.049			.002		—			
65	74.82	13.80	0.37	0.30	0.10	0.17	4.33	4.81	0.83		0.25		trace	Li_2O trace	99.78	2.59
A3. III	1.247	.135	.002	.004	.003	.003	.070	.051			.003		—			
66	72.88	12.90	0.74	1.05	0.75	0.81	3.72	5.03	1.22		0.45		0.05		99.60	2.64
A2. II	1.215	.126	.005	.015	.019	.014	.060	.054			.006		—			
67	72.48	13.14	1.66	1.02	0.15	1.04	4.22	4.88	0.42		0.32		trace		99.33	2.62
B3. IV	1.208	.129	.010	.014	.004	.019	.068	.052			.004		—			
68	72.38	14.71	1.09	0.82	0.70	0.67	4.28	4.15	0.92		0.10		trace	Li_2O trace	99.82	2.61
A3. III	1.206	.144	.007	.011	.018	.012	.069	.044			.001		—			
69	71.67	15.82	1.18	0.35	0.13	0.25	4.46	4.45	1.21		0.10		trace	Li_2O trace	99.62	2.60
A3. III	1.195	.155	.007	.005	.003	.004	.072	.047			.001		—			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. LIPAROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
56	I.(3)4.1.3.	Q 34.92 ac 0.92 or 27.80 di 0.22 ab 33.01 wo 0.23 mt 2.09 il 0.30	Chisos Mountain, Trans-Pecos, Texas.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 228, p. 74, 1904.	Rhyolite.	
57	I″.(3)4.1.3.	Q 32.82 ac 6.01 or 26.69 di 0.96 ab 30.92 hy 0.36 mt 1.16 il 0.46	Shafter, Trans-Pecos, Texas.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 228, p. 74, 1904.	Rhyolite.	
58	I.″4.1.3.	Q 30.12 di 0.22 or 30.02 wo 0.46 ab 35.63 mt 0.70 an 1.11 il 0.30 hm 0.96	Chisos Mountain, Trans-Pecos, Texas.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 228, p. 74, 1904.	Rhyolite.	
59	I(II).4.1.3.	Q 27.48 ac 5.08 or 28.91 di 0.99 ab 33.01 hy 1.78 mt 1.39 il 0.46	West of Paisano Mountain, Trans-Pecos, Texas.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 228, p. 74, 1904.	Rhyolite.	
60	I(II).4″.1.3(4).	Q 14.52 ac 10.16 or 27.80 wo 1.16 ab 43.49 mt 0.23 il 0.46	North of Chisos Mountain, Trans-Pecos, Texas.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 228, p. 75, 1904.	Grorudite.	
61	I.4.1.3.⊙	Q 25.86 hy 0.20 or 33.36 mt 1.16 ab 36.68 hm 1.12 an 1.39 C 0.61	Mosquez Canyon, Apache Mountains, Trans-Pecos, Texas.	A. Osann.	A. Osann, T. M. P. M., XV, p. 439, 1895.	Paisanite.	In W. T., p. 147.
62	I″.4.1.3.	Q 19.38 ac 0.92 or 32.80 di 1.08 ab 38.25 wo 1.39 mt 2.09 il 0.46 hm 3.04	Vieja Mountains, San Carlos, Presidio County, Texas.	G. Steiger.	E. C. E. Lord, U. S. G. S. B. 164, p. 92, 1900.	Quartz pantellerite.	In W. T., p. 147.
63	I.(3)4.1″.3.	Q 34.92 hy 3.53 or 30.02 il 0.30 ab 26.20 an 3.06 C 0.20	Red Mountain, Rimini, Butte District, Montana.	H. N. Stokes.	W. H. Weed, U. S. G. S. B. 168, p. 119, 1900.	Rhyolite.	In W. T., p. 149.
64	I.″4.1″.3″.	Q 31.38 hy 0.13 or 27.24 mt 0.93 ab 35.63 il 0.30 an 3.06 C 0.61	Fourmile Creek, Castle Mountains, Montana.	L. V. Pirsson.	Weed and Pirsson, U. S. G. S. B. 139, p. 120, 1896.	Rhyolite.	In W. T., p. 147.
65	I.″4.1.3″.	Q 30.72 hy 0.30 or 28.36 mt 0.23 ab 36.68 il 0.46 an 0.83 hm 0.16 C 1.12	Fourmile Creek, Castle Mountains, Montana.	L. V. Pirsson.	Weed and Pirsson, U. S. G. S. B. 139, p. 101, 1896.	Quartz-tourmaline porphyry.	In W. T., p. 147.
66	I.4.1(2).3.	Q 28.92 di 0.43 or 30.02 hy 2.23 ab 31.44 mt 1.16 an 3.33 il 0.91	Between Blackhawk and Robinson, Castle Mountains, Montana.	L. V. Pirsson.	Weed and Pirsson, U. S. G. S. B. 139, p. 96, 1896.	Aplitic granite.	In W. T., p. 149.
67	I.4.1″.3″.	Q 27.36 di 0.86 or 28.91 wo 0.70 ab 35.63 mt 2.32 an 2.50 il 0.61	Elk Peak, Castle Mountains, Montana.	L. V. Pirsson.	Weed and Pirsson, U. S. G. S. B. 139, p. 84, 1896.	Granite.	In W. T., p. 149.
68	I.4.1(2).3(4).	Q 28.98 hy 2.50 or 24.46 mt 1.62 ab 36.16 il 0.15 an 3.34 C 1.94	Between Fourmile and Checkerboard creeks, Castle Mountains, Montana.	L. V. Pirsson.	Weed and Pirsson, U. S. G. S. B. 139, p. 99, 1896.	Quartz porphyry.	In W. T., p. 149.
69	I.4.1.3(4).	Q 28.20 hy 0.30 or 26.13 mt 0.93 ab 37.73 il 0.15 an 1.11 hm 0.48 C 3.26	Musselshell River, Castle Mountains, Montana.	L. V. Pirsson.	Weed and Pirsson, U. S. G. S. B. 139, p. 103, 1896.	Quartz porphyry.	In W. T., p. 149.

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. LIPARASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
70	68.65	18.31	0.56	0.08	0.12	1.00	4.86	4.74	0.83	0.27	0.20	trace	trace	SO_3 trace Cl 0.03 F trace BaO 0.13 SrO 0.10	99.88	
A1. I	1.144	.180	.003	.001	.003	.018	.078	.050			.003	—	—			
71	68.34	15.32	1.90	0.84	0.54	0.92	5.45	5.62	0.30	0.15	0.21	0.13	0.07	Cl 0.04 F none BaO 0.08 SrO 0.04 Li_2O none	99.95	
A1. I	1.139	.150	.012	.012	.014	.016	.089	.060			.003	.001	.001			
72	75.71	11.11	1.56	0.37	0.08	0.88	4.64	4.18	0.35		1.25		0.07		100.20	
A2. II	1.262	.109	.010	.005	.002	.016	.075	.045			.016		.001			
73	70.92	13.24	3.54	0.66	0.23	1.42	4.28	4.25	0.57		0.16	0.18	0.14	Li_2O none	100.59	
A2. II	1.181	.130	.022	.010	.006	.025	.069	.046			.002	.001	.002			
74	75.62	12.96	1.00	0.31	0.03	0.39	3.80	5.20	0.48	0.29	0.21	none	0.04	CO_2 none ZrO_2 0.02 S 0.01 BaO 0.01 SrO none	100.37	
A1. I	1.260	.127	.006	.004	.001	.007	.061	.055			.003	—	—			
75	75.19	12.91	0.88	0.68	none	0.68	3.72	5.30	0.47	0.21	0.18	none	0.03	CO_2 0.11 S trace BaO none	100.36	
A2. II	1.253	.127	.006	.009	—	.012	.060	.056			.002	—	—			
76	74.45	14.72	none	0.56	0.37	0.83	3.97	4.53	0.66			0.01	0.28	Li_2O trace	100.38	
A2. II	1.241	.144	—	.008	.009	.914	.064	.048				—	.004			
77	74.27	13.67	0.48	0.45	0.12	0.65	3.48	5.90	0.04	0.10	0.49	0.04	none	ZrO_2 0.01 Cl 0.02	99.72	
A2. II	1.238	.134	.003	.006	.003	.012	.056	.063			.006	—	—			
78	73.82	10.59	2.18	2.98	0.04	0.28	4.20	4.57	0.49	0.39	0.13	0.02	none	ZrO_2 none F 0.06 S none BaO none	99.75	
A1. I	1.230	.104	.014	.042	.001	.005	.068	.049			.002	—	—			
79	73.22	10.93	3.94	1.20	none	0.41	3.63	4.59	0.99	0.87	0.22	none	0.03	ZrO_2 none F 0.10 S none BaO none	100.13	
A1. I	1.220	.107	.025	.017	—	.007	.058	.049			.003	—	—			
80	73.51	13.28	0.94	0.97	0.05	1.11	3.79	5.22	0.62	0.16	0.18	trace	trace	F 0.55 BaO trace SrO none Li_2O trace	100.38	
A2. II	1.225	.130	.006	.014	.001	.020	.061	.056			.002	—	—			
81	75.17	12.66	0.23	1.40	0.05	0.83	2.88	5.75	0.62	0.16	0.10	0.03	trace	F 0.31 BaO 0.03 Li_2O trace	100.26	
A2. II	1.253	.124	.001	.019	.001	.014	.047	.062			.001	—	—			
82	71.56	13.10	0.66	0.28	0.14	0.74	3.77	4.06	5.52				0.16		99.99	
A3. III	1.193	.128	.004	.004	.004	.012	.061	.043					.002			
83	70.73	14.22	1.59	0.59	none	0.72	4.96	5.57	0.32	1.16	0.34	0.03	0.11	ZrO_2 0.04 SO_3 none BaO 0.01	100.39	
A1. I	1.179	.139	.010	.008	—	.013	.080	.060			.004	—	.002			
84	69.89	17.94	0.39	0.52	0.14	trace	4.21	4.38	2.07			trace	0.23		99.77	2.602
A3. III	1.165	.176	.002	.007	.004	—	.068	.047				—	.003			
85	67.41	16.23	0.85	1.14	0.15	0.14	3.95	7.19	0.88	0.67	0.16	0.05	0.16	CO_2 0.56 ZrO_2 0.11 Cl none S trace BaO trace SrO none	99.65	
A1. I	1.124	.159	.005	.016	.004	.003	.064	.077			.002	—	.002			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. LIPAROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
70	I.4.1(2).3(4).	Q 20.20 or 27.80 ab 40.87 an 5.00 C 3.47 hy 0.30 il 0.15 hm 0.56 ru 0.16	Antoine Butte, Little Rocky Mountains, Montana.	H. N. Stokes.	Weed and Pirsson, J. G., IV, p. 414, 1896.	Quartz syenite porphyry.	In W. T., p. 147.
71	I.4(5).1.3(4).	Q 13.14 or 33.36 ab 46.64 di 2.81 mt 2.32 il 0.46 hm 0.32	Beaver Creek Stock, Bearpaw Mountains, Montana.	H. N. Stokes.	Weed and Pirsson, A. J. S., I, p. 354, 1896.	Quartz syenite.	In W. T., p. 147.
72	I″.(3)4.1.3″.	Q 32.58 or 25.02 ab 34.06 ac 4.62 di 0.65 wo 0.23 il 0.76 tn 2.16	Great Paint Pots, Yellowstone National Park.	F. A. Gooch.	J. P. Iddings, U. S. G. S. B. 148, p. 131, 1897.	Rhyolite.	In W. T., p. 149.
73	I.4.1(2).3(4).	Q 27.12 or 25.58 ab 36.16 an 4.17 di 1.30 wo 0.12 mt 2.32 il 0.30 hm 1.92 ap 0.34	Upper Geyser Basin, Yellowstone National Park.	F. A. Gooch.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 426, 1899.	Rhyolite.	In W. T., p. 149.
74	I.″4.1.3.	Q 32.94 or 30.58 ab 31.96 an 1.95 C 0.41 hy 0.10 mt 0.23 il 0.46 hm 0.80	Big Spring Creek, San Cristobal quadrangle, Colorado.	R. C. Wells.	W. Cross, U. S. G. S. rec. lab.	Rhyolite.	
75	I.″4.1″.3.	Q 32.10 or 31.14 ab 31.44 an 3.06 di 0.25 mt 1.39 il 0.30	Alpine Gulch, San Cristobal quadrangle, Colorado.	R. C. Wells.	W. Cross, U. S. G. S. rec. lab.	Granite porphyry.	
76	I.4.1(2).3.	Q 31.20 or 26.69 ab 33.54 an 3.89 C 1.84 hy 2.48	Chalk Mountain, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. Mon. 12, p. 349, 1886.	Nevadite.	In W. T., p. 149.
77	I.4.1(2).3.	Q 29.82 or 35.03 ab 29.34 an 3.34 C 0.31 hy 0.30 il 0.91 hm 0.48	Browns Gulch, Monarch District, Colorado.	R. M. Butters.	R. D. Crawford, Colo. G. S. B. 4, p. 154, 1913.	Granite.	
78	I(II).(3)4.1.3.	Q 30.72 or 27.74 ab 28.82 ac 6.01 di 0.75 hy 4.72 mt 0.23 il 0.30	Rosemount, Colorado Springs quadrangle, Colorado.	G. Steiger.	W. Cross, U. S. G. S. B. 419, p. 100, 1910.	Riebeckite granite.	
79	I.(3)4.1.3.	Q 34.28 or 27.24 ab 30.39 wo 0.81 mt 3.25 il 0.46 hm 1.76	Fairview, Colorado Springs quadrangle, Colorado.	G. Steiger.	W. Cross, U. S. G. S. B. 419, p. 100, 1910.	Mica granite.	
80	I.4.′(2).3.	Q 28.98 or 31.14 ab 31.96 di 1.70 mt 1.39 il 0.30	Middle Beaver Creek, Pikes Peak, Colorado.	W. F. Hillebrand.	E. B. Mathews, J. G., VIII, p. 237, 1900.	Granite.	In W. T., p. 149.
81	I.(3)4.1(2).″3.	Q 33.18 or 34.47 ab 24.63 an 3.89 C 0.10 hy 2.34 mt 0.23 il 0.15	Colorado Springs Waterworks, Pikes Peak, Colorado.	W. F. Hillebrand.	E. B. Mathews, J. G., VIII, p. 237, 1900.	Granite.	In W. T., p. 149.
82	I.(3)4.1(2).3″.	Q 32.34 or 23.91 ab 31.96 an 3.34 C 1.22 hy 0.56 mt 0.92	Fleetwood Tunnel, Silver Cliff, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. A. R. 17, (II), p. 320, 1896.	Pitchstone.	In W. T., p. 149.
83	I.4.1.3″.	Q 19.68 or 33.36 ab 41.39 ac 0.46 wo 1.51 mt 1.39 il 0.61 hm 0.48	Grayrock Peak, Engineer Mountain quadrangle, Colorado.	G. Steiger.	W. Cross, U. S. G. S. Fol. 171, p. 10, 1910.	Quartz trachyte.	
84	I.4.1.3″.	Q 27.78 or 26.13 ab 35.63 C 6.22 hy 1.46 mt 0.46	Arkansas River, Nathrop, Colorado.	L. G. Eakins.	W. Cross, Pr. Colo. Sc. Soc., II, p. 69, 1887.	Rhyolite.	In W. T., p. 149.
85	I.4″.1.3.	Q 15.42 or 42.81 ab 33.54 an 0.83 C 1.53 hy 1.85 mt 1.16 il 0.30	Idaho Springs, Colorado.	W. T. Schaller.	S. H. Ball, U. S. G. S. P. P. 63, p. 134, 1908.	Bostonite porphyry.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. LIPARASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
86	73.27	13.29	1.16	0.13	0.07	0.21	3.44	7.53	0.43	0.23	0.10	trace	0.03	CO_2 0.02 ZrO_2 0.02 SO_3 0.07 Cl 0.01 S none	100.11	
A1. I	1.221	.130	.007	.002	.002	.004	.055	.080			.001	—	—			
87	70.17	11.83	0.93	none	0.06	0.76	3.85	3.74	8.72		0.17				100.23	2.25
A3. III	1.170	.116	.006	—	.002	.013	.062	.040			.002					23.5°
88	70.02	14.38	1.17	0.13	0.61	0.66	5.48	5.87	0.44	0.27	0.10	trace	0.02	CO_2 0.38 ZrO_2 0.01 SO_3 0.19 Cl 0.03 BaO 0.13 SrO 0.06 Li_2O trace	99.95	
A1. I	1.167	.141	.008	.002	.015	.012	.089	.063			.001	—	—			
89	76.20	13.17	0.34	0.73	0.19	0.42	4.31	4.46	0.33				0.10		100.25	
A3. III	1.270	.129	.002	.010	.005	.007	.069	.048					.001			
90	75.86	12.17	0.85	0.36	none	0.62	3.60	5.04	0.72	0.27	0.21	trace	none		99.70	
A2. II	1.264	.119	.005	.005	—	.011	.058	.053			.003	—	—			
91	74.02	13.20	0.75	0.29	0.06	0.56	4.18	4.82	1.86		0.02		trace	Cl trace	99.76	
A2. II	1.234	.129	.005	.004	.002	.010	.068	.051			—		—			
92	76.30	12.50	1.47	n. d.	none	0.17	3.86	4.67	0.32	0.18	0.05	trace	trace	CO_2 none BaO 0.07 SrO none Li_2O none	99.59	
A2. II	1.272	.122	.009	(.018)	—	.003	.062	.050			—	—	—			
93	73.12	14.35	1.41	0.80	0.40	0.28	4.60	4.31	1.11	0.09	0.13	0.06			100.66	
A2. II	1.219	.141	.009	.011	.010	.005	.074	.045			.002	—				
94	75.78	12.39	0.22	1.25	0.31	0.81	4.00	4.64	0.41						99.81	
A3. III	1.263	.121	.001	.018	.008	.014	.064	.050								
95	74.05	13.85	trace	—	0.07	0.90	4.60	4.31	2.20						99.98	
A3. III	1.234	136	—	—	.002	.016	.074	.046								
96	74.01	12.95	n. d.	1.42	0.48	1.00	5.34	4.65	0.29		0.24	0.01	trace	Cl 0.07	100.46	
A3. III	1.234	.127	(.008)	.003	.012	.018	.085	.050			.003	—	—			
97	74.74	15.38	n. d.	0.77	0.03	0.26	4.20	4.26	0.58				0.04		100.26	
A3. III	1.246	.151	—	.011	.001	.005	.068	.046					—			
98	72.80	15.07	0.26	0.21	none	none	3.35	7.92	0.30				trace		99.91	
A3. III	1.213	.148	.002	.003	—	—	.054	.084					—			
99	75.70	13.33	0.40	0.06	0.06	0.55	3.19	5.39	1.17	0.31	0.02	0.07	trace	CO_2 none S 0.05 BaO 0.04	100.34	
A1. I	1.262	.131	.003	.001	.002	.010	.052	.057			—	—	—			
100	74.30	13.29	1.15	0.10	0.09	0.85	3.75	4.83	0.50	0.91	0.20	0.07	trace	CO_2 none S 0.03 BaO none	100.07	
A1. I	1.238	.130	.008	.001	.002	.015	.061	.051			.003	—	—			
101	74.00	13.48	1.73	0.06	0.13	0.63	4.63	5.12	0.15	0.11	0.16	0.06	trace	CO_2 trace ZrO_2 0.04 S trace BaO 0.05 SrO none Li_2O trace	100.35	
A1. I	1.233	.131	.011	.001	.003	.011	.074	.054			.002	—	—			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. LIPAROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
86	I.4.1.(2)3.	Q 24.90 or 44.48 ab 26.20 ac 2.31 di 0.43 wo 0.23 mt 0.23 il 0.15 hm 0.16	Mount Waas, La Sal Mountains, Utah.	W. F. Hillebrand.	L. M. Prindle, U. S. G. S. B. 228, p. 191, 1904.	Aegirite granite porphyry.	
87	I.(3)4.1(2).3(4).	Q 31.80 or 22.24 ab 32.48 an 3.61 C 0.10 hy 0.20 hm 0.93 ru 0.17	Near Marysvale, Utah.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 168, p. 168, 1900.	Rhyolitic glass.	
88	I″.4″.1.3.	Q 15.48 or 35.03 ab 40.87 ac 3.70 ns 0.37 di 2.62 hy 0.40 il 0.15	Mount Waas, La Sal Mountains, Utah.	W. F. Hillebrand.	L. M. Prindle, U. S. G. S. B. 228, p. 191, 1904.	Syenite aplite.	
89	I.″4.1.3″.	Q 32.40 or 26.69 ab 36.16 an 1.95 C 0.51 hy 1.69 mt 0.46	Obsidian Hill, Tewan Mountains, New Mexico.	L. G. Eakins.	J. P. Iddings, U. S. G. S. A. R. 7, p. 291, 1888.	Obsidian.	In W. T., p. 149.
90	I.(3)4.1.3.	Q 34.74 or 29.57 ab 30.39 an 2.22 di 0.35 mt 0.46 il 0.46 hm 0.48	Near Bisbee, Arizona.	G. Steiger.	F. L. Ransome, U. S. G. S. P. P. 21, p. 77, 1904.	Tourmaline granite.	
91	I.4.1″.3″.	Q 29.88 or 28.36 ab 35.63 an 2.78 hy 0.20 mt 0.93 hm 0.16	Sugarloaf Hill, San Francisco Mountains, Arizona.	S. H. Clapp.	H. H. Robinson, U. S. G. S. P. P. 76, p. 104, 1913.	Rhyolite.	
92	I.″4.1.3.	Q 34.56 or 27.80 ab 32.49 an 0.83 C 0.71 hy 2.38	Chilkoot Pass, Alaska.	H. N. Stokes.	J. E. Spurr, A. G., XXV, p. 231, 1900.	Alaskite.	In W. T., p. 149.
93	I.4.1.3(4).	Q 29.10 or 25.02 ab 38.77 an 1.39 C 1.73 hy 1.00 mt 2.09 il 0.30	Taku Arm, Vancouver Island, British Columbia.	M. F. Connor.	D. D. Cairnes, Can. G. S. Mem. 37, p. 68, 1913.	Granite porphyry.	
94	I.″4.1.3″.	Q 31.98 or 27.80 ab 33.54 an 1.95 di 1.67 hy 2.18 mt 0.23	Mono Lake, California.	W. H. Melville.	W. Lindgren, U. S. G. S. B. 150, p. 151, 1898.	Rhyolite obsidian.	In W. T., p. 151.
95	I.4.1(2).3(4).	Q 28.80 or 25.58 ab 38.78 an 4.45 hy 0.20	Mono Craters, n. Mono Lake, California.	T. M. Chatard.	I. C. Russell, U. S. G. S. A. R. 8, p. 380, 1888.	Rhyolite.	In W. T., p. 151.
96	I.4.1.3(4).	Q 24.60 or 27.80 ab 40.35 ac 3.70 di 2.59 wo 0.70 il 0.46	Clear Lake, California.	W. H. Melville.	G. F. Becker, U. S. G. S. Mon. 13, p. 154, 1888.	Andesite obsidian.	In W. T., p. 151.
97	I.4″.1.3(4).	Q 32.40 or 25.58 ab 35.63 an 1.39 C 3.26 hy 1.55	Rincon, San Diego County, California.	W. T. Schaller.	W. T. Schaller, U. S. G. S. rec. lab.	Pegmatite.	
98	I.4.1.″3.	Q 23.10 or 46.70 ab 28.30 C 1.02 mt 0.46	Hiriart Hill, San Diego County, California.	W. T. Schaller.	W. T. Schaller, U. S. G. S. rec. lab.	Graphic granite.	
99	I.(3)4.1″.3.	Q 35.16 or 31.69 ab 27.25 an 2.78 C 1.22 hy 0.20 mt 0.23 hm 0.32	Cactus Corral, Ralston District, Nevada.	G. Steiger.	J. E. Spurr, U. S. G. S. B. 228, p. 207, 1904.	Tordrillite.	
100	I.″4.1(2).3.	Q 32.40 or 28.36 ab 31.96 an 3.34 C 0.61 hy 0.20 il 0.15 hm 1.15 ru 0.16	Sweetwater, Nevada.	G. Steiger.	J. E. Spurr. U. S. G. S. B. 228, p. 208, 1904.	Tordrillite.	
101	I.4.1.3″.	Q 26.88 or 30.02 ab 38.77 an 0.31 di 0.65 wo 0.58 il 0.15 hm 1.76 ru 0.08	Meadow Creek Canyon, Nevada.	W. F. Hillebrand.	J. E. Spurr, U. S. G. S. B. 228, p. 208, 1904.	Tordrillite.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. LIPARASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
102	74.67	13.25	1.06	0.18	trace	1.26	3.99	4.62	0.22	0.18	0.07	0.06	none	CO_2 0.79 S trace BaO none SrO none	100.35	
A1. I	1.245	.130	.007	.003	—	.022	.065	.049			.001	—	—			
103	73.91	15.29	n. d.	0.89	none	0.77	3.62	4.79	1.19			0.07			100.53	
A3. III	1.232	.150	—	.013	—	.014	.058	.051				—				
104	73.92	12.38	1.62	0.56	0.27	0.33	3.49	5.39	1.69						99.65	2.420
A3. III	1.232	.121	.010	.008	.007	.006	.056	.057								
105	75.23	12.36	0.96	1.24	0.01	1.00	4.00	4.62	0.73			0.27			100.42	
A3. III	1.254	.121	.006	.017	—	.018	.064	.049				.002				
106	71.33	15.35	0.78	0.29	0.45	0.21	3.96	7.16	0.17		0.20	0.01	0.10		100.01	
A2. II	1.189	.150	.005	.004	.011	.004	.064	.077			.003	—	.001			
107	75.87	14.35	0.22	none	0.29	none	3.96	4.65	0.33		trace			SO_3 0.23	99.90	
A3. III	1.265	.141	.001		.007	—	.064	.050			—					
108	66.04	16.13	2.81	0.99	0.48	0.61	3.89	6.74	0.92		1.08	0.26	trace	FeS_2 0.07	100.02	2.634
A2. II	1.101	.158	.018	.014	.012	.011	.063	.071			.014	.002	—			
109	73.96	13.10	0.74	1.28	0.18	0.70	3.55	5.05	0.93	0.23	trace	0.10	0.04	F 0.08 S 0.04 BaO 0.06 SrO 0.13	100.13	
A1. I	1.233	.128	.005	.018	.005	.013	.057	.054			—	.001	—			
110	76.23	12.91	1.46	0.27	0.10	0.16	4.34	4.03	0.30	0.07	0.12		trace		99.99	
A3. III	1.271	.126	.009	.004	.003	.003	.070	.043			.002					
111	74.75	14.08	1.18	0.85	0.04	0.49	3.09	5.39	0.34			0.12	trace		100.33	
A3. III	1.246	.138	.008	.012	.001	.009	.050	.057				.001				
112	73.80	11.90	1.90	1.91	0.33	0.30	5.05	4.93	0.13	0.04	0.23	trace	0.12	ZrO_2 0.04 Ce_2O_3 0.04	100.72	
A1. I	1.230	.117	.012	.026	.008	.005	.082	.052			.003	—	.002		(100.68)	
113	73.19	12.65	1.04	1.53	0.30	0.55	4.45	5.08	0.38	0.09	0.27	0.24	0.08	F none FeS_2 0.17 NiO none BaO none Li_2O trace	100.02	
A1. I	1.220	.124	.006	.021	.008	.010	.072	.054			.003	.002	.001			
114	73.12	12.44	2.09	1.65	0.14	0.88	3.90	4.67	0.24	0.25	0.39	0.09	0.17	CO_2 0.05 NiO none BaO none	100.08	
A1. I	1.219	.122	.013	.023	.004	.016	.063	.050			.005	—	.002			
115	72.66	12.00	2.03	2.04	0.07	1.25	3.26	5.26	0.47	0.22	0.34	0.04	0.18	CO_2 0.24 NiO none BaO 0.12	100.18	
A1. I	1.211	.118	.013	.028	.002	.022	.053	.056			.004	—	.003			
116	71.30	11.24	1.80	2.84	0.61	1.56	3.44	4.66	1.04	0.39	0.58	0.22	0.31	S none NiO none BaO 0.07 LiO_2 trace	100.06	
A1. I	1.188	.110	.011	.039	.015	.028	.055	.050			.007	.002	.004			
117	71.05	15.36	0.70	0.66	0.25	0.29	3.24	6.18	1.69		0.47		trace	BaO 0.11	100.00	
B2. III	1.184	.151	.004	.009	.006	.005	.052	.066			.006		—			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. LIPAROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
102	I.″4.1(2).3″.	Q 31.38 wo 0.70 or 27.24 mt 0.46 ab 34.06 il 0.15 an 4.45 hm 0.80	Quinn Canyon Range, Nevada.	H. N. Stokes.	J. E. Spurr, J. G., IX, p. 602, 1901.	Rhyolite.	
103	I.″4.1(2).3.	Q 32.22 hy 1.72 or 28.36 ab 30.39 an 3.89 C 2.75	Pinto Peak, Eureka District, Nevada.	E. Hart.	A. Hague, U. S. G. S. Mon. 20, p. 264, 1892.	Rhyolite.	Not in W. T.
104	I.″4.1.3.	Q 32.10 hy 0.70 or 31.69 mt 1.86 ab 29.34 hm 0.32 an 1.67 C 0.20	Cerro Mercado, Durango, Mexico.	H. W. Nichols.	O. C. Farrington, Field Mus., G. Ser., II, p. 222, 1904.	Rhyolite.	
105	I.(3)4.1″.3″.	Q 32.76 di 0.75 or 27.24 hy 1.06 ab 33.54 mt 1.39 an 2.22 ap 0.67	Cerro de los Navajos, Tulancingo, Mexico.	F. Baerwald.	C. A. Tenne, Z. D. G. G., XXXVII, p. 616, 1885.	Obsidian.	In W. T., p. 151.
106	I.4.1.3.⊙	Q 19.44 hy 1.10 or 42.81 mt 0.46 ab 33.54 il 0.46 an 1.11 hm 0.48 C 0.51	Mazaruni River, British Guiana.	Harrison and Reid.	J. B. Harrison, pers. com.	Pegmatite.	Vein in No. 21, I.3.2.3.
107	I.(3)4.1.3.	Q 34.44 hy 0.70 or 27.80 hm 0.22 ab 33.64 C 2.75	Cali, Cauca, Colombia.	J. E. Whitfield.	G. P. Merrill, Pr. U. S. Nat. Mus., XL, p. 484, 1911.	Obsidian.	
108	I.4″.1.3.	Q 16.62 hy 1.20 or 39.48 il 2.13 ab 33.01 hm 2.81 an 1.11 ap 0.67 C 2.04	Near Cayaima, Upper Magdalena River, Colombia.	A. Lindner.	E. Lehmann, T. M. P. M., XXX, p. 261, 1911.	Quartz syenite aplite.	3 decimals.
109	I.″4.1″.3.	Q 31.74 hy 2.22 or 30.02 mt 1.16 ab 29.87 ap 0.34 an 2.78 C 0.71	Santo Antonio, Rio Madeira, Amazonas, Brazil.	G. S. Blake.	J. W. Evans, Q. J. G. S., LX, p. 117, 1906.	Granitite.	
110	I.(3)4.1.(3)4.	Q 35.04 hy 0.30 or 23.91 mt 0.46 ab 36.68 il 0.30 an 0.83 hm 1.12 C 1.12	Loch Croire na Meidhe, Assynt, Scotland.	W. Pollard.	G. S. U. K., Sum. Prog. 1900, p. 157.	Porphyry.	
111	I.(3)4.1.3.	Q 35.22 hy 0.63 or 31.69 mt 1.86 ab 26.20 ap 0.34 an 1.67 C 2.55	Benrinnes, Scotland.	W. Mackie.	W. Mackie, Tr. Edin. G. Soc., VIII, (1), p. 54, 1901.	Granite.	
112	I(II).4.1.3.	Q 26.22 ac 5.54 or 28.91 ns 0.61 ab 34.06 di 1.21 hy 3.47 il 0.51	Carn Chinneag, Rossshire, Scotland.	W. Pollard.	J. S. Flett, G. S. Scot. Mem. XCIII, p. 92, 1912.	Aegirite-riebeckite gneiss.	
113	I.4.1.3.⊙	Q 26.64 ac 0.92 or 30.02 di 0.71 ab 36.68 hy 2.15 mt 1.39 il 0.46 ap 0.67	Leaba Bhaltair, Rossshire, Scotland.	E. G. Radley.	J. S. Flett, G. S. Scot. Mem. XCIII, p. 92, 1912.	Granite gneiss.	
114	I.″4.1″.3.	Q 30.30 di 1.64 or 27.80 hy 0.50 ab 33.01 mt 3.02 an 2.50 il 0.76	Benmore Lodge, Loch Ba, Mull, Scotland.	E. G. Radley.	G. S. Gr. Br., Sum. Prog. (1912), p. 69, 1913.	Granophyre.	
115	I″.″4.1″.3.	Q 31.68 di 3.19 or 31.14 hy 0.36 ab 27.77 mt 3.02 an 2.50 il 0.61	Beinn a' Ghraig, Mull, Scotland.	E. G. Radley.	G. S. Gr. Br., Sum. Prog. (1912), p. 68, 1913.	Rhyolite.	
116	I(II).″4.1.3.	Q 29.52 di 3.78 or 27.80 hy 2.88 ab 28.82 mt 2.55 an 1.39 il 1.06 ap 0.67	Craignure Bay, Mull, Scotland.	E. G. Radley.	J. J. H. Teall, G. S. Gr. Br., Sum. Prog. (1913), p. 80, 1914.	Augite granophyre.	
117	I.4.1.3.⊙	Q 27.60 hy 0.60 or 36.70 mt 0.93 ab 27.25 il 0.91 an 1.39 C 2.86	Dufton Pike, Westmoreland, England.	P. Holland.	F. Rutley, Q. J. G. S., LVII, p. 36, 1901.	Rhyolite.	"H_2O" includes loss and CO_2.

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. LIPARASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
118	76.43	13.56	0.08	0.55	0.54	0.03	4.19	4.72	0.76	0.06					100.92	
A3. III	1.274	.133	.001	.008	.014	—	.068	.050								
119	75.96	12.86	0.57	0.10	0.38	0.46	4.35	4.54	0.39	0.27	0.07	0.04	0.19	CO_2 none S none NiO none BaO none	100.18	
A1. I	1.266	.126	.004	.001	.010	.008	.070	.048			.001	—	.003			
120	70.23	14.73	2.37	0.98	0.50	0.94	4.19	5.13	0.70				0.18		99.95	2.65
A3. III	1.171	.144	.015	.014	.013	.017	.068	.054					.003			
121	74.51	13.01	n. d.	1.06	0.39	0.71	4.80	5.07	0.85		0.13				100.53	
A4. IV	1.242	.127	—	.015	.010	.013	.077	.054			.002					
122	74.40	13.91	1.39	n. d.	0.28	0.61	4.65	4.36	0.65						100.25	
A4. IV	1.240	.136	.009	(.018)	.007	.010	.075	.047								
123	73.90	11.93	0.15	0.87	0.13	0.34	4.10	4.62	4.00						100.04	
A3. III	1.232	.117	.001	.012	.003	.006	.066	.049								
124	73.90	10.95	0.08	1.06	1.08	1.58	4.08	4.60	3.35						100.68	
A3. III	1.232	.108	.001	.015	.027	.029	.066	.049								
125	73.00	15.20	1.86	n. d.	1.01	0.56	3.44	4.14	1.25						100.46	
A4. IV	1.217	.149	.012	(.024)	.025	.010	.055	.044								
126	71.35	13.60	3.12	0.96	trace	trace	5.12	6.74							100.89	
B3. IV	1.189	.133	.019	.014	—	—	.082	.071								
127	70.04	12.72	2.16	2.61	0.22	0.94	4.40	5.05	0.63		0.45				99.22	
B5. IV	1.167	.525	.014	.036	.006	.017	.071	.054			.006					
128	76.05	11.68	0.34	1.05	0.29	0.42	3.79	5.09	1.36		0.05		trace	ZrO_2 0.42 F trace Li_2O trace	100.54	2.636
A2. II	1.268	.114	.002	.015	.007	.008	.060	.054								
129	71.49	15.33	2.15	n. d.	none	0.30	4.32	5.86	0.54		0.45		trace		100.44	
A4. IV	1.192	.150	.014	(.028)	—	.005	.070	.062			.006		—			
130	69.00	13.95	1.56	2.38	0.14	0.49	5.67	5.11	0.70		0.35		0.55		99.95	
A2. II	1.150	.137	.010	.033	.004	.009	.091	.054			.004		.008			
131	68.95	14.00	2.12	3.56	0.07	0.23	5.45	5.29	0.05		0.35		0.55		100.62	
A2. B	1.149	.137	.013	.049	.002	.004	.088	.056			.004		.008			
132	66.40	17.37	4.30	0.50	0.20	0.75	3.88	4.39	0.50		1.00		0.11		99.40	
B2. III	1.107	.170	.027	.007	.005	.014	.063	.047			.012		.002			
133	75.62	11.75	1.95	0.83	0.17	0.39	3.63	4.91	0.20		0.10	0.01	0.04	CO_2 0.22 S 0.04	99.97	
A2. II	1.260	.115	.012	.011	.004	.007	.058	.052			.001	—	—			
134	72.86	13.41	2.38	0.97	0.52	0.81	3.72	3.80	0.40		0.50		0.06		99.43	
B2. III	1.214	.131	.015	.014	.013	.014	.060	.040			.006		.001			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. LIPAROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
118	I.″4.1.3″.	Q 32.70 hy 2.32 or 27.80 mt 0.23 ab 35.63 C 1.53	Eskdale, Cumberland, England.	A. R. Dwerryhouse.	A. R. Dwerryhouse, Q. J. G. S., LXV, p. 64, 1909.	Granite.	Cf. No. 1, I.1.
119	I.″4.1″.3″.	Q 31.92 hy 1.00 or 26.69 mt 0.40 ab 36.68 il 0.15 an 2.22 hm 0.16	Gew Graze, Cornwall.	E. G. Radley.	Flett and Hill, Mem. G. S. Eng., Sh. 359, p. 144, 1912.	Granite.	Dike in serpentine.
120	I.4.1(2).3.	Q 23.40 hy 1.56 or 30.02 mt 3.48 ab 35.63 an 4.73 C 0.52	Fort Regent, St. Helier, Jersey, Channel Islands.	P. Holland.	Holland and Dickson, Pr. Liv. G. Soc., VII, p. 116, 1897.	Granite.	Not in W. T.
121	I″.4.1.3″.	Q 25.68 ac 1.85 or 30.02 di 3.03 ab 38.25 hy 1.19 il 0.30	Bizeul, Brittany, France.	Pisani.	L. Vandernotte, Mass. Armor., p. 141, 1913.	Micropegmatite.	
122	I.4.1″.3(4).	Q 27.78 hy 3.08 or 26.13 ab 39.30 an 2.78 C 0.41	Pelvoux, France.	P. Termier?	P. Termier, C. R., CXXIV, p. 318, 1897.	Granite.	In W. T., p. 151.
123	I.″4.1.3″.	Q 31.20 di 0.96 or 27.24 hy 1.26 ab 34.58 mt 0.23 an 0.56	Sailles, Mont Dore, France.	Pisani.	A. Lacroix, C. R., CXLVII, p. 779, 1908.	Rhyolite pumice.	
124	I″.(3)4.1.3.	Q 30.30 ac 0.46 or 27.24 ns 0.73 ab 30.92 di 6.55 hy 1.23	Ludiéres, Mont Dore, France.	Pisani.	A. Lacroix, C. R., CXLVII, p. 779, 1908.	Rhyolite pumice.	
125	I.(3)4.1″.3.	Q 33.24 hy 5.67 or 24.46 ab 28.82 an 2.78 C 4.08	Ile Longue, Brittany, France.	Not stated.	C. Barrois, VIII Cong. G. Int., Guide Exc., VII, p. 21, 1900.	Aplite.	In W. T., p. 129.
126	I(II).4.1.3.	Q 18.00 ac 8.78 or 39.48 ns 0.12 ab 32.49 hy 1.85	Lonca Valley, Corsica.	J. Deprat.	J. Deprat, B. Sv. Ct. G. Fr., XVII, No. 114, p. 49, 1906.	Quartz orthophyre.	
127	I″.4.1.3″.	Q 22.68 di 4.05 or 30.02 hy 0.63 ab 37.20 mt 3.25 il 0.91	Svolvaer, Lofoten Islands, Norway.	R. Mauzelius,	P. J. Holmquist, B. Un. Ups., VII, p. 268, 1906.	Granite.	
128	I.(3)4.1.3.	Q 33.18 di 1.89 or 30.02 hy 1.33 ab 31.44 mt 0.46 Z 0.55	Drammen, Norway.	P. Jannasch.	H. O. Lang, Nyt. Mag., XXX, p. 40, 1886.	Quartz porphyry.	In W. T., p. 151.
129	I.4.1.3.⊙	Q 22.08 hy 2.90 or 34.47 il 0.91 ab 36.68 an 1.39 C 1.33	Gislerud, Norway.	R. Mauzelius.	W. C. Brögger, Z. K., XVI, p. 46, 1890.	Quartz porphyry.	In W. T., p. 151.
130	I(II).4″.1.3(4).	Q 14.88 ac 3.70 or 30.02 di 2.20 ab 43.49 hy 3.86 mt 0.46 il 0.61	Frön, Christiania, Norway.	V. Schmelck.	W. C. Brögger, Eg. Kg., I, p. 139, 1894.	Quartz lindoite.	Center of dike. In W. T., p. 151.
131	I(II).4″.1.3″.	Q 14.76 ac 3.23 or 31.14 di 0.99 ab 42.44 hy 5.88 mt 1.39 il 0.61	Frön, Christiania, Norway.	V. Schmelek.	W. C. Brögger, Eg. Kg., I, p. 139, 1894.	Arfvedsonite grorudite.	Border of dike, In W. T., p. 151.
132	I.4.1(2).3.	Q 24.84 hy 0.50 or 26.13 il 1.37 ab 33.01 hm 4.30 an 3.89 ru 0.24 C 4.69	Fjelebua, Norway.	G. Särnstrom.	W. C. Brögger, Z. K., XVI, p. 46, 1890.	Quartz syenite porphyry.	In W. T., p. 151.
133	I.(3)4.1.3.	Q 35.04 di 0.43 or 28.91 hy 0.20 ab 30.39 mt 2.32 an 1.39 il 0.15 hm 0.32	Sakaravaara, Lapland, Sweden.	R. Mauzelius.	P. Geijer, G. Kir. Dist., p. 200, 1910.	Quartz porphyry.	
134	I.(3)4.1(2).3(4).	Q 34.38 hy 1.30 or 22.24 mt 2.09 ab 31.44 il 0.91 an 3.89 hm 0.96 C 1.73	Maskotjakko, Stora Sjöfallet, Lapland, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 256, 1906.	Granite.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. LIPARASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
135	69.08	12.75	5.84	2.16	0.50	0.28	3.97	4.39	0.78		0.27	0.02	0.02	S 0.02	100.08	
A2. II	1.151	.125	.036	.030	.013	.005	.065	.046			.003	—	—			
136	73.77	12.68	2.40	0.45	0.33	0.46	3.14	5.58	0.28	0.18	0.22	trace	0.01	ZrO_2 none F 0.21 S 0.07 BaO none	99.78	
A1. I	1.230	.124	.015	.006	.008	.008	.051	.060			.003	—	—			
137	72.78	12.79	2.57	1.73	0.27	0.64	3.17	5.16	0.55		0.50		0.18		100.34	
A2. II	1.213	.125	.016	.024	.007	.011	.051	.056			.006		.003			
138	72.22	14.80	0.96	0.80	0.33	0.74	4.16	5.16	0.71		0.57		0.13		100.58	
A2. II	1.204	.145	.006	.011	.008	.013	.067	.056			.007		.002			
139	71.25	13.90	1.28	1.24	0.45	0.97	3.29	6.28	0.83		0.32		trace		99.81	
A2. II	1.188	.136	.008	.017	.011	.018	.053	.067			.004		—			
140	69.73	13.02	2.28	1.92	0.21	1.16	3.08	5.78	1.94	0.38	0.29		trace		99.79	
A2. II	1.162	.127	.014	.027	.005	.021	.050	.062			.003		—			
141	76.64	13.50	0.50	n. d.	0.12	0.65	3.48	5.51	n. d.						100.40	
A4. IV	1.277	.132	.003	(.006)	.003	.011	.056	.059								
142	75.62	11.81	n. d.	1.59	0.55	0.36	2.83	5.78	0.54		0.59				99.67	
A4. IV	1.260	.116	—	.022	.014	.006	.045	.062			.007					
143	75.22	12.07	1.82	1.24	0.20	0.50	3.98	4.37	0.15		0.34		0.13	CO_2 0.11	100.13	
A2. II	1.254	.118	.011	.017	.005	.009	.065	.046			.004		.002			
144	73.03	12.35	1.17	0.71	0.46	2.13	3.54	4.98	0.99		0.32		0.56		100.24	
A2. II	1.217	.121	.007	.010	.012	.038	.057	.053			.004		.008			
145	71.51	12.82	2.09	1.40	0.17	1.09	4.24	4.52	1.23		0.10	trace			99.17	
B3. IV	1.192	.125	.013	.019	.004	.020	.068	.048			.001	—				
146	67.75	13.37	4.82	1.69	0.44	1.04	4.24	5.13	1.13		0.24		0.38		100.23	
A2. II	1.129	.131	.030	.024	.011	.019	.068	.054			.003		.005			
147	76.34	12.65	0.59	0.28	0.11	0.69	4.58	4.48	0.19		0.10	trace	0.01	S 0.05	100.07	
A2. II	1.272	.124	.004	.004	.003	.013	.074	.048			.001	—	—			
148	70.90	14.70	1.79	0.46	0.10	0.30	3.85	6.93	0.17		0.44	0.02	0.01	S 0.05	99.72	
A2. II	1.182	.144	.011	.006	.003	.005	.062	.073			.006	—	—			
149	69.36	15.00	2.84	0.55	0.49	0.41	5.23	5.31	0.25		0.45	0.08	0.01	S 0.06	100.04	
A2. II	1.156	.147	.018	.008	.012	.007	.084	.056			.006	—	—			
150	68.81	14.30	3.04	0.92	0.32	1.47	4.30	5.39	0.92		0.42	0.14	0.15	BaO 0.09	100.27	
A2. II	1.147	.140	.019	.013	.008	.027	.069	.057			.005	.001	.002			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. LIPAROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
135	I(II).″4.1.3″.	Q 27.72 hy 1.30 or 25.58 mt 6.26 ab 34.06 il 0.46 an 1.39 hm 1.44 C 0.92	Kiirunavaara, Lapland, Sweden.	K. Schröder.	P. Geijer, G. Kir. Dist., p. 132, 1910.	Quartz porphyry.	
136	I.(3)4.1″.3.	Q 32.40 hy 0.80 or 33.36 mt 0.70 ab 26.72 il 1.92 an 2.22 C 0.51	Norrtaskberget, N. Ulfön, Nordingra Region, Sweden.	N. Sahlbom.	J. E. Sobral, G. Nord. Reg., p. 90, 1913.	Granite.	
137	I.″4.1″.3.	Q 32.20 hy 1.36 or 31.12 mt 3.71 ab 26.72 il 0.91 an 3.06 C 0.82	Storholm, n. Rödö, Sweden.	H. Santesson.	P. J. Holmquist, Afh. Sv. G. Und., No. 181, p. 38, 1899.	Felsite porphyry.	In W. T., p. 151.
138	I.4.1(2).3.	Q 25.92 hy 0.80 or 31.14 mt 1.39 ab 35.12 il 1.06 an 3.61 C 0.92	Storholm, n. Rödö, Sweden.	H. Santesson.	P. J. Holmquist, Afh. Sv. G. Und., No. 181, p. 51, 1899.	Quartz porphyry.	In W. T., p. 151.
139	I.4.1(2).3.	Q 25.08 di 0.43 or 37.25 hy 1.56 ab 27.77 mt 1.83 an 4.45 il 0.61	Rödö, Sweden.	N. Sahlbom.	P. J. Holmquist, Afh. Sv. G. Und., No. 181, p. 25, 1899.	Rapakiwi granite porphyry.	In W. T., p. 151.
140	I″.4.1(2).3.	Q 26.34 di 1.43 or 34.47 hy 1.09 ab 26.20 mt 3.25 an 4.17 il 0.43	Gorgvik, Rödö, Sweden.	N. Sahlbom.	P. J. Holmquist, Afh. Sv. G. Und., No. 181, p. 34, 1899.	Felsite porphyry.	In W. T., p. 151.
141	I.″4.1″.3.	Q 33.36 hy 1.09 or 32.80 ab 29.34 an 3.05 C 0.61	Arild, Kullen, Sweden.	L. Ramberg.	A. Hennig, Act. Un. Lund., XXXIV, p. 41, 1898.	Granitite.	In W. T., p. 151.
142	I.(3)4.1.″3.	Q 34.62 hy 3.38 or 34.47 il 1.06 ab 23.58 an 1.67 C 0.31	Kvarunäs, Oskarshamn, Smaland, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 262, 1906.	Granite.	
143	I.(3)4.1.3″.	Q 33.78 di 0.46 or 25.58 hy 0.80 ab 34.06 mt 2.55 an 1.95 il 0.61	Jungfrun Island, Kalmarsund, Oskarshamn, Sweden.	E. Östlund.	P. J. Holmquist, B. Un. Ups., VII, p. 262, 1906.	Granite.	
144	I″.″4.1″.3.	Q 29.34 di 4.32 or 29.47 wo 0.93 ab 29.87 mt 1.62 an 3.06 il 0.61	Uthammar, Oskarshamn, Smaland, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 262, 1906.	Granite.	
145	I.4.1″.3″.	Q 27.48 di 2.10 or 26.68 wo 0.23 ab 35.63 mt 3.02 an 2.50 il 0.15	Sätersfugen, Brefven, Sweden.	K. Winge.	K. Winge, G. F. F., XVIII, p. 195, 1896.	Granite.	In W. T., p. 151.
146	I(II).4.1″.3.	Q 21.48 di 2.16 or 30.02 hy 0.10 ab 35.63 mt 6.03 an 2.50 il 0.46 hm 0.64	Stadsberg, Ragunda Massif, Jemtland, Sweden.	H. Santesson.	A. G. Högbom, Afh. Sv. G. Und., No. 182, p. 45, 1899.	Syenite porphyry.	Not in W. T.
147	I.″4.1.3(4).	Q 31.56 di 0.65 or 26.69 wo 0.93 ab 38.77 mt 0.70 an 0.56 il 0.15 hm 0.16	Ridderstolpe, Gellivare, Sweden.	G. Nyblom.	A. G. Högbom, G. F. F., XXXII, p. 569, 1910.	Granite.	
148	I.4.1.3.⊙	Q 21.54 hy 0.30 or 40.59 il 0.91 ab 32.49 hm 1.79 an 1.39 hm 1.79 C 0.41	Kapten, Gellivare, Sweden.	G. Nyblom.	A. G. Högbom, G. F. F., XXXII, p. 569, 1910.	Quartz syenite porphyry.	
149	I.4″.1.3(4).	Q 17.40 hy 1.20 or 31.14 mt 0.46 ab 44.01 il 0.91 an 1.95 hm 2.56	Wällkommen, Gellivare, Sweden.	G. Nyblom.	A. G. Högbom, G. F. F., XXXII, p. 569, 1910.	Syenite (gneissoid).	
150	I″.4.1(2).3.	Q 20.70 di 1.73 or 31.69 wo 0.23 ab 36.15 mt 2.32 an 3.89 il 0.76 hm 1.44 ap 0.34	Näflinge, Linderöd, Scania, Sweden.	R. Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 266, 1906.	Granite gneiss.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. LIPARASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
151	75.06	11.70	1.04	1.57	0.19	1.01	2.56	6.25	0.63		0.36				100.37	
A3. III	1.251	.115	.006	.022	.005	.018	.041	.067			.004					
152	72.59	13.90	2.03	n. d.	0.61	0.68	2.87	6.79	0.40	0.15			trace	SO_3 trace	100.02	
A4. IV	1.210	.136	.013	(.026)	.015	.013	.047	.072					—			
153	70.39	14.60	0.87	2.15	0.56	0.20	4.04	4.84	0.12		0.56	1.10	0.22		99.65	
A2. II	1.173	.143	.005	.030	.014	.004	.065	.051			.007	.008	.003			
154	73.77	11.97	1.84	0.78	0.23	1.10	2.75	5.61	0.49	0.65	0.32				99.51	
A3. III	1.230	.117	.012	.011	.006	.020	.045	.060			.004					
155	75.24	11.00	2.21	1.57	0.24	trace	3.86	4.78	0.42	0.20	0.25				99.77	
A3. III	1.254	.108	.014	.022	.006	—	.062	.051			.003					
156	73.58	15.21	0.41	n. d.	0.17	0.11	3.61	6.66	0.22		0.20		trace		100.17	
A3. III	1.226	.149	.003	(.006)	.004	.002	.058	.071			.003					
157	71.22	13.58	2.36	0.90	0.24	0.35	3.58	6.48	0.82		0.71	0.10	0.29		100.63	
A2. II	1.187	1.33	.015	.013	.006	.006	.058	.069			.009	001	.004			
158	73.52	14.03	0.31	1.00	0.17	0.39	4.00	5.59	0.75		trace	0.24			100.00	
A3. III	1.225	.137	.002	.014	.004	007	.065	.060			—	.002				
159	68.60	16.76	0.93	0.52	0.79	0.86	4.49	6.46	0.78						100.19	2.602
A3. III	1.143	.164	.006	.007	.020	.015	.072	.069								
160	74.00	15.06	1.54	n. d.	0.28	0.71	3.51	4.03	1.07						100.20	
A3. III	1.233	.148	.010	(.020)	.007	.013	.056	.042								
161	76.03	11.76	1.99	n. d.	0.27	0.45	3.36	5.61	0.63						100.10	
A4. IV	1.267	.115	.013	(.026)	.007	.008	.054	.060								
162	75.65	12.02	0.20	trace	1.04	1.16	3.13	5.60	1.10				trace		99.90	2.60
A3. III	1.261	.118	.001	(.002)	.026	.021	.050	.060					—			
163	75.26	13.32	2.02	trace	0.34	trace	3.72	4.57	0.79				trace		100.02	2.63
v3. III	1.254	.130	.013	(.026)	.008	—	.060	.049					—			
164	70.85	15.79	.120	1.27	trace	0.26	3.37	6.69	0.89		0.22	trace		CO_2 trace SO_3 0.06	100.60	2.599
A3. III	1.181	.155	.007	.018	—	.005	.055	.071			.003	—				
165	67.02	14.32	1.10	1.87	0.78	2.38	4.54	5.48	0.43		0.15	0.08		SO_3 0.14	100.29	2.654
A2. II	1.117	.140	.007	.026	.020	.043	.073	.058			.002	—				
166	66.28	16.64	1.18	1.68	0.84	0.52	3.91	6.43	1.45		0.61	0.17		CO_2 0.17 SO_3 0.13	100.01	2.589
A2. II	1.105	.163	.007	.024	.021	.009	.063	.068			.008	.001				
167	75.97	10.84	n. d.	2.03	0.16	1.01	4.23	4.91	0.49						99.64	
A4. IV	1.266	.106	—	.028	.004	.018	.068	.052								

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. LIPAROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
151	I.(3)4.1.(2)3.	Q 33.36 di 2.57 or 37.25 hy 1.39 ab 21.48 mt 1.39 an 1.95 il 0.62	Hogland Island, Finland.	Von Ungern Sternberg.	Von Ungern Sternberg, In. Diss. Leipz., 1882.	Rapakiwi granite.	Cf. W. Ramsay, G. F. F., XII, p. 486, 1890. In W. T., p. 153.
152	I.4.1″.(2)3.	Q 25.74 hy 4.93 or 40.03 ab 24.63 an 3.61 C 6.41	Kullerberg, Pitkäranta, Finland.	A. Poehl.	O. Trüstedt, B. Com. G. Fin., No. 19, p. 58, 1907.	Granite.	3 decimals.
153	I″.4.1.3.	Q 26.64 hy 4.17 or 28.36 mt 1.16 ab 34.06 il 1.06 an 1.11 C 2.35	Hangasoja, Lapland, Finland.	N. Sahlbom.	V. Hackman, B. C. G. Fin., No. 15, p. 40, 1905.	Granite porphyry.	P_2O_5 high.
154	I.(3)4.1(2).″3.	Q 33.72 di 1.30 or 33.36 wo 0.23 ab 23.58 mt 1.62 an 3.34 il 0.61 hm 0.80	Hammeren, Bornholm Island.	M. Dittrich.	G. Kalb, In. Diss. Greifs., p. 14, 1914.	Granite.	L. Milch, pers. com.
155	I″.(3)4.1.3.	Q 34.20 ac 2.31 or 28.36 hy 1.82 ab 29.87 mt 2.09 il 1.46	Waldow, Rummelsberg, Pomerania.	M. Dittrich.	L. Milch, Mt. Nw. Ver. Neupom., XLI, p. (10), 1909.	Granite porphyry.	Pebble. Same as No. 169.
156	I.4.1.3.⊙	Q 26.46 hy 0.80 or 39.48 il 0.46 ab 30.39 an 0.56 C 1.84	Sattelberg, n. Niederkirchen, Bayrischer Rheinpfalz.	A. Schwager.	M. Schuster, Geogn. Jheft., XIX, p. 57 (1906), 1908.	Aplite.	
157	I.4.1.3.⊙	Q 24.78 hy 0.60 or 38.36 mt 1.86 ab 30.39 il 1.37 an 0.83 hm 1.12 C 0.31 ap 0.34	Sattelberg, n. Niederkirchen, Bayrischer, Rheinpfalz.	A. Schwager.	M. Schuster, Geogn. Jheft., XIX, p. 57 (1906), 1908.	Aplite.	
158	I.4.1.3.⊙	Q 27.54 hy 1.98 or 33.36 mt 0.46 ab 34.06 ap 0.67 C 1.22	Eisenbach, Schwarzwald, Baden.	M. Dittrich.	M. Dittrich, Mt. Bad. G. L.-A., V, (1), p. 8, 1907.	Granite.	
159	I.4″.1″.3.	Q 15.18 hy 2.00 or 37.81 mt 1.39 ab 37.73 an 4.17 C 0.82	Giernigerloch, Baden.	M. Dittrich.	F. Schalch, Sp. Kte. Bad., Bl. Petersthal, p. 33, 1895.	Granite.	In W. T., p. 153.
160	I.(3)4.1(2).3″.	Q 35.52 hy 3.34 or 23.35 ab 20.34 an 3.61 C 3.77	Rauhfel, Baiersbronn, Württemberg.	Not stated.	K. Regelmann, Erl. G. Kt. Wurt., Bl. 92, p. 34, 1908.	Granite.	
161	I.″4.1.3.	Q 32.46 di 1.67 or 33.36 hy 3.27 ab 28.30 an 0.28	Thal, Thuringer Wald.	Not stated.	K. Futterer, Mt. Bad. B. L.-A., II, p. 58 (1890), 1893.	Quartz porphyry.	In W. T., p. 151.
162	I.″4.1″.3.	Q 32.64 di 2.84 or 33.36 hy 1.53 ab 26.20 an 2.22	Gottlob, Friederichsroda, Thuringia.	A. Muhlen- berg.	A. Muhlenberg, In. Diss. Halle, p. 33, 1908.	Granite.	Pebble in con- glomerate.
163	I.(3)4.1.3.	Q 33.96 hy 4.23 or 27.24 ab 31.44 C 2.14	Gottlob, Friederichsroda, Thuringia.	A. Muhlen- berg.	A. Muhlenberg, In. Diss. Halle, p. 33, 1908.	Granite.	Pebble in con- glomerate.
164	I.4.1.″3.	Q 24.42 hy 1.06 or 39.48 mt 1.62 ab 28.82 il 0.46 an 1.39 C 2.45	Tanngrund, Schleuse Thal, Thuringerwald.	Schade.	H. Loretz, Jb. Pr. G., L.-A., IX, p. 295, 1889.	Quartz porphyry.	In W. T., p. 153.
165	I(II).4″.1″.3.	Q 14.52 di 7.85 or 32.25 hy 0.33 ab 38.25 mt 1.62 an 2.50 il 0.30	Ehrenberg, n. Ilmenau, Thüringerwald.	Klüss.	R. Cronacher, In. Diss. Greifs., p. 59, 1909.	Quartz syenite aplite.	
166	I.4″.1.3.	Q 16.62 hy 3.29 or 37.81 mt 1.62 ab 33.01 il 1.22 an 1.67 ap 0.34 C 2.65	Schleuse River, Thüringerwald.	G. F. Steffen.	H. Loretz, Jb. Pr. C., L.-A., IX, p. 290, 1889.	Granite porphyry.	In W. T., p. 153.
167	I.″.(3)4.1.3.	Q 33.12 ac 6.47 or 28.91 di 0.86 ab 28.30 wo 1.63	Dreibrunnen, Milbocus, Odenwald, Hesse.	F. Kutscher.	C. Chelius, Notbl. Ver. Erdk., (4) XIII, p. 8, 1892.	Aplite.	In W. T., p. 153.

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. LIPARASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
168	73.77	14.13	0.80	0.75	0.27	0.35	2.75	5.99	1.29		0.10	0.18		SO_3 0.08	100.46	2.622
A2. II	1.230	.138	.005	.010	.007	.006	.044	.064			.001	.001				
169	75.24	11.00	2.21	1.57	0.24	trace	3.86	4.78	0.42	0.20	0.25				99.77	
A3. III	1.254	.108	.014	.022	.006	—	.062	.051			.003					
170	75.05	12.66	0.99	1.07	0.11	0.87	3.01	5.64	0.53			0.11		SO_3 0.10	100.14	2.625
A3. III	1.251	.124	.006	.015	.003	.016	.048	.060				.001				
171	74.73	12.49	1.73	0.32	0.18	0.51	2.83	6.12	0.79			0.09		CO_2 0.32 SO_3 0.19	100.30	2.610
A2. II	1.246	.122	.011	.004	.005	.009	.045	.065				—				
172	76.58	13.52	0.45	0.15	0.31	0.73	4.05	4.58	0.38						100.75	
A3. III	1.276	.133	.003	.002	.008	.013	.066	.049								
173	75.67	12.12	1.87	0.29	0.17	0.75	4.90	4.25	0.46						100.48	
A3. III	1.261	.119	.012	.004	.004	.014	.079	.046							(100.47)	
174	74.02	13.90	1.00	0.27	0.24	0.77	4.53	4.41	0.73						99.87	
A3. III	1.234	.136	.006	.004	.006	.014	.073	.047								
175	73.58	14.30	1.34	0.27	0.44	0.88	4.06	5.22	0.64						100.73	
A3. III	1.226	.140	.008	.004	.011	.016	.066	.055								
176	71.42	14.17	2.13	0.26	0.34	0.73	4.35	5.95	1.17						100.52	
A3. III	1.190	.139	.013	.004	.009	.013	.070	.064								
177	67.51	13.65	4.42	1.29	0.80	2.29	4.61	4.20	0.99		0.28	0.16			100.20	
A2. II	1.125	.134	.028	.018	.020	.041	.074	.045			.004	.001				
178	73.80	12.70	1.34	0.17	0.15	0.79	4.02	5.59	1.08		0.15	trace	trace	CO_2 0.11	99.90	2.598
A2. II	1.230	.124	.008	.002	.004	.014	.065	.060			.002	—	—			
179	70.48	13.44	2.13	1.32	0.60	1.51	4.06	4.98	0.60		0.44	0.47	trace	CO_2 0.10	100.13	2.630
A2. II	1.175	.131	.013	.018	.015	.027	.066	.053			.006	.003	—			
180	74.09	13.40	0.64	0.85	0.28	0.91	4.61	4.70	0.66			0.40			100.54	
A3. III	1.235	.131	.004	.012	.007	.016	.074	.050				.003				
181	69.30	12.75	2.26	2.90	0.92	1.56	3.89	4.61	1.11		0.13	0.38			99.81	
A2. II	1.155	.125	.014	.040	.023	.028	.063	.049			.002	.003				
182	73.92	12.72	0.86	1.14	0.44	1.14	3.55	5.65	0.50		0.06	0.36			100.34	
A2. II	1.232	.125	.005	.016	.011	.020	.057	.061			.001	.003				

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. LIPAROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
168	I.(3)4.1.″3.	Q 33.90 hy 1.23 or 35.58 mt 1.16 ab 23.06 il 0.15 an 0.83 ap 0.34 C 2.75	Magdeburg, Prussia.	Fischer.	F. Klockmann, Jb. Pr. G. L.-A., XI, p. 186 (1890), 1892.	Quartz porphyry breccia.	In W. T., p. 153.
169	I″.(3)4.1.3.	Q 34.20 ac 2.31 or 28.36 hy 1.92 ab 29.87 mt 2.09 il 0.46	Waldow, Pommern.	M. Dittrich.	L. Milch, Mt. Nw. Ver. Neup., XLI, p. (10), 1909.	Granite porphyry.	Glacial bowlder. Same as No. 155.
170	I.(3)4.1(2).3.	Q 34.02 hy 1.49 or 33.36 mt 1.39 ab 25.15 ap 0.34 an 3.61 C 0.31	Wolfsklippen, n. Plessenburg, Brocken, Harz.	Klüss.	O. H. Erdmannsdoerfer, Jb. Pr. G. L.-A., XXVII, p. 350, 1906.	Granite porphyry.	
171	I.″4.1″.″3.	Q 33.78 hy 0.50 or 36.14 mt 0.93 ab 23.58 hm 1.12 an 2.50 C 0.31	Tännental, n. Pflessenburg, Brocken, Harz.	Eyme.	O. H. Erdmannsdoerfer, Jb. Pr. G. L.-A., XXVII, p. 344, 1906.	Granite.	
172	I.″4.1(2).3″.	Q 33.12 hy 0.80 or 27.24 mt 0.46 ab 34.58 il 0.15 an 3.61 C 0.51	Zadel, n. Meissen, Saxony.	E. Worm.	E. Worm, In. Diss. Leip., p. 32, 1913.	Aplite.	
173	I.″4.1.3(4).	Q 29.70 ac 2.77 or 25.58 di 0.86 ab 38.25 wo 1.16 mt 0.93 hm 0.32	Near Meissen, Saxony.	E. Worm.	E. Worm, In. Diss. Leip., p. 32, 1913.	Aplite.	
174	I.4.1(2).3(4).	Q 28.80 hy 0.60 or 26.13 mt 0.93 ab 38.15 hm 0.30 an 3.89 C 0.20	Near Meissen, Saxony.	E. Worm.	E. Worm, In. Diss. Leip., p. 32, 1913.	Aplite.	
175	I.4.1(2).3.	Q 27.42 hy 1.10 or 30.58 mt 0.93 ab 34.58 hm 0.64 an 4.45 C 0.31	Near Meissen, Saxony.	E. Worm.	E. Worm, In. Diss. Leip., p. 32, 1913.	Granite.	
176	I.4.1.3.⊙	Q 21.54 di 1.73 or 35.58 hy 0.10 ab 36.68 mt 0.93 an 1.39 hm 1.44	Rottewitz, n. Meissen, Saxony.	E. Worm.	E. Worm, In. Diss. Leip., p. 32, 1913.	Granite.	
177	I(II).4.1(2).3(4).	Q 20.28 di 4.32 or 25.02 wo 0.35 ab 38.77 mt 3.25 an 4.17 il 0.61 hm 2.24 ap 0.34	Zadel, n. Meissen, Saxony.	E. Worm.	E. Worm, In. Diss. Leip., p. 32, 1913.	Granite.	
178	I.4.1.3.⊙	Q 27.84 ac 0.46 or 33.36 di 0.86 ab 33.54 wo 1.16 il 0.30 hm 1.12	Breiterberg, n. Lüptitz, Saxony.	C. Ambronn.	C. Ambronn, In. Diss. Leip., p. 43, 1907.	Schliere in quartz porphyry.	
179	I″. 4. 1″. 3.	Q 25.02 di 1.08 or 29.47 hy 1.00 ab 34.58 mt 2.78 an 3.34 il 0.91 hm 0.16 ap 1.01	Spielberg, n. Collmen, Saxony.	C. Ambronn.	C. Ambronn, In. Diss. Leip., p. 32, 1907.	Quartz porphyry.	
180	I.4.1.3(4).	Q 27.84 hy 1.76 or 27.80 mt 0.93 ab 38.77 ap 1.01 an 1.67 C 0.10	Striegau, Silesia.	F. Riegner.	F. Riegner, In. Diss. Bres., p. 30, 1909.	Center of schliere in granite.	Also Milch and Riegner, N. d. B. B., XXIX, p. 376, 1910. Cf. No. 270, I.4.2.3.
181	I(II).4.1(2).3.	Q 24.30 di 1.18 or 27.24 hy 4.87 ab 33.01 mt 3.25 an 3.61 il 0.30 ap 1.01	Striegau, Silesia.	F. Riegner.	F. Riegner, In. Diss. Bres., p. 31, 1909.	Border of schliere in granite.	Also as above. Cf. Nos. 180, 182.
182	I.4.1.3.	Q 29.16 di 0.68 or 33.92 hy 2.09 ab 29.87 mt 1.39 an 1.95 il 0.15 ap 1.01	Striegau, Silesia.	F. Riegner.	F. Riegner, In. Diss. Bres., p. 34, 1909.	Granite about schliere.	Also as above. Cf. No. 56, II.5.2.3 and No. 71, II.5.2.4.

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. LIPARASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
183	76.42	12.73	0.69	0.20	0.31	0.68	3.75	5.06	0.39						100.23	
A3. III	1.274	.125	.004	.003	.008	.015	.061	.054								
184	74.03	13.87	0.09	0.95	0.15	0.30	3.71	6.14	1.17		trace	0.27		F trace Li_2O trace Cu trace	100.68	2.662
A2. II	1.234	.136	.001	.013	.004	.005	.059	.056			—	.002				
185	73.00	15.02	1.51	0.91	0.35	0.40	3.85	4.42	0.62		0.58				100.66	
A3. III	1.217	.147	.009	.013	.009	.007	.062	.046			.007					
186	72.68	16.10	2.19	n. d.	0.21	0.58	3.39	4.46	0.52						100.13	
A4. IV	1.211	.158	.014	(.028)	.005	.010	.055	.048								
187	72.87	14.90	1.80	1.05	0.18	0.75	3.03	5.00	0.32						99.90	
A3. III	1.215	.146	.011	.015	.005	.014	.048	.053								
188	70.10	15.44	0.57	n. d.	0.30	0.25	3.90	7.91	0.99						99.46	
B3. IV	1.168	.151	.004	(.008)	.008	.004	.063	.084								
189	76.23	12.04	0.63	0.77	0.41	0.44	4.06	4.11	0.97	0.15	0.09				99.90	2.690
A3. III	1.271	.118	.004	.011	.010	.008	.066	.043			.001					
190	72.00	13.66	1.80	0.22	0.92	0.97	4.16	4.79	1.16	0.08	0.34				100.10	2.674
A3. III	1.200	.134	.011	.003	.023	.017	.067	.051			.004					
191	71.37	13.29	1.64	0.77	0.42	0.95	3.87	5.43	1.48	0.12	0.37				99.71	2.64
A3. III	1.190	.130	.010	.011	.011	.017	.063	.057			.005					
192	75.70	10.83	2.51	0.95	0.08	0.48	4.10	5.08	0.41		0.25				100.19	2.65
A3. III	1.262	.106	.016	.013	.002	.009	.066	.054			.003					
193	75.35	10.84	1.46	2.08	0.13	0.57	3.97	5.05	0.14	0.06	0.23				99.88	2.67
A3. III	1.256	.106	.009	.029	.003	.010	.065	.054			.003					
194	74.88	12.71	1.28	0.56	0.16	0.55	4.02	5.98	0.43	0.12	trace				100.67	2.66
A3. III	1.248	.125	.008	.008	.004	.010	.065	.064			—					
195	74.55	13.35	1.45	0.18	0.24	0.85	3.89	4.57	0.42	0.11	trace	0.15			99.76	2.62
A2. II	1.243	.131	.009	.003	.006	.015	.063	.048			—	.001				
196	74.96	13.65	0.38	0.45	0.05	0.31	4.75	5.09	0.50						100.15	2.62
A3. III	1.249	.134	.003	.006	.001	.005	.077	.054								
197	70.56	14.02	2.01	0.67	0.95	1.69	4.30	4.90	0.55	0.12	0.41				100.18	2.65
A3. III	1.176	.137	.013	.009	.024	.030	.069	.052			.005					
198	76.28	13.19	n. d.	1.23	0.42	0.88	4.18	4.32	0.39	0.12					101.01	2.622
B3. IV	1.271	.129	—	.017	.011	.016	.068	.046								
199	75.34	11.74	1.07	0.36	0.35	0.93	3.12	5.96	0.48	0.11	trace				99.46	2.64
B3. IV	1.256	.115	.007	.005	.009	.017	.050	.063			—					

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. LIPAROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
183	I.″4.1″.3.	Q 33.18 di 0.65 or 30.02 hy 0.50 ab 31.96 mt 0.70 an 2.78 hm 0.16	Abruzzen, n. Cunnersdorf, Riesengebirge.	F. Riegner.	F. Riegner, In. Diss. Bres., p. 46, 1909.	Aplite (dikelet in schliere).	
184	I.4.1.3.⊙	Q 28.44 hy 1.98 or 36.14 mt 0.23 ab 30.92 ap 0.67 C 1.22	Kleiner Kornberg, Erzgebirge.	A. Böttger.	F. v. Sandberger, Sb. Münch. Ak., XVIII, p. 466, 1888.	Granite.	In W. T., p. 153.
185	I.(3)4.1.3″.	Q 32.76 hy 0.90 or 25.58 mt 1.39 ab 32.49 il 1.06 an 1.95 hm 0.48 C 3.26	Sattelberg, n. Nieder Kirchen Bl. Kusel, Bavaria.	A. Schwager.	M. Schuster, Erl. G. Kt. Bay., XX, p. 31, 1910.	Aplite.	
186	I.(3)4.1″.3.	Q 32.40 hy 4.20 or 26.69 ab 28.82 an 2.78 C 4.59	Vietsberg, n. Karlsbad, Bohemia.	A. Schwager.	Schwager and v. Gümbel, Geogn. Jhft., VII, p. 69, 1895.	Granite.	In W. T., p. 153.
187	I.(3)4.1(2).3.	Q 34.32 hy 1.03 or 29.47 mt 2.55 ab 25.15 an 3.89 C 3.16	Vlegyasza Mountains, Hungary.	Govt. lab.	G. Szadeczky, Ref. N. J., 1903, II, p. 72.	Rhyolite.	
188	I.4″.1.″3.	Q 15.72 hy 1.86 or 46.70 ab 33.01 an 1.11	Zawrat, Tatra Mountains, Hungary.	Z. Weyberg.	Z. Weyberg, Ref. N. J., 1912, I, p. 398.	Granite.	
189	I.(3)4.1″.3(4).	Q 35.10 hy 1.79 or 23.91 mt 0.93 ab 34.58 il 0.15 an 2.22 C 0.10	Inn River, Ardez-Tarasp Road, Lower Engadine, Switzerland.	O. Züst.	U. Grubenmann, Btr. G. Kt. Schw., XXIII, p. 204, 1909.	Quartz porphyry.	
190	I.4.1(2).3″.	Q 26.16 hy 2.30 or 28.36 il 0.46 ab 35.11 hm 1.80 an 4.45 tn 0.20	Galgenhügel, below Sent, Lower Engadine, Switzerland.	O. Züst.	U. Grubenmann, Btr. G. Kt. Schw., XXIII, p. 196, 1909.	Granite.	
191	I.4.1″.3.	Q 25.92 di 1.51 or 31.69 hy 0.40 ab 33.01 mt 1.39 an 2.78 il 0.76 hm 0.64	Platta Mala, Lower Engadine, Switzerland.	O. Züst.	U. Grubenmann, Btr. G. Kt. Schw., XXIII, p. 191, 1909.	Granite.	
192	I″.(3)4.1.3.	Q 33.06 ac 6.47 or 30.02 di 2.00 ab 27.25 hy 0.10 mt 0.46 il 0.30	Platzero, Bernina Gebiet, Switzerland.	L. Hezner.	U. Grubenmann, Schw. Chem. Zeit., I, p. (2), 1914.	Paisanite.	Pers. com.
193	I(II).(3)4.1.3.	Q 32.46 ac 4.16 or 30.02 ns 0.49 ab 27.25 di 2.45 hy 2.44 il 0.46	Morteratsch Glacier, Bernina Gebiet, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Paisanite.	
194	I.4.1.3.⊙	Q 27.84 ac 1.85 or 35.58 di 1.86 ab 31.96 wo 0.23 mt 0.93	Piz Chalchagu, Bernina Gebiet, Switzerland.	L. Hezner.	U. Grubenmann, Schw. Chem. Zeit., I, p. (2), 1914.	Alkali granite.	Pers. com.
195	I.″4.1(2).3.	Q 32.82 hy 0.60 or 26.69 mt 0.70 ab 33.01 hm 0.96 an 3.34 ap 0.34 C 0.82	Piz Chalchagu, Bernina Gebiet, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Aplite.	
196	I.4.1.3″.	Q 27.06 di 0.49 or 30.02 hy 0.23 ab 40.35 mt 0.70 an 0.83	Piz Dadeno, Ponteglia Gebiet, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Aplite.	
197	I″.4.1(2).3.	Q 22.80 di 3.03 or 28.91 hy 1.00 ab 36.15 mt 0.93 an 4.45 il 0.76 hm 1.44	Piz Posta Bialla, Ponteglia Gebiet, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Aplite.	
198	I.″4.1(2).3(4).	Q 31.74 hy 3.15 or 25.58 ab 35.63 an 4.17	Aletschhorn, Aarmassif, Switzerland.	L. Duparc.	E. v. Fellenberg, Btr. G. Kt. Schw., XXI, p. 22, 1893.	Granite gneiss.	Not in W. T.
199	I.″4.1.3.	Q 32.88 di 1.94 or 35.02 wo 0.93 ab 26.20 mt 1.16 an 0.56 hm 0.32	Voralp, Aarmassif, Switzerland.	O. Fischer.	O. Fischer, T. M. P. M., XXIV, p. 73, 1905.	Granite porphyry.	Border of dike. Cf. No. 29, I.4.1.2.

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. LIPARASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
200	73.68	12.70	1.34	0.89	0.21	1.13	4.65	5.37	0.35	0.12	trace				100.44	2.64
A3. III	1.228	.125	.008	.013	.005	.020	.075	.057			—					
201	73.33	15.90	0.06	0.21	trace	0.70	4.36	4.83	0.21	0.11	trace				99.71	2.518
A3. III	1.222	.156	—	0.03	—	.013	.070	.051								
202	73.83	12.66	1.85	0.40	0.35	0.82	2.83	6.39	0.68		0.13				100.08	2.64
A3. III	1.231	.124	.012	.006	.009	.014	.045	.068			.002					
203	73.36	14.59	1.13	0.47	0.23	1.28	3.53	4.43	0.59	0.06	trace	0.43	0.07		100.17	2.64
A2. II	1.223	.143	.007	.007	.006	.023	.056	.047			—	.003	.001			
204	73.88	13.86	1.10	0.66	0.17	0.41	2.70	6.14	0.76		trace				99.68	2.658
A3. III	1.231	.136	.007	.009	.004	.007	.044	.065			—					
205	70.48	14.48	1.99	0.64	1.04	0.62	2.46	5.98	1.68		0.30				99.67	2.719
A3. III	1.175	.142	.013	.009	.026	.011	.040	.064			.004					
206	70.25	14.01	1.12	1.59	0.94	0.86	2.63	5.97	0.46	0.89	0.43	0.19	0.08		99.42	2.690
B2. III	1.171	.137	.007	.022	.024	.015	.042	.062			.005	.001	.001			
207	73.23	11.46	2.44	1.15	0.63	0.51	4.12	5.33	0.44	0.14					99.45	2.60
B3. IV	1.221	.112	.015	.016	.016	.009	.066	.056								
208	65.95	15.24	1.18	2.27	1.87	1.22	3.78	5.02	1.91	0.10	0.64	0.47	trace		99.65	
A2. II	1.099	.149	.008	.032	.047	.021	.061	.053			.008	.003	—			
209	67.04	16.00	2.11	1.55	0.69	1.00	4.65	5.49	1.53		0.92				100.95	
B3. IV	1.117	.157	.013	.022	.017	.018	.075	.059			.012					
210	74.18	13.91	n. d.	0.83	0.33	0.70	4.91	5.40	0.60		0.12	0.19			101.17	2.56
B3. IV	1.236	.136	—	.011	.008	.013	.079	.057			.002	.001				
211	73.40	13.70	n. d.	1.53	0.62	1.10	4.48	5.34	0.60		0.05	0.25			101.07	2.62
B3. IV	1.223	.134	—	.021	.016	.020	.073	.056			—	.002				
212	73.62	12.32	2.82	0.60	0.51	0.61	3.43	5.57	0.72		trace				100.20	
A3. III	1.227	.121	.018	.008	.013	.011	.055	.060			—					
213	72.13	11.28	4.87	0.51	0.33	1.71	3.92	4.54	0.72		0.44				100.45	
A3. III	1.202	.111	.031	.007	.008	.030	.063	.048			.006					
214	75.17	14.05	0.21	n. d.	0.16	0.32	4.57	5.00	0.45					B_2O_3 trace	99.93	
A3. III	1.253	.138	.001	(.002)	.004	.005	.074	.053								
215	72.89	14.50	n. d.	2.48	1.17	0.58	4.42	4.23	n. d.		0.06				100.33	
A4. IV	1.215	.142	—	.035	.019	.010	.071	.045			.001					

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. LIPAROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
200	I″.4.1.3.	Q 24.78 ac 3.23 or 31.69 di 4.05 ab 35.63 wo 0.35 mt 0.23	Voralp, Aarmassif, Switzerland.	O. Fischer.	O. Fischer. T. M. P. M., XXIV, p. 56, 1905.	Granite.	
201	I.4.1(2).3″.	Q 28.02 hy 0.40 or 28.36 ab 36.68 an 3.61 C 2.24	Piz Giuf, Aarmassif, Switzerland.	Not stated.	F. Weber, Btr. G. Kt. Schw., XIV, p. 102, 1904.	Aplite.	
202	I.″4.1″.(2)3.	Q 31.14 di 0.65 or 37.81 hy 0.60 ab 23.58 mt 0.93 an 3.06 il 0.30 hm 1.28	Voralptal, Bernese Alps, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Granite porphyry.	
203	I.(3)4.1(2).3.	Q 34.32 hy 0.73 or 26.13 mt 1.62 ab 29.34 ap 1.01 an 3.61 C 2.75	Lauffenburg, Bernese Alps, Switzerland.	L. Hezner.	P. Niggli, pers. com.	Aplite.	
204	I.(3)4.1.(2)3.	Q 33.42 hy 0.66 or 36.14 mt 1.62 ab 23.06 an 1.85 C 2.04	Inner Ferrera, Rofna, Switzerland.	G. Rütschi.	G. Rütschi, In. Diss. Zür., p. 25, 1903.	Aplite.	
205	I.″4.1″.(2)3.	Q 30.18 hy 2.60 or 35.58 mt 1.16 ab 20.96 il 0.61 an 3.06 hm 1.28 C 2.75	Mulin, n. Andeer, Rofna, Switzerland.	G. Rütschi.	G. Rütschi, In. Diss. Zür., p. 35, 1903.	Granite porphyry.	
206	I″.″4.1(2),(2)3.	Q 29.28 hy 3.85 or 34.47 mt 1.62 ab 22.01 il 0.76 an 3.34 ap 0.34 C 2.14	Ausser Ferrera, Rofna, Switzerland.	G. Rütschi.	G. Rütschi, In. Diss. Zür., p. 19, 1903.	Granite porphyry.	
207	I(II).″4.1.3.	Q 28.38 ac 4.62 or 31.14 di 2.07 ab 29.34 hy 2.02 mt 1.16	Tremola, St. Gotthard, Switzerland.	K. M. Jene.	P. Wainziok, In. Diss. Zür., p. 17, 1906.	Granite.	
208	I(II).4.1″.3.	Q 19.80 hy 6.81 or 29.47 mt 1.86 ab 31.96 il 1.22 an 3.06 ap 1.01 C 2.45	Bibertenälpeli, Tödi, Switzerland.	L. Hezner.	B. G. Escher, In. Diss. Zür., p. 108, 1911.	Granite.	
209	I″.4″.1(2).3.	Q 15.60 hy 1.70 or 32.80 mt 2.32 ab 39.30 il 1.82 an 5.00 hm 0.48 C 0.51	Käserngrat, Windgälle Mountains, Switzerland.	C. Schmidt.	C. Schmidt, N. J. B. B., IV, p. 432, 1886.	Porphyry.	In W. T., p. 153.
210	I.4.1.3″.	Q 22.98 di 2.32 or 31.69 hy 0.83 ab 41.39 il 0.30 ap 0.34	Groppo Maggio, n. Parma, Italy.	M. Ferrari,	M. Ferrari, Mem. Ac. Linc., (5), VIII, No. 4, p. 176, 1910.	Granite.	
211	I.4.1.3.⊙	Q 23.64 di 1.89 or 31.14 hy 3.41 ab 38.25 ap 0.67 an 1.39	Groppo Maggio, n. Parma, Italy.	M. Ferrari.	M. Ferrari, Mem. Ac. Linc. (5), VIII, No. 4, p. 176, 1910.	Granite.	
212	I.″4.1.3.	Q 30.42 di 1.08 or 33.36 hy 0.80 ab 28.82 mt 1.86 an 1.67 hm 1.60	Gavorrano, Tuscany, Italy.	A. Martelli.	A. Martelli, Rend. Ac. Linc., XVIII (2), p. 667, 1909.	Tourmaline granite.	
213	I(II).″4.1.3.	Q 29.88 di 1.73 or 26.69 wo 2.55 ab 33.01 mt 0.23 il 0.91 hm 4.80	Gavorrano, Tuscany, Italy.	A. Martelli.	A. Martelli, Rend. Ac. Linc., XVIII (2), p. 666, 1909.	Granite.	
214	I.4.1.3″.	Q 28.50 hy 0.66 or 29.47 ab 38.77 an 1.39 C 0.61	Monte Capanne, Elba.	E. Manasse.	E. Manasse, Mem. Soc. Tosc. Sc. Nat., XVII, p. 224, 1900.	Tourmaline aplite.	Not in W. T.
215	I″.4.1″.3(4).	Q 26.76 hy 6.39 or 25.02 il 0.15 ab 37.20 an 2.78 C 1.63	Pietre Cotte, Vulcano, Aeolian Islands.	Pisani.	A. Lacroix, C. R., CXLVII, p. 1454, 1908.	Rhyolite obsidian.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. LIPARASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
216	71.60	13.05	0.92	1.26	0.69	1.94	4.65	4.90	0.62		0.14				99.77	
A3. III	1.193	.128	.006	.018	.017	.035	.075	.052			.002					
217	71.41	13.30	n. d.	2.40	0.85	2.63	4.30	4.57	0.12			0.25			99.83	
A4. IV	1.190	.130	—	.033	.021	.046	.069	.049				.002				
218	74.37	12.65	2.58	n. d.	0.20	1.22	3.87	4.57	0.22	0.02					99.70	
A4. IV	1.240	.124	.016	(.032)	.005	.021	.063	.049								
219	74.61	12.68	0.09	1.36	0.21	0.69	3.68	4.77	1.37	0.04	0.08				99.58	
A3. III	1.244	.124	.001	.019	.005	.013	.060	.051			.001					
220	73.09	13.80	1.28	0.68	0.37	0.69	3.77	5.36	0.60	0.72	0.38	0.07	trace	CO_2 none ZrO_2 0.02	100.83	
A1. I	1.218	.135	.008	.010	.009	.013	.061	.057			.005	—	—	SO_3 none BaO none		
221	70.50	14.28	0.75	1.22	0.49	1.00	3.62	5.28	2.86	0.10	0.47	0.11	0.04		100.72	
A2. II	1.175	.140	.005	.017	.012	.018	.058	.056			.006	.001	—	CO_2 none		
222	74.76	11.60	3.50	0.19	0.18	0.07	4.35	4.92	0.64		trace	trace			100.21	
A3. III	1.246	.114	.022	.003	.005	.001	.070	.052			—	—				
223	74.09	10.88	3.35	0.42	0.30	0.16	4.56	4.45	1.52						99.73	
A3. III	1.235	.107	.021	.006	.008	.003	.074	.048								
224	73.23	12.25	3.25	0.28	0.13	0.25	4.44	4.32	1.74						99.89	
A3. III	1.221	.120	.020	.004	.003	.005	.072	.046								
225	73.35	13.08	3.06	n. d.	0.08	0.08	4.68	4.99	1.00						100.32	
A4. IV	1.223	.128	.019	—	.002	.001	.076	.053								
226	71.81	14.44	2.77	n. d.	none	0.60	3.37	6.08	1.00		0.23				100.30	
A4. IV	1.197	.142	.018	(.036)	—	.011	.055	.065			.003					
227	71.23	14.51	1.56	1.27	0.04	none	4.50	5.86	0.43		0.42				99.82	
A3. III	1.187	.142	.010	.018	.001	—	.073	.063			.005					
228	71.21	14.95	1.81	n. d.	0.15	0.63	3.97	5.83	1.13		0.20				99.88	
A4. IV	1.187	.147	.001	(.022)	.004	.011	.065	.062			.003					
229	76.74	11.12	1.00	0.78	0.19	0.82	3.35	5.87	0.19		0.05				100.11	
A3. III	1.279	.109	.006	.014	.005	.014	.054	.063			—					
230	76.10	12.90	n. d.	0.81	0.27	0.63	3.88	4.63	0.44		0.07				99.83	
A3. III	1.268	.126	—	.011	.007	.011	.063	.049			.001					
231	75.46	12.05	1.11	0.99	0.25	1.16	2.99	5.53	0.97						100.51	
A3. III	1.258	.118	.007	.014	.006	.021	.048	.059								

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. LIPAROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
216	I″.4.1.3″.	Q 22.08 di 6.15 or 28.91 wo 0.81 ab 39.30 mt 1.39 an 0.28 il 0.30	Eruption 1888–89, Vulcano, Aeolian Islands.	Pisani.	A. Lacroix, C. R., CXLVII, p. 1454, 1908.	Rhyolite.	
217	I(II).4.1″.3.	Q 22.62 di 6.34 or 27.24 hy 3.24 ab 36.15 ap 0.67 an 3.34	Monte Lentia, Vulcano, Aeolian Islands.	Pisani.	A. Lacroix, C. R., CXLVII, p. 1454, 1908.	Rhyolite.	
218	I.″4.1(2).3.	Q 29.88 di 2.20 or 27.24 hy 3.57 ab 33.01 an 3.34	Forgia Vecchia, Lipari, Aeolian Islands.	F. Glaser.	A. Bergeat, Ab. Münch. Ak., XX, p. 111, 1899.	Obsidian.	In W. T., p. 153.
219	I.″4.1(2).3.	Q 31.80 hy 2.74 or 28.36 mt 0.23 ab 31.44 il 0.15 an 3.61	Conca Cannas, Monte Arci, Sardinia.	H. S. Washington.	H. S. Washington, A. J. S., XXXVI, p. 582, 1913.	Obsidian.	Mt omitted from norm in ref.
220	I.4.1″.3.	Q 28.50 hy 0.90 or 31.69 mt 1.16 ab 31.96 il 0.76 an 3.61 hm 0.48 C 0.41	Capanna, n. Marubbiu, Monte Arci, Sardinia.	H. S. Washington.	H. S. Washington, A. J. S., XXXVI, p. 582, 1913.	Liparite.	Mt omitted from norm in ref.
221	I.4.1(2).3.	Q 26.58 hy 1.99 or 31.14 mt 1.16 ab 30.39 il 0.91 an 4.17 ap 0.34 C 1.12	Punta Brenta, n. Uras, Monte Arci, Sardinia.	H. S. Washington.	H. S. Washington, A. J. S., XXXVI, p. 582, 1913.	Perlite.	Mt omitted from norm in ref.
222	I″.″4.1.3.	Q 31.44 ac 3.70 or 28.91 di 0.22 ab 32.49 wo 0.46 mt 0.70 hm 1.76	Comende, San Pietro Island, Sardinia.	M. Dittrich.	H. Rosenbusch, Elem. Geste., p. 257, 1898.	Comendite.	In W. T., p. 153.
223	I(II).(3)4.1.3.	Q 31.32 ac 6.93 or 26.69 di 0.65 ab 30.92 hy 0.50 mt 1.39	Guardia dei Mori, San Pietro, Sardinia.	A. Johnsen.	A. Johnsen, Abh. Pr. Ak. Wiss., Anh. No. 2, p. 22, 1912.	Comendite.	Also in N.J.C.B. 1912, p. 738.
224	I.″4.1.3(4).	Q 30.18 di 0.65 or 25.58 mt 0.93 ab 37.73 hm 2.56 an 0.56	Canale del Baccio, San Pietro, Sardinia.	A. Johnsen.	A. Johnsen, Abh. Pr. Ak. Wiss., Anh. No. 2, p. 22, 1912.	Comendite.	Also in N.J.C.B. 1912, p. 738.
225	I.4.1.3″.	Q 26.88 ac 0.46 or 29.47 di 0.22 ab 39.30 hy 0.10 hm 4.18	Cala Lunga, San Antioco, Sardinia.	A. Johnsen.	A. Johnsen, Abh. Pr. Ak. Wiss., Anh. No. 2, p. 22, 1912.	Comendite.	Also in N.J.C.B. 1912, p. 738.
226	I.4.1″.3.	Q 25.98 hy 4.36 or 36.14 il 0.46 ab 28.82 an 3.06 C 1.12	Roccadella Guardia, San Antioco, Sardinia.	A. Johnsen.	A. Johnsen, Abh. Pr. Ak. Wiss., Anh. No. 2, p. 33, 1912.	Liparite.	Also in N.J.C.B. 1912, p. 738.
227	I.4.1.3.⊙	Q 22.02 hy 0.50 or 35.03 mt 2.32 ab 38.25 il 0.76 C 0.61	Calasetta, San Antioco, Sardinia.	A. Johnsen.	A. Johnsen, Abh. Pr. Ak. Wiss., Anh. No. 2, p. 28, 1912.	Liparite.	Also in N.J.C.B. 1912, p. 738.
228	I.4.1″.3.	Q 22.80 hy 2.78 or 34.47 il 0.46 ab 34.06 an 3.06 C 0.92	Sisimeddu, San Antioco, Sardinia.	A. Johnsen.	A. Johnsen, Abh. Pr. Ak. Wiss., Anh. No. 2, p. 33, 1912.	Liparite.	Also in N.J.C.B. 1912, p. 738.
229	I″.(3)4.1.″3.	Q 33.96 ac 2.77 or 35.03 ns 0.24 ab 24.10 di 3.38 hy 0.90	Capo Bellavista, Sardinia.	C. Riva.	C. Riva, Att. Ac. Sc. Nap., (2), XII, No. 9, p. 40, 1905.	Quartz porphyry.	
230	I.(3)4.1″.3″.	Q 33.42 hy 1.92 or 27.24 il 0.15 ab 33.01 an 3.06 C 0.31	Capo Bellavista, Sardinia.	C. Riva.	C. Riva, Att. Ac. Sc. Nap., (2), XII, No. 9, p. 39, 1905.	Quartz porphyry.	
231	I.(3)4.1″.3.	Q 34.26 di 2.32 or 32.80 hy 0.36 ab 25.15 mt 1.62 an 3.06	Southern Ural Mountains, Russia.	Not stated.	A. Ginsberg, Ann. Inst. Polyt. St. Pet., XV, p. 211, 1911.	Rapakiwi granite.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. LIPARASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
232	75.35	12.46	1.14	1.03	trace	0.69	3.08	5.41	0.71	0.27					100.14	
A3. III	1.256	.122	.007	.014	—	.013	.050	.057								
233	69.91	13.76	2.17	1.23	0.46	1.39	4.45	6.33	0.12	none	0.16	0.11	trace	CO_2 none	100.09	
A2. II	1.165	.135	.014	.017	.012	.025	.072	.067			.002	.001	—			
234	74.13	13.88	0.96	0.75	0.15	0.92	4.68	5.01	n. d.		trace	trace	0.18	Cl 0.09	100.48	2.349
A3. III	1.236	.136	.006	.010	.004	.016	.075	.053			—	—	.003			
235	73.72	13.07	0.29	1.28	0.22	2.10	4.58	5.01	n. d.		trace		0.52		110.79	
A3. III	1.229	.128	.002	.018	.006	.038	.074	.053			—		.007			
236	76–82	12.46	1.06	n. d.	0.05	1.35	2.85	5.71	0.24						100.54	
A4. IV	1.280	.122	.007	(.014)	.001	.024	.046	.061								
237	75.25	11.60	0.78	3.00	0.39	0.70	3.98	4.20	n. d.		0.19				100.09	
A3. III	1.254	.114	.005	.042	.010	.013	.065	.044			.002					
238	73.55	12.20	2.75	0.26	0.90	1.08	3.74	4.90	0.63		0.18				100.15	
A3. III	1.226	.120	.017	.004	.023	.019	.060	.052			.002					
239	71.95	11.95	4.08	0.53	0.99	0.42	4.51	4.79	0.75		0.42				100.39	
A3. III	1.199	.117	.026	.007	.025	.007	.073	.051			.005					
240	71.70	13.26	0.08	1.90	0.40	3.02	4.72	4.74	0.58		0.50	0.04			100.94	
B2. III	1.195	.130	.001	.026	.010	.054	.076	.050			.006	—				
241	73.02	11.50	1.98	2.31	0.11	0.34	4.85	4.64	0.59		0.57	0.14			100.05	2.627
A2. II	1.217	.113	.013	.032	.003	.006	.078	.049			.007	.001				
242	73.9	13.6	1.4	0.5	0.3	0.4	4.4	4.4	0.5		0.2				99.6	
B3. IV	1.232	.133	.009	.007	.008	.007	.071	.047			.003					
243	71.7	14.0	0.6	1.1	0.3	1.0	6.0	4.9	0.2						100.3	
B3. IV	1.195	.137	.004	.015	.008	.018	.097	.052								
244	74.19	13.55	0.46	n. d.	0.28	0.94	5.68	4.82	0.40			trace			100.32	
A3. III	1.237	.133	.003	(.006)	.007	.017	.092	.051				—				
245	72.46	13.96	1.65	0.89	trace	0.81	5.69	5.16	0.17						100.79	
A3. III	1.208	.137	.010	.013	—	.014	.092	.055								
246	76.01	11.96	2.06	n. d.	trace	0.26	4.46	4.73	0.28				trace		99.76	2.58
A4. IV	1.267	.117	.013	(.016)	—	.004	.072	.050					—			
247	76.0	12.7	2.1	0.6	none	0.2	4.0	4.2	1.1						100.9	2.59
B3. IV	1.267	.125	.013	.008	—	.004	.065	.045								

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. LIPAROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
232	I.(3)4.1(2).3.	Q 34.86 hy 0.92 or 31.69 mt 1.62 ab 26.20 an 3.61 C 0.20	Southern Ural Mountains, Russia.	Not stated.	A. Ginsberg, Ann. Inst. Polyt. St. Pet., XV, p. 211, 1911.	Rapakiwi granite.	
233	I″.4.1.3.	Q 18.00 ac 1.85 or 37.25 di 3.83 ab 35.63 wo 0.58 mt 2.32 il 0.30 ap 0.34	Miask, Ural Mountains, Russia.	H. S. Washington.	L. V. Pirsson, A. J. S., XIII, p. 180, 1902.	Aegirite granite.	
234	I.4.1.3″.	Q 25.98 di 1.89 or 29.47 hy 0.33 ab 39.30 mt 1.39 an 2.22	Kotan Dag, Caucasus.	A. Dannenberg.	A. Dannenberg, T. M. P. M., XXIII, p. 30, 1904.	Obsidian.	
235	I″.4.1.3″.	Q 23.94 di 7.00 or 29.47 wo 0.93 ab 38.77 mt 0.46 an 0.28	Cumpana Mare, Arges Valley, Carpathian Mountains, Rumania.	W. T. Saidel.	M. Reinhard, In. Diss. Zür., p. 89, 1906.	Aplite.	Center of dike. Cf. No. 48, II. 4.2.3.
236	I.(3)4.1(2).3.	Q 35.04 di 2.20 or 33.92 hy 0.79 ab 24.10 an 4.17	Cap Marsa, n. Menerville, Algeria.	Not stated.	Duparc, Pearce, and Ritter, Mem. Soc. Phys. Gen., XXXIII, p. 77, 1900.	Liparite.	In W. T., p. 153.
237	I″.(3)4.1.3(4).	Q 32.22 di 1.92 or 24.46 hy 4.63 ab 34.06 mt 1.16 an 1.39 il 0.30	Gouré, Zinder Territory, n. Sokoto, Fr. Nigeria.	Pisani.	A. Lacroix, C. R., CXL, p. 24, 1905.	Microgranite (Paisanite).	
238	I″.″4.1.3.	Q 30.24 di 2.38 or 28.91 hy 1.20 ab 31.44 mt 0.46 an 2.22 il 0.30 hm 2.40	Zinder, n. Lake Chad, Fr. Nigeria.	Pisani.	Gentil and Freydenberg, C. R., CXLVI, p. 354, 1908.	Riebeckite granite.	
239	I(II).4.1.3.	Q 26.22 ac 3.23 or 28.36 di 1.51 ab 34.58 hy 1.80 mt 0.46 il 0.76 hm 2.72	Hadjer el Khemis, n. Lake Chad, Fr. Nigeria.	Pisani.	Gentil and Freydenberg, C. R., CXLVI, p. 354, 1908.	Riebeckite rhyolite.	
240	I(II).4.1.3(4).	Q 21.12 di 6.87 or 27.80 wo 2.44 ab 39.82 mt 0.23 an 1.11 il 0.91	Kil. 176, Konakry-Niger R. R., French Guinea.	Pisani?	Col. Azema, C. R., Cong. Soc. Sav. 1912, p. 111.	Granite.	
241	I(II).4.1.3″.	Q 27.30 ac 6.01 or 27.24 ns 0.12 ab 33.54 di 0.75 hy 3.20 il 1.06 ap 0.34	Mungo Rapids, Kamerun.	A. Lindner.	A. Hintze, Jb. Pr. G., L.-A., XXVIII, p. 340 (1907), 1910.	Grorudite.	
242	I.″4.1″.3(4).	Q 30.12 hy 0.80 or 26.13 mt 0.93 ab 37.20 il 0.46 an 1.95 hm 0.80 C 0.82	Gebel Doukhan, Red Sea, Egypt.	Not stated.	Couyat, C. R., CXLVII, p. 869, 1908.	Granite.	
243	I″.4.1.3(4).	Q 18.84 ac 1.85 or 28.91 ns 0.98 ab 44.54 di 4.08 il 1.39	Gebel Doukhan, Red Sea, Egypt.	Not stated.	Couyat, C. R., CXLVII, p. 869, 1908.	Granite.	
244	I.4.1.3(4).	Q 23.76 ac 1.39 or 28.36 ns 0.85 ab 42.97 di 1.51 wo 1.16	Adi Enfi, Eritrea.	E. Manasse.	E. Manasse, Stud. Petr. Erit., p. 52, 1909.	Granite.	
241	I″.4.1.3(4).	Q 19.14 ac 4.62 or 30.58 di 3.35 ab 42.97	Alid Volcano, Buia, Eritrea.	E. Manasse.	E. Manasse, Stud. Petr. Erit., p. 114, 1909.	Obsidian.	
246	I.″4.1.3.	Q 31.50 ac 2.31 or 27.80 di 0.99 ab 35.10 hy 1.58	Mount Scholoda, Abyssinia.	G. T. Prior.	G. T. Prior, Min. Mag., XII, p. 264, 1900.	Paisanite.	In W. T., p. 153.
247	I.(3)4.1.3″.	Q 35.94 mt 1.86 or 25.02 hm 0.80 ab 34.06 an 1.11 C 1.12	Helabala, n. Djibouti, French Somali.	H. Arsandaux.	H. Arsandaux, Roches Est Afr., p. 75, 1906.	Rhyolite.	Also in C. R., CXXXVII, p. 878, 1903.

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. LIPARASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
248	72.9	12.4	3.0	2.4	0.5	0 1	4.4	4.3	0.4						100.4	2.46
B3. IV	1.215	.122	.019	.033	.013	.002	.071	.046								
249	71.7	14.2	1.6	1.6	0.4	none	3.8	4.6	2.2						100.1	2.42
B3. IV	1.195	.139	.010	.022	.010	——	.061	.049								
250	71.4	11.8	5.6	1.4	0.6	0.2	4.2	4.3	1.4						100.9	2.49
B3. IV	1.190	.116	.035	.019	.015	.004	.068	.046								
251	71.75	13.04	2.24	0.47	0.44	0.74	3.52	5.35	0.47	0.27	1.18	0.23			99.70	
A2. II	1.196	.128	.014	.007	.011	.013	.056	.057			.015	.002				
252	69.95	11.99	0.76	0.64	0.09	0.66	3.70	3.80	4.98	2.80	0.18	0.09			99.64	
A2. II	1.166	.118	.005	.009	.002	.012	.060	.040			.002	——				
253	69.71	14.68	1.09	1.48	0.34	1.11	4.36	5.67	0.44	0.30	0.47	0.08			99.73	
A2. II	1.162	.144	.007	.021	.009	.020	.070	.061			.006	——				
254	62.73	15.42	5.65	0.83	0.64	0.40	4.38	5.72	1.36	0.97	1.41	0.24			99.75	
A2. II	1.046	.151	.036	.012	.016	.007	.071	.061			.018	.002				
255	71.41	13.94	0.63	0.78	0.09	0.62	3.75	4.74	4.09	0.34	0.01	trace	0.09	Ce_2O_3 trace	100.49	
A2. II	1.190	.137	.004	.011	.002	.011	.061	.050			——	——	.001			
256	75.13	12.03	1.01	0.70	0.17	1.27	3.44	5.48	0.29	0.29					99.81	2.603
A3. III	1.252	.118	.006	.010	.004	.023	.055	.059								
257	73.96	13.64	0.78	1.72	trace	trace	2.82	6.52	0.64		trace			Li_2O 0.10	100.18	
A3. III	1.233	.134	.005	.024	——	——	.045	.069			——					
258	72.25	13.97	0.76	1.90	trace	0.63	2.77	6.58	0.31					Li_2O trace	99.21	
B3. IV	1.204	.137	.005	.026	——	.011	.045	.070								
259	70.96	15.65	0.81	1.93	0.86	0.84	3.28	5.04	0.48				0.13		99.98	
A3. III	1.183	.153	.005	.026	.022	.015	.053	.053					.002			
260	75.44	11.98	0.88	1.02	0.10	0.33	4.06	5.01	0.68	0.13	trace		trace	CO_2 none	99.63	
A3. III	1.257	.117	.006	.014	.003	.004	.065	.054			——		——			
261	72.19	11.25	4.47	0.83	0.54	2.32	3.89	4.26	n. d.						99.75	
A3. III	1.203	.110	.028	.011	.014	.041	.063	.046								
262	71.23	14.59	1.98	0.65	0.16	1.20	3.85	6.49	n. d.						100.15	
A3. III	1.187	.143	.013	.009	.004	.021	.062	.069								
263	75.34	11.72	0.52	1.52	0.34	0.49	3.60	5.59	0.70		trace				99.72	2.64
A3. III	1.256	.115	.003	.021	.009	.009	.058	.060			——					
264	73.29	12.94	2.63	n. d.	0.58	0.86	3.25	5.71	0.82		trace	trace		CO_2 0.43	100.51	2.63
A4. IV	1.222	.127	.016	(.032)	.015	.015	.053	.061			——	——				

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. LIPAROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
248	I″.″4.1.3(4).	Q 28.92, or 25.58, ab 37.20, an 0.56, C 0.31; hy 3.15, mt 4.41	Tcheffedonza, French Somali.	H. Arsandaux.	H. Arsandaux, Roches Est Afr., p. 75, 1906.	Pantellerite.	Also in C. R., CXXXVII, p. 878, 1903. (SiO_2 correct here.)
249	I.″4.1.3.	Q 30.78, or 27.24, ab 31.96, C 2.96; hy 2.58, mt 2.32	Baldji, French Somali.	H. Arsandaux.	H. Arsandaux, Roches Est Afr., p. 75, 1906.	Pantellerite obsidian.	Also in C. R., CXXXVII, p. 878, 1903.
250	I″.″4.1.3(4).	Q 29.10, or 25.58, ab 35.63, an 0.56; di 0.53, hy 1.30, mt 4.41, hm 2.56	Moullou, French Somali.	H. Arsandaux.	H. Arsandaux, Roches Est Afr., p. 75, 1906.	Pantellerite.	Also in C. R., CXXXVII, p. 878, 1903.
251	I.″4.1.3.	Q 29.70, or 31.69, ab 29.34, an 1.67, C 0.92; hy 1.10, il 1.06, hm 2.24, ru 0.64, ap 0.67	Kizomohitalko, Sakalave Region, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVII, p. 18, 1913.	Microgranite.	
252	I.(3)4.1(2).3(4).	Q 32.28, or 22.24, ab 31.44, an 3.34, C 0.61; hy 0.46, mt 1.16, il 0.30	Ampasibitika, Sakalave Region, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVII, p. 18, 1913.	Pitchstone.	
253	I.4.1″.3.	Q 20.34, or 33.92, ab 36.68, an 3.61; di 1.61, hy 1.16, mt 1.62, il 0.91	Mount Antatrotro, Madagascar.	Boiteau?	A. Lacroix, pers. com.	Rhyolite.	
254	I(II).4″.1.3.	Q 14.28, or 33.92, ab 37.20, C 1.94; hy 1.60, il 1.82, hm 5.65, ru 0.48, ap 0.67	Bekodia, Sakalave Region, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVII, p. 18, 1913.	Trachyte.	
255	I.″4.1″.3.	Q 29.52, or 27.80, ab 31.96, an 3.06, C 1.53; hy 1.26, mt 0.93	Manwan Creek, Lebombo Range, Zululand.	G. T. Prior.	G. T. Prior, Ann. Natal Mus., II, No. 2, p. 154, 1910.	Rhyolite.	
256	I.″4.1.3.	Q 31.98, or 32.80, ab 28.82, an 1.11; di 1.86, wo 1.28, mt 1.39	Tatarka River, Jenissei District, Siberia.	Not stated.	A. Meister, Expl. G. Reg. Aurif. Sib., IX, p. 172, 1910.	Aplite.	
257	I.″4.1.(2)3.	Q 31.80, or 38.36, ab 23.58, C 2.04; hy 2.51, mt 1.16	Angara River, Jenissei District, Siberia.	B. Karpov.	A. Meister, Expl. G. Reg. Aurif. Sib., IX, p. 189, 1910.	Granite.	Center of dike. Cf. No. 26, 1.3.1.2.
258	I.4.1.(2)3.	Q 28.26, or 38.92, ab 23.58, an 3.06, C 1.12; hy 2.77, mt 1.16	Angara River, Jenissei District, Siberia.	B. Karpov.	A. Meister, Expl. G. Reg. Aurif. Sib., IX, p. 193, 1910.	Granite.	Liegendes Salband. Cf. No. 26, I.3 1.2; No. 257, I.4.1.3.
259	I″.″4.1(2).3.	Q 28.32, or 29.47, ab 27.77, an 4.17, C 3.26; hy 5.24, mt 1.16	Angara River, Jenissei District, Siberia.	A. A. Semenchenko.	A. Meister, Expl. G. Reg. Aurif. Sib., IX, p. 172, 1910.	Granitite.	
260	I.″4.1.3.	Q 31.80, or 30.02, ab 33.81; ac 0.92, di 0.96, hy 1.12, mt 0.93	Iskagan Bay, East Cape, Siberia.	H. S. Washington.	H. S. Washington, A. J. S., XIII, p. 180, 1902.	Comendite.	
261	I(II).″4.1.3″.	Q 29.58, or 25.58, ab 33.01, an 0.28; di 3.03, wo 3.02, mt 2.55, hm 2.72	Kara Tioubé, n. Samarkand, Turkestan.	Not stated.	K. I. Timofeef, Ann. G. Min. Russ, XII, p. 82, 1910.	Granite porphyry.	
262	I.4.1″.3.	Q 21.84, or 38.36, ab 32.49, an 3.34; di 0.86, wo 0.58, mt 2.09, hm 0.64	Kara Tioubé, n. Samarkand, Turkestan.	Not stated.	K. I. Timofeef, Ann. G. Min. Russ., XII, p. 82, 1910.	Granite.	
263	I.″4.1.3.	Q 30.90, or 33.36, ab 28.82; ac 1.39, di 2.13, hy 2.58	Camp. XIII, Peishan Range, Manchuria.	M. Dittrich.	K. Futterer, Durch Asien, II, (1), p. 329, 1905.	Quartz porphyry.	
264	I.4.1″.3.	Q 27.78, or 33.92, ab 27.77, an 3.61; di 0.49, hy 5.46	Yung-chang-hsien, Nanshan Mountains, Kwangsi, China.	C. Pfeil.	K. Futterer, Durch Asien, II, (2), p. 29, 1905.	Quartz porphyry.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. LIPARASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
265	72.21	11.20	2.25	2.66	0.08	0.27	4.29	4.81	1.45		0.44	0.10	0.10		99.86	
A2. II	1.204	.110	.014	.037	.002	.005	.069	.051			.006	.001	.001			
266	70.57	15.15	1.87	0.16	0.16	0.50	4.48	6.04	0.97		0.40	0.09	trace		100.39	
A2. II	1.176	.149	.012	.002	.004	.009	.073	.064			.005	.001				
267	67.51	13.69	1.68	2.83	0.18	0.61	4.65	5.45	2.77		0.53	0.05	0.01		99.96	
A2. II	1.125	.134	.011	.039	.005	.011	.075	.058			.007	—	—			
268	64.51	14.18	3.42	2.81	0.21	1.49	4.37	5.75	2.48		0.59	0.05	0.03		99.89	
A2. II	1.075	.139	.021	.039	.005	.027	.071	.062			.007	—	—			
269	75.28	14.24	n. d.	0.13	0.20	0.90	3.60	5.10	0.41		0.12	0.11			100.09	
A2. II	1.255	.140	—	.002	.005	.016	.058	.054			.002	.001				
270	74.12	13.66	0.48	0.63	0.41	0.88	3.15	5.34	0.76		0.09	0.20			99.72	
A2. II	1.235	.134	.003	.009	.010	.016	.051	.056			.001	.001				
271	72.0	14.9	0.3	0.2	0.3	0.8	4.1	4.2	2.7						99.5	
B3. IV	1.200	.146	.002	.003	.008	.014	.066	.045								
272	75.62	11.50	n. d.	1.39	0.39	1.95	3.17	4.68	1.65						100.35	
A4. IV	1.260	.113	—	.019	.010	.035	.052	.050								
273	74.20	11.75	1.92	1.30	0.30	0.19	4.25	5.00	0.27	0.06	0.13	none	0.02	CO_2 0.01 ZrO_2 0.38 Cl 0.17 F 0.02 S 0.10 NiO 0.03 BaO, SrO no.	100.12	2.62
A1. I	1.237	.115	.012	.018	.008	.003	.069	.053			.002	—	—			
274	72.38	12.21	3.36	0.69	0.17	0.18	3.52	5.20	0.86	0.69	0.25	trace	0.70	Cl 0.01 NiO 0.04 BaO none SrO none Li_2O none	100.26	2.47
A1. I	1.206	.120	.021	.010	.004	.003	.056	.055			.003	—	.010			
275	74.10	12.08	2.02	0.86	0.64	1.10	3.32	4.98	0.81	0.34	0.21	0.07	0.05		100.58	2.50
A2. II	1.235	.118	.013	.012	.016	.020	.053	.053			.003	—	—			
276	73.52	11.05	none	3.15	1.03	1.70	4.08	3.99	0.44	0.16	0.20	0.15			99.47	
A2. II	1.225	.109	—	.044	.026	.030	.066	.043			.003	.001				
277	73.10	13.09	1.19	1.43	0.43	0.87	4.03	4.92	0.54	none	0.39	0.11	none		100.10	2.38
A2. II	1.218	.128	.007	.019	.011	.016	.065	.052			.005	.001				
278	72.35	10.96	2.60	1.50	0.17	1.03	3.26	4.87	3.50	0.35	none	0.09	0.03		100.71	2.39
A2. II	1.206	.108	.016	.021	.004	.018	.053	.052			—	—	—			
279	76.52	12.73	0.48	0.62	0.14	0.75	3.58	4.59	0.37	0.17	0.07	0.02	0.12	CO_2 0.04 ZrO_2 none SO_3 none Cl trace S none Cr_2O_3 none V_2O_3 none NiO none BaO none SrO trace Li_2O trace Cu trace	100.20	
A1. I	1.275	.125	.003	.009	.004	.013	.058	.049			.001	—	.002			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. LIPAROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
265	I(II).″4.1.3.	Q 28.32, or 28.36, ab 30.92, ac 4.62, di 0.49, hy 3.63, mt 0.93, il 0.91, ap 0.34	Iibi, Dogo, Oki Islands, Japan.	K. Yokoyama	S. Kozu, Sci.Rep.Tohoku Un., (2), I, p. 37,1913.	Comendite.	
266	I.4.1.3.⊙	Q 20.28, or 35.58, ab 38.25, an 1.67, C 0.61, hy 0.40, il 0.30, hm 1.87, ru 0.24, ap 0.34	Terayama, Dogo, Oki Islands, Japan.	K. Yokoyama.	S. Kozu, Sci.Rep.Tohoku Un., (2), I, p. 42, 1913.	Rhyolite.	
267	I″.4.1.3″.	Q 17.40, or 32.25, ab 39.30, di 2.67, hy 1.88, mt 2.55, il 1.06	Nakamura, Dogo, Oki Islands, Japan.	K. Yokoyama.	S. Kozu, Sci.Rep.Tohoku Un., (2), I, p. 39; 1913.	Comendite.	
268	I(II).4″.1.3.	Q 13.68, or 34.47, ab 37.20, an 1.67, di 3.81, wo 0.58, mt 4.87, il 1.06	Utagi, Dogo, Oki Islands, Japan.	K. Yokoyama.	S. Kozu, Sci.Rep.Tohoku Un., (2), I, p. 45, 1913.	Trachyte.	
269	I.″4.1(2).3.	Q 33.12, or 30.02, ab 30.39, an 3.61, C 1.53, hy 0.50, il 0.30, ap 0.34	Lau Alas, Sumatra.	F. Riegner.	F. Riegner, In. Diss. Bres., p. 52, 1909.	Border of schliere in granite.	Cf.No.270 below and No. 48. II. 4. 2. 4.
270	I.(3)4.1(2).3.	Q 33.12, or 31.14, ab 26.72, an 3.61, C 1.43, hy 1.66, mt 0.70, il 0.15, ap 0.34	Lau Alas, Sumatra.	F. Riegner.	F. Riegner, In. Diss. Bres., p. 50, 1909.	Granite.	
271	I.″4.1(2).3″.	Q 29.82, or 25.02, ab 34.58, an 3.89, C 2.14, hy 0.93, mt 0.46	Manindjan Volcano, Sumatra.	H. Hoppe.	H. Hoppe, In. Diss. Bres., p. 52, 1903.	Pumice.	
272	I″.(3)4.1(2).3.	Q 34.26, or 27.80, ab 27.25, an 3.06, di 5.81, hy 0.60	Embonang Falls, Taisoui River, Hiton, Ambon Island, Moluccas.	D. Funk.	R. D. M. Verbeek, Jaarb. Mijnw., XXXIV, p. 230, 1905.	Liparite ("ambonite")	French ed., p. 243.
273	I″.″4.1.3.	Q 30.24, or 29.47, ab 32.49, hl 0.23, Z 0.55, ac 2.31, di 0.71, hy 1.62, mt 1.62, il 0.30	Mount Conowrin, Glass House Mountains, Queensland.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXI, p. 168, 1906.	Comendite.	
274	I.″4.1.3.	Q 31.80, or 30.58, ab 29.34, an 0.83, C 0.61, hy 0.40, mt 3.94, il 0.46, hm 0.64	Ngun-Ngun, Glass House Mountains, Queensland.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXI, p. 168, 1906.	Pantellerite.	
275	I.(3)4.1(2).3.	Q 33.06, or 29.47, ab 27.77, an 3.34, di 1.73, hy 0.80, mt 2.09, il 0.46, hm 0.64	Mount Barney, Queensland.	G. R. Patten.	A. R. Agric, Chem. Qld., 1914.	Rhyolite.	H. C. Richards, pers. com.
276	I(II).″4.1.3(4).	Q 28.62, or 23.91, ab 34.58, di 6.37, hy 4.77, il 0.46, ap 0.34	Enoggera, n. Brisbane, Queensland.	G. R. Patten.	A. R. Agric, Chem. Qld., 1914.	Granite.	H. C. Richards, pers. com.
277	I.4.1″.3.	Q 28.44, or 28.91, ab 34.06, an 3.06, di 0.46, hy 1.79, mt 1.62, il 0.76, ap 0.34	Springbrook, Queensland.	G. R. Patten.	A. R. Agric. Chem. Qld., 1914.	Rhyolite.	H. C. Richards, pers. com.
278	I″.(3)4.1.3.	Q 32.76, or 28.91, ab 27.77, an 0.83, di 2.10, wo 0.70, mt 3.71	Mount Lindsay, Queensland.	G. R. Patten.	A. R. Agric. Chem. Qld., 1914.	Pitchstone.	H. C. Richards, pers. com.
279	I.(3)4.1(2).3.	Q 35.76, or 27.24, ab 30.39, an 3.61, C 0.51, hy 1.32, mt 0.70, il 0.15	Ruby Parish, Buller County, New South Wales.	W. A. Greig.	J. E. Carne, N. S. W. G. S., Min. Res., 14, p. 85, 1911.	Granite.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. LIPARASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
280	76.28	11.41	1.60	0.72	0.15	0.62	3.97	4.54	0.40	0.16	0.20	0.17	0.06	CO_2 0.04 ZrO_2 none SO_3 none Cl none F none Cr_2O_3 none V_2O_3 none NiO none BaO none SrO trace	100.32	
A1. I	1.271	.112	.010	.010	.004	.011	.065	.048			.003	.001	—			
281	76.10	11.60	0.15	1.48	0.54	1.39	3.76	4.03	0.32	0.18	0.20	0.12	0.03	CO_2 0.36 SrO trace Li_2O trace	100.26	2.626
A2. II	1.268	.114	.001	.021	.014	.025	.061	.043			.003	.001	—			
282	74.74	13.57	1.20	0.27	0.32	0.26	3.89	4.48	0.57	0.26	0.36	0.05	trace	CO_2 0.02 ZrO_2 none Cl trace S none Cr_2O_3 none NiO none BaO 0.05 SrO trace V_2O_3 none Li_2O none	100.04	2.604
A1. I	1.246	.133	.008	.004	.008	.005	.063	.048			.005	—	—			
283	74.50	13.72	0.69	0.90	0.44	0.52	3.47	5.13	0.26	0.18	0.17	0.27	0.03	CO_2 0.04 ZrO_2 none SO_3 none Cl trace S 0.07 Cr_2O_3 none NiO none BaO 0.05 SrO none	100.44 (100.35)	2.693
A1. I	1.242	.134	.004	.013	.011	.009	.056	.054			.002	.002	—			
284	74.12	12.39	0.31	0.21	0.42	0.30	3.22	5.07	2.17	2.22		trace	trace	SO_3 trace	100.43 (100.33)	
A3. III	1.235	.121	.002	.003	.011	.005	.052	.055				—	—			
285	73.68	15.06	0.68	0.54	0.26	0.54	3.36	5.45	0.28	0.18	0.16	0.11	0.07	CO_2 0.01 ZrO_2 none SO_3 none Cl, F none Cr_2O_3 none V_2O_3 none NiO none BaO 0.04 SrO trace Li_2O none	100.42	2.658
A1. I	1.228	.147	.004	.007	.007	.010	.054	.058			.002	.001	.001			
286	73.93	12.19	1.80	0.99	0.44	0.76	3.32	4.95	1.13	0.15	0.10	0.05	0.04	ZrO_2 none SrO trace Li_2O trace	100.05	2.645
A2. II	1.232	.120	.011	.014	.011	.014	.053	.053			.001	—	—			
287	67.68	13.99	3.20	1.98	0.34	0.84	5.30	4.87	1.05	0.65	0.20	0.04	0.02	CO_2 0.02 ZrO_2 none SO_3 none Cl trace Cr_2O_3 none V_2O_3 none NiO none BaO none SrO trace Li_2O trace	100.18	2.617
A1. I	1.118	.137	.020	.028	.009	.015	.085	.052			.003	—	—			
288	75.74	12.45	1.02	n. d.	0.08	1.00	2.91	6.77	0.33						100.30	2.635
A3. III	1.262	.122	.006	(.012)	.002	.018	.047	.072								
289	73.30	13.84	0.82	1.22	0.82	0.84	3.12	4.89	0.50	0.19	0.20	0.08	0.15	SO_3 none Cl none NiO none Li_2O none	99.97	
A1. I	1.222	.136	.005	.017	.021	.015	.050	.052			.003	—	.002			
290	62.56	17.89	4.98	0.45	0.18	0.72	5.06	5.13	0.73	1.30	0.38	0.11	trace	SO_3 trace Cl none Li_2O trace	99.49	2.504
A2. II	1.043	.175	.031	.007	.005	.013	.082	.054			.005	.001				
291	72.30	14.64	1.21	0.24	0.32	0.32	4.38	6.04	0.24	0.20	0.36	0.04	0.11	CO_2 0.10 Cl 0.03 FeS_2 0.15	100.68	
A1. I	1.205	.142	.008	.003	.008	.005	.071	.064			.005	—	.002			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. LIPAROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
280	I.(3)4.1.3″.	Q 34.98, or 26.69, ab 33.54, ac 0.46, hy 0.86, wo 0.46, mt 1.62, il 0.46, hm 0.32, ap 0.34	Middle Creek, Tingha District, New South Wales.	H. P. White.	J. E. Carne, N. S. W. G. S., Min. Res., 14, p. 63, 1911.	Granite.	
281	I.(3)4.1″.3″.	Q 34.86, or 23.91, ab 31.96, an 2.78, di 2.81, hy 2.22, mt 0.23, il 0.46, ap 0.34	Hillend, New South Wales.	W. G. Stone.	A. R. Dep. Min. N. S. W. (1911), 1912, p. 198.	Quartz felsite.	
282	I.(3)4.1.3″.	Q 33.72, or 26.69, ab 33.01, an 1.39, C 1.73, hy 0.80, il 0.61, hm 1.20	Mumbedah Creek, Lincoln County, New South Wales.	J. C. H. Mingaye.	A. R. Dep. Min. N. S. W. (1908), 1909, p. 184.	Aplitic granite.	
283	I.(3)4.1.3.	Q 33.60, or 30.02, ab 29.34, an 0.56, C 2.24, hy 2.08, mt 0.93, il 0.30, ap 0.67	Broken Hill, New South Wales.	J. C. H. Mingaye.	A. R. Dep. Min. N. S. W. (1909), 1910, p. 198.	Granite.	
284	I.(3)4.1.3.	Q 34.26, or 30.58, ab 27.24, an 1.39, C 0.92, hy 1.23, mt 0.46	Wantialable Creek, Gowen County, New South Wales.	J. C. H. Mingaye.	G. W. Card, Rec. G. S. N. S. W., IV, p. 116, 1895.	Trachyte.	In W. T., p. 153.
285	I.″4.1.3.	Q 31.98, or 32.25, ab 28.30, an 1.95, C 2.86, hy 0.96, mt 0.93, il 0.30, ap 0.34	Tenterfield, New England, New South Wales.	J. C. H. Mingaye.	E. C. Andrews, Rec. G. S. N. S. W., VIII (3), p. 200, 1907.	Granite.	
286	I.(3)4.1(2).3.	Q 33.30, or 29.47, ab 27.77, an 3.89, hy 1.36, mt 2.55, il 0.15	Rivertree, New South Wales.	W. A. Greig.	Dep. Min. N. S. W., A. R., (1912), p. 198, 1913.	Granite.	
287	I″.4″.1.3(4).	Q 16.08, or 28.91, ab 44.54, di 3.19, mt 4.64, il 0.46	Dungarry Parish, Dubbo, New South Wales.	H. P. White.	A. R. Dep. Min. N. S. W., (1905), 1906, p. 165.	Trachyte.	
288	I.″4.1.(2)3.	Q 30.78, or 40.03, ab 24.63, an 0.83, di 3.52	Ensay, Omeo, Victoria.	A. W. Howitt.	A. W. Howitt, Tr. R. Soc. Vict., XXII, p. 97, 1886.	Aplite.	In W. T., p. 153.
289	I.″4.1″.3.	Q 32.88, or 28.91, ab 26.20, an 4.17, C 1.94, hy 3.55, mt 1.16, il 0.46	Buffalo Mountains, Victoria.	P. G. W. Bayley.	D. V. Mahoney, Mem. G. S. Vict., No. 6, p. 8, 1908.	Granite.	
290	I″.4(5).1″.3(4).	Q 12.12, or 30.02, ab 42.97, an 2.78, C 2.96, hy 0.50, mt 0.46, il 0.76, hm 4.64, ap 0.34	McAlisters Creek, Newnham, Macedon, Victoria.	A. G. Hall.	Skeats and Summers, G. S. Vict., B. 24, p. 25, 1912.	Trachyte.	
291	I.4.1.3.⊙	Q 22.62, or 35.58, ab 37.20, an 1.39, C 0.20, hy 0.80, il 0.76, hm 1.28	Minnipa Hill, South Australia.	W. S. Chapman.	R. L. Jack, G. S. So. Aust., B. 1, p. 12, 1912.	Granite.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. LIPARASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
292	71.48	14.73	1.14	1.16	0.25	0.54	2.74	5.68	1.08	0.32	0.35	0.04	0.10	CO_2 0.12 Cl 0.04 FeS_2 0.14	99.91	
A1. I	1.191	.144	.007	.016	.006	.010	.044	.061			.004	—	.001			
293	76.15	11.78	0.94	1.59	0.42	0.30	3.99	4.23	0.46		0.15	0.19	0.08	CO_2 none	100.28	
A2. II	1.269	.116	.006	.022	.011	.005	.065	.045			.002	.001	.001			
294	75.46	11.27	1.17	2.05	0.27	0.53	3.45	4.88	0.28	0.07	0.05	none	trace	CO_2 none SO_3 trace Cl trace	99.93	2.353
A2. II	1.258	.111	.008	.029	.007	.009	.056	.052			—	—	—			
295	75.05	14.74	0.16	0.34	0.05	0.78	4.32	4.02	0.41	0.20	0.07	0.04	01.0	CO_2 none SO_3 0.07	100.37	
A2. II	1.251	.145	.001	.005	.001	.014	.069	.043			—	—	.001			
296	74.75	13.77	0.60	0.58	0.36	0.30	4.51	4.30	0.17	0.23	none	0.12	0.06	CO_2 none	99.75	
A2. II	1.246	.135	.004	.008	.009	.005	.073	.046			—	.001	—			
297	72.85	13.79	1.32	0.87	0.53	0.90	2.77	5.61	0.95	0.10	0.12	0.35	0.01	CO_2 none	100.17	
A2. II	1.214	.135	.008	.012	.013	.016	.045	.060			.002	.002	—			
298	73.55	13.19	0.89	1.49	0.37	0.96	4.45	4.32	0.37	0.04	0.23	none	0.10	CO_2 none Cl trace NiO 0.01 Li_2O trace	99.97	2.376
A2. II	1.226	.129	.006	.021	.009	.017	.072	.046			.003	—	.001			
299	73.08	11.98	n. d.	2.12	0.23	1.93	3.58	6.57	0.29	0.23		0.01		Cl trace	100.02	
A4. IV	12.18	.118	(.010)	(.009)	.006	.034	.058	.070								

RANG 1. PERALKALIC. LIPARASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	69.48	14.19	3.89	1.47	0.68	0.90	5.32	4.34	0.72				0.12		101.11	2.63
B3. IV	1.158	.139	.024	.020	.017	.016	.085	.046					.002			
2	65.89	19.73	2.03	0.75	0.27	0.46	6.59	3.95	0.34		none	none	trace	CO_2 0.44	100.45	
A2. II	1.098	.193	.013	.010	.007	.008	.106	.042				—	—			
3	76.70	12.98	0.25	n. d.	0.06	0.54	4.92	4.14	0.59		trace	0.31		CO_2 trace	100.53	
A3. III	1.278	.127	.002	(.004)	.002	.010	.079	.044			—	.002				
4	69.90	16.78	0.47	2.00	0.48	0.74	4.84	3.64	0.78	0.28	0.39	0.09	0.06	CO_2 0.17	100.62	
A2. II	1.165	.164	.003	.028	.012	.013	.077	.038			.005	—	—			
5	77.00	13.60	0.41	n. d.	none	0.70	5.78	1.50	0.48	0.23	0.07	trace	none		99.77	
A3. III	1.283	.133	.003	(.006)	—	.013	.094	.016			.001	—	—			
6	73.72	13.22	1.48	1.72	0.66	0.65	4.52	2.90	0.36	0.10	0.34		trace	CO_2 0.15	99.82	
A3. III	1.229	.130	.009	.024	.017	.012	.073	.031			.004		—			
7	71.73	15.00	1.54	1.05	0.86	0.69	4.69	2.90	0.94	0.14	0.35		trace	CO_2 0.19 S trace	100.08	
A3. III	1.196	.147	.010	.015	.022	.013	.076	.031			.004					
8	69.64	13.04	4.15	1.98	0.32	0.54	5.46	3.55	0.69		0.55				99.92	
A3. III	1.161	.128	.026	.028	.008	.010	.088	.038			.007					

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. LIPAROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
292	I.(3)4.1″.″3.	Q 31.74 hy 1.39 or 33.92 mt 1.62 ab 23.06 il 0.61 an 2.78 C 2.96	Paney Bluff, South Australia.	W. S. Chapman.	R. L. Jack, G. S. So. Aust., B. 1, p. 15, 1912.	Porphyry.	
293	I.(3)4.1.3.	Q 34.74 hy 3.08 or 25.02 mt 1.39 ab 34.06 il 0.30 an 0.56 ap 0.34 C 0.81	Near Kumara, Taramaku River, New Zealand.	J. S. Maclaurin.	P. G. Morgan, N. Z. G. S., B. 13, p. 79, 1911.	Granite porphyry.	
294	I.(3)4.1.3.	Q 34.62 di 1.43 or 28.91 hy 2.74 ab 29.34 mt 1.86 an 0.83	Mayers Island, New Zealand.	A. G. Hall?	A. R. Sec. Min. Vict., (1907), 1908, p. 63.	Obsidian.	
295	I.″4.1(2).3(4).	Q 32.64 hy 0.76 or 23.91 mt 0.23 ab 36.15 an 3.89 C 1.94	Mount Albert, Waitahu, Reefton District, New Zealand.	Not stated.	P. G. Morgan, pers. com.	Microgranite.	
296	I.″4.1.3(4).	Q 30.90 hy 1.43 or 25.58 mt 0.93 ab 38.25 ap 0.34 an 0.56 C 1.43	Mokihinui, Westport District, New Zealand.	Not stated.	P. G. Morgan, pers. com.	Aplite.	To be pub. in N. Z. G. S. B. 17.
297	I.(3)4.1″.″3.	Q 33.06 hy 1.56 or 33.36 mt 1.16 ab 23.58 il 0.30 an 2.50 ap 0.67 C 2.14	Mokihinui, Westport District, New Zealand.	Not stated.	P. G. Morgan, pers. com.	Granite.	To be pub. in N. Z. G. S. B. 17.
298	I.4.1″.3(4).	Q 28.14 di 1.40 or 25.58 hy 1.79 ab 37.73 mt 1.39 an 3.06 il 0.46	Admiralty Island, South Pacific.	E. J. Dunn.	A. R. Sec. Min. Vict., (1911), 1912, p. 62.	Obsidian.	Spearhead.
299	I(II).4.1.″3.	Q 25.26 ac 4.62 or 38.92 di 3.53 ab 25.15 wo 2.20	Bounty Island, South Pacific.	R. Morgan.	Speight and Finlayson, Subant. Islds. of N. Z., p. 739, 1909.	Granite.	

SUBRANG 4. DOSODIC. KALLERUDOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I″.4.1.(3)4.	Q 19.86 di 1.73 or 25.58 hy 0.90 ab 44.55 mt 5.10 an 2.22 hm 0.32	Rigaud Mountain, Quebec.	O. E. Le Roy.	O. E. Le Roy, B. G. S. A., XII, p. 389, 1901.	Quartz syenite porphyry.	
2	I.4(5).1.4.	Q 12.18 hy 0.70 or 23.35 mt 2.32 ab 55.54 hm 0.48 C 4.59	Methuen Township, Ontario.	N. N. Evans.	Adams and Barlow, Tr. R. Soc. Can., II (4), p. 54, 1909.	Syenite.	Also in Can. G. S. Mem. 6, p. 298, 1910.
3	I.″4.1.(3)4.	Q 31.68 hy 0.73 or 24.46 ap 0.67 ab 41.39 an 0.83 C 0.10	Arisaig, Nova Scotia.	W. H. Twenhope.	W. H. Twenhope, A. J. S., XXVIII, p. 159, 1909.	Rhyolite.	
4	I.4.1(2).″4.	Q 25.02 di 3.84 or 21.13 mt 0.70 ab 40.35 il 0.76 an 3.61 C 3.67	Long Island, n. Portland, Maine.	W. C. Wheeler.	U. S. G. S. rec. lab.	Granite porphyry.	
5	I.(3)4.1(2).4(5).	Q 35.22 hy 0.66 or 8.90 il 0.15 ab 49.25 an 3.61 C 1.02	Fallon Hill, Enfield, Massachusetts.	G. Steiger.	B. K. Emerson, U. S. G. S. B. 228, p. 40, 1904.	Aplite.	
6	I.(3)4.1(2).4.	Q 33.18 hy 3.15 or 17.24 mt 2.09 ab 38.25 il 0.61 an 3.34 C 1.43	Neponset Valley, Massachusetts.	W. T. Hall.	F. Bascom, J. Ac. N. Sci. Phil., (2), XV, p. 148, 1912.	Rhyolite.	Center of dike.
7	I.″4.1(2).4.	Q 30.30 hy 2.33 or 17.24 mt 2.32 ab 39.82 il 0.61 an 3.61 C 2.75	Neponset Valley, Massachusetts.	W. T. Hall.	F. Bascom, J. Ac. N. Sci. Phil., (2), XV, p. 148, 1912.	Rhyolite.	Border of dike.
8	I″.4.1.4.	Q 23.10 di 1.73 or 21.13 mt 4.87 ab 46.11 il 1.06 an 0.56 hm 0.76	West Lynn, Essex County, Massachusetts.	S. J. Schofield.	C. H. Clapp, pers. com.	Quartz keratophyre.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. LIPARASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
9	76.34	11.60	2.41	0.30	0.06	0.55	5.50	2.75	0.39	0.10	0.26	trace	trace	CO_2 trace BaO 0.09 SrO none Li_2O none	100.35	
A1. I	1.272	.114	.015	.004	.002	.010	.089	.029			.003	—	—			
10	70.20	14.22	1.14	1.24	0.48	2.14	5.39	4.82	0.33		0.24	trace	trace	SO_3 trace	100.20	2.63
A3. III	1.170	.139	.007	.017	.012	.038	.087	.051			.003	—	—			
11	74.80	15.46	1.04	n. d.	0.11	0.82	4.80	2.52	0.31						99.86	
A4. IV	1.247	.152	.007	(.014)	.003	.014	.077	.027								
12	72.80	15.50	2.04	0.60	0.08	0.52	5.70	2.52	0.27	0.16					100.19	
A3. III	1.213	.152	.013	.008	.002	.009	.092	.027								
13	72.56	12.33	0.80	0.82	trace	trace	5.36	3.08	4.59		0.20		trace		99.74	2.37
A3. III	1.209	.121	.005	.012	—	—	.087	.032			.003		—			
14	77.31	12.45	0.43	0.33	none	0.50	4.72	3.84	0.40	0.42	0.06	none	0.01	ZrO_2 none F 0.15 S none BaO none	100.62	
A1. I	1.289	.122	.003	.005	—	.009	.076	.040			.001	—	—			
15	75.92	12.96	0.33	1.40	trace	0.15	4.60	4.15	0.32	0.16	0.05	trace	0.04	CO_2 0.03 F 0.12 BaO trace SrO none Li_2O trace	100.23	
A1. I	1.265	.127	.002	.019	—	.003	.074	.044			—	—	—			
16	66.90	14.86	0.93	3.41	0.31	1.23	5.56	5.02	0.31	0.16	0.43	0.12	0.15	F 1.00 BaO 0.14 SrO none Li_2O 0.06	100.59	
A1. I	1.115	.146	.006	.048	.008	.021	.090	.053			.005	.001	.002			
17	68.40	17.99	2.66	1.63	0.49	0.67	4.54	3.54	0.52				0.21		100.65	
A3. III	1.140	.176	.017	.022	.012	.012	.073	.037					.003			
18	74.93	13.11	0.51	0.77	0.23	0.30	5.64	4.28	0.28	0.04	0.07	trace	trace	CO_2 none Cl trace	100.16	2.37
A2. II	1.249	.128	.003	.011	.006	.005	.091	.046			.001	—	—			
19	74.23	13.65	0.84	1.04	0.23	0.75	4.87	3.96	0.19		0.08	trace	trace	CO_2 none Cl trace	99.84	2.56
A2. II	1.237	.134	.005	.014	.006	.013	.079	.042			.001	—	—			
20	74.19	12.85	1.60	0.98	0.11	0.12	5.86	3.98	0.10	0.16	0.09	trace	trace	CO_2 none ZrO_2 trace Cl trace BaO trace Li_2O trace	100.04	2.66
A2. II	1.237	.126	.010	.014	.003	.002	.105	.042			.001	—	—			
21	74.01	13.08	1.38	1.21	trace	0.13	5.78	4.31	0.16	0.10	0.11	trace	trace	CO_2 none ZrO_2 trace Cl trace Li_2O trace	100.27	2.38
A2. II	1.234	.128	.009	.017	—	.002	.094	.046			.001	—	—			
22	70.94	13.96	1.74	1.69	0.12	1.13	5.64	4.03	0.45	0.09	0.30	0.10	0.15	CO_2 none ZrO_2 0.05 S none NiO none BaO 0.06 SrO trace	100.45	
A1. I	1.182	.137	.011	.024	.003	.020	.091	.043			.004	.001	.002			
23	75.40	13.56	0.21	0.61	0.07	0.38	4.64	4.40	0.94	0.44	0.04	0.09	trace		100.78	
A2. II	1.257	.133	.001	.008	.002	.007	.075	.047			—	—	—			
24	71.45	14.53	0.49	0.94	0.30	2.01	7.15	2.55	0.38	0.15	0.16	0.09	trace	CO_2 0.08 S trace BaO 0.03 SrO none	100.31	
A1. I	1.191	.142	.003	.013	.008	.036	.116	.028			.002	—	—			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 4. DOSODIC. KALLERUDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
9	I.(3)4.1.4.	Q 33.60 ac 1.85 or 16.12 di 0.43 ab 44.54 wo 0.93 mt 0.23 il 0.46 hm 1.60	Monterey, Franklin County, Pennsylvania.	H. N. Stokes.	F. Bascom, U. S. G. S. B. 150, p. 348, 1898.	Aporhyolite.	In W. T., p. 155.
10	I''.4''.1.(3)4.	Q 17.04 di 4.32 or 28.36 wo 2.09 ab 45.59 mt 1.62 an 0.28 il 0.46	Carlisle, Union County, South Carolina.	Hardin and Robertson.	E. Sloan, S. C. G. S. B. 2, p. 199, 1908.	Granite.	
11	I.(3)4.1(2).4.	Q 34.68 hy 2.15 or 15.01 ab 40.35 an 3.87 C 3.47	Flat Shoals, Meriwether County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9A, p. 77, 1902.	Granite.	
12	I.4.1''.4.	Q 28.14 hy 0.20 or 15.01 mt 1.86 ab 48.21 hm 0.80 an 2.50 C 4.49	Endeavor, Fox River Valley, Wisconsin.	W. W. Daniells.	Hobbs and Leith, B. Un. Wisc. 158, p. 262, 1907.	Aporhyolite.	
13	I.''4.1.4.	Q 29.46 hy 0.53 or 17.79 mt 1.16 ab 45.59 il 0.46 C 0.20	Checkerboard Creek, Castle Mountains, Montana.	L. V. Pirsson.	Weed and Pirsson, U. S. G. S. B. 139, p. 125, 1896.	Rhyolite.	In W. T., p. 155.
14	I.(3)4.1.(3)4.	Q 34.98 hy 0.13 or 22.24 mt 0.70 ab 39.82 il 0.15 an 1.39 fl 0.31 C 0.10	St. Peters Dome, Colorado Springs quadrangle, Colorado.	G. Steiger.	W. Cross, U. S. G. S. B. 419, p. 100, 1910.	Aplitic granite.	
15	I.''4.1.(3)4.	Q 32.04 hy 2.24 or 24.46 mt 0.46 ab 38.78 an 0.83 C 0.61	Near Florissant, Pikes Peak District, Colorado.	W. F. Hillebrand.	E. B. Mathews, U. S. G. S. B. 148, p. 160, 1897.	Granite.	In W. T., p. 155.
16	I(II).4(5).1.(3)4.	Q 11.34 di 3.62 or 29.47 hy 4.06 ab 47.16 mt 1.39 an 0.83 il 0.76 ap 0.34	Twin Creek Pikes Peak, Colorado.	W. F. Hillebrand.	E. B. Mathews, U. S. G. S. B. 148, p. 160, 1897.	Granite gneiss.	In W. T., p. 155.
17	I.4.1(2).''4.	Q 26.16 hy 2.26 or 20.57 mt 3.94 ab 38.25 an 3.34 C 5.41	San Mateo Mountain, Mount Taylor Region, New Mexico.	T. M. Chatard.	U. S. G. S. B. 148, p. 185, 1897.	Lava (rhyolite?).	In W. T., p. 155.
18	I.4.1.(3)4.	Q 26.52 ac 1.39 or 25.58 ns 0.73 ab 42.97 di 1.18 hy 1.32 il 0.15	Sitgreaves Peak, San Francisco Mountains, Arizona.	H. H. Robinson.	H. H. Robinson, U. S. G. S. P. P. 76, p. 108, 1913.	Rhyolite.	
19	I.4.1(2).(3)4.	Q 28.26 hy 1.66 or 23.35 mt 1.16 ab 41.39 il 0.15 an 3.61	Marble Hill, San Francisco Mountains, Arizona.	H. H. Robinson.	H. H. Robinson, U. S. G. S. P. P. 76, p. 106, 1913.	Granite porphyry.	
20	I''.4.1.''4.	Q 25.50 ac 4.62 or 23.35 ns 1.34 ab 44.01 di 0.43 hy 0.10 il 0.15	Fremont Peak, San Francisco Mountains, Arizona.	H. H. Robinson.	H. H. Robinson, U. S. G. S. P. P. 76, p. 113, 1913.	Riebeckite granite porphyry.	
21	I.4.1.(3)4.	Q 25.50 ac 4.16 or 25.58 ns 0.37 ab 42.97 wo 0.23 il 0.15	San Francisco Mountain, Arizona.	H. H. Robinson.	H. H. Robinson, U. S. G. S. P. P. 76, p. 109, 1913.	Riebeckite rhyolite.	
22	I.4.1.''4.	Q 20.76 di 2.88 or 23.91 wo 0.23 ab 47.68 mt 2.55 an 0.83 il 0.61 ap 0.30	Mount Sanford, Copper River Basin, Alaska.	G. Steiger.	U. S. G. S. B. 228, p. 271, 1904.	Augite andesite.	
23	I.4.1.(3)4.	Q 30.12 hy 1.12 or 25.02 mt 0.23 ab 40.35 an 1.95 C 0.41	Antelope Valley, John Day Basin, Oregon.	F. C. Calkins.	F. C. Calkins, Un. Cal. B. Dep. G., III, p. 156, 1902.	Rhyolite.	
24	I''.4''.1.4''.	Q 16.62 ac 0.92 or 15.57 di 4.21 ab 59.73 wo 2.09 mt 0.23 il 0.30	Near Big Bend, Rogue River, Port Orford quadrangle, Oregon.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. Fol. 89, p. 4, 1903.	Dacite porphyry.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. LIPARASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
25	75.64	12.68	1.07	n. d.	trace	0.83	4.98	3.51	1.58						100.29	
A4. IV	1.261	.124	.007	(.014)	—	.014	.080	.037								
26	67.23	14.70	2.85	1.15	1.39	2.91	6.89	1.70	0.79		0.08	trace	0.12	CO_2 trace ZrO_2 none Cl 0.02 FeS_2 0.02 BaO none Cu 0.04 Pb none	99.89	
A1. I	1.121	.144	.018	.017	.035	.051	.111	.018			.001	—	.002			
27	76.33	12.89	1.17	0.32	0.08	0.72	5.45	2.49	0.35			0.01			99.81	2.34
A3. III	1.272	.126	.008	.004	.002	.013	.088	.027				—				
28	73.61	13.01	2.66	0.51	0.53	1.34	6.69	2.02	0.04			trace			100.41	2.355
A3. III	1.227	.127	.017	.007	.013	.024	.108	.021				—				
29	72.70	13.79	1.01	n. d.	0.65	2.07	4.93	4.33	1.10						100.48	2.359
A4. IV	1.212	.135	.006	(.012)	.016	.038	.079	.046								
30	69.00	14.48	1.25	1.01	0.36	2.34	6.00	2.76	2.19			0.24			99.63	2.385
A3. III	1.150	.142	.008	.014	.009	.042	.097	.030				.002				
31	75.20	12.65	1.53	0.28	0.26	0.60	5.67	4.14	0.12		0.12		0.10		100.67	
A2. II	1.253	.124	.010	.005	.007	.011	.091	.044			.002		.001			
32	71.17	15.84	0.82	0.65	0.27	0.67	4.38	3.96	1.05	0.31	0.19	0.27	0.23	CO_2 0.52 S 0.04 BaO 0.04	100.41	
A1. I	1.186	.155	.005	.009	.007	.013	.071	.042			.002	.002	.003			
33	70.74	17.00	1.61	0.98	trace	0.82	7.17	1.92	0.34		trace				100.58	
A3. III	1.179	.167	.010	.014	—	.014	.116	.020			—					
34	71.60	13.60	2.40	n.d.	0.21	2.30	5.55	3.53	0.70						99.89	
A4. IV	1.193	.133	.015	(.030)	.005	.041	.089	.037								
35	70.17	15.07	0.88	1.79	1.11	1.13	2.69	5.73	0.70	0.18	0.41	0.34	0.12	Cl 0.06 F 0.15 S 0.04 Li_2O 0.11 B_2O_3 trace	100.68	
A1. I	1.170	.148	.006	.025	.028	.020	.044	.061			.005	.002	.002			
36	71.40	13.40	0.93	4.16	0.10	0.44	6.20	2.23	0.90	0.13		0.14		SrO 0.01	100.04	2.66
A3. III	1.190	.131	.006	.058	.003	.008	.100	.023				.001				
37	71.18	14.89	2.11	1.21	0.14	0.82	6.85	1.70	0.64	0.24	0.48				100.26	
A3. III	1.186	.146	.013	.017	.004	.014	.111	.018			.006					
38	76.10	11.39	n. d.	2.70	0.59	0.60	4.65	2.95	0.90		0.07				99.95	
A4. IV	1.235	.112	—	.038	.015	.011	.075	.032			.001					
39	71.65	13.90	2.64	0.24	0.09	0.10	6.65	4.22	n. d.						99.49	
A4. IV	1.194	.136	.016	.003	.002	.002	.107	.045								
40	71.65	13.04	2.79	1.80	trace	trace	6.30	3.98	1.10		trace		trace		100.66	
A3. III	1.194	.128	.018	.025	—	—	.102	.042			—		—			
41	71.30	13.53	2.33	1.75	0.70	0.67	5.77	3.02	0.56		0.51	0.03	0.07		100.24	
A2. II	1.188	.133	.014	.025	.018	.012	.094	.032			.006	—	.001			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 4. DOSODIC. KALLERUDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
25	I.″4.1.″4.	Q 31.44 di 1.73 or 20.57 hy 0.92 ab 41.92 an 1.95	Cerro de los Navajos, n. Tulancingo, Mexiço.	F. Baerwald.	C. A. Tenne, Z. D. G. G., XXXVII, p. 616, 1885.	Obsidian.	In W. T., p. 155.
26	I(II).4″.1(2).4(5).	Q 14.70 di 7.78 or 10.01 mt 3.94 ab 58.16 il 0.15 an 4.17	Mazaruni District, British Guiana.	J. B. Harrison.	J. B. Harrison, G. Goldf. Br. Gui., p. 77, 1908.	Pyroxene granitite.	In W. T., p. 155.
27	I.″4.1″.4.	Q 33.36 di 0.43 or 15.01 mt 0.93 ab 46.11 hm 0.64 an 3.06	Encañada, Guamani Volcano, Ecuador.	E. Esch.	E. Esch, in W. Reiss, Ecuador, I, p. 71, 1901.	Obsidian.	
28	I″.4.1.4″.	Q 25.32 ac 0.92 or 11.68 di 2.81 ab 55.54 wo 1.14 mt 1.62 hm 1.28	Urcu-cui, Antisana Volcano, Ecuador.	F. von Wolff.	E. Esch, in W. Reiss, Ecuador, I, p. 81, 1901.	Liparite.	
29	I″.4.1″.(3)4.	Q 23.16 di 6.43 or 25.58 ab 41.40 an 2.78	Cerro del Quinche, Quito, Ecuador.	A. Lagorio.	A. Lagorio, T. M. P. M., VIII, p. 444, 1887.	Obsidian.	In W. T., p. 155.
30	I″.4.1(2).4.	Q 19.38 di 4.17 or 16.68 hy 0.58 ab 50.83 mt 1.86 an 4.17 ap 0.67	Inca-loma, Cotopaxi Volcano, Ecuador.	A. Young.	A. Young, Hochgeb. Rep. Ec., II, (2), p. 256, 1902.	Biotite andesite.	
31	I″.4.1.(3)4.	Q 26.76 ac 4.62 or 24.46 ns 0.12 ab 41.92 di 2.51 il 0.30	Cnoc an Droighinn, n. Inchnadampf, Sutherland, Scotland.	W. Pollard.	J. J. H. Teall, Mem. G. S. Un. K., N. W. Highlands, p. 449, 1907.	Aegirite felsite.	
32	I.″4.1.(3)4.	Q 29.04 hy 1.36 or 23.35 mt 1.16 ab 37.20 il 0.30 an 1.67 ap 0.67 C 3.67	Inversnaid, Scotland.	W. Pollard.	G. S. Un. K., Sum. Prog., 1903, p. 57.	Orthoclase porphyry.	
33	I.4.1″.4(5).	Q 19.86 hy 0.53 or 11.12 mt 2.32 ab 60.78 an 3.89 C 1.73	Ledmore, Assynt, Scotland.	A. Gemmell.	A. Gemmell, Tr. Edin. G. Soc., IX, (5), p. 418, 1910.	Aegirite aplite.	
34	I″.4.1.4.	Q 21.30 di 8.27 or 20.57 ab 46.64 an 1.95	Carrock Fell, England.	G. Barrow.	A. Harker, Q. J. G. S., LI, p. 129, 1895.	Granophyre.	In W. T., p. 155.
35	I″.″4.1(2).″3.	Q 28.20 hy 4.91 or 33.92 mt 1.39 ab 23.06 il 0.76 an 3.61 ap 0.67 C 3.06	Lamorua, Lands End, Cornwall.	W. Pollard.	Reid and Flett, Mem. G. S. Eng., Sh. 351, p. 59, 1907.	Granite.	
36	I″.4.1.4.	Q 23.22 hy 7.16 or 12.79 mt 1.39 ab 52.40 ap 0.34 an 1.39 C 0.31	Y Trefan, Nant Ffrancon, Caernarvonshire, Wales.	H. W. Greenwood.	C. B. Travis, Pr. Liverp. G. Soc., X, (5), p. 315, 1909.	Rhyolite.	
37	I.4.1(2).4(5).	Q 22.80 hy 0.40 or 10.01 mt 2.55 ab 58.16 il 0.91 an 3.89 hm 0.32 C 0.31	Carn Llidi, St. Davids Head, Pembrokeshire, Wales.	J. V. Elsden.	J. V. Elsden, Q. J. G. S., LXIV, p, 283, 1908.	Aplite.	
38	I.(3)4.1.4.	Q 31.50 di 1.43 or 17.79 hy 5.66 ab 39.30 il 0.15 an 1.39	Bonne, Brittany, France.	Pisani.	L. Vandernotte, Mass. Armor., p. 48, 1913.	Rhyolite.	
39	I″.4.1.″4.	Q 18.42 ac 7.39 or 25.02 di 0.46 ab 47.68 hy 0.36	Col de Salto, Corsica.	J. Deprat.	J. Deprat B. Ser. Ct. G. Fr., XVII, No. 114, p. 40, 1906.	Micropegmatite.	
40	I(II).4.1.″4.	Q 20.34 ac 7.39 or 23.35 hy 3.04 ab 45.06 mt 0.46	Hougnatten, Sandsvär Parish, Norway.	L. Schmelck.	W. C. Brögger, Eg. Kg., I, p. 127, 1894.	Soda granite.	In W. T., p. 155.
41	I″.4.1.4.	Q 23.34 di 1.11 or 17.79 hy 2.06 ab 49.25 mt 3.25 an 1.95 il 0.91	Kiruna, Lapland, Sweden.	Lundbohm.	O. Stutzer, N. J. B. B., XXIV, p. 570, 1907.	Keratophyre.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. LIPARASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
42	70.08	13.83	2.97	1.04	1.10	0.83	5.33	3.84	0.47		0.40	0.02	0.02	S 0.04	99.97	
A2, II	1.168	1.36	.019	.014	.028	.014	.085	.040			.005	—	—			
43	67.81	14.92	1.42	0.80	1.71	2.83	6.45	3.01	0.30		0.78	0.02	0.06	CO_2 0.28 S 0.07	100.47	
A2, II	1.130	.146	.009	.011	.043	.051	.104	.032			.010	—	.001			
44	73.63	12.89	n. d.	2.46	0.57	1.37	5.28	3.67	0.81						100.68	
A4, IV	1.227	.126	—	.034	.014	.025	.085	.039								
45	71.78	13.65	2.04	0.96	0.19	1.16	6.12	4.15	0.46						100.51	
A3, III	1.196	.134	.013	.014	.005	.021	.098	.044								
46	70.70	13.13	2.73	0.69	0.49	1.15	4.94	4.41	1.49		0.03		0.13		99.89	
A2, II	1.178	.129	.017	.010	.012	.021	.080	.046			—		.002			
47	67.39	16.24	1.14	2.29	1.05	4.33	4.50	1.24	0.77		0.47	0.14	0.07	S 0.01	99.64	2.72
A2, II	1.123	.159	.007	.032	.026	.077	.073	.013			.006	.001	.001			
48	72.11	15.85	1.63	n. d.	0.69	0.83	4.85	4.23	0.68						100.87	2.624
A4, IV	1.202	.155	.010	(.020)	.017	.014	.078	.045								
49	75.55	11.09	0.58	1.51	0.88	0.39	4.36	3.51	1.32	0.26	0.24				99.69	2.687
A3, III	1.259	.109	.004	.021	.022	.007	.070	.037			.003					
50	76.47	13.28	0.26	0.24	0.15	0.58	5.27	3.68	0.21	0.07	trace				100.21	2.68
A3, III	1.275	.130	.002	.003	.004	.010	.085	.039			—					
51	74.96	13.78	0.74	0.58	0.36	0.58	4.78	3.66	0.49	0.09	0.28				100.30	2.65
A3, III	1.249	.135	.005	.008	.009	.010	.077	.039			.004					
52	72.11	14.58	0.57	n. d.	0.29	2.63	6.64	2.23	0.69						99.74	2.66
A3, III	1.202	.143	.004	(.008)	.007	.046	.107	.023								
53	76.52	14.17	0.54	n. d.	0.20	0.61	4.24	3.66	0.92					B_2O_3 trace	100.86	2.59
A3, III	1.275	.139	.003	(.003)	.005	.011	.068	.039								
54	72.93	13.34	n. d.	2.29	0.70	1.26	5.01	3.97	0.75		trace	trace	trace		100.25	2.63
A4, IV	1.216	.131	—	.032	.018	0.22	.081	.042			—	—	—			
55	65.27	13.50	4.40	2.52	0.55	0.85	5.19	4.21	1.98	0.14	1.09	0.17	0.27		100.14	
A2, II	1.088	.132	.028	.035	.014	.015	.084	.045			.014	.001	.003			
56	76.35	13.38	0.64	0.23	0.23	0.51	5.75	2.37	0.58						100.04	2.617
A3, III	1.272	.131	.004	.003	.006	.009	.093	.026								21°
57	68.54	15.47	2.03	2.09	0.21	0.30	5.68	5.75	0.59		0.14	0.10			100.90	2.622
A2, II	1.142	.152	.013	.029	.005	.005	.092	.062			.002	.001				

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 4. DOSODIC. KALLERUDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
42	I''.4.1''.4.	Q 21.90 di 0.65 or 22.24 hy 2.50 ab 44.54 mt 2.09 an 3.06 il 0.76 hm 1.60	Tuolluvaara, Lapland, Sweden.	G. Nyblom.	P. Geijer, G. Kir. Dist., p. 208, 1910.	Quartz porphyry.	
43	I(II).4(5).1''.4.	Q 12.60 di 8.86 or 17.79 hy 0.20 ab 54.49 mt 0.46 an 2.78 il 1.52 hm 1.12	Kirunavaara, Lapland, Sweden.	K. Schröder.	P. Geijer, G. Kir. Dist., p. 49, 1910.	Syenite porphyry.	
44	I''.4.1.''4.	Q 24.08 di 5.48 or 21.68 hy 3.08 ab 44.54 an 0.56	Ornö, Sweden.	R. Mauzelius.	A. Cederström, G. F. F., XV, p. 111, 1893.	Granite.	In W. T., p. 155.
45	I.4.1.''4.	Q 19.50 ac 3.70 or 24.46 di 3.32 ab 47.16 wo 0.81 mt 1.16	Östra Solsjön, Baldersnäs, Dalsland, Sweden.	D. Hummel.	P. J. Holmquist, B. Un. Ups., VII, p. 218, 1906.	Granite gneiss.	
46	I''.4.1.(3)4.	Q 23.16 di 2.59 or 25.58 wo 0.70 ab 41.92 mt 2.78 an 0.83 hm 0.80	Ragunda, Jemtland, Sweden.	H. Santesson.	A. G. Högbom, Afh. Sv. G. Und., No. 182, p. 45, 1899.	Granite.	Not in W. T.
47	I''.4.1.4''.	Q 24.90 hy 5.24 or 7.23 mt 1.62 ab 38.25 il 0.91 an 20.29 ap 0.34	Mans Ols, Sala, Sweden.	G. Nyblom.	H. J. Sjögren, G. F. F., XXXII, p. 1371, 1910.	Porphyrite.	
48	I.4.1(2).(3)4.	Q 23.94 hy 4.34 or 25.02 ab 40.87 an 3.81 C 1.84	Griesbach, Petersthal, Baden.	Thürach.	F. Schalch, Sp. Kte. Bad., Bl. Petersthal, No. 83, p. 31, 1895.	Granite.	In W. T., p. 155.
49	I.(3)4.1.(3)4.	Q 34.32 di 1.14 or 20.57 hy 3.48 ab 36.68 mt 0.93 an 0.56 il 0.46	Ardez, Lower Engadine, Switzerland.	O. Züst.	O. Züst, In Diss. Zür., p. 18, 1905.	Granite.	
50	I.''4.1.''4.	Q 30.60 di 0.89 or 21.68 hy 0.10 ab 44.54 mt 0.46 an 1.67	Piz Dado, Punteglia Gebiet, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Aplite.	
51	I.''4.1''.''4.	Q 31.44 hy 0.90 or 21.68 mt 0.93 ab 40.35 il 0.61 an 2.78 hm 0.16 C 0.92	Piz Tumbif, Punteglia Gebiet, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Quartz porphyry.	
52	I.4.1''.4''.	Q 20.88 di 3.50 or 12.79 wo 2.09 ab 56.07 an 3.61	Hohmad, Aarmassif, Switzerland.	O. Fischer.	O. Fischer, T. M. P. M., XXIV, p. 83, 1905.	Aplite.	
53	I.(3)4.1''.(3)4.	Q 36.00 hy 1.29 or 21.68 ab 35.63 an 3.06 C 2.14	Longone, Elba.	P. Aloisi.	P. Aloisi, Mem. Soc. Tosc. Sc. Nat., XXVI, p. 20, 1910.	Aplite.	
54	I''.4.1.''4.	Q 23.88 di 3.32 or 23.35 hy 4.34 ab 42.44 an 2.22	Groppo del Vescovo, n. Parma, Italy.	M. Ferrari.	M. Ferrari, Mem. Ac. Linc., (5), VIII, No. 21, p. 730, 1911.	Quartz porphyry.	
55	I(II).4.1.(3)4.	Q 17.10 di 1.94 or 25.02 hy 0.50 ab 44.01 mt 5.57 an 0.83 il 2.13 hm 0.64 ap 0.34	Costa Zichidi, Pantelleria.	H. S. Washington.	H. S. Washington, J. G., XXI, p. 688, 1913.	Trachyte (gibelite).	
56	I.''4.1''.4.	Q 32.04 hy 0.60 or 14.46 mt 0.70 ab 48.73 hm 0.16 an 2.50 C 0.31	Magnitnaya Gora, South Ural Mountains, Russia.	J. Morozewicz.	J. Morozewicz, T. M. P. M., XXIII, p. 118, 1904.	Quartz keratophyre.	
57	I''.4(5).1.(3)4.	Q 12.06 ac 0.92 or 34.47 di 0.43 ab 47.16 hy 2.08 mt 3.02 il 0.30 ap 0.34	Ekone-Sungale Volcano, Kamerun.	A. Lindner.	A. Hintze, Jb. Pr. G. L.-A., XXVIII, p. 321, (1907), 1910.	Riebeckite granite.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. LIPARASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
58	72.71	12.80	2.64	1.48	0.10	0.58	6.50	3.87	0.48				trace		101.16	
B3. IV	1.212	.125	.016	.021	.003	.010	.105	.041					—			
59	70.99	14.84	3.76	0.35	0.14	0.60	5.94	2.40	0.40				trace		99.42	
B3. IV	1.183	.145	.024	.005	.004	.011	.096	.025					—			
60	71.42	14.09	1.41	2.32	0.08	0.80	6.01	3.52	0.85						100.50	
A3. III	1.190	.138	.009	.032	.002	.014	.097	.037								
61	74.72	13.38	1.29	0.77	0.35	0.18	4.27	3.94	1.46				trace		100.36	
A3. III	1.245	.131	.008	.011	.009	.003	.069	.041					—			
62	73.44	14.35	0.50	n. d.	0.39	0.53	5.74	3.82	0.67			trace			99.44	
A3. III	1.224	.141	.003	(.006)	.010	.009	.093	.040				—				
63	72.02	14.44	1.32	1.04	0.41	0.98	6.10	4.26	0.35			trace	trace	SO_3 trace	100.92	
A3. III	1.200	.142	.008	.014	.010	.018	.098	.045				—	—			
64	71.98	14.48	0.88	0.92	0.28	0.76	5.98	3.71	0.85			trace	trace		99.84	
A3. III	1.200	.142	.006	.013	.007	.014	.097	.039				—	—			
65	70.36	16.90	0.91	n. d.	trace	0.48	5.92	5.04	1.30						100.91	
A4. IV	1.173	.166	.006	(.012)	—	.009	.095	.053								
66	74.02	13.56	1.93	1.09	0.23	0.56	5.80	2.06	1.05				trace	Li_2O trace	100.30	
A3. III	1.234	.133	.012	.015	.006	.010	.094	.022								
67	73.50	15.35	0.76	n. d.	0.76	none	4.69	3.88	1.20						100.20	
A3. III	1.225	.150	.005	(.010)	.019	—	.076	.041								
68	73.10	13.12	2.65	0.52	0.32	0.87	5.24	2.33	0.47	0.32	0.46	0.35			99.75	
A2. II	1.218	.129	.017	.007	.008	.016	.084	.025			.006	.002				
69	70.47	14.49	3.40	0.33	0.16	0.52	5.32	4.00	0.39	0.07	0.35	0.13			99.63	
A2. II	1.175	.142	.021	.005	.004	.009	.085	.043			.004	.001				
70	68.28	17.08	1.58	1.03	0.14	0.26	5.68	4.62	0.12	0.41	0.23	0.10			100.13	
A2. II	1.138	.167	.010	.014	.004	.005	.092	.049			.003	.001				
71	72.68	15.59	0.45	0.06	trace	1.02	5.15	4.13	0.39						99.47	
B3. IV	1.211	.153	.003	.001	—	0.18	.083	.044								
72	72.60	12.63	1.50	1.68	0.11	0.86	5.16	4.21	0.58		0.07		trace	F 0.70	100.10	2.643
A2. II	1.210	.124	.009	.024	.003	.015	.084	.044			.001		—			
73	70.44	16.22	1.38	1.26	0.36	0.92	7.33	1.95	n. d.						99.68	
A3. III	1.174	.159	.009	.018	.009	.016	.118	.021								

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 4. DOSODIC. KALLERUDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
58	I(II).4.1.″4.	Q 21.54 ac 7.39 or 22.80 ns 0.61 ab 44.02 di 2.45 hy 1.78	Green Mountain, Ascension Island, Atlantic Ocean.	C. Klement.	A. Renard, Challenger Reps., Petr. Oc. Islds., p. 52, 1889.	Obsidian.	In W. T., p. 157.
59	I.4.1″.4.	Q 25.86 hy 0.40 or 13.90 mt 1.16 ab 50.30 hm 3.04 an 3.01 C 1.33	Weather Post Hill, Ascension Island, Atlantic Ocean.	C. Klement.	A. Renard, Challenger Reps., Petr. Oc. Islds., p. 47, 1889.	Trachyte.	In W. T., p. 157.
60	I.4.1.4.⊙	Q 20.58 di 2.45 or 20.57 hy 1.95 ab 50.83 mt 2.09 an 1.11	Riding School, Ascension Island, Atlantic Ocean.	R. Reinisch.	R. Reinisch, D. Sudpol. Exp., II (7), p. 647, 1912.	Rhyolite obsidian.	
61	I.(3)4.1.(3)4.	Q 34.02 hy 1.30 or 22.80 mt 1.86 ab 36.15 an 0.83 C 1.84	Barachit, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 100, 1909.	Quartz bostonite.	
62	I.4.1.4.⊙	Q 23.58 di 0.22 or 22.24 hy 1.79 ab 48.73 an 2.22	Senafé, Adi Caieh, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 99, 1909.	Quartz bostonite.	
63	I.4.1.″4.	Q 18.54 ac 0.46 or 25.02 di 3.89 ab 50.83 wo 0.12 mt 1.62	Alid Volcano, Buia, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 120, 1909.	Dacite.	
64	I.4.1.4.⊙	Q 21.00 di 1.86 or 21.68 hy 0.70 ab 50.83 mt 1.39 an 1.67	Toguilé, Digsa, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 97, 1909.	Paisanite.	
65	I.4″.1.(3)4.	Q 15.30 hy 1.58 or 29.47 ab 49.78 an 2.50 C 0.92	Senafé, Adi Caieh, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 98, 1909.	Bostonite.	
66	I.(3)4.1″.4.	Q 30.54 hy 1.00 or 12.23 mt 2.78 ab 49.25 an 2.78 C 0.71	Dahamis, Hagher Mountains, Socotra Island, Red Sea.	E. Ludwig.	A. Pelikan, Ds. Ak. Wiss. Wien, LXXI, p. 78, 1902.	Dahamite (riebeckite grorudite).	
67	I.″4.1.(3)4.	Q 29.64 hy 3.22 or 22.80 ab 39.82 C 3.37	Ampangarinana, Nosy Komba, Madagascar.	Pisani.	A. Lecroix, Mat. Min. Mad., I, p. 55, 1902.	Bostonite.	
68	I.(3)4.1.4.	Q 32.28 hy 0.80 or 13.90 mt 0.23 ab 44.01 il 0.91 an 2.50 hm 2.56 C 1.12 ap 0.67	Mount Betandroka, Sakalave Region, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVII, p. 19, 1913.	Rhyolite.	
69	I.4.1.″4.	Q 23.46 hy 0.40 or 23.91 mt 0.23 ab 44.54 il 0.61 an 1.67 hm 3.20 C 0.82 ap 0.34	Mount Antsutrotro, Madagascar.	Boiteau.	A. Lacroix, pers. com.	Aegirite micro-granite.	
70	I.4″.1.(3)4.	Q 16.98 hy 0.53 or 27.24 mt 2.32 ab 48.21 il 0.46 an 0.56 ap 0.34 C 2.45	Marovitsika, Ankaratra, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVI, p. 176, 1913.	Aegirite trachyte.	
71	I.4.1(2).(3)4.	Q 24.78 mt 0.23 or 24.46 hm 0.32 ab 43.49 an 5.00 C 0.82	Angara River, Jenissei District, Siberia.	N. E. Podopaev.	A. Meister, Expl. G. Reg. Aurif. Sib., IX, p. 199, 1910.	Granite.	Border of dike.
72	I″.4.1.(3)4.	Q 24.84 ac 1.85 or 24.46 di 3.56 ab 41.92 hy 0.76 mt 1.16 il 0.15	Rudikovka River, Jenissei District, Siberia.	A. Semenchenko.	A. Meister, Expl. G. Reg. Aurif. Sib., IX, p. 218, 1910.	Soda granite.	F high.
73	I.4″.1(2).4(5).	Q 17.40 hy 2.09 or 11.68 mt 2.09 ab 61.83 an 4.45 C 0.41	Marekanka River, n. Ochotsk, Siberia.	Y. F. Gervé.	K. E. Bogdanowitch, Fund. Marek., p. 11, 1904?	Granite.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. LIPARASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
74	67.80	18.25	2.45	0.23	0.18	0.84	4.62	3.42	1.78				trace		99.57	2.62
A3. III	1.130	.179	.015	.003	.005	.015	.074	.036					—			
75	74.78	11.94	2.46	0.88	0.16	0.07	4.77	3.99	0.28	0.19	0.17	trace	0.08	Nio 0.03 BaO none SrO none Li_2O none	99.80	2.70
A1. I	1.246	.117	.015	.013	.004	.001	.077	.042			.002	—	.001			
76	72.73	13.57	0.69	1.43	0.42	1.00	4.98	3.74	0.95	0.50	trace	0.07	0.04		100.12	2.43
A2. II	1.212	.133	.004	.019	.011	.018	.081	.039			—	—	—			
77	72.02	12.60	0.32	3.29	0.55	1.95	4.84	2.82	0.20	0.30	0.69	0.11	0.04	CO_2 none	99.73	2.61
A2. II	1.200	.123	.002	.046	.014	.035	.078	.030			.009	.001	——			
78	72.06	13.86	1.90	1.71	0.19	0.18	5.84	3.69	0.33	0.21	0.12	0.06	0.07	CO_2 0.03 ZrO_2 none SO_3 none Cl trace Cr_2O_3 trace V_2O_3 trace NiO none BaO none SrO trace	100.25	2.625
A1. I	1.201	.136	.012	.024	.005	.003	.094	.039			.002	—	.001			
79	69.23	14.58	2.54	0.67	0.30	0.44	6.82	3.95	0.94		0.13		trace	NiO 0.05	99.65	
A2. II	1.154	.153	.016	.010	.008	.008	.110	.042			.002					
80	71.56	17.27	n. d.	0.78	trace	1.06	6.82	2.13	0.26			0.22		SO_3 0.35	100.45	
A3. III	1.193	.169	—	.011	—	.019	.110	.022				.002				
81	66.68	14.63	2.18	2.31	0.30	1.88	6.12	4.02	0.83	0.38	0.20	0.28	0.49	CO_2 0.05 ZrO_2 trace SO_3 trace Cl 0.03 S 0.05 Cr_2O_3 none V_2O_3 none BaO none SrO none	100.43	2.618
A1. I	1.111	.143	.014	.032	.008	.034	.099	.043			.003	.002	.007			
82	67.06	17.40	2.24	0.84	0.26	0.34	5.88	4.10	0.62	0.71	0.16	trace	trace	SO_3 none Cl trace	99.61	2.559
A2. II	1.118	.171	.014	.012	.007	.006	.095	.044			.002	—	—			
83	66.86	16.34	2.38	1.99	0.22	0.92	6.01	4.07	0.41	0.18	0.21	trace	trace	SO_3 none Cl trace Li_2O trace	99.59	2.646
A2. II	1.114	.160	.015	.028	.006	.016	.097	.044			.003					
84	76.19	13.49	0.55	0.38	0.06	0.59	4.71	3.79	0.66	0.13	0.06		none		100.61	
A2. II	1.270	.132	.003	.005	.002	.011	.076	.040			—					
85	69.01	14.21	2.23	2.89	0.62	2.11	6.30	2.07	0.09		0.58	0.12			100.23	
A2. II	1.150	.139	.014	.040	.016	.038	.102	.022			.007	.001				
86	73.25	12.60	0.34	2.65	0.51	trace	5.37	3.95	0.75		trace				99.42	
A3. III	1.221	.123	.002	.037	.013	—	.087	.042			—					

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 4. DOSODIC. KALLERUDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
74	I.4.1(2).″4.	Q 26.10, or 20.02, ab 38.77, an 4.17, C 5.51, hy 0.50, mt 0.70, hm 1.92	Kekva River, n. Okhotsk, Siberia.	Y. F. Gervé.	K. E. Bogdanowitch, Fund. Marek., p. 57, 1904?	Dacite.	
75	I.″4.1.(3)4.	Q 31.86, or 23.35, ab 39.30, ac 0.92, di 0.22, hy 0.30, mt 2.78, il 0.30, hm 0.16	Mount Coolum, Yandina, Queensland.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXI, p. 168, 1906.	Comendite.	
76	I.4.1(2).″4.	Q 26.10, or 21.68, ab 42.44, an 3.61, di 1.18, hy 2.48, mt 0.93	Glen Rock, Esk, Queensland.	G. R. Patten.	A. R. Agric, Chem. Qld., 1914.	Rhyolite.	H. C. Richards, pers. com.
77	I(II).4.1(2).4.	Q 27.36, or 16.68, ab 40.87, an 4.17, di 4.05, hy 3.94, mt 0.46, il 1.37, ap 0.34	Ottaba, Esk, Queensland.	G. R. Patten.	A. R. Agric, Chem. Qld., 1914.	Rhyolite.	H. C. Richards, pers. com.
78	I.4.1.4.⊙	Q 22.86, or 21.68, ab 49.25, an 0.83, hy 1.95, mt 2.78, il 0.30	The Young Man, Canobolas Mountains, New South Wales.	H. P. White.	Sussmilch and Jensen, Pr. Linn Soc. N. S. W., XXXIV, p. 191, 1909.	Trachytic rhyolite.	
79	I.4(5).1.4.	Q 13.50, or 23.35, ab 57.64, an 0.28, di 1.51, hy 0.10, mt 1.86, il 0.30, hm 1.28	Cadiangelong Creek, Canobolas Mountains, New South Wales.	H. I. Jensen.	Sussmilch and Jensen, Pr. Linn. Soc. N. S. W., XXXIV, p. 191, 1909.	Comendite.	
80	I.4.1″.4″.	Q 21.96, or 12.23, ab 57.64, an 3.34, C 2.55, hy 1.45, ap 0.67	Broken Hill, New South Wales.	J. C. H. Mingaye.	J. B. Jaquet, Mem. G. S. N. S. W., No. 5, p. 51, 1894.	Granite.	Not in W. T.
81	I(II).4(5).1.4.	Q 12.06, or 23.91, ab 51.87, an 0.28, di 6.26, hy 0.46, mt 3.25, il 0.46, ap 0.68	Mount Jellore, Mittagong, New South Wales.	D. Mawson.	Taylor and Mawson, Pr. R. Soc. N. S. W., XXXVII, p. 341, 1903.	Trachyte.	
82	I.4″.1.″4.	Q 15.90, or 24.46, ab 49.78, an 1.67, C 2.65, hy 0.70, mt 2.32, il 0.30, hm 0.64	Hanging Rock, Macedon, Victoria.	A. G. Hall.	Skeats and Summers, G. S. Vict. B. 24, p. 22, 1912.	Sölvsbergite.	
83	I.4(5).1(2).″4.	Q 13.20, or 24.46, ab 50.83, an 4.45, C 0.31, hy 1.92, mt 3.48, il 0.46	Brock's Monument, Macedon, Victoria.	A. G. Hall.	Skeats and Summers, G. S. Vict. B. 24, p. 20, 1912.	Sölvsbergite.	
84	I.(3)4.1″(3)4.	Q 34.88, or 22.24, ab 39.82, an 3.06, C 0.51, hy 0.46, mt 0.70	Paku Islana, Tairua, New Zealand.	H. S. Washington.	J. P. Iddings, pers. com.	Phonolitic rhyolite.	
85	I(II).4.1(2).4″.	Q 19.26, or 12.23, ab 53.45, an 4.17, di 4.67, hy 1.76, mt 3.25, il 1.06, ap 0.34	Deception Island, South Shetland Islands.	Boiteau.	E. Gourdon, pers. com.	Trachyte.	
86	I″.4.1.″4.	Q 25.26, or 23.35, ab 42.44, ac 0.92, ns 0.49, hy 6.18	Wandel Island, Graham Land, Antarctica.	Pisani.	E. Gourdon, Exp. Ant. Fr., Pet. vol., p. 200, 1908.	Microgranite (paisanite).	Also in C. R., CXLIV, p. 1226, 1907.

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. LIPARASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	73.07	14.88	0.04	2.93	1.30	0.66	6.17	0.46	0.90		0.41			NiO none	100.82	
A3. III	1.218	.146	—	.040	.033	.012	.100	.005			.005					
2	72.33	12.99	none	2.50	0.97	1.73	7.60	none	1.09		0.74			CO_2 1.00	100.95	
A3. III	1.206	.127	—	.035	.024	.030	.123	—			.009					
3	75.46	13.18	0.91	n. d.	0.10	0.95	6.88	1.09	0.93						99.50	2.42
A3. III	1.258	.129	.006	(.012)	.003	.017	.111	.012								
4	72.51	13.10	2.81	0.90	0.20	1.84	6.76	0.33	0.35	0.04	0.31	0.06	0.20	CO_2 0.76 FeS_2 none BaO none	100.17	
A1. I	1.209	.128	.018	.013	.005	.033	.109	.004			.004	—	.003			
5	71.26	11.87	0.10	2.12	1.08	2.88	6.73	0.05	2.71	0.62	0.28	0.10	0.06	F 0.01 FeS_2 0.26	100.13	
A2. II	1.188	.116	.001	.029	.027	.052	.108	.001			.004	.001	.001		(100.12)	
6	77.29	14.62	trace	—	0.38	trace	7.60	0.16	0.57						100.62	
A3. III	1.288	.143	—	—	.010	—	.122	.002								
7	72.50	17.00	1.17	n. d.	0.74	0.20	6.28	0.77	1.62						100.28	
A4. IV	1.208	.167	.007	(.014)	.019	.004	.102	.008								
8	71.20	17.60	1.74	n. d.	1.17	0.76	6.20	0.85	1.37						100.89	
A4. IV	1.187	.172	.011	(.022)	.029	.014	.100	.009								
9	73.10	13.20	0.26	3.60	0.92	0.59	6.30	0.35	1.10		0.92				100.34	
A3. III	1.218	.129	.002	.050	.023	.011	.102	.004			.012					
10	67.10	15.55	1.53	3.92	1.34	0.30	5.65	0.85	2.90		0.55				99.69	
A3. III	1.118	.152	.010	.054	.034	.005	.091	.009			.008					
11	75.06	13.65	1.78	0.02	0.19	0.74	7.65	0.16	0.70				trace		99.95	2.52
A3. III	1.251	.134	.011	—	.005	.013	.124	.002								
12	78.77	12.44	0.95	n. d.	0.02	0.53	6.79	0.24	0.26	0.14					100.14	2.614
A3. III	1.313	.122	.006	(.012)	.001	.010	.110	.003								
13	77.66	12.30	0.61	0.17	0.73	0.16	6.96	0.19	0.46	0.33		trace			99.57	2.634
A3. III	1.294	.121	.004	.003	.018	.003	.112	.002								
14	75.06	14.21	1.31	0.27	0.09	0.42	6.88	0.58	0.62	0.56	none	0.03	0.04	SO_3 0.11 V_2O_3 none Li_2O none	100.18	2.604
A2. II	1.251	.139	.008	.004	.002	.007	.111	.006			—	—	—			

RANG 2. DOMALKALIC. TOSCANASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	69.65	14.68	3.01	1.01	0.32	1.02	0.22	9.25	0.74		0.44		0.04		100.38	
A2. II	1.161	.144	.019	.014	.008	.018	.003	.099			.005		—			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 5. PERSODIC. NOYANGOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I''.''4.1(2).5.	Q 29.76, or 2.78, ab 52.40, an 3.34, C 2.96, hy 7.92, il 0.76	University Mine, Cobalt, Ontario.	R. E. Hore.	R. E. Hore, J. G., XVIII, p. 275, 1910.	Aplitic soda granite.	
2	I(II).4.1.5.	Q 23.22, ab 64.45, an 1.11, di 0.71, hy 5.47, il 1.37, cc 2.30	University Mine, Cobalt, Ontario.	N. L. Bowen.	N. L. Bowen, J. Can. Min. Inst., XII, p. 523, (1909), 1910.	Aplitic soda granite.	Fresh?
3	I.4.1.(4)5.	Q 28.92, or 6.67, ab 58.16, an 1.67, di 2.67, hy 0.50	Berkeley, California.	C. Palache.	C. Palache, B. Dep. G. Cal. Un., I, p. 67, 1894.	Soda rhyolite.	In W. T., p. 157.
4	I.''4.1(2).5.	Q 29.76, or 2.22, ab 57.11, an 4.17, hy 0.50, mt 2.78, il 0.61, hm 0.96	Rudhanah-Airde, Argyllshire, Scotland.	E. G. Radley.	J. S. Flett, Mem. G. S. Scot., G. Knapd., p. 94, 1911.	Porphyry.	
5	I(II).4.1.5.	Q 25.56, or 0.56, ab 56.59, an 1.95, di 9.71, hy 1.16, mt 0.23, il 0.61, ap 0.34	Kettlestown, Linlithgow, Scotland.	G. S. Blake.	J. D. Falconer, Tr. R. Soc. Edin., XLV, p. 147, 1908.	Felsite?	
6	I.''4.1.5.	Q 32.04, or 1.11, ab 63.93, C 1.94, hy 1.00	Near Rathdrum, County Wicklow, Ireland.	F. H. Hatch.	F. H. Hatch, Geol. Mag., (3), VI, p. 70, 1889.	Quartz kerato-phyre.	In W. T., p. 157.
7	I.''4.1.''5.	Q 30.42, or 4.45, ab 53.45, an 1.11, C 5.41, hy 3.75	Prat-meur, Brittany, France.	Not stated.	C. Barrois, VIII Cong. G. Int., Guide Exc., VII, p. 21, 1900.	Euritic aplite.	In W. T., p. 157.
8	I.4.1(2).''5.	Q 27.24, or 5.00, ab 52.40, an 3.89, C 5.00, hy 5.80	Rostellec, Brittany, France.	Not stated.	C. Barrois, VIII Cong. G. Int., Guide Exc., VII, p. 21, 1900.	Euritic aplite.	In W. T., p. 157.
9	I(II).(3)4.1(2).5.	Q 30.06, or 2.22, ab 53.45, an 3.06, C 1.22, hy 7.05, mt 0.46, il 1.82	Begon, Brittany, France.	Pisani.	L. Vandernotte, Mass. Armor., p. 66, 1913.	Albitophyre.	
10	I(II).''4.1.''5.	Q 26.28, or 5.00, ab 47.68, an 1.39, C 4.79, hy 8.15, mt 2.32, il 1.22	Deux Evailles, Brittany, France.	Pisani.	L. Vandernotte, Mass. Armor., p. 41, 1913.	Microgranite.	
11	I.4.1.5.⊙	Q 28.14, or 1.11, ab 64.97, an 2.22, di 1.08, hm 1.78	Uli River, n. Okhotsk, Siberia.	Not stated.	K. E. Bogdanovitch, Fund. Marek., p. 17, 1904?	Dacite.	
12	I.(3)4.1.5.	Q 36.18, or 1.67, ab 57.64, an 2.50, di 0.25, hy 1.55	Noyang, Victoria.	A. W. Howitt.	A. W. Howitt, Tr. R. Soc. Vict., XX, p. 46, 1884.	Quartz porphyrite.	In W. T., p. 157.
13	I.(3)4.1.5.	Q 35.16, or 1.11, ab 58.69, an 0.83, C 0.41, hy 1.80, mt 0.70, hm 0.16	Noyang, Victoria.	A. W. Howitt.	A. W. Howitt, Tr. R. Soc. Vict., XX, p. 41, 1884.	Quartz porphyrite.	In W. T., p. 157.
14	I.''4.1.5.	Q 31.98, or 3.34, ab 58.16, an 1.95, C 1.53, hy 0.20, mt 0.93, hm 0.61	Raymond Terrace, New South Wales.	W. A. Grieg.	G. W. Card, pers. com.	Rhyolite.	

SUBRANG 1. PERPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.''4.(1)2.1.	Q 30.30, or 55.04, ab 1.57, an 5.00, C 2.45, hy 0.80, mt 2.09, il 0.76, hm 1.60	Pidjastjäkko, Jukkasjärvi, Lapland, Sweden.	H. Santesson.	F. Svenonius, Sv. G. Und., No. 183, p. 15, 1900.	Porphyry.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	72.26	13.58	2.97	0.75	0.03	1.24	2.18	5.69	0.57	0.09					99.36	
B3. IV	1.204	.133	.019	.010	.001	.022	.035	.061								
2	70.90	14.59	0.39	n. d.	0.45	1.40	1.84	6.11	2.23	0.73				FeS_2 2.03	100.67	2.546
B3. IV	1.182	.143	.002	(.004	.011	.025	.030	.065								
3	73.17	13.34	1.35	0.76	0.81	1.32	1.80	7.10	0.54			0.07		BaO 0.10	100.36	
A2. II	1.220	.131	.008	.011	.020	.023	.029	.076				—				
4	64.83	16.68	3.74	1.22	0.79	2.85	0.86	7.56	0.92					ZrO_2 0.35 BaO 0.11	99.91	
A2. II	1.081	.164	.023	.017	.020	.051	.014	.081								
5	66.20	14.33	2.09	1.93	0.89	1.39	2.58	7.31	0.83	0.48	0.65	0.25	0.13	CO_2 0.36 ZrO_2 0.02 SO_3 none Cl trace FeS_2 0.12 BaO 0.18 SrO trace	99.74	
A1. I	1.103	.140	.013	.026	.044	.025	.042	.078			.008	.002	.002			
6	66.32	15.06	4.59	0.53	0.86	1.63	1.32	6.82	1.28		trace	0.18	trace	ZrO_2 none S 0.05 Cr_2O_3 none Sb 0.14 PbO 0.09 CuO 0.03 ZnO 0.27 CoO 0.15 BeO none	99.32	
A1. I	1.105	.148	.029	.007	.022	.029	.021	.072			—	.001	—			
7	73.97	12.66	1.35	1.00	0.55	1.08	2.38	6.21	0.79		0.15	0.05	0.08		100.27	
A2. II	1.233	.124	.009	.014	.014	.020	.039	.066			.002	—	.001			
8	73.92	12.78	0.86	1.54	0.45	1.05	2.27	6.39	0.75		0.16	0.08	0.11		100.36	
A2. II	1.232	.125	.005	.021	.011	.019	.037	.068			.002	—	.002			
9	72.71	12.98	1.27	1.48	0.77	1.44	2.25	6.10	0.84		0.22	0.08	0.14		100.28	
A2. II	1.212	.127	.008	.021	.019	.026	.036	.065			.003	—	.002			
10	72.46	12.80	2.02	0.73	0.59	1.37	2.52	6.27	0.44		0.65		0.44		100.29	
A2. II	1.208	.125	.013	.010	.015	.025	.040	.067			.008		.006			
11	72.27	14.63	3.17	n. d.	0.45	1.33	1.97	5.67	0.40		0.31		0.52		100.72	
A4. IV	1.205	.143	.020	(.040)	.011	.023	.032	.061			.004		.007			
12	72.24	13.52	1.40	1.04	0.49	1.28	1.81	6.40	0.81		0.23	0.15	0.17	BaO 0.09	99.63	
A2. II	1.202	.132	.009	.014	.012	.023	.029	.068			.003	.001	.002			
13	68.55	16.46	0.85	0.56	0.17	4.17	1.92	5.59	n. d.		0.35		0.52	F 1.89	101.03 .80	
A2. II	1.143	.161	.005	.008	.004	.075	.031	.060			.004		.008		100.23	
14	68.36	13.24	1.29	3.39	1.15	2.51	2.05	5.34	2.63				0.27		100.23	
A3. III	1.139	.130	.008	.048	.029	.045	.033	.057					.004			
15	65.98	15.00	2.35	1.47	0.79	1.58	2.91	7.47	0.88		0.54	0.20	0.14	CO_2 0.50 S 0.03 BaO 0.15	99.99	
A2. II	1.100	.147	.015	.020	.020	.029	.047	.080			.007	.001	.002			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 2. DOPOTASSIC. DELLENOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.″4.″2.2(3).	Q 34.98 hy 0.10 or 33.92 mt 2.32 ab 18.34 hm 1.44 an 6.12 C 1.53	Westerly, Rhode Island.	I. A. Williams.	I. A. Williams, A. G., XXXV, p. 37, 1905.	Granite.	
2	I.(3)4.2.2″.	Q 32.82 hy 2.03 or 36.14 pr 2.03 ab 15.72 an 6.95 C 2.35	Homestake Mine, Lead, South Dakota.	W. J. Sharwood.	W. J. Sharwood, Ec. Geol., VI, p. 734, 1911.	Rhyolite.	
3	I.″4.2.2.	Q 31.26 hy 2.40 or 42.26 mt 1.86 ab 15.20 an 6.39 C 0.31	Antelope Hills, Iron Springs District, Utah.	R. D. Hall.	Leith and Harder, U. S. G. S. B. 338, p. 58, 1908.	Trachyte.	
4	I″.4.2(3).(1)2.	Q 23.16 hy 2.00 or 45.04 mt 3.94 ab 7.34 hm 0.91 an 14.18 C 1.84 Z 0.55	Antelope Range, Iron Springs District, Utah.	R. D. Hall.	Leith and Harder, U. S. G. S. B. 338, p. 58, 1908.	Trachyte.	
5	I(II).4.(1)2.2(3).	Q 17.52 hy 5.32 or 43.37 mt 3.02 ab 21.48 il 1.22 an 5.56 ap 0.67	Ajax Mine, Cripple Creek, Colorado.	W. F. Hillebrand.	Lindgren and Ransome, U. S. G. S. P. P. 54, p. 45, 1906.	Granite.	
6	I″.″4.2.2.	Q 28.38 hy 2.20 or 40.03 mt 1.62 ab 11.00 hm 3.52 an 7.23 ap 0.34 C 2.96	Cerro Mercado, Durango, Mexico.	H. W. Nichols.	O. C. Farrington, Field Col. Mus., G. Ser., II, p. 224, 1904.	Rhyolite.	
7	I.″4.(1)2.2(3).	Q 32.82 hy 1.93 or 36.70 mt 2.09 ab 20.44 il 0.30 an 5.28	Edeby, Stockholm, Sweden.	R. Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 258, 1906.	Granite.	
8	I.″4.″2.2(3).	Q 32.22 hy 3.21 or 37.81 mt 1.16 ab 19.39 il 0.30 an 5.28 C 0.10	Svalnäs, Rydboholm, Sweden.	R. Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 258, 1906.	Granite.	
9	I.″4.2.2(3).	Q 31.38 hy 3.48 or 36.14 mt 1.86 ab 18.86 il 0.46 an 7.23	Alby, Rydboholm, Sweden.	R. Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 258, 1906.	Granite.	
10	I.″4.(1)2.2(3).	Q 30.48 di 1.51 or 37.25 hy 0.80 ab 20.96 mt 1.86 an 5.00 il 1.22 hm 0.80	Gamhed, Fjällbacka, Bohuslän, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 260, 1906.	Granite.	
11	I″.(3)4.2.2″.	Q 32.82 hy 6.78 or 33.92 il 0.61 ab 16.77 an 6.39 C 2.75	Solhem, Fjällbacka, Bohuslän, Sweden.	C. G. L. Broomé.	P. J. Holmquist, B. Un. Ups., VII, p. 260, 1906.	Granite.	Same rock as No. 3, I. 3, 2. 2.
12	I.(3)4.″2.2.	Q 33.84 hy 1.73 or 37.81 mt 2.09 ab 15.20 il 0.46 an 5.56 ap 0.34 C 1.53	Vasastaden, Stockholm, Sweden.	R. Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 258, 1906.	Granite.	
13	I″.(3)4.2.2″.	Q 32.16. hy 1.32 or 33.36 mt 1.16 ab 16.24 il 0.61 an 6.95 ft 3.90 C 4.69	Storholm, Rödö, Sweden.	H. Santesson.	P. J. Holmquist, Afh. Sv. G. Und., No. 181, p. 51, 1899.	Quartz porphyry.	F high. In W. T., p. 157.
14	I(II).4.2.2(3).	Q 26.46 di 1.18 or 31.69 hy 8.11 ab 17.29 mt 1.86 an 11.12	Dellen, Helsingland, Sweden.	H. Santesson.	F. Svenonius, G. F. F., X, p. 273, 1888.	Hypersthene andesite.	Dellenite of Brögger, Eg. Kg., II, p. 59, 1895. In W. T., p. 157.
15	I″.4″.(1)2.2(3).	Q 16.32 di 1.30 or 44.48 hy 1.40 ab 24.63 mt 3.48 an 5.56 il 1.06	Vänstern, Lake Vattern, Smaland, Sweden.	R. Mauzelius.	A. Gavelin, Sver. G. Und., Arsb. 5, No. 3, p. 22, 1912.	Quartz orthophyre.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
16	69.21	15.59	1.08	1.29	0.11	1.30	8.92	0.75							99.94	
A3. III	1.154	.152	.007	.019	.003	.023	.094									
17	69.19	14.12	1.64	1.71	1.58	1.66	1.81	8.45							100.31	
A3. III	1.153	.138	.010	.024	.040	.030	.029	.090								
18	66.64	15.10	0.69	3.08	1.36	1.49	2.05	6.71	2.82						99.94	
A3. III	1.111	.148	.004	.043	.034	.027	.033	.071								
19	65.17	17.09	1.26	2.93	1.75	1.39	2.16	5.70	2.75						100.20	
A3. III	1.086	.168	.008	.040	.044	.025	.035	.061								
20	66.24	15.64	1.16	2.19	0.89	2.17	2.05	6.60	3.25						100.19	2.455
A3. III	1.102	.153	.008	.030	.022	.039	.033	.070								
21	60.77	21.27	2.94	0.57	0.41	2.88	1.16	7.97	2.13						100.10	2.714
A3. III	1.013	.209	.018	.008	.010	.052	.019	.085								
22	69.90	14.09	0.88	2.33	0.98	1.10	2.35	5.99	1.00	0.10	0.40	0.19	0.02	CO_2 0.40 ZrO_2 none Cl 0.03 F none S 0.02 Cr_2O_3 none NiO none BaO 0.02 SrO trace CuO 0.01	99.81	2.649
A1. I	1.165	.138	.006	.032	.025	.020	.038	.064			.005	.001	—			

RANG 2. DOMALKALIC. TOSCANASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	67.27	13.67	1.83	2.49	1.72	1.90	2.79	5.80	0.45	0.08	1.70	0.16	0.19		100.05	
A2. II	1.121	.134	.011	.035	.043	.034	.045	.062			.021	.001	.003			
2	71.85	15.25	1.04	2.56	0.63	2.46	3.18	3.04	0.17		0.58	trace	trace		100.76	
A3. III	1.198	.150	.006	.036	.016	.044	.052	.032			.007	—	—			
3	70.44	14.69	1.45	1.17	0.74	1.43	3.66	4.61	1.14		0.32				99.65	
A3. III	1.174	.142	.009	.017	.019	.025	.059	.049			.004					
4	71.69	14.84	n. d.	1.25	0.37	1.03	3.13	7.09	0.49	0.10			trace		99.99	
A4. IV	1.195	.145	—	.018	.009	.018	.050	.075					—			
5	74.54	13.30	0.92	0.79	0.01	1.26	3.69	5.01	n. d.				0.51	S 0.04	100.07	
A2. II	1.242	.130	.006	.011	—	.022	.060	.053					.007			
6	73.01	13.73	0.44	1.48	0.01	0.94	3.50	5.62	0.18	0.05			0.09		99.05	2.624
B3. IV	1.217	.135	.003	.021	—	.017	.056	.060					.001			
7	65.02	17.93	4.69	0.17	1.24	1.34	3.04	5.98	0.86				0.11		100.38	
A3. III	1.084	.176	.029	.002	.031	.023	.049	.064					.002			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 2. DOPOTASSIC. DELLENOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
16	I.4.″2.2.	Q 22.12, or 52.26, ab 14.15, an 6.39, C 0.82, hy 1.88, mt 1.62	Wirvik, Finland.	B. Frosterus.	B. Frosterus, T. M. P. M., XIII, p. 188, 1892.	Granite.	In W. T., p. 157.
17	I″.4.(1)2.2.	Q 20.16, or 50.04, ab 15.20, an 5.28, di 2.48, hy 4.65, mt 2.32	Triberg Waterfall, Baden.	C. Habenstreit.	F. Schalch, Erl. G. Kt. Bad., No. 101–102, p. 11, 1897.	Granite.	Not in W. T.
18	I(II).4.2.2″.	Q 21.60, or 39.48, ab 17.29, an 7.51, C 1.73, hy 8.55, mt 0.93	Der Gabel, Münsterthal, Schwarzwald, Baden.	Bunsen's laboratory.	A. Schmidt, Ref. N. J., 1889, I, p. 95.	Porphyry.	In W. T., p. 159.
19	I(II).4.2.2(3).	Q 23.04, or 33.92, ab 18.34, an 6.95, C 4.79, hy 8.62, mt 1.86	Brandenberg, Münsterthal, Schwarzwald, Baden.	Bunsen's laboratory.	A. Schmidt, Ref. N. J., 1889, I, p. 95.	Porphyry.	In W. T., p. 159.
20	I″.4.2.2″.	Q 21.72, or 39.82, ab 17.29, an 10.84, C 1.12, hy 5.10, mt 1.86	Monte Cucco, Cerveteri, Italy.	H. S. Washington.	H. S. Washington, J. G., V, p. 49, 1897.	Toscanite.	In W. T., p. 159.
21	I.4.2″.″2.	Q 16.50, or 47.26, ab 9.96, an 14.46, C 5.41, hy 1.00, mt 1.86, hm 1.60	Kija River, Jenissei District, Siberia.	Not stated.	A. Meister, Expl. G. Reg. Aurif. Sib., IX, p. 254, 1910.	Granite.	
22	I″.″4.(1)2.2(3).	Q 28.38, or 35.58, ab 19.91, an 4.73, C 1.94, hy 5.27, mt 1.39, il 0.76, ap 0.34	Cobar, New South Wales.	W. A. Greig.	A. R. Dep. Min. N. S. W. (1911), 1912, p. 198.	Orthoclase porphyry.	

SUBRANG 3. SODIPOTASSIC. TOSCANOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I″.4.2.″3.	Q 22.32, or 34.47, ab 23.58, an 7.51, di 0.89, hy 4.66, mt 2.55, il 3.19, ap 0.34	Ujarartorsuak, Nagsuaks Peninsula, Greenland.	W. C. Phalen.	W. C. Phalen, Smiths. Misc. Coll., XLV, p. 208, 1904.	Quartz monzonite.	
2	I″.(3)4.2″.3(4).	Q 34.02, or 17.79, ab 27.25, an 12.23, C 2.24, hy 4.64, mt 1.39, il 1.06	Havnefjord, Jones Sound, Ellesmere Land.	P. Schei.	C. Bugge, Rep. 2d Arct. Exp. Fram, No. 22, p. 18, 1910.	Hypersthene adamellite.	
3	I.4.2.3.⊙	Q 27.18, or 27.24, ab 30.92, an 6.95, C 0.92, hy 2.43, mt 2.09, il 0.61	Pim Island, Rice Strait, Ellesmere Land.	P. Schei.	C. Bugge, Rep. 2d Arct. Exp. Fram, No. 22, p. 18, 1910.	Granite aplite.	
4	I.4.(1)2.(2)3.	Q 22.92, or 41.70, ab 26.20, an 5.00, C 0.20, hy 3.28	Taggart Bay, Lake Keepawa, Quebec.	F. G. Wait.	G. C. Hoffman, A. R. G. S. Can., IX, p. 18R, (1896), 1898.	Granitite gneiss.	In W. T., p. 159.
5	I.″4.(1)2.3.	Q 30.78, or 29.47, ab 31.44, an 4.73, di 1.24, hy 0.92, mt 1.39	Highdale Quarry, n. Rockland, Knox County, Maine.	Student of J. F. Kemp.	T. N. Dale, U. S. G. S. B. 313, p. 122, 1907.	Granite.	
6	I.4.(1)2.3.	Q 28.08, or 33.36, ab 29.34, an 4.73, C 0.20, hy 2.51, mt 0.70	Mount Kearsarge, New Hampshire.	J. H. Perry.	J. H. Perry, J. G., XI, p. 405, 1903.	Granite.	
7	I″.4.″2.3.	Q 19.74, or 35.58, ab 25.68, an 6.39, C 4.08, hy 3.10, mt 0.91, hm 4.00	Pemigewasset, New Hampshire.	L. G. Eakins.	U. S. G. S. B. 148, p. 67, 1897.	Quartz porphyry.	In W. T., p. 159.

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
8	69.89	15.08	1.04	1.46	0.66	2.07	4.73	4.29	0.23	0.31		trace			99.76	
A3. III	1.165	.148	.007	.020	.017	.038	.076	.046				—				
9	64.62	16.46	1.82	2.14	1.10	2.39	4.57	5.21	0.39	0.13	0.81	0.21	0.12	CO_2 0.11 ZrO_2 0.03 Cl 0.05 FeS_2 0.19 BaO 0.03 SrO trace CuO trace	100.38	2.666
A1. I	1.077	.161	0.11	.030	.028	.043	.074	.055			.010	.001	.002			
10	74.15	13.35	1.26	0.53	0.23	1.92	2.84	4.58	0.50	0.13	0.12	0.06		CO_2 none	99.67	
A2. II	1.236	.131	.008	.007	.006	.034	.046	.049			.002	—				
11	74.06	14.45	0.15	1.44	trace	1.03	4.74	4.36	0.52					S 0.02	100.77	
A3. III	1.234	.142	.001	.020	—	.018	.076	.047								
12	72.45	13.32	1.93	0.63	.044	1.81	3.55	3.86	1.51	0.59	0.27	0.06		CO_2 none	100.42	
A2. II	1.208	.130	.012	.009	.011	.032	.057	.041			.003	—				
13	71.63	13.71	2.09	1.76	0.19	1.31	3.24	4.49	0.51	0.08	0.34	trace	trace	CO_2 0.41 S trace	99.76	
A2. II	1.194	.134	.013	.025	.005	.023	.052	.048			.004	—	—			
14	68.88	14.96	0.64	4.64	0.37	1.74	3.83	4.97	0.24	0.06	trace		trace		100.33	2.696
A3. III	1.148	.146	.004	.064	.009	.031	.062	.053			—		—			12°
15	68.36	16.58	0.90	3.24	0.45	1.85	3.97	5.27	0.17	0.18	trace		trace		100.97	
B3. IV	1.139	.163	.006	.045	.011	.033	.064	.056					—			
16	66.60	15.05	1.07	4.42	0.36	2.21	4.03	5.42	0.41		0.26		trace	BaO none	100.33	2.612
A2. II	1.110	.148	.007	.061	.009	.039	.065	.058			.009		—			17°
17	67.12	14.97	2.61	2.19	0.54	1.69	3.92	5.15	1.13	0.19	0.37	0.14	0.02	ZrO_2 0.03 S none Cr_2O_3 trace BaO 0.19	100.26	
A1. I	1.119	.147	.016	.031	.014	.030	.063	.055			.009	.001	—			
18	71.23	13.64	1.70	1.00	0.75	2.31	3.55	3.79	1.72		0.21		0.05		99.95	2.690
A2. II	1.187	.134	.011	.015	.019	.041	.057	.040			.003		—			
19	72.47	14.78	0.57	2.00	0.34	1.27	4.03	4.53	0.48			trace		CO_2 trace	100.47	
A3. III	1.208	.145	.004	.028	.009	.023	.065	.048				—				
20	71.24	14.34	0.80	1.80	0.66	2.17	4.25	4.14	0.03	0.05	0.40		0.02	CO_2 none ZrO_2 trace FeS_2 0.18 BaO none Li_2O none	100.08	
A1. I	1.187	.141	.005	.025	.017	.039	.069	.044			.005		—			
21	68.40	15.75	2.97	0.65	0.12	1.64	4.16	5.78	0.48				trace	S 0.63	100.58	2.66
A3. III	1.140	.154	.019	.009	.003	.029	.067	.062					—			
22	71.45	13.83	1.10	1.91	0.56	1.44	2.62	6.09	0.32		0.42	0.03	0.17	ZrO_2 0.02 Cl 0.03 F 0.01 S 0.02 BaO 0.02	100.04	
A1. I	1.191	.136	.007	.026	.014	.026	.042	.065			.008	—	.002			
23	66.72	16.15	1.23	2.19	0.73	2.30	4.36	5.66	0.77				0.07		100.18	
A3. III	1.112	.158	.008	.031	.018	.041	.070	.061					.001			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. TOSCANOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
8	I.4.2.3(4).	Q 20.34 di 2.75 or 25.58 hy 2.06 ab 39.82 mt 1.62 an 7.23	Millstone Hill, Barre, Vermont.	G. I. Finlay.	G. I. Finlay, G. S. Vt. Rep., III, p. 55, 1902.	Granite.	
9	I″.4(5).2.3.	Q 11.70 di 1.36 or 30.58 hy 3.46 ab 38.77 mt 2.55 an 8.90 il 1.52 ap 0.51	Little Ascutney Mountain, Vermont.	W. F. Hillebrand.	R. A. Daly, U. S. G. S. B. 209, p. 47, 1903.	Windsorite (diorite).	In W. T., p. 159.
10	I.(3)4.2.3.	Q 35.52 hy 0.60 or 27.24 mt 1.16 ab 24.10 il 0.30 an 9.45 hm 0.48 C 0.20	Erving, Massachusetts.	G. Steiger.	B. K. Emerson, U. S. G. S. B. 228, p. 39, 1904.	Granite (gneissoid).	
11	I.4.(1)2.3(4).	Q 26.46 hy 2.51 or 26.13 mt 0.23 ab 39.82 an 5.00	Hingham, Plymouth County, Massachusetts.	F. J. Moore.	T. N. Dale, U. S. G. S. B. 470, p. 276, 1911.	Granite.	
12	I.(3)4.2.3″.	Q 32.70 hy 1.10 or 22.80 mt 1.39 ab 29.87 il 0.46 an 8.90 hm 0.96	Pelham, Massachusetts.	G. Steiger.	T. N. Dale, U. S. G. S. B. 470, p. 261, 1911.	Granite (gneissoid).	
13	I.″4.″2.3.	Q 32.10 hy 1.56 or 26.69 mt 3.02 ab 27.25 il 0.61 an 6.39 C 1.12	Stony Brook, Neponset Valley, Massachusetts.	W. T. Hall.	F. Bascom, J. Ac. N. Sci. Phila., (2), XV, p. 135, 1912.	Rhyolitic granite.	
14	I″.4.2.3.	Q 19.62 hy 8.82 or 29.47 mt 0.83 ab 32.49 an 8.62	Squam Light, Cape Ann, Essex County, Massachusetts.	H. S. Washington.	H. S. Washington, J. G., VII, p. 109, 1899.	Quartz syenite porphyry.	In W. T., p. 159.
15	I″.4.2.3.	Q 18.18 hy 6.25 or 31.13 mt 1.39 ab 33.54 an 9.17 C 1.02	Wolf Hill, Gloucester, Essex County, Massachusetts.	H. S. Washington.	H. S. Washington, J. G., VI, p. 800, 1898.	Nordmarkite.	In W. T., p. 159.
16	I(II).4″.2.3.	Q 15.24 di 3.41 or 32.25 hy 5.06 ab 34.06 mt 1.62 an 6.95 il 1.37	Prospect Street, Gloucester, Essex County, Massachusetts.	H. S. Washington.	H. S. Washington, J. G., VI, p. 798, 1898.	Akerite.	In W. T., p. 159
17	I″.4.″2.3.	Q 19.98 hy 2.72 or 30.58 mt 3.71 ab 33.01 il 0.76 an 7.51 ap 0.34 C 0.20	Hoosac Mountain, Massachusetts.	E. T. Allen.	J. E. Wolff, U. S. G. S. B. 228, p. 41, 1904.	Granite gneiss.	
18	I.″4.2.3″.	Q 30.42 di 0.86 or 22.24 hy 1.63 ab 29.88 mt 2.55 an 10.29 il 0.46	Conanicut Island, Rhode Island.	L. V. Pirsson.	L. V. Pirsson, A. J. S., XLVI, p. 373, 1893.	Granite.	In W. T., p. 159
19	I.4.″2.3″.	Q 27.06 hy 4.07 or 26.69 mt 0.93 ab 34.06 an 6.39 C 0.92	Branford, n. New Haven, Connecticut.	F. Ward.	F. Ward, A. J. S., XXVIII, p. 137, 1909.	Granite.	
20	I″.4.2.3″.	Q 24.60 di 2.54 or 24.46 hy 2.42 ab 36.15 mt 1.16 an 7.78 il 0.76	Griswold, Connecticut.	W. A. Drushell.	G. F. Loughlin, U. S. G. S. B. 492, p. 123, 1912.	Granite.	
21	I.4.″2.3.	Q 18.54 di 0.65 or 34.47 wo 0.12 ab 35.12 mt 2.09 an 6.95 hm 1.60	Millstone Point, Connecticut.	H. T. Vulté.	J. F. Kemp, B. G. S. A., X, p. 375, 1899.	Granite.	In W. T., p. 159.
22	I.4.2.3(4).	Q 28.02 hy 3.51 or 36.14 mt 1.62 ab 22.01 il 0.76 an 7.23 C 0.31	Northville, Fulton County, New York.	E. W. Morley.	W. J. Miller, N. Y. St. Mus. B. 153, p. 19, 1911.	Granite porphyry.	
23	I″.4(5).″2.3.	Q 12.90 di 3.29 or 33.92 hy 3.44 ab 36.68 mt 1.86 an 7.51	Little Falls, Herkimer County, New York.	E. W. Morley.	H. P. Cushing, N. Y. St. Mus. A. R. LIV, p. R69, (1900), 1902.	Augite syenite.	Iron oxides corrected in N. Y. St. Mus. A. R. LX, (2), p. 514, 1907.

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
24	75.15	14.65	0.11	0.90	0.04	0.92	3.60	4.71	0.24		0.12	0.02	0.01	ZrO_2 0.01 SO_3 0.12 BaO 0.05	100.64	
A1. I	1.253	.144	.001	.013	.001	.016	.058	.050			.002	—	—			
25	75.02	13.73	0.83	0.99	0.03	0.88	3.36	4.74	0.17		0.10	0.04	0.04	CO_2 0.11 ZrO_2 0.05 SO_3 0.08 BaO 0.06	100.23	
A1. I	1.250	.135	.005	.014	.001	.016	.054	.050			.001	—	—			
26	72.57	15.11	0.59	1.02	0.30	1.65	3.92	4.33	0.47						99.96	
A3. III	1.210	.148	.004	.014	.008	.030	.063	.046								
27	71.79	15.00	0.77	1.12	0.51	2.50	3.09	4.75	0.64						100.17	
A3. III	1.197	.147	.005	.015	.013	.045	.050	.051								
28	70.45	15.98	0.75	1.84	0.77	2.60	3.83	3.59	0.45					Li_2O trace	100.26	
A3. III	1.174	.157	.005	.026	.019	.047	.061	.038								
29	72.27	14.30	1.16	0.97	0.70	1.56	3.46	5.00	0.25	0.04	0.31	0.02	trace	CO_2 0.21	100.25	
A2. II	1.205	.140	.007	.014	.018	.028	.056	.053			.004	—	—			
30	71.51	13.82	1.76	1.20	0.80	1.79	3.64	4.63	0.31	0.17	0.33	0.30	0.03	CO_2 trace	100.29	
A2. II	1.192	.136	.011	.017	.020	.032	.059	.049			.004	.002	—			
31	71.19	14.01	1.66	1.29	0.44	2.04	3.56	4.45	0.33	0.04	0.35	0.34	0.02	CO_2 trace	99.72	
A2. II	1.187	.137	.010	.018	.011	.037	.057	.047			.004	.002	—			
32	70.83	12.70	2.67	1.36	0.53	1.88	3.49	4.83	0.34	0.07	0.41	0.33	0.03	CO_2 trace	99.47	
A2. II	1.181	.125	.017	.019	.013	.034	.056	.051			.005	.002	—			
33	69.48	13.95	2.82	1.70	1.10	2.81	3.65	3.45	0.50	0.04	0.47	0.49	0.03	CO_2 trace	100.49	
A2. II	1.158	.137	.018	.024	.028	.050	.059	.037			.006	.003	—			
34	69.44	15.46	1.31	1.43	1.01	2.11	3.97	4.25	0.29	0.07	0.48	0.22	0.03	CO_2 trace	100.07	
A2. II	1.157	.152	.008	.020	.025	.038	.065	.045			.006	.002	—			
35	69.56	15.52	1.67	1.19	0.41	1.20	4.46	4.68	0.67	0.34	0.31	0.08	0.07	CO_2 none S trace BaO 0.10 SrO trace Li_2O trace	100.26	
A1. I	1.159	.152	.010	.017	.010	.021	.072	.050			.004	—	.001			
36	66.46	14.92	1.87	3.08	1.11	3.10	2.63	4.74	0.80	0.06	0.83	0.29	0.07	CO_2 trace S trace	99.96	
A2. II	1.108	.146	.012	.043	.028	.055	.042	.050			.010	.002	.001			
37	73.10	13.82	0.93	1.43	0.51	1.72	3.04	5.06	0.23		0.24	trace	trace	SO_3 trace	100.08	2.64
A3. III	1.218	.136	.006	.019	.013	.031	.049	.054			.003	—	—			
38	72.19	14.06	0.70	1.80	0.84	1.88	3.46	3.94	0.18		0.48	trace	0.16	SO_3 trace	99.69	2.68
A2. II	1.203	.138	.004	.025	.021	.034	.056	.041			.006	—	.002			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. TOSCANOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
24	I.(3)4.(1)2.3.	Q 33.72 or 27.80 ab 30.39 an 4.45 C 2.04 hy 1.42 mt 0.23 il 0.30	Near Waterloo, New Jersey.	R. B. Gage.	J. V. Lewis, N. J. G. S. A. R. (1908), p. 73, 1909.	Granite gneiss.	
25	I.(3)4.(1)2.3.	Q 35.10 or 27.80 ab 28.30 an. 4.45 C 1.53 hy 1.16 mt 1.16 il 0.15	Waterloo, New Jersey.	R. B. Gage.	J. V. Lewis, N. J. G. S., A. R. (1908), p. 72, 1909.	Granite gneiss.	
26	I.4.2.3″.	Q 28.68 or 25.58 ab 33.01 an 8.34 C 0.92 hy 2.12 mt 0.93	Guilford, Howard County, Maryland.	W. F. Hillebrand.	G. H. Williams, U. S. G. S. A. R. 15, p. 672, 1895.	Granite.	In W. T., p. 159.
27	I.4.″2.3.	Q 28.68 or 28.36 ab 26.20 an 12.51 hy 2.62 mt 1.16	Woodstock, Baltimore County, Maryland.	W. F. Hillebrand.	G. H. Williams, U. S. G. S. A. R. 15, p. 672, 1895.	Granite.	Also E. B. Mathews, Md. G. S. A. R. II, p. 156, 1898, In W. T., p. 159.
28	I.4.2″.3(4).	Q 26.76 or 21.13 ab 31.96 an 13.07 C 1.12 hy 4.67 mt 1.16	Dorsey Run Cut, Howard County, Maryland.	W. F. Hillebrand.	C. R. Keyes, U. S. G. S. A. R. 15, p. 697, 1895.	Granite.	In W. T., p. 159.
29	I.4.2.3.⊙	Q 28.44 or 29.47 ab 29.34 an 7.78 C 0.31 hy 2.20 mt 1.62 il 0.61	Richmond, Virginia.	W. M. Thornton.	T. L. Watson, Va. G. S. B. 1A, p. 81, 1909.	Granite.	
30	I.4.2.3.⊙	Q 28.44 or 27.24 ab 30.92 an 6.67 hy 2.26 mt 2.55 il 0.61 ap 0.67	Petersburg, Virginia.	W. M. Thornton.	T. L. Watson, Va. G. S. B. 1A, p. 81, 1909.	Granite.	
31	I.″4.2.3.	Q 29.28 or 26.13 ab 29.87 an 8.34 C 0.31 hy 1.63 mt 2.32 il 0.61 ap 0.67	Henrico County, n. Richmond, Virginia.	W. M. Thornton.	T. L. Watson, Va. G. S. B. 1A, p. 81, 1909.	Granite.	
32	I″.″4.(1)2.3.	Q 28.86 or 28.36 ab 29.34 an 5.00 di 1.94 hy 0.40 mt 3.25 il 0.76 hm 0.48 ap 0.67	Near Richmond, Virginia.	W. M. Thornton.	T. L. Watson, Va. G. S. B. 1A, p. 81, 1909.	Granite.	
33	I″.4.2.3(4).	Q 28.32 or 20.57 ab 30.92 an 11.40 hy 2.80 mt 4.18 il 0.91 ap 1.01	Fredericksburg, Virginia.	W. M. Thornton.	T. L. Watson, Va. G. S. B. 1A, p. 81, 1909.	Granite.	
34	I″.4.2.3″.	Q 24.24 or 25.02 ab 34.06 an 8.62 C 1.12 hy 3.29 mt 1.86 il 0.91 ap 0.67	Near Richmond, Virginia.	W. M. Thornton.	T. L. Watson, Va. G. S. B. 1A. p. 81, 1909.	Granite.	
35	I.4.″2.3″.	Q 22.26 or 27.80 ab 37.73 an 5.84 C 0.92 hy 1.53 mt 2.32 il 0.61	Monterey Mountain, Virginia.	W. F. Hillebrand.	Darton and Keith, A. J. S., VI, p. 307, 1898.	Felsophyre.	In W. T., p. 161.
36	I(II).4.2″.3.	Q 24.60 or 27.80 ab 22.01 an 13.34 C 0.61 hy 5.70 mt 2.78 il 1.52 ap 0.67	Lovingston, Nelson County, Virginia.	W. M. Thornton.	Watson and Taber, Va. G. S. B. 3A, p. 63, 1913.	Quartz monzonite gneiss.	
37	I.″4.2.3.	Q 30.90 or 30.02 ab 25.68 an 8.62 C 0.20 hy 2.62 mt 1.39 il 0.46	Near Batesburg, Lexington County, South Carolina.	Hardin and Robertson.	E. Sloan, S. C. G. S., (IV), B. 2, p. 193, 1908.	Granite gneiss.	
38	I.″4.2.3″.	Q 30.90 or 22.80 ab 29.34 an 9.45 C 0.71 hy 4.34 mt 0.93 il 0.91	Near Columbia, Lexington County, South Carolina.	Hardin and Robertson.	E. Sloan, S. C. G. S., (IV), B. 2, p. 206, 1908.	Granite.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
39	70.77	14.89	0.75	1.24	0.43	2.08	4.47	4.70	0.19		0.36	trace	trace	SO_3 trace	99.88	2.65
A3. III	1.180	.146	.005	.017	.011	.038	.073	.050			.005	—	—			
40	70.54	14.56	1.06	1.62	0.78	1.28	3.97	5.37	0.27		0.60	trace	trace	SO_3 0.06	100.11	
A3. III	1.176	.143	.007	.022	.020	.023	.065	.057			.008	—	—			
41	70.11	15.76	1.07	1.76	0.62	1.84	3.39	4.27	0.45		0.45	trace	trace	SO_3 trace	99.72	2.66
A3. III	1.169	.155	.007	.024	.016	.033	.055	.045			.006	—	—			
42	69.52	16.77	0.95	1.56	0.75	1.82	3.43	4.10	1.43		0.36	trace	trace	SO_3 trace	99.69	2.65
A3. III	1.159	.165	.006	.022	.019	.032	.055	.043			.005	—	—			
43	68.80	15.73	2.14	1.57	1.16	1.64	3.45	4.54	0.33		0.45	trace	trace	SO_3 trace	99.81	2.65
A3. III	1.147	.154	.013	.022	.019	.029	.056	.048			.006	—	—			
44	68.71	15.41	1.85	1.59	1.25	1.64	3.48	4.61	0.34		0.60	trace	trace	SO_3 trace	99.46	2.65
A3. III	1.145	.151	.012	.022	.031	.029	.056	.049			.008	—	—			
45	68.70	15.49	1.10	3.73	0.86	1.70	3.09	3.36	0.81		0.84	trace	trace	SO_3 0.13	99.91	2.73
A3. III	1.145	.152	.007	.051	.022	.030	.050	.036			.011	—	—		(99.51)	
46	68.15	14.30	2.44	2.49	1.04	2.80	3.80	3.84	0.28		0.60	trace	0.11	SO_3 trace	99.85	2.66
A2. II	1.136	.140	.015	.035	.026	.050	.061	.040			.008	—	.002			
47	65.72	17.22	1.70	2.67	1.45	2.80	3.68	3.80	0.35		0.72	trace	trace	SO_3 0.08	100.19	2.68
A3. III	1.095	.169	.011	.036	.036	.050	.060	.040			.009	—	—			
48	76.37	13.31	1.21	n. d.	0.10	1.13	4.02	3.68	0.20						100.02	2.642
A4. IV	1.273	.130	.008	(.016)	.003	.020	.065	.039								
49	75.45	13.71	0.92	n. d.	0.18	0.94	3.87	4.30	0.40						99.77	
A4. IV	1.258	.134	.006	(.012)	.005	.017	.063	.045								
50	72.96	14.70	1.28	n. d.	0.07	1.28	4.18	4.73	0.23						99.43	
A4. IV	1.216	.144	.008	(.016)	.002	.023	.068	.050								
51	71.66	16.05	0.86	n. d.	0.17	1.07	4.66	4.92	1.00						100.39	
A4. IV	1.194	.157	.005	(.010)	.004	.019	.075	.052								
52	71.00	16.33	1.12	n. d.	0.35	1.83	4.80	4.65	0.87						100.95	
A4. IV	1.183	.160	.007	(.014)	.009	.033	.077	.050								
53	70.90	15.86	1.37	n. d.	0.02	2.15	5.05	4.62	0.50						100.47	2.664
A4. IV	1.182	.155	.008	(.016)	.001	.038	.081	.049								
54	70.88	15.86	1.77	n. d.	0.93	1.79	3.94	4.64	0.49						100.30	2.659
A4. IV	1.181	.155	.011	(.022)	.023	.032	.064	.049								

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. TOSCANOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
39	I.4.2.3(4).	Q 21.78 di 3.43 or 27.80 hy 0.33 ab 38.25 mt 1.16 an 6.39 il 0.76	Filbert Station, York County, South Carolina.	Hardin and Robertson.	E. Sloan, S. C. G. S., (IV), B. 2, p. 207, 1908.	Granite.	
40	I.4.(1)2.3.	Q 22.38 di 0.43 or 31.69 hy 2.72 ab 34.06 mt 1.62 an 5.84 il 1.22	Greenwood, Greenwood County, South Carolina.	T. L. Watson.	E. Sloan, S. C. G. S., (IV), B. 2, p. 187, 1908.	Granite.	Also T. L. Watson, J. G., XVII, p. 735, 1909.
41	I.″4.2.3.	Q 28.46 hy 3.05 or 25.02 mt 1.62 ab 28.82 il 0.91 an 9.17 C 2.24	Heath Springs, Lancaster County, South Carolina.	Hardin and Robertson.	E. Sloan, S. C. G. S., (IV), B. 2, p. 222, 1908.	Granite.	
42	I.″4.2.3.	Q 28.62 hy 3.35 or 23.91 mt 1.39 ab 28.82 il 0.76 an 8.90 C 3.57	Brown Quarry, Newberry County, South Carolina.	Hardin and Robertson.	E. Sloan, S. C. G. S. (IV), B. 2, p. 195, 1908.	Granite.	
43	I.4.2.3.⊙	Q 26.58 hy 2.30 or 26.69 mt 3.02 ab 29.34 il 0.91 an 8.06 C 2.14	High Point, Laurens County, South Carolina.	Hardin and Robertson.	E. Sloan, S. C. G. S. (IV), B. 2, p. 190, 1908.	Granite.	Also in T. L. Watson, J. G., XVII, p. 735, 1909.
44	I″.4.2.3.	Q 25.44 hy 3.36 or 27.24 mt 2.78 ab 29.34 il 1.22 an 8.06 C 1.73	Flat Rock, Kershaw County, South Carolina.	Hardin and Robertson.	E. Sloan, S. C. G. S. (IV), B. 2, p. 223, 1908.	Granite.	
45	I″.(3)4.2.3″.	Q 30.84 hy 6.56 or 20.02 mt 1.62 ab 26.20 il 1.67 an 8.34 C 3.67	Batesburg, Saluda County, South Carolina.	Hardin and Robertson.	E. Sloan, S. C. G. S. (IV), B. 2, p. 192, 1908.	Granite porphyry.	Also in T. L. Watson, J. G., XVII, p. 735, 1909.
46	I(II).4.2.3(4).	Q 24.06 di 2.51 or 22.24 hy 3.22 ab 31.96 mt 3.48 an 10.84 il 1.22	Beverly, Pickens County, South Carolina.	Hardin and Robertson.	E. Sloan, S. C. G. S. (IV), B. 2, p. 181, 1908.	Granite gneiss.	
47	I(II).4.2″.3(4).	Q 20.58 hy 5.71 or 22.24 mt 2.55 ab 31.44 il 1.37 an 13.90 C 1.94	Table Rock, Saluda River, Pickens County, South Carolina.	Hardin and Robertson.	E. Sloan, S. C. G. S. (IV), B. 2, p. 185, 1908.	Granite gneiss.	
48	I.(3)4.″2.3(4).	Q 35.40 hy 2.41 or 21.68 ab 34.06 an 5.56 C 0.61	Odessadale, Meriwether County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9A, p. 79, 1902.	Granite.	
49	I.(3)4.(1)2.3″.	Q 33.54 hy 2.08 or 25.02 ab 33.01 an 4.73 C 0.92	Conyers, Rockdale County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9A, p. 127, 1902.	Granite gneiss.	
50	I.4.″2.3.	Q 26.76 hy 2.31 or 27.80 ab 35.63 an 6.39 C 0.31	Lithonia, DeKalb County, Georgia.	T. L. Watson.	T. L. Watson, A. G., XXVII, p. 213, 1901.	Granite gneiss.	Also in Ga. G. S. B. 9A, p. 127, 1902.
51	I.4.(1)2.3″.	Q 22.80 hy 1.72 or 28.91 ab 39.30 an 5.28 C 1.12	Stone Mountain, Georgia.	R. L. Packard.	T. L. Watson, Ga. G. S. B. 9A, p. 117, 1902.	Granite.	
52	I.4.2.3(4).	Q 19.92 hy 2.75 or 27.80 ab 40.35 an 9.17	Goss, Elbert County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9A, p. 210, 1902.	Granite.	
53	I.4.″2.3(4).	Q 19.32 di 3.19 or 27.24 hy 0.53 ab 42.44 an 6.95	Sparta, Hancock County, Georgia.	T. L. Watson.	T. L. Watson, J. G., IX, p. 119, 1901.	Granite.	Also in Ga. G. S. B. 9A, p. 178, 1902.
54	I.4.2.3.⊙	Q 23.64 hy 5.20 or 27.24 ab 33.54 an 8.90 C 1.02	Line Creek, Fayette County, Georgia.	T. L. Watson.	T. L. Watson, J. G., IX, p. 119, 1901.	Granite.	Also in Ga. G. S. B. 9A, p. 103, 1902

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
55	70.30	16.17	1.19	n. d.	0.31	2.61	4.72	4.88	0.63						100.81	2.666
A4. IV	1.172	.158	.008	(.016)	.008	.046	.076	.052								
56	70.24	16.78	1.46	n. d.	0.76	2.00	3.70	5.03	0.50						100.47	
A4. IV	1.171	1.64	.009	(.018)	.019	.036	.060	.053								
57	70.18	17.30	1.20	n. d.	0.64	2.03	4.36	4.77	0.35						100.83	
A4. IV	1.170	.170	.008	(.016)	.016	.036	.070	.051								
58	69.88	16.42	1.96	n. d.	0.36	1.78	4.45	5.63	0.39						100.87	2.662
A4. IV	1.165	.161	.013	(.026)	.009	.032	.072	.060								
59	69.77	17.05	1.60	n. d.	0.99	2.21	3.97	4.08	0.44						100.11	2.674
A4. IV	1.163	.167	.010	(.020)	.025	.039	.065	.043								
60	69.74	16.72	1.45	n. d.	0.36	1.93	4.84	5.33	0.47						100.84	2.84
A4. IV	1.162	.164	.009	(.018)	.009	.034	.078	.056								27°
61	69.64	17.21	1.32	n. d.	0.66	2.14	4.53	4.95	0.31						100.80	
A4. IV	1.161	.169	.008	(.016)	.016	.073	.073	.053								
62	69.53	16.46	1.15	n. d.	0.85	2.10	5.00	4.91	0.91						100.91	
A4. IV	1.159	.161	.007	(0.14)	.021	.038	.081	.052								
63	69.51	16.32	2.38	n. d.	1.28	1.84	3.82	3.47	1.11						99.73	
A4. IV	1.159	.160	.015	(.030)	.032	.033	.061	.037								
64	69.48	16.64	1.84	n. d.	0.29	2.32	4.74	4.49	0.46						100.26	
A4. IV	1.158	.163	.011	(.022)	.007	.041	.076	.047								
65	69.37	16.99	1.99	n. d.	0.84	2.03	3.44	4.54	0.55						99.75	
A4. IV	1.156	.167	.013	(.026)	.021	.036	.055	.048								
66	69.34	17.01	1.74	n. d.	0.61	2.77	4.69	4.54	0.26						100.96	2.701
A4. IV	1.156	.167	.011	(.022)	.015	.050	.076	.048								
67	69.13	17.14	1.52	n.d.	0.79	1.85	4.06	5.49	0.52						100.50	
A4. IV	1.152	.168	.009	(.018)	.020	.033	.066	.059								
68	69.07	16.56	1.37	n. d.	0.76	1.83	4.65	5.02	0.92						100.18	
A4. IV	1.151	.162	.009	(0.18)	.019	.032	.075	.053								
69	69.00	17.31	1.31	n. d.	0.42	1.18	4.00	4.74	1.79						99.75	
A4. IV	1.150	.170	.008	(.016)	.011	.021	.065	.050								
70	68.79	16.48	0.98	n. d.	1.30	1.76	4.74	5.85	0.38						100.28	2.657
A4. IV	1.147	.162	.006	(.012)	.033	.031	.076	.063								27°
71	67.98	14.84	1.00	3.15	0.91	2.17	2.66	4.76	0.49	0.14	0.84	0.34	trace	CO_2 none Cl trace F trace S 0.08 BaO 0.20 SrO trace Li_2O trace Graph. 0.21	99.77	
A1. I	1.133	.146	.006	.044	.023	.039	.043	.051			.010	.002	—			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. TOSCANOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
55	I.4″.2.3″.	Q 18.24 di 3.81 or 28.91 hy 0.96 ab 39.82 an 8.34	Hutchins, Oglethorpe County, Georgia.	T. L. Watson.	T. L. Watson, A. G., XXVII, p. 203, 1901.	Granite.	Also in Ga. G. S. B. 9A, p. 191, 1902.
56	I.4.2.3.⊙	Q 23.04 hy 4.31 or 29.47 ab 31.44 an 10.01 C 1.53	Flat Rock, Pike County, Georgia.	T. L. Watson.	T. L. Watson, A. G., XXVII, p. 216, 1901.	Granite.	Also in Ga. G. S. B. 9A, p. 98, 1902.
57	I.4.2.3″.	Q 20.40 hy 3.71 or 28.36 ab 36.68 an 10.01 C 1.33	Carlton, Madison County, Georgia.	T. L. Watson.	T. L. Watson, A. G., XXVII, p. 203, 1901.	Granite.	Also in Ga. G. S. B. 9A, p. 200, 1902.
58	I.4″.2.3.	Q 16.62 di 0.71 or 33.36 hy 3.97 ab 37.73 an 8.06	Greenville, Meriwether County, Georgia.	T. L. Watson.	T. L. Watson, A. G., XXVII, p. 216, 1901.	Granite.	Also in Ga. G. S. B. 9A, p. 75, 1902.
59	I.4.2.3(4).	Q 23.52 hy 5.14 or 23.91 ab 34.06 an 10.84 C 2.04	Appling, Columbia County, Georgia.	T. L. Watson.	T. L. Watson, A. G., XXVII, p. 216, 1901.	Granite.	Also in Ga. G. S. B. 9A. p. 236, 1902.
60	I.4″.2.3″.	Q 16.02 di 0.92 or 31.14 hy 2.81 ab 40.87 an 8.34	Oglesby, Elbert County, Georgia.	T. L. Watson.	T. L. Watson, A. G., XXVII, p. 203, 1901.	Granite.	Also in Ga. G. S. B. 9A, p. 217, 1902.
61	I.4″.2.3″.	Q 17.82 hy 3.71 or 29.47 ab 38.25 an 10.56 C 0.51	Oglesby, Elbert County, Georgia.	T. L. Watson.	T. L. Watson, A. G., XXVII, p. 203, 1901.	Granite.	Also in Ga. G. S. B. 9A, p. 216, 1902.
62	I.4″.2.3(4).	Q 15.60 di 2.29 or 28.91 hy 2.82 ab 42.44 an 7.78	Hutchins, Oglethorpe County, Georgia.	T. L. Watson.	T. L. Watson, A. G., XXVII, p. 203, 1901.	Granite.	Also in Ga. G. S. B. 9A, p. 191, 1902.
63	I.″4.2.3(4).	Q 27.48 hy 5.18 or 20.57 ab 31.96 an 9.17 C 2.96	Athens, Clarke County, Georgia.	T. L. Watson,	T. L. Watson, Ga. G. S. B. 9A, p. 164, 1902.	Granite gneiss.	
64	I.4.2.3(4).	Q 18.54 hy 3.60 or 26.13 ab 39.82 an 11.40	Sparta Quarry, Hancock County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9A, p. 179, 1902.	Granite.	Also in J. G., IX, p. 119, 1901.
65	I.4.2.3.⊙	Q 25.14 hy 5.53 or 26.19 ab 28.82 an 10.01 C 2.86	Milledgeville, Baldwin County, Georgia.	T. L. Watson.	T. L. Watson, A. G., XXVII, p. 216, 1901.	Granite.	Also in Ga. G. S. B. 9A, p. 171, 1902.
66	I.4″.2.3(4).	Q 16.92 di 1.64 or 26.69 hy 3.58 ab 39.82 an 11.95	Eatonton, Putnam County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9A, p. 168, 1902.	Granite.	
67	I.4.2.3.⊙	Q 17.88 hy 4.38 or 32.80 ab 34.58 an 9.17 C 1.02	Near Greensboro, Greene County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9A, p. 186, 1902.	Granite.	Also in A. G., XXVII, p. 216, 1901.
68	I.4″.2.3″.	Q 16.92 hy 4.28 or 29.47 ab 39.30 an 8.90 C 0.20	Griffin, Spalding County, Georgia.	T. L. Watson.	T. L. Watson, A. G., XXVII, p. 205, 1901.	Granite.	Also in Ga. G. S. B. 9A, p. 100, 1902.
69	I.4.(1)2.3.	Q 23.46 hy 3.21 or 27.80 ab 34.06 an 5.84 C 3.47	Elberton, Elbert County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9A, p. 205, 1902.	Granite.	
70	I.4(5).(1)2.3.	Q 12.84 di 1.79 or 35.03 hy 4.02 ab 39.82 an 6.39	Lexington, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9A, p. 196, 1902.	Granite.	Also in A. G., XXVII, p. 205, 1901.
71	I″.″4.2.3.	Q 27.24 hy 6.00 or 28.36 mt 1.39 ab 22.53 il 1.52 an 8.90 ap 0.67 C 2.04	Rowland, Bartow County, Georgia.	H. N. Stokes.	A. H. Brooks, U. S. G. S. B. 168, p. 55, 1900.	Granite.	In W. T., p. 161.

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
72	69.69	15.64	0.90	1.62	0.66	1.22	3.34	5.30	n. d.		0.29				98.66	
A3. III	1.162	.153	.006	.022	.017	.021	.054	.057			.004					
73	73.30	15.32	1.21	0.96	0.39	1.33	3.47	3.86	0.21	0.05					100.10	
A3. III	1.222	.150	.008	.013	.010	.023	.056	.041								
74	69.94	15.19	1.88	0.60	0.92	1.15	3.95	4.29	0.85	0.14	0.25	0.13	0.03	NiO trace	99.32	
B2. III	1.166	.149	.012	.008	.023	.021	.064	.046			.003	.001	—			
75	74.61	13.36	0.83	0.36	0.35	1.35	2.49	5.70	0.42	0.19	0.11	0.06	trace	CO_2 none S trace Cr_2O_3 none NiO none BaO 0.10 SrO trace	99.93	
A1. I	1.244	.131	.005	.005	.009	.024	.040	.061			.001	—	—			
76	74.37	13.12	0.73	0.87	0.35	1.26	2.57	6.09	0.25	0.05	0.29	0.06	trace	BaO 0.10 SrO trace Li_2O trace	100.11	
A2. II	1.240	.128	.005	.011	.009	.022	.042	.065			.004	—	—			
77	72.07	15.51	0.31	1.01	0.35	1.93	4.02	4.09	0.30	0.03	0.16	0.11	trace	CO_2 none	99.89	
A2. II	1.201	.152	.002	.014	.009	.034	.065	.044			.002	.001	—			
78	68.60	16.13	2.22	0.44	0.72	1.36	4.37	4.89	0.58	0.20	0.32	0.18	trace	SO_3 trace Cl trace BaO 0.27 SrO 0.09	100.37	
A1. I	1.143	.158	.014	.006	.018	.024	.071	.053			.004	.001	—			
79	67.44	15.78	1.58	0.85	1.43	2.38	4.11	4.87	0.70	0.32	0.32	0.21	trace	SO_3 trace Cl trace BaO 0.24 SrO 0.09	100.32	
A1.	1.124	.154	.010	.012	.036	.043	.066	.052			.004	.001	—			
80	67.04	15.25	1.69	1.13	1.75	2.17	4.09	5.10	0.56	0.51	0.20	0.21	0.05	BaO 0.33 SrO 0.03	100.11	
A1. 1	1.117	.150	.011	.015	.049	.039	.066	.055			.003	.001	—			
81	66.29	15.09	1.37	1.17	2.39	2.38	3.96	4.91	0.60	0.39	0.27	0.15	0.06	CO_2 0.45 BaO 0.30 SrO 0.07 Li_2O trace	99.85	
A1. I	1.105	.148	.009	.017	.060	.064	.064	.052			.003	.001	.001			
82	64.64	16.27	2.42	1.58	1.27	2.65	4.39	4.98	0.27	0.09	0.51	0.37	trace	CO_2 0.37 SO_3 trace Cl 0.05 BaO 0.18 SrO 0.08	100.12	
A1. I	1.078	.160	.015	.022	.032	.047	.071	.053			.006	.003	—			
83	72.07	15.51	0.31	1.01	0.35	1.93	4.02	4.09	0.30	0.03	0.16	0.11	trace	CO_2 none	99.89	
A2. II	1.201	.152	.002	.014	.009	.034	.065	.044			.002	.001	—			
84	69.95	15.14	0.38	0.83	0.56	1.45	2.70	6.36	0.91	0.40	0.24	0.10	0.08	CO_2 0.37 ZrO_2 0.02 FeS_2 0.39 BaO 0.13 SrO 0.02 Cu 0.03	100.06	
A1. I	1.166	.148	.002	.011	.014	.026	.043	.068			.003	.001	.001			
85	67.12	15.00	1.62	2.23	1.74	3.43	2.76	4.52	0.58	0.09	0.48	0.15	0.06	CO_2 none SO_3 trace Cr_2O_3 none BaO 0.07 SrO 0.03 Li_2O trace	99.88	
A1. I	1.119	.147	.010	.031	.044	.061	.044	.048			.006	.001	.001			
86	65.91	15.32	2.28	2.02	1.52	3.28	3.08	4.80	0.60	0.60	0.59	0.18	trace	CO_2 0.21 S 0.02 BaO 0.10	100.51	2.651
A1. I	1.099	.150	.014	.028	.038	.059	.050	.051			.007	.001	—			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. TOSCANOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
72	I.4.″2.3.	Q 25.50 hy 3.28 or 31.69 mt 1.39 ab 28.30 il 0.61 an 5.84 C 2.14	Felch Mountain, Michigan.	H. N. Stokes.	H. L. Smyth, U. S. G. S. Mon. 36, p. 389, 1899.	Granite.	Low sum due to H_2O. In W. T., p. 161.
73	I.(3)4.2.3″.	Q 34.74 hy 1.66 or 22.80 mt 1.86 ab 29.34 an 6.39 C 3.06	Marquette, Fox River Valley, Wisconsin.	W. W. Daniells.	Hobbs and Leith, B. Un. Wisc. 158, p. 262, 1907.	Aporhyolite porphyry.	
74	I.4.″2.3″.	Q 26.82 hy 2.30 or 25.58 mt 1.16 ab 33.54 il 0.46 an 5.00 hm 1.12 C 2.14 ap 0.34	Near Ironton, Missouri.	W. H. Melville.	E. Haworth, Mo. G. S. A. R. VIII, p. 181, 1895.	Granite.	In W. T., p. 161.
75	I.(3)4.2.(2)3.	Q 34.86 hy 0.90 or 33.92 mt 0.93 ab 20.96 il 0.15 an 6.67 hm 0.16 C 0.61	Elkhorn District, Montana.	H. N. Stokes.	J. S. Barrell, U. S. G. S. A. R. 22, p. 540, 1901.	Aplite.	
76	I.″4.″2.(2)3.	Q 32.70 hy 1.16 or 36.14 mt 1.16 ab 22.01 il 0.61 an 5.84	Big Timber Creek, Crazy Mountains, Montana.	W. F. Hillebrand.	J. E. Wolff, U. S. G. S. B. 148, p. 142, 1897.	Granitite.	In W. T., p. 161. Cf. No. 87.
77	I.4.2.3(4).	Q 27.96 hy 2.22 or 24.46 mt 0.46 ab 34.06 il 0.30 an 8.62 ap 0.34 C 1.22	Mill Creek, Bitterroot Range, Montana.	W. F. Hillebrand.	W. Lindgren, U. S. G. S. P. P. 27, p. 18, 1904.	Quartz monzonite.	Same as No. 83.
78	I.4.(1)2.3″.	Q 20.34 hy 1.80 or 29.47 mt 0.46 ab 37.20 il 0.61 an 5.84 hm 1.92 C 1.33	Mount Barker, Little Belt Mountains, Montana.	W. F. Hillebrand.	L. V. Pirsson, U. S. G. S. A. R. 20, III, p. 505, 1900.	Granite porphyry.	In W. T., p. 161.
79	I″.4.2.3.	Q 18.18 di 1.08 or 28.91 hy 3.10 ab 34.58 mt 1.83 an 10.01 il 0.61 ap 0.34	Thunder Mountain, Little Belt Mountains, Montana.	H. N. Stokes.	L. V. Pirsson, U. S. G. S. A. R. 20, III, p. 509, 1900.	Granite porphyry.	In W. T., p. 161.
80	I.″4″.2.3.	Q 16.68 di 1.08 or 30.58 hy 4.53 ab 34.58 mt 2.55 an 8.06 il 0.46 ap 0.51	Big Baldy Mountain, Little Belt Mountains, Montana.	W. F. Hillebrand.	L. V. Pirsson, U. S. G. S. A. R. 20, III, p. 511, 1900.	Quartz syenite porphyry.	In W. T., p. 161.
81	I(II).4″.2.3.	Q 15.66 di 1.79 or 28.91 hy 7.25 ab 33.54 mt 2.09 an 8.90 il 0.46 ap 0.34	Sheep Creek, Little Belt Mountains, Montana.	W. F. Hillebrand.	L. V. Pirsson, U. S. G. S. A. R. 20, III, p. 497, 1900.	Granite syenite aplite.	In W. T., p. 161.
82	I″.4(5).2.3″.	Q 13.68 di 0.22 or 29.47 hy 3.23 ab 37.20 mt 3.48 an 10.01 il 0.91	Barker, Little Belt, Mountains, Montana.	W. F. Hillebrand.	L. V. Pirsson, U. S. G. S. A. R. 20, III, p. 466, 1900.	Syenite.	In W. T., p. 161.
83	I.4.2.3(4).	Q 27.96 hy 2.22 or 24.46 mt 0.46 ab 34.06 il 0.31 an 8.62 ap 0.34 C 1.22	Mill Creek, Bitterroot Range, Montana.	W. F. Hillebrand.	W. Lindgren, U. S. G. S. P. P. 27, p. 18, 1904.	Quartz monzonite.	Same as No. 77.
84	I.4.″2.(2)3.	Q 25.98 hy 2.32 or 37.81 mt 0.46 ab 22.53 il 0.46 an 6.39 ap 0.34 C 1.43	Modoc Mine, Butte District, Montana.	W. F. Hillebrand.	W. H. Weed, U. S. G. S. P. P. 74, p. 41, 1912.	Rhyolite porphyry.	In W. T., p. 161.
85	I(II).4.2(3).3.	Q 23.64 di 0.71 or 26.69 hy 6.18 ab 23.06 mt 2.32 an 15.29 il 0.91	Boulder, Butte District, Montana.	H. N. Stokes.	W. H. Weed, U. S. G. S. P. P. 74, p. 33, 1912.	Granite.	Also in J. G., VII, p. 739, 1899. In W. T., p. 163.
86	I(II).4.2″.3.	Q 20.58 di 1.54 or 28.36 hy 3.99 ab 26.20 mt 3.25 an 13.62 il 1.06 ap 0.34	Rimini, Montana.	J. G. Fairchild.	A. Knopf, U. S. G. S. rec. lab.	Quartz monzonite.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
87	64.49	17.25	0.86	2.42	1.24	3.79	4.19	4.15	0.54	0.06	0.51	0.23	trace	BaO 0.30 SrO 0.08 Li_2O trace	100.11	
A1. I	1.075	.169	.005	.034	.031	.067	.068	.044			.006	.002	——			
88	71.26	13.94	1.01	1.35	0.67	1.64	3.96	4.35	0.55	0.26	0.56	0.10	0.55	F trace?	100.20	
A2. II	1.188	.137	.006	.019	.017	.029	.064	.047			.007	.001	.008			
89	70.18	12.97	0.82	0.86	0.95	3.98	2.89	5.40	0.29	0.18	0.54	0.26	0.55	F 0.04	99.91	
A2. II	1.170	.127	.005	.012	.019	.071	.047	.057			.007	.002	.008			
90	68.42	15.01	0.97	1.93	1.21	2.60	3.23	4.25	0.73	0.54	0.50	0.13	0.06	CO_2 0.20 S 0.02 NiO none BaO 0.12 SrO 0.03	99.95	
A1. I	1.140	.147	.006	.027	.030	.047	.051	.046			.006	.001	.001			
91	73.84	12.47	0.32	0.90	0.25	1.08	2.88	5.38	2.76				trace		99.88	
A3. III	1.231	.122	.002	.012	.006	.020	.047	.058					——			
92	71.85	13.17	2.17	1.34	0.63	2.25	4.06	3.89	0.43		0.43	0.14	0.12		100.48	
A2. II	1.198	.129	.014	.018	.016	.040	.065	.041			.008	.001	.002			
93	71.62	14.99	1.27	1.01	0.74	1.33	3.62	4.81	0.41		0.08	trace	0.17	Cl trace	100.05	
A2. II	1.194	.147	.008	.014	.019	.023	.058	.051			.001	——	.002			
94	64.40	15.77	2.47	1.15	2.12	3.54	4.10	3.81	1.93	0.31	0.40	0.16	0.04	NiO 0.17	100.37	
A2. II	1.073	.154	.015	.016	.053	.063	.066	.041			.005	.001	——			
95	69.45	14.92	3.16	0.23	0.05	1.19	3.19	5.95	1.69		0.19	0.06	0.07	BaO 0.03	100.18	
A2. II	1.158	.146	.020	.003	.001	.021	.051	.064			.002	——	.001			
96	73.50	14.87	0.95	0.42	0.29	2.14	3.46	3.56	0.90		none	none	0.03	SrO trace	100.12	
A2. II	1.225	.146	.006	.006	.007	.038	.056	.038			——	——	——			
97	68.60	16.21	1.67	1.57	1.05	2.61	3.29	3.88	0.92			0.21	0.09	CO_2 0.19 Cl 0.03 SrO trace	00.32	2.640
A2. II	1.143	.159	.010	.022	.026	.047	.053	.041				.001	.001			27°
98	65.51	17.01	none	2.79	0.90	3.16	3.82	4.67	1.78			0.13		Cl trace S 0.38	100.15	2.666
A3. III	1.092	.167	——	.039	.023	.056	.061	.050				.001				26°
99	75.17	12.66	0.23	1.40	0.05	0.82	2.88	5.75	0.66	0.16	0.10	0.03	trace	F 0.31 BaO 0.03 SrO trace? Li_2O trace	100.26	
A2. II	1.253	.124	.001	.019	.001	.014	.047	.062			.001	——	——			
100	69.52	15.44	1.90	0.09	0.17	1.70	4.54	5.04	0.27	0.33	0.23	0.14	0.08	CO_2 0.17 ZrO_2 0.05 BaO 0.19 SrO 0.04	99.90	
A1. I	1.169	.151	.012	.001	.004	.030	.073	.054			.003	.001	.001			
101	66.12	17.21	2.43	trace	0.35	2.11	4.70	5.57	0.71	0.14	0.29	0.11	0.08	ZrO_2 0.06 BaO 0.25 SrO 0.05	100.18	
A1. I	1.102	.169	.015	——	.009	.038	.076	.060			.004	.001	.001			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. TOSCANOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
87	I''.4''.2''.3''.	Q 13.86 or 24.46 ab 35.63 an 15.85 di 0.68 hy 5.90 mt 1.16 il 0.92 ap 0.67	Sweet Grass Creek, Crazy Mountains, Montana.	W. F. Hillebrand.	J. E. Wolff, U. S. G. S. B. 148, p. 142, 1897.	Porphyrite.	In W. T., p. 161. Cf. No. 76.
88	I.4.2.3.⊙	Q 26.34 or 26.13 ab 33.54 an 7.23 hy 3.55 mt 1.22 il 1.43 ap 0.34	White Knob, Mackay, Idaho.	C. Palmer.	J. B. Umpleby, U. S. G. S. rec. lab.	Granite porphyry.	
89	I(II).4.''2.3.	Q 25.92 or 31.69 ab 24.63 an 6.39 di 6.09 wo 1.63 mt 1.16 il 1.06 ap 0.67	White Knob, Mackay, Idaho.	C. Palmer.	J. B. Umpleby, U. S. G. S. rec. lab.	Granite porphyry.	
90	I''.4.2''.3.	Q 25.50 or 25.58 ab 26.72 an 12.23 C 0.61 hy 5.11 mt 1.39 il 0.92 ap 0.34	Hailey, Idaho.	W. F. Hillebrand.	W. Lindgren, U. S. G. S. A. R. 20, III, p. 81, 1900.	Quartz monzonite.	In W. T., p. 163.
91	I.(3)4.(1)2.3.	Q 32.88 or 32.25 ab 24.63 an 4.73 di 0.71 hy 1.56 mt 0.46	Midway Geyser Basin, Yellowstone National Park.	H. N. Stokes.	J. P. Iddings, U. S. G. S. Mon. 32 (II), p. 426, 1899.	Rhyolite perlite.	Also in U. S. G. S. B. 150, p. 153, 1898. In W. T., p. 163.
92	I''.''4.''2.3(4).	Q 29.10 or 22.80 ab 34.06 an 6.39 di 3.06 hy 0.30 mt 3.25 il 0.76 ap 0.34	Tower Creek, Yellowstone National Park.	F. A. Gooch.	J. P. Iddings, U. S. G. S. Mon. 32 (II), p. 426, 1899.	Rhyolite.	In W. T., p. 163.
93	I.4.''2.3.	Q 28.08 or 28.36 ab 30.39 an 6.39 C 1.53 hy 2.82 mt 1.86 il 0.15	Hurricane Ridge, Crandall Basin, Yellowstone National Park.	L. G. Eakins.	J. P. Iddings, U. S. G. S. Mon. 32 (II), p. 261, 1899.	Aplite.	In W. T., p. 163.
94	I(II).4.2.3(4).	Q 16.46 or 22.80 ab 34.54 an 13.07 di 2.81 hy 4.00 mt 2.55 il 0.76 hm 0.64 ap 0.34	Hurricane Ridge, Crandall Basin, Yellowstone National Park.	W. H. Melville.	J. P. Iddings, U. S. G. S. Mon. 32 (II), p. 261, 1899.	Quartz diorite porphyry.	In W. T., p. 163.
95	I.4.''2.3.	Q 25.50 or 35.58 ab 26.72 an 5.84 C 1.02 hy 0.10 mt 0.46 il 0.30 hm 2.88	Sunset Peak, Bear Gulch, Yellowstone National Park.	L. G. Eakins.	J. P. Iddings, U. S. G. S. Mon. 32 (II), p. 325, 1899.	Rhyolite.	In W. T., p. 163.
96	I.(3)4.2.3''.	Q 34.68 or 21.13 ab 29.34 an 10.56 C 1.43 hy 0.70 mt 1.39	Prospect Mountain, Mosquito Range, Leadville District, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. Mon. 12, p. 326, 1886.	Quartz porphyry.	In W. T., p. 163.
97	I''.4.2.3.	Q 27.42 or 22.80 ab 27.77 an 11.68 C 2.35 hy 4.18 mt 2.32	McNulty Gulch, Leadville, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 148, p. 176, 1897.	Granite porphyry.	In W. T., p. 163.
98	I''.4''.''2.3.	Q 15.48 or 27.80 ab 31.96 an 14.73 C 0.31 hy 7.45 ap 0.34	Jefferson Tunnel, Leadville, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. B. 148, p. 176, 1897.	Granite porphyry.	In W. T., p. 163.
99	I.(3)4.(1)2.''3.	Q 33.18 or 34.47 ab 24.62 an 3.89 C 0.20 hy 2.34 mt 0.23 il 0.15	Pikes Peak, Colorado.	W. F. Hillebrand.	E. B. Matthews, J. G., VIII, p. 237, 1900.	Granite.	In W. T., p. 149.
100	I.4.''2.3''.	Q 21.12 or 30.02 ab 38.25 an 6.67 di 0.43 hy 0.20 il 0.30 hm 1.90 tn 0.20 ap 0.34	Robbins Ranch, Pikes Peak, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 148, p. 163, 1897.	Rhyolite.	In W. T., p. 165.
101	I.4(5).2.3.	Q 12.60 or 33.36 ab 39.82 an 8.90 hy 0.90 il 0.15 hm 2.43 tn 0.59 ap 0.34	Wicher Mountain, Pikes Peak, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 148, p. 163, 1897.	Trachyte?	In W. T., p. 165.

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
102	67.90	16.08	0.83	2.02	0.73	2.86	4.08	4.11	0.21	0.14	1.15	0.12	none	Cl 0.01	100.24	
A2. II	1.132	.158	.005	.028	.018	.051	.066	.043			.014	.001	—			
103	67.64	14.75	0.81	1.95	0.94	3.98	3.40	4.06	0.19	0.13	1.36	0.20	0.27	ZrO_2 trace Cl 0.08	99.76	
A2. II	1.127	.145	.005	.027	.024	.071	.055	.043			.017	.001	.004			
104	66.71	15.04	0.92	1.74	1.53	2.92	3.37	5.04	0.43	0.34	1.29	0.20	0.46	ZrO_2 none Cl 0.04	100.03	
A2. II	1.112	.147	.006	.024	.038	.052	.055	.053			.016	.001	.006			
105	64.56	17.36	0.76	1.81	0.73	3.25	3.56	5.94	0.45	0.41	0.61	0.08	0.33	ZrO_2 trace Cl 0.01	99.86	
A2. II	1.076	.170	.005	.025	.018	.058	.057	.063			.008	—	.005			
106	71.56	14.91	1.47	1.04	0.08	1.98	3.78	4.94	0.44			trace			100.20	2.59
A3. III	1.193	.146	.009	.014	.002	.036	.061	.053				—				18°
107	70.87	15.18	2.18	0.12	0.60	1.58	3.47	5.04	1.08		trace	trace	trace		100.12	
A3. III	1.181	.149	.014	.002	.015	.029	.056	.054			—	—	—			
108	68.85	17.01	1.78	0.65	trace	1.62	3.44	5.11	1.79				trace		100.25	2.489
A3. III	1.148	.167	.011	.009	—	.029	.055	.055					—			14°
109	68.83	15.60	2.11	0.56	0.60	1.86	3.66	5.09	0.62	0.44	0.47	0.07	0.05	CO_2 none ZrO_2 0.05 S 0.03 BaO 0.13 SrO none	100.17	
A1. I	1.147	.153	.013	.008	.015	.033	.059	.054			.006	—	—			
110	68.81	15.54	1.78	0.80	0.52	2.43	4.24	4.07	0.78	0.50	0.28	0.13	0.12	CO_2 0.48 ZrO_2 trace BaO 0.13 SrO 0.04	100.65	
A1. I	1.147	.152	.011	.011	.013	.043	.068	.043			.004	.001	.002			
111	68.61	16.43	0.73	1.52	0.05	1.79	2.82	4.65	3.35						99.95	2.423
A3. III	1.144	.161	.005	.021	.001	.032	.045	.050								14°
112	68.14	15.29	0.35	1.66	0.26	3.03	3.59	4.07	0.39	0.40	0.36	0.17	0.12	CO_2 0.22 ZrO_2 0.01 F none FeS_2 1.52 NiO 0.01 BaO 0.03 SrO 0.03	99.65	
A1. I	1.136	.150	.002	.023	.007	.054	.058	.044			.005	.001	.002			
113	67.76	16.08	2.22	0.23	0.43	2.59	4.06	4.91	0.54	0.94	0.45	0.11	0.04	CO_2 none ZrO_2 0.02 S 0.02 BaO 0.12 SrO 0.03	100.55	
A1. I	1.129	.158	.014	.003	.011	.046	.066	.052			.006	.001	—			
114	67.29	15.78	1.86	1.97	0.72	2.36	3.77	3.55	2.10		none	0.28	0.21	CO_2 0.27 SrO none Li_2O trace	100.16	
A2. II	1.122	.155	.012	.028	.018	.042	.061	.038			—	.002	.003			
115	65.70	15.31	2.54	1.62	1.62	2.56	3.62	4.62	0.42	0.17	0.72	0.33	trace	CO_2 none SO_3 0.12 Cl 0.03 BaO 0.12 SrO 0.03 Li_2O trace	99.53	2.720
A1. I	1.095	.150	.015	.022	.041	.047	.058	.049			.009	.002	—			34°
116	64.93	16.79	3.54	0.32	0.65	2.11	3.33	4.76	1.65	1.12	0.53	0.17	trace	ZrO_2 0.03 BaO 0.15 SrO trace Li_2O trace	100.08	
A1. I	1.082	.165	.022	.004	.016	.038	.053	.051			.007	.001	—			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. TOSCANOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
102	I''.4.2''.3(4).	Q 21.18 hy 2.99 or 23.91 mt 1.16 ab 34.58 il 2.13 an 13.62 ap 0.34	Jennings Gulch, Monarch District, Colorado.	R. M. Butters.	R. D. Crawford, Colo. G. S. B. 4, p. 150, 1913.	Quartz monzonite gneiss.	
103	I(II).4.2''.3.	Q 24.06 di 4.73 or 23.91 hy 1.30 ab 28.82 mt 1.16 an 13.07 il 2.58 ap 0.34	Taylor Mountain, Monarch District, Colorado.	R. M. Butters.	R. D. Crawford, Colo. G. S. B. 4, p. 144, 1913.	Quartz monzonite.	
104	I(II).4.2.3.	Q 19.80 di 2.26 or 29.47 hy 3.76 ab 28.82 mt 1.39 an 10.84 il 2.43 ap 0.34	Clover Mountain, Monarch District, Colorado.	R. M. Butters.	R. D. Crawford, Colo. G. S. B. 4, p. 158, 1913.	Quartz monzonite porphyry.	
105	I''.4(5).2.3.	Q 12.78 di 1.86 or 35.03 hy 3.12 ab 29.87 mt 1.16 an 13.90 il 1.22	Mohammed Tunnel, Monarch District, Colorado.	R. M. Butters.	R. D. Crawford, Colo. G. S. B. 4, p. 166, 1913.	Quartz latite porphyry.	
106	I.4.2.3⊙	Q 26.04 di 0.96 or 29.47 hy 0.36 ab 31.96 mt 2.09 an 8.90	Round Mountain, Elk Mountains, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. B. 148, p. 177, 1897.	Rhyolite.	In W. T., p. 163.
107	I.4.2.3⊙	Q 26.88 hy 1.50 or 30.02 mt 0.46 ab 29.34 hm 1.92 an 8.06 C 1.02	Pennsylvania Hill, Rosita Hills, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. A. R. 17, II, p. 324, 1896.	Rhyolite.	In W. T., p. 163.
108	I.4.2.3⊙	Q 25.80 mt 2.09 or 30.58 hm 0.32 ab 28.82 an 8.06 C 2.86	Summit District, Rio Grande County, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. B. 148, p. 179, 1897.	Rhyolite.	In W. T., p. 163.
109	I.4.2.3⊙	Q 22.92 hy 1.50 or 30.02 mt 0.46 ab 30.92 il 0.96 an 9.17 hm 2.08 C 0.71	Lost Trail Creek, San Cristobal quadrangle, Colorado.	R. C. Wells.	W. Cross, U. S. G. S. rec. lab.	Rhyolite.	
110	I.4.2.3(4).	Q 24.60 hy 1.30 or 23.91 mt 2.09 ab 35.63 il 0.61 an 8.06 hm 0.32 C 1.22 ap 0.34	Difficulty Creek, Ouray quadrangle, Colorado.	G. Steiger.	Cross and Howe, U. S. G. S. Fol. 153, p. 12, 1907.	Quartz latite.	
111	I.''4.2.3.	Q 29.58 hy 2.21 or 27.80 mt 1.16 ab 23.58 an 8.90 C 3.47	Del Norte, Rio Grande County, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. B. 148, p. 179, 1897.	Rhyolite.	In W. T., p. 163.
112	I.4.2''.3.	Q 24.00 di 0.71 or 24.46 hy 2.71 ab 30.39 mt 0.46 an 13.34 il 0.76 ap 0.34 pr 1.52	Swan City, Breckinridge District, Colorado.	R. C. Wells.	F. L. Ransome, U. S. G. S. P. P. 75, p. 45, 1911.	Quartz monzonite porphyry.	
113	I.4.2.3.⊙	Q 19.62 hy 1.10 or 28.91 il 0.46 ab 34.58 hm 2.22 an 11.12 tn 0.59 ap 0.34	Bachelor, Creede County, Colorado.	G. Steiger.	E. S. Larsen, U. S. G. S. rec. lab.	Tridymite latite.	
114	I''.4.2.3(4).	Q 25.26 hy 4.32 or 21.13 mt 2.78 ab 31.96 ap 0.67 an 9.73 C 2.04	Sugar Loaf, Ten Mile District, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. A. R. 14, p. 227, 1894.	Quartz porphyrite.	In W. T., p. 163.
115	I''.4.2.3.	Q 19.92 hy 4.10 or 27.24 mt 3.02 ab 20.39 il 1.37 an 11.12 hm 0.32 C 0.31 ap 0.67	Near San Miguel Peak, Telluride, Colorado.	H. N. Stokes.	W. Cross, U. S. G. S. Fol. 57, p. 6, 1899.	Quartz monzonite.	In W. T., p. 165.
116	I''.4.2.3.	Q 22.32 hy 1.60 or 28.36 il 0.61 ab 27.77 hm 3.52 an 9.73 ru 0.48 C 2.65 ap 0.34	Greenhalgh Mountain, Silverton, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. Fol. 120, p. 10, 1905.	Quartz latite.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
117	61.85	16.22	5.07	0.69	1.50	3.60	3.87	4.14	0.78	0.66	0.68	0.15	0.08	CO_2 0.03 ZrO_2 0.02 S 0.21 BaO 0.09 SrO 0.04 Li_2O none	99.68	
A1. I	1.031	.159	.032	.010	.038	.064	.063	.044			.009	.001	.001			
118	74.49	14.51	0.57	0.32	trace	1.03	3.79	4.64	0.64				trace	Li_2O trace	99.99	
A3. III	1.242	.142	.004	.004	—	.018	.061	.050								
119	71.56	14.28	0.89	n. d.	0.42	1.18	3.00	4.37	0.79	0.36	0.38		trace	Cl 0.06 FeS_2 2.29 Cr_2O_3 trace V_2O_3 0.02 BaO 0.08 SrO trace As trace	100.01	
A2. II	1.193	.140	.006	(.012)	.011	.021	.048	.047			.005		—			
120	69.18	14.37	2.52	0.57	0.70	1.88	3.58	5.00	0.25	0.35	0.69	0.26	0.10	Cl trace Cr_2O_3 trace V_2O_3 trace NiO trace MoO trace BaO 0.09 SrO trace	99.55	
A1. I	1.153	.141	.015	.008	.018	.034	.058	.053			.008	.002	.001			
121	70.67	16.24	0.37	1.15	0.26	1.71	3.95	4.85	0.64	0.29	0.23	0.11	0.03	CO_2 trace ZrO_2 none S 0.01 BaO 0.05	100.56	
A1. I	1.178	.159	.002	.016	.007	.030	.064	052			.003	.001	—			
122	67.02	15.78	1.56	2.18	1.09	3.31	3.85	3.67	0.63	0.29	0.37	0.26	0.02	CO_2 none ZrO_2 0.04 S 0.03 BaO 0.13	100.23	
A1. I	1.117	.155	.010	.031	.027	.059	.062	.039			.005	.002	—			
123	70.52	15.54	0.77	1.31	0.66	2.49	3.96	3.72	0.88	0.36	0.27	0.09	0.02	CO_2 none ZrO_2 none S trace BaO 0.03 SrO none	100.62	
A1. I	1.175	.152	.005	.018	.017	.045	.064	.039			.003	.001	—			
124	68.76	15.48	2.50	0.44	0.56	2.23	3.89	3.88	0.57	0.79	0.50	0.06	0.02	ZrO_2 0.03 Cl 0.03 S none Cr_2O_3 none NiO none BaO 0.08 SrO none	99.82	
A1. I	1.146	.152	.016	.006	.014	.039	.063	.041			.006	—	—			
125	68.63	13.68	2.53	1.81	1.10	2.51	2.94	4.04	0.87	0.70	0.69	0.24	0.15	ZrO_2 0.01 FeS_2 0.11 BaO 0.05 SrO trace Li_2O trace	100.06	
A1. I	1.144	.134	.016	.025	.028	045	.047	.043			.009	.002	.002			
126	75.01	13.88	0.74	n. d.	0.09	1.00	3.52	4.89	0.26	0.11	0.06	trace	trace	CO_2 none BaO 0.10 SrO trace Li_2O trace	99.66	
A3. III	1.250	.136	.005	(.010)	.002	.018	.056	.053			.001	—	—			
127	71.24	14.11	1.75	1.23	1.07	2.87	2.37	3.97	0.59	0.11	0.42	0.17	trace	CO_2 0.28 BaO 0.09	100.27	2.651
A2. II	1.187	.138	.011	.017	.027	.052	.039	.043			.005	.001	—			
128	71.21	15.38	0.25	1.47	0.33	1.37	4.28	4.85	0.43	0.02	0.16	0.05	0.06	BaO 0.09	99.95	2.621
A2. II	1.187	.151	.002	.020	.008	.025	.069	.052			.002	—	—			
129	70.78	15.72	0.36	1.61	0.46	1.92	3.48	5.23	0.25	0.10	0.20	0.26	0.03	BaO 0.01 SrO trace	100.41	2.654
A2. II	1.181	.154	.002	.022	.012	.034	.056	.055			.003	.002	—			
130	69.08	13.93	2.72	1.62	0.80	3.38	3.55	3.99	1.05	0.03	0.23	0.07	trace		100.45	2.69
A2. II	1.151	.137	.017	.022	.020	.061	.057	.042			.003	—	—			
131	66.46	15.34	1.68	1.83	1.11	3.43	4.86	4.58	0.29		0.27	0.08			99.93	
A2. II	1.108	.150	.011	.025	.028	.061	.078	.049			.003	—				

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. TOSCANOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
117	I(II).4″.2″.3″.	Q 14.28 di 1.94 or 24.46 hy 2.90 ab 33.01 mt 0.46 an 14.46 il 1.37 hm 4.36 ap 0.34	Millie Gulch, Lake City quadrangle, Colorado.	R. C. Wells.	W. Cross, U. S. G. S. rec. lab.	Latite.	
118	I.(3)4.(1)2.3.	Q 32.40 mt 0.91 or 27.80 ab 31.96 an 5.00 C 1.33	Thomas Range, Utah.	L. G. Eakins.	W. Cross, Pr. Colo. Sc. Soc., II, p. 69, 1887.	Rhyolite.	In W. T., p. 165.
119	I.(3)4.″2.3.	Q 34.14 hy 1.23 or 26.13 il 0.76 ab 25.15 pr 2.29 an 5.84 C 2.45	Swansea Mine, Tintic District, Utah.	H. N. Stokes.	Tower and Smith, U. S. G. S. A. R. 19, III, p. 637, 1899.	Quartz porphyry.	In W. T., p. 165.
120	I.4.2.3⊙	Q 24.54 hy 1.80 or 30.02 mt 0.23 ab 30.39 il 1.22 an 7.51 hm 2.24 C 0.20 ap 0.67	Pinyon Creek, Tintic District, Utah.	H. N. Stokes.	Tower and Smith, U. S. G. S. A. R. 19, III, p. 634, 1899.	Rhyolite.	In W. T., p. 165.
121	I.4.2.3.⊙	Q 24.60 hy 2.15 or 28.91 mt 0.46 ab 33.54 il 0.30 an 7.51 ap 0.34 C 1.63	Clifton District, Utah.	R. C. Wells.	B. S. Butler, U. S. G. S. rec. lab.	Quartz monzonite.	
122	I″.4.2″.3(4).	Q 21.84 hy 4.81 or 21.68 mt 2.32 ab 32.49 il 0.76 an 14.46 ap 0.67 C 0.20	Clifton District, Utah.	R. C. Wells.	B. S. Butler, U. S. G. S. rec. lab.	Syenite.	
123	I.4.2.3(4).	Q 27.00 hy 3.02 or 21.68 mt 1.16 ab 33.54 il 0.46 an 11.68 ap 0.34 C 0.71	Granite Mountain, Ray District, Arizona.	R. C. Wells.	F. L. Ransome, U. S. G. S. rec. lab.	Quartz monzonite porphyry.	
124	I.4.2.3(4).	Q 25.80 hy 1.40 or 22.80 il 0.92 ab 33.01 hm 2.50 an 10.84 C 0.92	Old Dominion Mine, Globe District, Arizona.	W. F. Hillebrand.	F. L. Ransome, U. S. G. S. P. P. 12, p. 92, 1903.	Dacite.	
125	I″.″4.2.3.	Q 29.88 hy 3.00 or 23.91 mt 3.71 ab 24.63 il 1.37 an 10.56 ap 0.67 C 0.61	Lost Gulch, Globe District, Arizona.	W. F. Hillebrand.	F. L. Ransome, U. S. G. S. P. P. 12, p. 76, 1903.	Quartz monzonite.	
126	I.″4.(1)2.3.	Q 32.94 hy 1.39 or 29.46 il 0.15 ab 29.34 an 5.00 C 0.92	Skwentua River, Alaska.	H. N. Stokes.	J. E. Spurr, A. G., XXV, p. 231, 1900.	Alaskite.	In W. T., p. 165.
127	I″.(3)4.2(3).3.	Q 34.14 hy 2.83 or 23.91 mt 2.55 ab 20.44 il 0.76 an 13.62 ap 0.34 C 0.71	Sumas Mountain, Skagit Range, British Columbia.	M. Dittrich	R. A. Daly, Can. G. S., Mem. 38, (I), p. 527, 1912.	Granite.	
128	I.4.″2.3.	Q 23.22 hy 2.91 or 28.91 mt 0.46 ab 36.15 il 0.30 an 6.95 C 0.51	Bauerman Ridge, Okanagan Range, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38, (I), p. 460, 1912.	Granite.	
129	I.4.2.3.⊙	Q 25.86 hy 3.44 or 30.58 mt 0.46 ab 29.34 il 0.46 an 7.51 ap 0.67 C 1.63	Rykert Batholith, Nelson Range, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38, (I), p. 287, 1912.	Granite,	
130	I″.4.2.3″.	Q 26.22 di 4.81 or 23.35 mt 3.94 ab 29.87 il 0.46 an 10.56	Taku Arm, Atlin District, British Columbia.	M. F. Connor.	D. D. Cairnes, Can. G. S. Mem. 37, p. 58, 1913.	Granodiorite.	
131	I(II).4(5).(1)2.3(4).	Q 13.44 di 8.53 or 27.24 mt 2.55 ab 40.87 il 0.46 an 6.39	Kokanee Mountain, W. Kootenai District, British Columbia.	F. Dittrich.	R. W. Brock, Can. G. S. A. R. (1902), p. 99, 1903.	Granodiorite.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
132	75.02	13.90	0.45	0.40	0.10	1.16	3.06	5.37	0.95		0.04	0.15	0.10		100.70	2.63
v2. II	1.250	.136	.003	.006	.003	.021	.049	.057			—	.001	.001			
133	76.26	13.43	0.11	0.06	0.04	1.06	2.95	5.44	0.51	0.19	0.07	trace	none	CO_2 none ZrO_2 trace S trace BaO 0.10 SrO 0.03 Li_2O trace	100.25	
A1. I	1.271	.132	.001	.001	.001	.019	.048	.058			.001	—	—			
134	76.03	13.39	0.48	0.31	0.05	1.28	2.98	5.18	0.34	0.15	0.07	0.03	trace	BaO 0.04 SrO trace Li_2O none	100.33	
A2. II	1.267	.121	.003	.005	.001	.023	.048	.055			.001	—	—			
135	75.97	13.07	0.61	0.39	0.14	1.49	2.51	5.62	0.24	0.14	0.09	trace	trace	CO_2 none Cr_2O_3 none NiO none BaO 0.14 SrO 0.03 Li_2O trace	100.44	
A1. I	1.266	.128	.004	.005	.004	.027	.040	.060			.001	—	—			
136	74.60	13.41	1.28	0.30	0.26	1.08	3.38	4.50	0.85		0.16	0.03	0.06	BaO 0.11 SrO none Li_2O trace	100.02	
A1. I	1.243	.131	.008	.004	.007	.020	.055	.048			.002	—	.001			
137	73.64	13.44	0.60	0.74	0.26	1.26	3.51	4.50	1.99		0.11	0.06	0.06	BaO 0.11 SrO 0.02 Li_2O trace	100.30	
A1. I	1.227	.132	.004	.010	.007	.022	.056	.048			.001	—	.001			
138	73.51	14.42	0.46	1.49	0.33	1.26	4.03	4.29	0.40			0.04	trace		100.23	
A3. III	1.225	.141	.003	.021	.008	.022	.064	.046				—	—			
139	72.48	14.06	0.89	1.05	0.62	2.17	3.30	4.75	0.35	0.16	0.28	0.09	trace	BaO 0.08 SrO trace	100.28	
A2. II	1.208	.138	.006	.015	.016	.039	.053	.051			.004	—	—			
140	72.40	14.81	0.81	0.88	0.47	1.94	3.91	3.90	0.59		0.18	0.03	0.07	BaO 0.10 SrO 0.04 Li_2O trace	100.13	
A1. I	1.207	.145	.005	.012	.012	.035	.063	.041			.002	—	.001			
141	71.39	14.13	0.63	0.37	0.08	1.01	2.89	5.69	3.32	0.42	0.17	0.03	trace	BaO 0.09 SrO trace Li_2O trace	100.22	
A2. II	1.190	.138	.004	.005	.002	.018	.047	.061			.002	—	—			
142	71.08	15.90	0.62	1.31	0.54	2.60	3.54	4.08	0.30	none	0.22	0.10	0.15	ZrO_2 0.08 SO_3 none Cl 0.02 BaO 0.04 SrO 0.02 Li_2O trace	100.60	
A1. I	1.185	.156	.004	.018	.014	.047	.057	.043			.003	.001	.002			
143	70.75	15.13	0.98	1.43	0.73	3.09	3.05	3.62	0.51	0.10	0.42	0.10	trace	CO_2 none FeS_2 0.06 NiO none BaO 0.12 SrO 0.04 Li_2O trace	100.13	
A1. I	1.179	.148	.006	.019	.018	.055	.049	.038			.005	.001	—			
144	70.43	15.51	0.96	1.28	0.37	2.76	2.75	5.14	0.40	0.08	0.24	0.11	trace	CO_2 none FeS_2 trace BaO 0.20 SrO 0.05 Li_2O trace	100.28	
A1. I	1.174	.152	.006	.018	.009	.049	.044	.055			.003	.001	—			
145	70.39	14.09	0.53	2.12	0.62	3.08	3.70	3.51	2.50						100.54	2.41
A3. III	1.173	.138	.003	.030	.016	.055	.059	.037								

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. TOSCANOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
132	I.″4.(1)2.3.	Q 34.26 or 31.69 ab 25.68 an 5.00 C 1.22 hy 0.83 mt 0.70 ap 0.34	Prospect Lake, Lake District, Vancouver, British Columbia.	M. F. Connor.	C. H. Clapp, Can. G. S. Mem. 36, p. 67, 1913.	Granite gneiss.	Salic facies. Cf. No. 1, II.3.2.4.
133	I.(3)4.(1)2.3.	Q 35.76 or 32.25 ab 25.15 an 5.28 C 0.71 hy 0.10 il 0.15 hm 0.11	Fremont Peak, Mojave Desert, California.	W. F. Hillebrand.	J. E. Spurr, U. S. G. S. B. 228, p. 253, 1904.	Alaskite.	
134	I.(3)4.(1)2.3.	Q 36.36 or 30.58 ab 25.15 an 5.00 di 0.46 wo 0.35 mt 0.70 il 0.15	Yuba Gap, Sierra County, California.	W. F. Hillebrand.	H. W. Turner, J. G., III, p. 403, 1895.	Aplite.	Also in U. S. G. S. A. R. 17, (I), p. 721, 1896. In W. T., p. 165.
135	I.(3)4.2.(2)3.	Q 36.48 or 33.36 ab 20.96 an 7.51 hy 0.40 mt 0.93 il 0.15	East of Milton, Sierra County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 17, I, p. 721, 1896.	Aplite.	Also in J. G., VII, p. 160, 1899. In W. T., p. 165.
136	I.(3)4.″2.3.	Q 34.68 or 26.68 ab 28.82 an 5.56 C 0.82 hy 0.70 mt 0.70 il 0.30 hm 0.80	Clipper Mills, Shasta County, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 148, p. 192, 1887.	Rhyolite.	In W. T., p. 133.
137	I.(3)4.″2.3.	Q 32.76 or 26.69 ab 29.34 an 6.12 C 0.61 hy 1.49 mt 0.93 il 0.15	Slate Creek, Tehama County, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 148, p. 192, 1897.	Rhyolite.	In W. T., p. 165.
138	I.″4.″2.3″.	Q 29.70 or 25.57 ab 33.53 an 6.12 C 0.92 hy 3.18 mt 0.70	Medicine Lake, Modoc County, California.	L. G. Eakins.	J. S. Diller, U. S. G. S. B. 148, p. 228, 1897.	Rhyolite obsidian.	In W. T., p. 165.
139	I.4.2.3.⊙	Q 29.40 or 28.36 ab 27.77 an 9.45 di 1.11 hy 1.73 mt 1.39 il 0.61	Lake Tenaya, Mariposa County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 14, II, p. 482, 1894.	Granite porphyry.	In W. T., p. 167.
140	I.″4.2.3(4).	Q 29.70 or 22.80 ab 33.01 an 9.73 C 0.71 hy 1.99 mt 1.16 il 0.30	Mount Stover, Plumas County, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 148, p. 192, 1897.	Rhyolite.	In W. T., p. 167.
141	I.″4.(1)2.3.	Q 30.24 or 33.91 ab 24.63 an 5.00 C 1.22 hy 0.20 mt 0.70 il 0.30 hm 0.16	Near Grizzly Peak, Plumas County, California.	W. F. Hillebrand.	H. W. Turner, J. G., III, p. 407, 1895	Rhyolite.	Also in U. S. G. S. A. R. 17, (I), p. 721, 1896. In W. T., p. 165.
142	I.4.2.3″.	Q 28.20 or 23.91 ab 29.87 an 12.23 C 1.22 hy 3.12 mt 0.93 il 0.46 ap 0.34	El Capitan, Yosemite Valley, California.	W. Valentine.	H. W. Turner, J. G., VII, p. 143, 1899.	Biotite granite.	Also in A. J. S., VII, p. 295, 1899. In W. T., p. 165.
143	I.″4.2(3).3″.	Q 31.62 or 21.13 ab 25.68 an 14.46 C 0.92 hy 2.86 mt 1.39 il 0.76 ap 0.34	North Fork of Tuolumne River, Amador County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 17, I, p. 702, 1896.	Biotite granite.	Also in J. G., VII, p. 143, 1899. In W. T., p. 185.
144	I.″4.2″.3.	Q 28.14 or 30.59 ab 23.06 an 12.79 C 0.71 hy 2.22 mt 1.39 il 0.46 ap 0.34	North Fork of Tuolumne River, Amador County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 17, I, p. 702, 1896.	Biotite granite.	Also in J. G., VII, p. 143, 1899. In W. T., p. 167.
145	I″.4.2.3(4).	Q 27.42 or 20.58 ab 30.92 an 11.68 di 3.07 hy 3.61 mt 0.70	Northwest Harbor, San Clemente Island, California.	W. S. T. Smith.	W. S. T. Smith, U. S. G. S. A. R. 18, II, p. 488, 1898.	Rhyolite.	In W. T., p. 167.

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
146	69.01	15.44	1.28	1.28	0.62	2.54	3.85	4.52	0.56	0.33	0.49	0.24	0.01	CO_2 trace S trace SrO trace	100.17	2.664
A2. II	1.150	.151	.008	.018	.016	.045	.062	.048			.006	.002	—			
147	67.39	15.99	0.56	1.99	0.77	1.63	4.74	4.80	2.06						99.93	
A3. III	1.123	.156	.003	.028	.019	.029	.076	.051								
148	66.83	15.24	2.73	1.66	1.63	3.59	3.10	4.46	0.56	none	0.54	0.18	0.10	CO_2 trace ZrO_2 0.04 SO_3 none Cl 0.02 BaO 0.11 SrO 0.03	100.82	
A1. I	1.114	.149	.017	.023	.041	.064	.050	.048			.007	.001	.001			
149	65.81	15.11	1.85	1.40	0.37	1.98	2.59	5.24	n. d.		0.54	0.23		BaO 0.10	95.22	2.38
B3. IV	1.097	.148	.012	.019	.009	.036	.042	.056			.007	.002				
150	62.33	17.30	3.00	1.63	1.05	3.23	4.21	4.46	0.75	0.44	1.05	0.29	0.08	ZrO_2 0.04 FeS_2 0.06 V_2O_3 0.01 BaO 0.24 SrO 0.05 C 0.11	100.33	
A1. I	1.039	.170	.019	.022	.026	.057	.068	.048			.013	.002	.001			
151	75.09	13.51	1.13	0.08	0.18	0.91	3.58	4.71	0.25	0.17	0.22	0.04	trace	CO_2 none SrO trace	99.87	
A2. II	1.252	.132	.007	.001	.005	.016	.058	.050			.003	—	—			
152	72.96	12.32	0.76	0.03	0.35	2.18	3.24	4.88	1.63	0.80	0.11	0.10	trace	CO_2 0.92 ZrO_2 trace S none BaO trace SrO trace	100.28	
A2. II	1.216	.121	.005	—	.009	.039	.052	.052			.001	.001	—			
153	72.54	13.32	2.41	0.09	0.51	1.37	3.40	5.25	0.97	0.21	0.35	0.11	none	ZrO_2 0.06 BaO 0.03	100.62	
A2. II	1.209	.130	.015	.001	.013	.025	.055	.056			.005	.001	—			
154	71.71	14.00	1.06	.051	0.43	2.25	3.21	4.41	1.38	0.44	0.28	0.07		CO_2 trace SO_3 0.54 S none	100.29	
A2. II	1.195	.137	.007	.007	.011	.040	.052	.047			.004	—				
155	71.60	12.44	1.00	0.65	0.06	1.90	3.30	4.22	3.78	0.81	0.25	0.08	0.06	CO_2 none ZrO_2 0.01 BaO 0.03 SrO 0.03	100.22	
A1. I	1.193	.122	.006	.009	.002	.034	.053	.045			.003	.001	.001			
156	63.34	15.46	4.14	0.39	0.66	2.01	3.89	5.31	1.16	1.89	1.53	0.22	0.04	CO_2 none BaO 0.15 SrO 0.03	100.22	
A1. I	1.056	.152	.026	.006	.017	.036	.063	.056			.019	.002	—			
157	71.48	13.00	1.25	1.55	0.95	2.60	2.60	4.24	1.24	0.20	0.43	0.09	0.09	CO_2 0.30 S none BaO 0.09	100.11	
A1. I	1.191	.127	.008	.022	.019	.046	.042	.045			.005	.001	.001			
158	69.76	14.05	2.05	none	0.17	1.73	3.90	3.57	3.65	0.62	0.19	0.07	0.10	BaO 0.14	100.00	
A2. II	1.163	.138	.013	—	.004	.030	.063	.038			.002	—	.001			
159	65.62	15.33	2.39	1.46	1.56	3.40	2.88	3.78	1.85		0.66	0.36		CO_2 0.24 S 0.55 SrO 0.05 Li_2O 0.03	100.16	
A1. I	1.094	.150	.015	.020	.039	.061	.047	.040			.008	.003				

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. TOSCANOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
146	I.4.2.3″.	Q 23.64 di 2.13 or 26.69 mt 1.86 ab 32.49 il 0.91 an 10.56 ap 0.67 C 0.31	Lone Pine Creek, Mount Whitney quadrangle, California.	R. C. Wells.	U. S. G. S. rec. lab.	Quartz monzonite.	
147	I.4″.2.3(4).	Q 15.54 hy 5.20 or 28.36 mt 0.70 ab 39.82 an 8.06	Mono Lake, California.	W. H. Melville.	W. Lindgren, U. S. G. S. B. 150, p. 149, 1898.	Rhyolite pumice.	In W. T., p. 167.
148	I″.4.2″.3.	Q 22.38 di 2.16 or 26.69 hy 3.10 ab 26.20 mt 3.94 an 14.18 il 1.06 ap 0.34	Nevada Falls Trail, Yosemite Valley, California.	W. Valentine.	H. W. Turner, J. G., VII, p. 152, 1899.	Quartz monzonite.	Also in A. J. S., VII, p. 297, 1899. In W. T., p. 167.
149	I.4.2.″3.	Q 26.52 hy 0.90 or 31.14 mt 2.78 ab 22.01 il 1.08 an 8.06 ap 0.67 C 2.14	Griswold Creek, Sierra Nevada, California.	G. Steiger.	F. L. Ransome, A. J. S., V, p. 363, 1898.	Latite pitchstone.	Also in U. S. G. S., B. 89, p. 58, 1898. Low sum due to H_2O. In W. T., p. 165.
150	I″.4(5).2.3″.	Q 13.02 hy 2.60 or 26.69 mt 2.32 ab 35.63 il 1.98 an 13.90 hm 1.44 C 0.41 ap 0.67	Clover Meadow, Tuolumne County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 17, II, p. 727, 1896.	Trachyte.	"Latite." Cf. F. L. Ransome, U. S. G. S. B. 89, 1898. In W. T., p. 165.
151	I.(3)4.(1)2.3.	Q 34.02 hy 0.50 or 27.80 il 0.15 ab 30.39 hm 1.13 an 4.45 C 0.82	Pine Nut Range, Nevada.	H. N. Stokes.	J. E. Spurr, J. G., IX, p. 599, 1901.	Granite.	
152	I.(3)4.(1)2.3.	Q 31.80 di 1.94 or 28.91 wo 1.16 ab 27.25 hm 0.76 an 4.73 ru 0.10 ap 0.34	Meadow Creek Canyon, Nevada.	W. F. Hillebrand.	J. E. Spurr, U. S. G. S. B. 228, p. 208, 1904.	Rhyolite.	Fresh?
153	I.4.(1)2.3.	Q 29.34 di 0.65 or 31.14 hy 1.00 ab 28.82 il 0.15 an 5.28 hm 2.41 ru 0.30 ap 0.34	Red Mountain, Silver Peak Range, Nevada.	G. Steiger.	J. E. Spurr, U. S. G. S. P. P. 55, p. 28, 1906.	Rhyolite.	
154	I.(3)4.2.3.	Q 30.96 di 1.10 or 26.13 mt 0.70 ab 27.25 il 0.61 an 10.56 hm 0.64	Mount Brougher, Tonopah, Nevada.	G. Steiger.	J. E. Spurr, U. S. G. S. P. P. 42, p. 57, 1905.	Dacite	
155	I.(3)4.2.3.	Q 32.88 di 0.43 or 25.02 wo 0.58 ab 27.77 mt 1.39 an 6.67 il 0.46 ap 0.34	Burton Peak, Bullfrog District, Nevada.	G. Steiger.	F. L. Ransome, U. S. G. S. B. 407, p. 51, 1910.	Rhyolite glass.	
156	I″.4″.2.3.	Q 16.02 hy 1.70 or 31.14 il 0.91 ab 33.01 hm 4.14 an 8.06 ru 1.04 C 0.41 ap 0.67	Black Peak, Bullfrog District, Nevada.	G. Steiger.	F. L. Ransome, U. S. G. S. B. 407, p. 55, 1910.	Dacite.	
157	I″.(3)4.2″.3.	Q 33.42 di 0.68 or 25.02 hy 2.89 ab 22.01 mt 1.86 an 11.12 il 0.76 ap 0.34	Quinn Canyon Range, Nevada.	H. N. Stokes.	J. E. Spurr, J. G., IX, p. 602, 1901.	Granite.	
158	I.″4.2.3(4).	Q 29.94 hy 0.40 or 21.13 hm 2.05 ab 33.01 ru 0.19 an 7.51 ap 0.34 C 1.02	Emigrant Road, Silver Peak Range, Nevada.	G. Steiger.	J. E. Spurr, U. S. G. S. P. P. 55, p. 28, 1906.	Dacite.	
159	I″.4.2(3).3.	Q 25.86 hy 3.90 or 22.24 mt 1.86 ab 24.63 il 1.82 an 14.18 hm 0.48 C 1.22 ap 1.01	Aranzazu, Concepcion del Oro, Zacatecas, Mexico.	M. Dittrich.	A. Bergeat, N. J. B. B., XXVIII, p. 438, 1909.	Granodiorite.	Also in Bol. Inst. G. Mex. No. 27, p. 12, 1910.

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
160	70.22	15.34	0.33	2.00	0.92	2.31	2.72	5.32	0.48	0.13	0.74	0.14		S none	100.65	
A2. II	1.170	.150	.020	.028	.023	.041	.044	.056			.009	.001				
161	68.40	13.59	1.32	2.41	1.26	2.34	3.89	4.24	0.85		1.10	trace	0.20	CO_2 none ZrO_2 trace Cl 0.03 S none BaO 0.36 CuO,PbO no.	99.99	
A1. I	1.140	.133	.008	.033	.032	.041	.063	.045			.014	—	.003			
162	71.94	13.06	2.23	0.34	0.38	1.53	3.44	4.40	1.79			0.19			99.30	2.348
A3. III	1.199	.128	.014	.005	.010	.027	.055	.046				.001				
163	75.08	13.63	1.35	0.28	0.17	1.22	3.79	4.22	0.23		0.03	0.06	trace		100.06	2.354
A2. II	1.251	.134	.009	.004	.004	.021	.061	.045			—	—	—			
164	69.58	13.72	1.95	2.30	0.34	1.54	3.57	5.19	0.78	0.52			0.09	F 0.07 S 0.19 BaO 0.12	99.96	
A2. II	1.160	.134	.012	.032	.009	.028	.058	.055					.001			
165	72.93	12.67	none	2.08	0.62	1.91	3.19	4.55	0.50	0.11	0.54	0.11	0.03	CO_2 0.38 ZrO_2 0.06 BaO 0.12	99.80	2.665
A1. I	1.216	.124	—	.029	.016	.034	.052	.049			.007	.001	—			
166	71.93	14.40	1.49	0.63	0.47	1.81	3.99	4.58	0.40		0.30	trace	trace		100.00	2.597
A3. III	1.199	.141	.009	.009	.012	.032	.065	.049			.004	—	—			
167	68.42	15.51	1.07	1.51	1.14	2.71	4.20	4.08	1.17		0.31			X 0.12	100.24	2.574
A2. II	1.140	.152	.007	.021	.029	.048	.068	.044			.004					
168	65.24	14.95	3.46	1.28	1.11	3.31	3.91	4.16	1.52		1.05	0.24	trace	CO_2 0.46 S 0.07	100.76	2.602
A2. II	1.087	.147	.022	.018	.028	.059	.063	.045			.013	.002	—			
169	72.90	13.85	1.85	n. d.	0.72	1.17	2.49	5.21	1.50						99.69	
A4. IV	1.215	.136	.012	(.024)	.018	.021	.040	.055								
170	72.30	12.91	0.59	2.04	0.82	1.95	3.68	4.63	0.55	0.03	0.37	0.10	0.10	S none Cr_2O_3 none V_2O_3 none NiO none BaO 0.03	100.10	
A1. I	1.205	.126	.004	.028	.021	.035	.060	.049			.005	.001	.001			
171	68.02	14.16	1.82	1.95	1.91	2.81	3.90	3.92	0.56	0.20	0.63	0.16	0.22	CO_2 none NiO none BaO 0.06	100.32	
A1. I	1.134	.139	.011	.027	.048	.050	.063	.041			.008	.001	.007			
172	71.35	13.68	1.75	0.97	0.84	1.85	3.75	4.36	0.51	0.19	0.47	0.11	0.18	S none NiO none BaO 0.05	100.06	
A1. I	1.189	.134	.011	.014	.021	.033	.061	.047			.006	.001	.003			
173	71.98	13.13	1.33	1.64	0.56	1.15	2.98	4.93	1.38	0.39	0.37	0.19	0.14	Cl 0.01 BaO trace	100.18	2.63
A2. II	1.200	.129	.008	.023	.014	.021	.048	.052			.005	.001	.002			
174	70.34	13.18	2.65	2.24	0.40	1.24	3.61	4.90	0.76	0.46	0.46	0.10	0.19	Cl 0.02 BaO trace Li_2O trace	100.55	2.66
A2. II	1.172	.129	.017	.031	.010	.022	.058	.052			.006	.001	.003			
175	69.99	17.75	0.49	0.17	0.13	1.67	3.24	5.86	0.73						100.03	
A3. III	1.166	.174	.003	.003	.003	.030	.052	.063								

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. TOSCANOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
160	I″.4.2.3.	Q 28.26 hy 2.30 or 31.14 mt 4.64 ab 23.06 il 1.37 an 10.56 ap 0.34 C 1.22	Jorullo Volcano, Mexico.	F. Roel.	E. Ordonez, Cong. G. Int., X, Guide, XI, p. 55, 1906.	Diorite.	Inclusion in basalt.
161	I(II).4.2.3″.	Q 22.80 di 3.59 or 25.02 hy 3.32 ab 33.01 mt 1.86 an 6.95 il 2.13	Barima River, Northwest District, British Guiana.	J. B. Harrison.	J. B. Harrison, G. Gold. Br. Gui., p. 76, 1908.	Granitite.	
162	I.(3)4.1.3.	Q 32.10 hy 1.00 or 25.50 mt 1.16 ab 28.82 hm 1.44 an 6.67 ap 0.34 C 0.31	Urcu-Cui Antisana Volcano, Ecuador.	E. Esch.	E. Esch, in Reiss, Ecuador, I, p. 83, 1901.	Liparite.	
163	I.(3)4.″2.3″.	Q 34.14 hy 0.40 or 25.02 mt 0.93 ab 31.96 hm 0.80 an 5.84 C 0.71	Laguna di Marecunga, Chile.	F. v. Wolff.	F. v. Wolff, Z. D. G. G., LI, p. 546, 1899.	Liparite.	In W. T., p. 167.
164	I″.4.″2.3.	Q 24.18 di 1.67 or 30.58 hy 2.81 ab 30.39 mt 2.78 an 5.84	Salto do Girao, Madeira River, Amazonas, Brazil.	G. S. Blake.	J. W. Evans, Q. J. G. S., LXII, p. 107, 1906.	Granite porphyry.	
165	I″.″4.″2.3.	Q 31.08 di 1.89 or 27.24 hy 3.54 ab 27.25 il 1.06 an 6.39 ap 0.34	Olavarria, Buenos Aires, Argentina.	M. Dittrich.	H. Backlund, Bol. Minist. Agric. Arg., No. 2B, p. 25, 1913.	Granite gneiss.	
166	I.4.2.3″.	Q 27.06 di 1.08 or 27.24 hy 0.70 ab 34.06 mt 1.16 an 7.51 il 0.61 hm 0.64	Agua de Medano, Catamarca, Argentina.	P. Jannasch.	F. Tannhäuser, N. J. B. B., XXII, p. 576, 1906.	Liparite.	
167	I″.4.2.3(4).	Q 20.46 di 1.79 or 24.46 hy 3.36 ab 35.63 mt 1.62 an 11.12 il 0.61	Incaguasi, Jujuy, Argentina.	P. Jannasch.	F. Tannhäuser, N. J. B. B., XXII, p. 587, 1906.	Andesite.	
168	I(II).4.2.3″.	Q 19.20 di 2.81 or 25.02 hy 1.50 ab 33.01 mt 1.16 an 10.84 il 1.98 hm 2.72	Puerta de Aparoma, Catamarca, Argentina.	P. Jannasch.	F. Tannhäuser, N. J. B. B., XXII, p. 577, 1906.	Dacitic liparite.	
169	I.(3)4.″2.″3.	Q 33.66 hy 4.97 or 30.58 ab 20.96 an 5.84 C 2.04	Smiorasair, Fannich Mountains, Scotland.	Barrow.	Peach et al., G. S. Scot. Mem. No. 92, p. 29, 1913.	Pegmatite.	
170	I″.4.2.3.	Q 26.76 di 1.14 or 27.24 hy 4.61 ab 31.44 mt 0.93 an 7.51 il 0.76 ap 0.34	Huntley, Aberdeenshire, Scotland.	E. G. Radley.	G. S. G. Brit., Sum. Prog., (1913), p. 83, 1914.	Granite.	
171	I(II).4.2.3(4).	Q 22.14 di 2.65 or 22.80 hy 4.99 ab 33.01 mt 2.55 an 9.73 il 1.22 ap 0.34	Dalness, Glen Etive, Argyllshire, Scotland.	E. G. Radley.	H. B. Manfe, G. S. Grt. Br., Sum. Prog. (1909), p. 87, 1910.	Granite.	
172	I.4.2.3″.	Q 27.84 di 0.86 or 26.13 hy 1.70 ab 31.96 mt 2.55 an 7.23 il 0.91 ap 0.34	Glen Etive, Argyllshire, Scotland.	E. G. Radley.	J. S. Flett, G. S. Scot. Mem. No. 93, p. 92, 1912.	Granite.	
173	I.(3)4.(1)2.3.	Q 32.28 hy 2.98 or 28.91 mt 1.86 ab 25.15 il 0.76 an 5.00 ap 0.34 C 1.12	Beinn a' Chairn, Island of Skye, Scotland.	W. Pollard.	A. Harker, Rocks of Skye, p. 153, 1904.	Granophyre.	
174	I″.4.(1)2.3.	Q 27.18 hy 2.45 or 28.91 mt 3.94 ab 30.39 il 0.91 an 5.28 ap 0.34	Druinn Eadmar da Choine, Island of Skye, Scotland.	W. Pollard.	A. Harker, Rocks of Skye, p. 153, 1904.	Granophyre.	
175	I.4.2.3.⊙	Q 24.78 hy 0.30 or 35.03 mt 0.70 ab 27.25 an 8.34 C 2.96	Kinsteary, Nairnshire, Scotland.	W. Mackie.	W. Mackie, Tr. Edin. G. Soc., VIII, p. 54, 1901.	Granite.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
176	69.01	17.74	0.97	2.05	0.48	1.95	2.73	3.94	1.18		trace				100.05	
A3. III	1.150	.174	.006	.029	.012	.035	.044	.041			—					
177	75.46	12.68	0.85	0.34	1.68	1.21	2.48	5.46	0.89					CO_2 none	101.05	2.621
B3. IV	1.258	.124	.005	.005	.042	.021	.040	.059								
178	72.30	14.60	n. d.	2.05	1.34	1.24	3.45	3.42	1.10		0.12	trace			99.62	
A4. IV	1.205	.143	—	.029	0.34	.022	.056	.036			.002	—				
179	75.50	13.50	0.95	n. d.	0.39	0.99	4.35	4.15	n. d.		0.37				100.20	
A4. IV	1.258	.132	.006	(.012)	.010	.018	.070	.044								
180	62.35	17.43	1.56	0.81	0.95	1.77	3.22	5.06	6.50		0.87				100.52	
A3. III	1.039	.171	.010	.011	.024	.032	.052	.054			.011					
181	61.50	17.90	0.86	1.44	0.53	1.29	3.20	5.03	7.50		0.70				99.95	
A3. III	1.015	.175	.005	.020	.013	.023	.052	.053			.009					
182	60.20	17.35	1.76	0.82	0.79	0.98	3.50	4.84	8.70		0.72				99.66	
A3. III	1.003	.170	.011	.011	.020	.018	.056	.051			.009					
183	73.9	13.9	1.8	n. d.	0.4	1.1	4.1	4.4	0.9						100.5	
B3. IV	1.232	.136	.011	(.022)	.010	.020	.066	.046								
184	70.10	18.40	1.72	n. d.	1.05	0.83	3.55	3.42	1.88						100.95	
A4. IV	1.168	.180	.011	(.022)	.026	.014	.057	.036								
185	69.10	15.70	0.47	2.05	2.40	0.80	2 .55	4.98	2.00						100.05	
A3. III	1.152	.154	.003	.029	.060	.014	.041	.053								
186	67.50	14.60	0.43	2.00	2.35	2.88	3.80	3.93	2.00		0.78	0.06			100.27	
A2. II	1.125	.143	.003	.028	.059	.052	.061	.041			.010	—				
187	74.04	14.70	0.17	trace	0.15	1.60	2.50	5.84	2.01						101.01	
B3. IV	1.234	.144	.001	—	.004	.029	.040	.062								
188	75.74	13.71	0.55	n. d.	trace	1.26	3.72	4.69	0.46		0.17				100.30	
A4. IV	1.262	.134	.003	(.006)	—	.022	.060	.050			.002					
189	69.36	15.64	1.57	1.03	0.54	1.67	3.87	5.84	0.49		0.35	0.16	0.15	CO_2 trace	100.67	
A2. II	1.156	.153	.010	.014	.014	.030	.063	.062			.004	.001	.002			
190	67.80	14.08	3.24	1.60	0.67	2.61	3.42	4.87	1.05		0.50	0.05	trace		99.89	
A2. II	1.130	.138	.020	.022	.017	.046	.055	.052			.006	—				
191	67.49	13.85	3.55	1.95	0.53	1.50	3.60	5.56	0.80		0.61	0.33	0.08		99.85	
A2. II	1.125	.136	.022	.027	.013	.027	.058	.060			.008	.002	.001			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. TOSCANOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
176	I.(3)4.2.3.	Q 32.10 or 22.80 ab 23.06 an 9.73 C 5.51 hy 4.24 mt 1.39	Rubislaw, Aberdeen, Scotland.	W. Mackie.	W. Mackie, Tr. Edin. G. Soc., VIII, p. 54, 1901.	Granite.	
177	I.(3)4.″2.″3.	Q 34.80 or 32.80 ab 20.96 an 5.84 C 0.41 hy 4.20 mt 1.16	Foxdale, England.	A. M. Finlayson.	A. M. Finlayson, Q. J. G. S., LXVI, p. 304, 1910.	Granite.	
178	I″.(3)4.2.3(4).	Q 32.88 or 20.02 ab 29.34 an 6.12 C 2.96 hy 6.96 il 0.30	Deux Evailles, Brittany, France.	Pisani.	L. Vandernotte, Mass. Armor., p. 37, 1913.	Granite.	
179	I.″4.(1)2.3(4).	Q 31.26 or 24.46 ab 36.68 an 5.00 hy 1.92 il 0.76	Perrier, Mont Dore, Auvergne.	Pisani.	A. Lacroix, C. R., CXLVII, p. 779, 1908.	Rhyolite.	
180	I.4.2.3.⊙	Q 18.90 or 30.02 ab 27.25 an 8.90 C 3.37 hy 2.40 il 1.67 hm 1.56	Rigolet, Mont Dore, Auvergne.	Pisani.	Michel-Levy and Lacroix, C. R., CLII, p. 1202, 1911.	Trachyte pumice.	Fresh?
181	I.4.″2.3.	Q 19.20 or 29.75 ab 27.25 an 6.39 C 4.79 hy 2.09 mt 1.16 il 1.37	Queurenich, Mont Dore, Auvergne.	Pisani.	Michel-Levy and Lacroix, C. R., CLII, p. 1202, 1911.	Trachyte pumice.	Fresh?
182	I.4.(1)2.3.	Q 18.30 or 28.36 ab 29.34 an 5.00 C 4.59 hy 2.00 mt 0.46 il 1.37 hm 1.44	Fougères, Mont Dore, Auvergne.	Pisani.	Levy and Lacroix, C. R., CLII, p. 1202, 1911.	Trachyte pumice.	Fresh?
183	I.4.(1)2.3″.	Q 29.28 or 25.58 ab 34.58 an 5.56 C 0.41 hy 3.90	Ravin de Marus, Ardennes, France.	J. de Lapparent.	J. de Lapparent, B. Soc. Min. Fr., XXXII, p. 257, 1909.	Microgranite.	
184	I.(3)4.(1)2.3(4).	Q 32.04 or 20.02 ab 29.87 an 3.89 C 7.45 hy 5.50	Chaumeix, La Créuse, France.	Pisani.	L. de Launay, B. Sv. Ct. G. Fr., XI, No. 83, p. 77, 1902.	Porphyry.	Al_2O_3 high?
185	I(II).″4,(1)2.3.	Q 28.44 or 29.47 ab 21.48 an 3.89 C 4.69 hy 9.43 mt 0.70	Roche d'Agoux, La Creuse, France.	Pisani.	L. de Launay, B. Sv. Ct. G. Fr., XI, No. 83, p. 77, 1902.	Porphyry.	
186	I(II).4.2.3(4).	Q 20.76 or 22.80 ab 31.96 an 11.40 di 2.44 hy 6.72 mt 0.70 il 1.52	St. Symphorien, Lyonnais, France.	Pisani.	A. Michel-Lèvy, C. R., CLVI, p. 718, 1913.	Microgranulite.	
187	I.(3)4.2.(2)3.	Q 33.60 or 34.47 ab 20.96 an 8.06 C 1.33 hy 0.40 hm 0.17	Not stated, Corsica.	J. Deprat.	J. Deprat, B. Sv. Ct. G. Fr., XVII, No. 117, p. 57, 1907.	Rhyolite.	
188	I.″4.″2.3.	Q 33.25 or 27.80 ab 21.44 an 6.12 hy 0.53 il 0.30	Lier, Norway.	R. Mauzelius.	W. C. Brögger, Z. K., XVI, p. 77, 1890.	Granite.	In W. T., p. 167.
189	I.4.″2.3.	Q 19.44 or 34.47 ab 33.01 an 7.51 C 0.10 hy 1.66 mt 2.32 il 0.61 ap 0.34	Finse, Norway.	O. N. Heidenreich.	V. M. Goldschmidt, Videns. Skr., No. 18, p. 6, 1912.	Granite.	
190	I″.4.2.3.	Q 23.64 or 28.91 ab 28.82 an 8.62 di 3.24 hy 0.20 mt 3.71 il 0.91 hm 0.64	Riksgränsen, Lapland, Sweden.	O. Berg.	P. J. Holmquist, B. Un. Ups., VII, p. 266, 1906.	Granite.	
191	I″.4.(1)2.3.	Q 21.96 or 33.36 ab 30.39 an 5.00 di 0.43 hy 1.10 mt 4.64 il 1.22 hm 0.32 ap 0.67	Törnetrask Lake, Lapland, Sweden.	R. Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 266, 1906.	Granite.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
192	69.59	12.94	2.51	2.07	0.96	3.35	2.69	3.71	1.09		0.70	0.47	0.09		100.17	
A2. II	1.160	.127	.016	.029	.024	.060	.044	.039			.009	.003	.001			
193	68.00	15.08	1.56	1.66	0.95	2.50	3.64	5.00	0.86		0.62		0.13		100.00	
A2. II	1.133	.148	.010	.023	.024	.045	.059	.053			.008		.002			
194	70.65	12.47	2.71	2.58	0.66	2.06	2.56	4.53	0.44		0.50		0.06	BaO 0.10	99.32	
B2. III	1.178	.122	.017	.036	.017	.037	.041	.048			.006		.001			
195	69.21	14.72	2.33	2.15	0.55	2.52	2.69	4.77	0.80				0.78		100.52	
A3. III	1.154	.144	.014	.030	.014	.045	.044	.051					.011			
196	68.79	12.85	4.07	2.16	0.70	2.60	2.30	4.97	0.67		0.55		0.49		100.15	
A2. II	1.147	.126	.026	.030	.018	.046	.037	.053			.007		.007			
197	69.92	14.78	1.54	1.75	1.05	1.88	2.92	4.16	1.51				0.43		99.94	
A3. III	1.165	.145	.009	.025	.026	.034	.047	.044					.005			
198	69.48	13.88	2.67	1.53	0.71	2.39	3.74	4.44	1.19				0.15		100.18	
A3. III	1.158	.136	.017	.021	.018	.043	.059	.047					.002			
199	69.83	15.20	2.13	0.34	0.49	1.22	3.65	5.85	0.45	(0.08)	0.37	0.10	0.05	S 0.04 BaO 0.17	99.89	
A2. II	1.164	.149	.013	.005	.012	.021	.059	.063			.005	.001	—			
200	68.19	13.96	3.03	2.26	0.99	3.02	2.77	4.54	0.78		0.49	0.26	0.17		100.37	
A2. II	1.137	.137	.019	.032	.025	.054	.045	.047			.006	.002	.002			
201	73.79	13.04	0.98	1.15	0.37	2.61	2.56	4.87	0.78				0.61		100.76	
A3. III	1.230	.028	.006	.016	.009	.046	.041	.052					.009			
202	70.56	12.27	2.74	2.93	0.65	1.87	3.20	4.92	0.60		0.44	0.13	0.14		100.45	
A2. II	1.176	.120	.017	.040	.016	.034	.052	.052			.006	.001	.002			
203	71.21	13.95	0.65	2.22	0.94	2.28	2.87	4.86	0.89				0.42		100.29	
A3. III	1.187	.137	.004	.030	.024	.039	.047	.052					.006			
204	69.79	14.23	0.10	2.58	0.61	1.73	3.27	4.45	3.19				0.24		100.19	
A3. III	1.163	.140	.001	.036	.015	.030	.053	.047					.003			
205	68.55	14.73	0.37	2.56	1.39	2.83	2.88	4.10	2.34				0.73		100.48	
A3. III	1.143	.144	.002	.036	.035	.050	.047	.043					.010			
206	67.00	15.79	0.02	3.10	0.97	1.77	2.14	4.74	4.43						99.96	
A3. III	1.117	.155	—	.043	.024	.032	.034	.050								
207	75.10	12.50	0.67	0.82	0.32	1.28	2.69	5.27	0.47		0.56		0.50		100.18	
A2. II	1.252	.123	.004	.011	.008	.023	.044	.056			.007		.007			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. TOSCANOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
192	I(II).(3)4.2″.3.	Q 32.34 di 1.33 or 21.68 hy 2.43 ab 23.06 mt 3.71 an 12.23 il 1.37 ap 1.01	Bräcke, Jemtland, Sweden.	R. Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 260, 1906.	Granite.	
193	I″.4.2.3.	Q 20.94 di 2.00 or 29.47 hy 2.36 ab 30.92 mt 2.32 an 10.01 il 1.22	Pilgrimsta, Jemtland, Sweden.	E. Ostlund.	P. J. Holmquist, B. Un. Ups., VII, p. 260, 1906.	Granite.	
194	I″.(3)4.2.3.	Q 32.58 di 0.92 or 26.69 hy 3.08 ab 21.48 mt 3.94 an 9.17 il 0.91	Gammalkroppa, Wermland, Sweden.	R. Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 264, 1906.	Granite.	
195	I″.4.2″.3.	Q 27.18 hy 4.96 or 28.36 mt 3.25 ab 23.06 an 12.51 C 0.41	Skärjen, Nora, Wermland, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 264, 1906.	Granite.	
196	I(II).″4.2.″3.	Q 30.18 di 2.22 or 29.47 hy 1.26 ab 19.39 mt 6.03 an 10.01 il 1.06	Kortfors, Latorp, Wermland, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 264, 1906.	Granite.	
197	I″.″4.2.3.	Q 30.18 hy 5.50 or 24.46 mt 2.09 ab 24.63 an 9.45 C 2.04	Brusen, Helsingland, Sweden.	H. Santesson.	F. Svenonius, G. F. F., X, p. 273, 1888.	Andesite breccia.	Dellenite of Brögger. In W. T., p. 169.
198	I″.4.2.3.	Q 25.50 di 2.91 or 26.13 hy 1.20 ab 30.91 mt 3.94 an 8.34	Dellen, Helsingland, Sweden.	H. Santesson.	F. Svenonius, G. F. F., X, p. 273, 1888.	Hypersthene andesite.	Dellenite of Brögger, Eg. Kg., II, p. 59, 1895. In W. T., p. 169.
199	I.4.(1)2.3.	Q 23.04 hy 1.20 or 35.03 il 0.76 ab 30.92 hm 2.13 an 5.00 C 0.92	Grenna, Lake Vättern, Smaland, Sweden.	R. Mauzelius.	A. Gavelin, Sver. G. Und., Arsb. 5, No. 3, p. 4, 1912.	Quartz porphyry.	
200	I(II).4.2″.3.	Q 27.54 di 0.43 or 26.13 hy 3.49 ab 23.58 mt 4.41 an 12.51 il 0.91 ap 0.67	Järna, Dalarne, Sweden.	R. Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 260, 1906.	Granite.	
201	I.(3)4.2.3.	Q 33.78 di 2.64 or 28.91 hy 2.05 ab 21.48 mt 1.39 an 9.73	Osterbergshyttan, Nora Westmanland, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 260, 1906.	Granite.	
202	I(II).″4.(1)2.3.	Q 28.20 di 3.50 or 28.91 hy 2.35 ab 27.25 mt 3.94 an 4.45 il 0.91 ap 0.34	Haraldsby, Saltvik, Aland, Finland.	N. Sahlbom.	V. Hackmann, B. C. G. Finl., No. 15, p. 28, 1905.	Rapakiwi granite.	
203	I″.4.2.3.	Q 27.64 hy 6.62 or 28.91 mt 0.93 ab 24.63 an 10.84	Lake Mien, Blekinge, Sweden.	H. Santesson.	N. O. Holst, Abh. Sver. G. Und., No. 110, p. 37, 1890.	Rhyolite.	In W. T., p. 167.
204	I″.4.2.3.	Q 27.00 hy 6.52 or 26.13 mt 0.23 ab 27.77 an 8.34 C 1.02	Lake Mien, Blekinge, Sweden.	H. Santesson.	N. O. Holst, Abh. Sver. G. Und., No. 110, p. 37, 1890.	Rhyolite.	In W. T., p. 167.
205	I(II).4.2(3).3.	Q 25.44 hy 9.31 or 23.90 mt 0.46 ab 24.62 an 13.90 C 0.41	Lake Mien, Blekinge, Sweden.	H. Santesson.	N. O. Holst, Abh. Sver. G. Und., No. 110, p. 37, 1890.	Rhyolite.	In W. T., p. 169.
206	I″.(3)4.2.(2)3.	Q 28.92 hy 8.08 or 27.80 ab 17.81 an 8.90 C 3.98	Lake Mien, Blekinge, Sweden.	H. Santesson.	N. O. Holst, Abh. Sver. G. Und., No. 110, p. 37, 1890.	Rhyolite.	In W. T., p. 169.
207	I.(3)4.2.3.	Q 35.46 hy 1.72 or 31.14 mt 0.93 ab 23.06 il 1.06 an 6.39	Härsjön, Ronneby, Blekinge, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 258, 1906.	Granite.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
208	72.94	12.67	1.44	1.48	0.46	1.89	3.04	5.18	0.27		0.43	0.11	0.02	S 0.01 BaO 0.08	100.02	
A1. I	1.216	.124	.009	.021	.012	.034	.049	.055			.005	.001	——			
209	66.03	14.41	2.17	3.70	0.98	2.28	3.15	4.99	0.77		0.72	0.21	0.07	S 0.05 BaO 0.09	99.62	
A1. I	1.101	.141	.014	.051	.025	.041	.051	.053			.009	.001	.001			
210	64.28	15.72	2.17	3.56	1.08	3.09	3.41	4.34	1.31		0.71	0.21	0.07	S 0.04 BaO 0.09	100.08	
A1. I	1.071	.154	.014	.050	.027	.055	.055	.045			.009	.001	.001			
211	74.19	13.07	1.12	0.58	0.40	1.38	2.85	5.56	0.70		0.21		0.35		100.41	
A2. II	1.237	.128	.007	.008	.010	.025	.046	.060			.003		.005			
212	73.88	14.86	0.10	1.64	0.23	0.89	3.94	3.89	0.82						100.25	
A3. III	1.231	.146	.001	.023	.006	.016	.064	.041								
213	73.32	12.88	1.05	1.14	0.34	1.65	2.38	5.86	0.90		0.25	0.24	0.07		100.08	
A2. II	1.222	.126	.007	.016	.009	.030	.039	.063			.003	.002	.001			
214	71.71	12.69	2.83	0.75	0.68	1.71	2.58	5.42	0.64		0.44		0.44		99.89	
A2. II	1.195	.125	.018	.011	.017	.030	.042	.057			.006		.006			
215	68.96	13.28	5.40	0.12	0.97	2.56	3.63	3.43	0.96		0.72	0.16	0.12		100.19	
A2. II	1.146	.130	.034	.002	.024	.046	.058	.036			.009	.001	.002			
216	74.81	12.96	0.69	0.53	0.40	1.20	3.26	4.96	0.71		0.52		0.26		100.30	
A2. II	1.247	.127	.004	.007	.010	.021	.053	.053			.007		.004			
217	73.19	12.88	1.18	1.80	1.03	1.38	3.46	4.87	0.35		0.35	0.03	0.17		100.69	
A2. II	1.220	.126	.007	.025	.026	.025	.056	.052			.004	——	.002			
218	72.76	14.89	0.95	n. d.	0.46	1.26	4.25	4.50	0.54		trace		0.13		99.74	
A4. IV	1.213	.146	.006	(.012)	.012	.023	.069	.048			——		.002			
219	72.43	13.53	1.43	1.17	0.38	1.00	3.28	5.77	0.57		0.34	0.07	0.15		100.12	
A2. II	1.207	.133	.009	.017	.010	.018	.053	.062			.004	——	.002			
220	70.89	14.03	1.69	0.49	0.37	2.14	3.26	5.62	0.43		0.52		0.33		99.77	
A2. II	1.182	.137	.011	.007	.009	.038	.053	.060			.007		.005			
221	70.69	13.94	0.79	1.89	0.98	1.99	2.56	5.03	1.19		1.01		0.29		100.36	
A2. II	1.178	.137	.005	.026	.025	.036	.041	.053			.013		.004			
222	70.13	13.24	2.57	2.25	1.16	2.60	3.20	3.78	0.32		0.50	0.18	0.15		100.08	
A2. II	1.169	.130	.016	.032	.029	.046	.052	.040			.006	.001	.002			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. TOSCANOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
208	I''.''4.''2.3.	Q 31.32 di 2.51 or 30.58 hy 0.90 ab 25.68 mt 2.09 an 5.56 il 0.76 ap 0.34	Loftahammar, Sweden.	R. Mauzelius.	A. Gavelin, Sver. G. Und., Aarb. III, No. 7, p. 8, (1909), 1910.	Granite.	Also, A. G Högbom, G. F. F., XXXII, p. 991, 1910.
209	I(II).4.2.3.	Q 20.94 hy 6.20 or 29.47 mt 3.25 ab 26.72 il 1.37 an 10.29 ap 0.34	Loftahammar, Sweden.	R. Mauzelius.	A. Gavelin, Sver. G. Und., Aarb. III, No. 7, p. 13, (1909), 1910.	Granite.	Also, A. G. Högbom, G. F. F., XXXII, p. 991, 1910.
210	I(II).4.2''.3.	Q 18.72 hy 6.40 or 25.02 mt 3.25 ab 28.82 il 1.37 an 14.46 ap 0.34 C 0.20	Loftahammar, Sweden.	R. Mauzelius.	A. Gavelin, Sver. G. Und., Aarb. III, No. 7, p. 72, (1909), 1910.	Granite porphyry.	Also, A. G. Högbom, G. F.F., XXXII, p. 1023, 1910.
211	I.''4.''2.''3.	Q 32.46 di 0.68 or 33.36 hy 1.06 ab 24.10 mt 1.62 an 6.12 il 0.46	Rörkärr, Fjallbocka, Bohuslän, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 260, 1906.	Granite.	
212	I.(3)4.(1)2.3(4).	Q 32.46 hy 3.50 or 22.80 mt 0.23 ab 33.54 an 4.45 C 2.55	Björketorp, Linde, Sweden.	A. Hasselbom.	P. J. Holmquist, B. Un. Ups., VII, p. 260, 1906.	Granite.	
213	I.''4.2.(2)3.	Q 32.88 hy 1.82 or 35.03 mt 1.62 ab 20.44 il 0.46 an 6.39 ap 0.67 C 0.10	Björna, Angermanland, Sweden.	R. Mauzelius.	P. J. Holmquist, B. Un. Ups, VII, p. 260, 1906.	Granite.	
214	I.''4.2.''3.	Q 31.68 di 0.86 or 31.69 hy 1.30 ab 22.01 mt 2.55 an 7.23 il 0.91 hm 1.12	Krokstrand, Strömstad, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 258, 1906.	Granite.	
215.	I(II).''4.2.3(4).	Q 28.92 hy 2.40 or 20.02 il 0.30 ab 30.39 tn 1.37 an 10.01 ap 0.34	Karl Johann Schlacht, Grängegebirge, Sweden.	A. Grabe.	H. Johanssen, G. F. F., XXXII, p. 263, 1910.	Granite gneiss.	Igneous?
216	I.''4.''2.3.	Q 33.54 hy 1.00 or 29.47 mt 0.93 ab 27.77 il 1.06 an 5.84	Sönnerhult, Hvetlanda, Smaland, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 262, 1906.	Granite.	
217	I''.''4.(1)2.3.	Q 29.28 di 1.57 or 28.91 hy 3.95 ab 29.34 mt 1.62 an 5.00 il 0.61	Vansvik, Mönsteras, Smaland, Sweden.	R. Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 262, 1906.	Granite.	
218	I.4.''2.3''.	Q 26.34 hy 3.05 or 26.69 ab 36.16 an 6.39 C 0.61	Hamphorva, Smaland, Sweden.	H. Santesson.	O. Nordenskjöld, Afh. Sver. G. Und., No. 135, p. 35, 1894.	Hälleflinta (micro-granite).	In W. T., p. 167.
219	I.4.(1)2.3.	Q 27.90 hy 1.79 or 34.47 mt 2.09 ab 27.77 il 0.61 an 5.00	Angsdal, Oskarshamn, Smaland, Sweden.	R. Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 262, 1906.	Granite.	
220	I.4.''2.3.	Q 25.98 di 1.94 or 33.36 wo 0.58 ab 27.77 mt 1.16 an 6.67 il 1.06 hm 0.96	Gershult, Oskarshamn, Smaland, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 262, 1906.	Granite.	
221	I''.''4.2.''3.	Q 30.30 hy 4.08 or 29.47 mt 1.16 ab 21.48 il 1.98 an 10.01 C 0.71	Marieholm. Oskarshamn, Smaland, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 262, 1906.	Granite.	
222	I(II).''4.2.3''.	Q 29.70 di 1.11 or 22.24 hy 3.95 ab 27.25 mt 3.71 an 10.56 il 0.91 ap 0.34	Högsby, Mönsteras, Smaland, Sweden.	R. Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 262, 1906.	Granite.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
223	69.36	13.10	2.73	2.05	1.17	2.34	3.65	4.33	0.95		0.35	0.21	0.15		100.39	
A2. II	1.156	.128	.017	.029	.029	.042	.059	.045			.004	.001	.002			
224	69.14	13.53	1.55	1.94	0.63	1.75	3.29	5.24	0.90		0.74		1.37		100.08	
A?2. II	1.152	.133	.010	.027	.016	.031	.053	.055			.009		.020			
225	68.57	14.02	2.27	2.08	1.35	2.58	3.36	3.89	0.71		0.54	0.18	0.18		99.73	
A2. II	1.143	.137	.014	.029	.034	.046	.054	.041			.007	.001	.003			
226	67.62	15.18	3.41	0.91	0.87	1.93	3.03	5.03	0.66		0.84		0.49		99.97	
A2. II	1.127	.149	.021	.013	.022	.034	.048	.053			.011		.007			
227	73.30	12.77	1.87	0.74	0.44	1.32	2.86	5.56	0.90		0.38	0.12			100.26	
A2. II	1.222	.125	.012	.010	.011	.023	.046	.060			.005	.001				
228	69.63	13.11	3.31	1.25	0.69	2.09	2.90	5.07	0.26		0.93	0.25	0.25		99.74	
A2. II	1.161	.128	.021	.018	.017	.038	.047	.054			.012	.002	.004			
229	70.44	12.74	3.56	1.03	0.81	2.30	2.94	4.64	0.77		0.60	0.26	0.23	BaO 0.10	100.42	
A2. II	1.174	.125	.022	.014	.020	.041	.047	.049			.008	.002	.003			
230	73.38	14.36	0.86	0.79	0.46	1.33	2.85	4.98	0.37		0.20		0.22		99.80	
A2. II	1.223	.141	.005	.011	.012	.023	.046	.053			.003		.003			
231	73.18	13.71	0.52	1.22	0.37	1.22	2.40	5.70	0.69		0.21	0.05	0.01		99.28	
B2. III	1.220	.134	.003	.017	.009	.021	.039	.061			.003	—	—			
232	73.03	14.41	0.68	1.25	0.38	1.41	3.03	5.58	0.39		0.20	trace	trace		100.36	
A3. III	1.217	.142	.004	.018	.010	.025	.048	.060			.003	—	—			
233	71.63	16.10	1.01	n. d.	0.26	1.72	3.96	4.49	0.60						99.77	2.59
A4. IV	1.194	.158	.006	(.012)	.007	.030	.064	.048								
234	71.24	14.81	1.25	1.14	0.62	1.37	3.02	5.11	1.44		0.26	trace	trace		100.26	
A3. III	1.188	.145	.008	.016	.016	.025	.048	.054			.003	—	—			
235	71.08	14.26	1.12	2.31	0.53	0.96	3.49	5.61	0.60		0.29	trace	trace		100.25	
A3. III	1.185	.140	.007	.032	.013	.017	.056	.060			.004	—	—			
236	66.95	15.16	2.34	1.40	1.29	3.90	3.36	4.13	1.49		0.30	0.08	trace		100.40	
A2. II	1.116	.148	0.15	.019	.032	.070	.054	.044			.004	—	—			
237	68.79	14.44	1.61	3.01	0.49	1.33	2.95	6.85	0.50		0.38	trace	trace		100.35	
A3. III	1.147	.142	.010	.042	.012	.023	.048	.073			.005	—	—			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. TOSCANOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
223	I(II).4.2.3″.	Q 25.68, or 25.02, ab 30.92, an 6.67, di 3.17, hy 2.79, mt 3.94, il 0.61, ap 0.34	Runtorp, Kalmar, Smaland, Sweden.	R. Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 262, 1906.	Granite.	
224	I(II).4.2.3.	Q 24.24, or 30.58, ab 27.77, an 6.95, di 1.43, hy 4.57, mt 2.32, il 1.37	Wirbo, Oskarshamn, Smaland, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 262, 1906.	Granite.	MnO high?
225	I(II).4.2.3″.	Q 26.64, or 22.80, ab 28.30, an 11.68, hy 4.85, mt 3.25, il 1.06, ap 0.34	Finsjokvarn, Mönsteras, Smaland, Sweden.	R. Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 262, 1906.	Granite.	
226	I″.4.2.3.	Q 25.86, or 29.47, ab 25.15, an 9.45, C 1.43, hy 2.20, mt 2.09, il 1.67, hm 1.92	Klubb, Oskarshamn, Smaland, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 262, 1906.	Granite.	
227	I.″4.″2.″3.	Q 32.16, or 33.36, ab 24.10, an 5.28, di 0.22, hy 1.00, mt 1.16, il 0.76, hm 1.12, ap 0.34	Slottskogen, Göteborg, Sweden.	R. Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 268, 1906.	Granite gneiss.	
228	I″.″4.2.3.	Q 28.80, or 30.02, ab 24.63, an 7.51, di 0.86, hy 1.30, mt 2.32, il 1.82, hm 1.76, ap 0.67	Stenshafvud, Simrishamn, Skane, Sweden.	R. Mauzelius.	P. J. Holmquist, B. Un, Ups., VII, p. 266, 1906.	Granite gneiss.	
229	I″.″4.2.3.	Q 30.90, or 27.24, ab 24.63, an 8.06, di 1.08, hy 1.50, mt 2.09, il 1.22, hm 2.08, ap 0.67	Lönhult, Vidtsköfle, Skane, Sweden.	R. Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 266, 1906.	Granite gneiss.	
230	I.(3)4.2.3.	Q 33.80, or 29.47, ab 24.10, an 6.39, C 1.94, hy 1.99, mt 1.16, il 0.46	Lake Raslangen, Vestana, Skane, Sweden.	H. Santesson.	H. Backström, Afh. Sver. G. Und., No. 168, p. 8, 1897.	Granite.	In W. T., p. 169.
231	I.(3)4.″2.(2)3.	Q 33.38, or 33.92, ab 20.44, an 5.84, C 1.33, hy 2.35, mt 0.70, il 0.46	Hangö, Finland.	I. G. Sundell.	V. Hackmann, B. C. G. Fin., No. 15, p. 30, 1905.	Granite.	
232	I.″4.2.3.	Q 29.88, or 33.36, ab 25.15, an 6.95, C 0.92, hy 2.45, mt 0.93, il 0.46	Lörpys, Kuru, Finland.	N. Sahlbom.	V. Hackmann, B. C. G. Fin., No. 15, p. 31, 1905.	Granite.	
233	I.4.2.3.⊙	Q 26.58, or 26.69, ab 33.54, an 8.35, C 1.63, hy 2.28	Lestiware, Umptek, Kola, Finland.	H. Berghell.	W. Ramsay, Fennia, XI, p. 72, 1894.	Granite.	In W. T., p. 169.
234	I.″4.2.3.	Q 30.30, or 30.02, ab 25.15, an 6.95, C 1.84, hy 2.26, mt 1.86, il 0.46	Marrasjärvi, Rovaniemi, Finland.	N. Sahlbom.	V. Hackmann, B. C. G. Fin., No. 15, p. 36, 1905.	Granite.	
235	I.4.(1)2.3.	Q 25.26, or 33.36, ab 29.34, an 4.73, C 0.71, hy 4.07, mt 1.62, il 0.61	Onas, Finland.	N. Sahlbom.	V. Hackmann, B. C. G. Fin., No. 15, p. 37, 1905.	Granite.	
236	I(II).4.2″.3.	Q 22.74, or 24.46, ab 28.30, an 13.90, di 3.67, hy 1.50, mt 3.48, il 0.61, ap 0.34	Ukonvaara, Finland.	G. Aminoff.	V. Hackmann, B. C. G. Fin., No. 15, p. 46, 1905.	Granite.	
237	I″.4.(1)2.(2)3.	Q 20.28, or 40.59, ab 25.15, an 5.84, di 0.46, hy 4.53, mt 2.32, il 0.76	Nystad, Finland.	N. Sahlbom.	V. Hackmann, B. C. G. Fin., No. 15, p. 27, 1905.	Rapakiwi granite.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
238	66.73	15.27	1.47	3.41	0.44	2.94	2.79	5.30	0.38	0.70	0.69	0.12	0.07		100.31	
A2. II	1.112	.150	.009	.047	.011	.053	.045	.056			.009	.00.	.001			
239	66.99	13.00	2.98	2.23	0.65	2.64	3.28	4.39	0.70	0.78	0.71	0.57	0.11		99.03	
C2. IV	1.117	.127	.019	.030	.016	.047	.053	.047			.009	.004	.002			
240	65.40	14.73	1.14	2.92	1.02	2.78	3.54	4.31	1.58	0.55	1.01	0.19	0.06	CO_2 0.68	99.91	
A2. II	1.090	.144	.007	.040	.026	.050	.057	.046			.025	.001	—			
241	73.51	15.53	2.07	n. d.	0.39	1.12	3.01	4.93	0.29						100.85	
A4. IV	1.225	.152	.013	(.026)	.010	.020	.048	.052								
242	67.50	15.31	1.48	2.43	1.63	1.59	4.02	4.74	1.05						99.75	
A3. III	1.125	.150	.009	.033	.041	.029	.065	.050								
243	66.75	15.87	1.82	2.31	0.91	1.99	3.13	4.40	2.74						99.92	
A3. III	1.113	.155	.011	.032	.022	.036	.050	.047								
244	66.42	15.61	1.87	1.96	2.15	2.73	3.75	4.02	0.69	0.14	0.83		trace		100.17	2.691
A2. II	1.107	.153	.012	.027	.054	.048	.061	.042			.010		—			
245	65.26	16.52	1.67	1.87	1.82	2.22	4.46	4.18	1.23		0.53	0.16	trace		99.92	
A2. II	1.088	.162	.010	.026	.046	.039	.072	.044			.007	.001	—			
246	65.91	15.58	2.07	2.19	1.41	2.40	4.01	3.94	1.15		0.58	0.20		CO_2 0.11 SO_3 0.14 Org 0.15	99.84	2.613
A2. II	1.099	.153	.013	.030	.035	.043	.064	.042			.007	.001				
247	72.98	14.58	1.28	n. d.	0.69	0.94	3.22	4.57	1.44						99.70	
A4. IV	1.216	.143	.008	(.016)	.017	.017	.052	.049								
248	70.09	14.04	1.75	1.87	1.03	3.11	3.31	3.49	0.02	0.05	0.80	0.17		CO_2 0.54 SO_3 0.24	100.21	
A2. II	1.168	.138	.011	.026	.026	.055	.053	.037			.010	.001				
249	65.47	16.11	1.61	2.23	1.65	3.56	3.00	3.76	1.10	0.04	0.66	0.57		CO_2 0.02 SO_3 0.15	99.93	
A?2. II	1.091	.158	.010	.031	.041	.064	.048	.040			.008	.004				
250	63.86	17.87	1.24	2.88	0.99	3.33	4.10	3.56	0.84	0.17	0.03	0.65			99.52	
A2. II	1.064	.175	.008	.040	.025	.059	.066	.038			—	.005				
251	73.93	11.95	1.09	2.19	0.52	2.49	2.59	5.10	0.62			0.21			100.69	
A3. III	1.232	.117	.007	.031	.013	.045	.042	.054				.001				
252	70.15	13.48	3.12	2.44	0.56	2.50	3.38	4.15	0.12		0.03	0.19			100.12	
A2. II	1.169	.132	.019	.034	.014	.045	.055	.044			—	.001				
253	62.09	17.55	0.62	3.25	1.48	2.88	3.99	4.35	2.94		0.64	0.85			100.59	2.579
A2. II	1.035	.172	.004	.045	.037	.052	.065	.046			.008	.006				

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. TOSCANOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
238	I''.4.2''.3.	Q 22.02 hy 5.06 or 31.14 mt 2.09 ab 23.58 il 1.37 an 13.62 ap 0.34	Östersundhom, Finland.	Not stated.	L. H. Borgstrom, B. C. G. Fin., No. 22, p. 19, 1907.	Granite porphyry.	
239	I(II).4.2.3.	Q 26.16 di 1.54 or 26.13 hy 1.40 ab 27.77 mt 4.41 an 7.51 il 1.37 ap 1.34	Klondyke, Bornholm Island, Denmark.	M. Dittrich.	G. Kalb, In Diss. Greifs., p. 19, 1914.	Granite.	Sum low.
240	I(II).4.2.3.	Q 21.00 di 1.36 or 25.58 hy 2.99 ab 29.87 mt 1.62 an 11.40 il 3.80 ap 0.34	Paradisbakke, Bornholm Island, Denmark.	M. Dittrich.	G. Kalb, In. Diss. Greifs., p. 24, 1914.	Granite.	L. Milch, pers. com.
241	I.(3)4.''2.3.	Q 32.94 hy 4.43 or 28.91 ab 25.15 an 5.56 C 3.26	Serrerhof, n. Wolfach, Schwarzwald.	H. Schwenkel.	H. Schwenkel, In. Diss., Tüb., p. 146, 1912.	Granite.	L. Milch, pers. com.
242	I''.4.2.3''.	Q 18.72 hy 7.27 or 27.80 mt 2.09 ab 34.06 an 8.06 C 0.61	Zieselberg, n. Ottenhöfen, Schwarzwald.	Regelmann.	Regelmann, In. Diss. Heid., 1903.	Granite.	Osann, III, (1), 1913, p. 1.
243	I''.4.2.3.	Q 24.96 hy 4.97 or 26.13 mt 2.55 ab 26.20 an 10.01 C 2.24	Brandenberg, Munstertbal, Schwarzwald.	Bunsen's laboratory.	A. Schmidt, Ref. N. J., 1889, I, p. 95.	Porphyry.	In W. T., p. **169**.
244	I(II).4.2''.''3.	Q 20.04 hy 6.06 or 23.35 mt 2.78 ab 31.96 il 1.52 an 13.34 C 0.20	Tiefenstein, Albthal, Schwarzwald.	H. Hirschi.	H. Hirschi, In. Diss. Zür., p. 10, 1901.	Granite.	
245	I(II).4''.2.3(4).	Q 15.90 hy 5.79 or 24.46 mt 2.32 ab 37.73 il 1.06 an 10.01 ap 0.34 C 1.02	Heidelberg, Baden.	M. Dittrich.	M. Dittrich, Mt. Bad. G. L.-A., IV, p. 74, 1900.	Granite.	Not in W. T.
246	I''.4.2.3(4).	Q 20.28 hy 4.82 or 23.35 mt 3.02 ab 33.54 il 1.06 an 11.12 C 0.71	Lemberg, Nahe Thal, Rheinpreussen.	Jacobs.	K. A. Lossen, Z. D. G. G., XL, p. 203, 1888.	Quartz porphyrite.	In W. T., p. **169**.
247	I.(3)4.(1)2.3.	Q 32.55 hy 3.81 or 27.24 ab 27.25 an 4.73 C 2.55	Bruderhof, Oberthal, Wurttemberg.	Not stated.	K. Regelmann, Erl. G. Kt. Wurt., Bl. 92, p. 34, 1908.	Granite.	
248	I''.''4.2''.3''.	Q 29.82 di 0.89 or 20.57 hy 2.83 ab 27.77 mt 2.55 an 13.34 il 1.52 ap 0.34	Erlenweg, Darmstadt, Hesse.	Stadler.	G. Klemm, Erl. G. Kt. Hess., Bl. Rossdorf, p. 41, 1912.	Granite.	Fresh?
249	I(II).4.2''.3.	Q 24.42 hy 5.92 or 22.24 mt 2.32 ab 25.15 il 1.22 an 14.18 ap 1.34 C 1.94	Near Ober Ramstadt, Hesse.	Stadler.	G. Klemm, Erl. G. Kt. Hess., Bl. Rossdorf, p. 58, 1912.	Granite porphyry.	
250	I(II).4.2.3(4).	Q 18.18 hy 6.72 or 21.13 mt 1.86 ab 34.58 ap 1.68 an 11.68 C 2.96	Steinauer Oberwald, Hesse.	Survey laboratory.	C. Chelius, Erl. G. Kt. Hess., Bl. Neunkirchen, p. 10, 1901.	Granite.	Al_2O_3 high, TiO_2 low?
251	I''.(3)4.''2.3.	Q 33.36 di 4.99 or 30.02 hy 1.92 ab 22.01 mt 1.62 an 5.84 ap 0.34	Nossert, n. Wunsiedel, Fichtelgebirge.	H. Oberembt.	H. Oberembt, In. Diss. Erl., p. 19, 1905.	Granite.	
252	I''.''4.2.3.	Q 28.26 di 2.10 or 24.46 hy 2.32 ab 28.82 mt 4.41 an 9.17 ap 0.34	Schneeberg, n. Wunsiedel, Fichtelgebirge.	H. Oberembt.	H. Oberembt, In Diss. Erl., p. 33, 1905.	Granite gneiss.	
253	I(II).4''.2.3''.	Q 14.10 hy 8.06 or 25.58 mt 0.93 ab 34.06 il 1.22 an 8.90 ap 2.02 C 2.96	Wenneberg, n. Nordlingen, Ries, Bavaria.	E. Showalter.	E. Showalter, In Diss., Erl., p. 37, 1904.	Wennebergite.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
254	69.72	15.25	2.89	1.90	1.63	2.15	3.30	3.01	0.93						100.78	2.67
A3. III	1.162	.150	.018	.026	.041	.039	.053	.032								
255	66.51	16.61	3.18	2.43	1.20	1.97	2.95	3.42	1.08						99.35	
B3. IV	1.109	.163	.020	.033	.030	.036	.048	.036								
256	65.98	16.86	2.67	2.96	0.85	2.09	3.02	3.59	2.36						100.38	2.63
A3. III	1.100	.165	.017	.041	.021	.038	.048	.038								
257	64.25	18.38	2.92	2.07	1.46	2.64	3.00	4.27	1.63						100.62	2.70
A3. III	1.071	.180	.018	.029	.037	.047	.048	.046								
258	63.94	17.87	4.68	1.88	1.82	1.48	2.75	3.56	1.91						99.79	2.67
A3. III	1.066	.175	.029	.026	.046	.027	.045	.038								
259	69.57	13.79	2.54	0.67	0.52	1.43	3.89	5.14	1.62		0.45	trace	trace	CO_2 0.20	99.82	2.603
A2. II	1.160	.135	.016	.009	.013	.025	.063	.054			.006	—	—			
260	65.09	15.22	2.32	3.09	0.70	2.69	4.18	4.82	0.43		0.69	0.26	0.12	CO_2 0.19 ZrO_2 0.06	99.86	2.649
A2. II	1.085	.149	.014	.043	.018	.048	.068	.051			.009	.002	.002			
261	74.97	12.58	0.26	1.41	0.10	0.93	2.75	5.74	0.52		0.26	trace		SO_3 trace	99.52	2.605
A3. III	1.250	.123	.002	.019	.003	.016	.044	.061			.003	—				
262	74.62	12.87	0.78	1.07	0.15	0.95	2.89	5.74	0.41			0.08		SO_3 0.20	99.76	2.623
A3. III	1.241	.126	.005	.015	.004	.017	.047	.061				—				
263	72.67	13.44	1.06	1.56	0.23	1.15	3.08	5.75	0.88		trace	0.12		SO_3 0.26	100.20	2.635
A3. III	1.211	.132	.007	.022	.006	.021	.050	.062			—	.001				
264	71.95	13.29	1.32	2.45	0.27	1.00	3.07	4.98	1.20			0.12		SO_3 0.10	99.75	2.598
A3. III	1.199	.130	.008	.034	.007	.018	.050	.053				.001				
265	71.80	13.87	0.89	1.99	0.36	1.57	3.23	5.32	0.64		0.42	0.13		CO_2 0.06 SO_3 0.15	100.43	2.598
A2. II	1.197	.136	.006	.028	.009	.028	.052	.056			.005	.001				
266	71.21	13.08	0.39	3.62	0.40	1.56	3.18	4.57	1.01		0.48	0.14		SO_3 0.18	99.82	
A2. II	1.187	.128	.003	.050	.010	.028	.052	.049			.006	.001				
267	69.88	14.04	0.86	2.74	0.60	1.81	3.52	4.73	0.90			0.13	trace	SO_3 0.12	99.30	
B3. IV	1.165	.138	.005	.038	.015	.032	.056	.050				.001	—			
268	69.85	13.61	0.80	4.09	1.03	2.18	3.53	3.30	0.83		0.53	0.10		SO_3 0.23	100.08	2.694
A2. II	1.164	.133	.005	.057	.026	.039	.056	.035			.007	.001				

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. TOSCANOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
254	I″.(3)4.2″.3(4).	Q 31.50 or 17.79 ab 27.77 an 10.84 C 2.65 hy 5.16 mt 4.18	Kamm, Lausitz, Saxony.	R. Reinisch.	R. Reinisch, Hab. Schr. Leip., p. 26, 1902.	Granite.	
255	I(II).(3)4.2.3″.	Q 29.40 or 20.02 ab 25.15 an 10.01 C 4.39 hy 4.72 mt 4.64	Klotzsche, Lausitz, Saxony.	R. Reinisch.	R. Reinisch, Hab. Schr. Leip., p. 27, 1902.	Granite.	Squeezed.
256	I(II).″4.2.3.	Q 27.78 or 21.13 ab 25.15 an 10.56 C 4.18 hy 5.27 mt 3.94	Weberberg, Lausitz, Saxony.	R. Reinisch.	R. Reinsch, Hab. Schr. Leip., p. 26, 1902.	Granite.	Squeezed.
257	I(II).4.2″.3.	Q 21.90 or 25.58 ab 25.15 an 13.07 C 2.96 hy 5.15 mt 4.18	Kohlhaustrasse, Lausitz, Saxony.	R. Reinisch.	R. Reinisch, Hab. Schr. Leip., p. 26, 1902.	Granite.	
258	I(II).(3)4.2.3.	Q 28.08 or 21.13 ab 23.58 an 7.51 C 6.63 hy 4.60 mt 6.03 hm 0.48	Georgenthal, Lausitz, Saxony.	R. Reinisch.	R. Reinisch, Hab. Schr. Leip., p. 26, 1902.	Granite.	
259	I.4.(1)2.3.	Q 24.12 or 30.02 ab 33.01 an 5.00 di 1.51 hy 0.60 mt 0.70 il 0.91 hm 2.08	Spitzberg, n. Grimma, Saxony.	C. Ambronn.	C. Ambronn, In. Diss. Leip., p. 32, 1907.	Quartz porphyry.	
260	I(II).4″.2.3″.	Q 15.60 or 28.36 ab 35.63 an 8.34 di 2.57 hy 3.41 mt 3.25 il 1.37 ap 0.67	Kleinsteinberg, n. Beucha, Saxony.	C. Ambronn.	C. Ambronn, In. Diss. Leip., p. 27, 1907.	Quartz porphyry.	
261	I.(3)4.(1)2.″3.	Q 34.26 or 33.92 ab 23.06 an 4.45 C 0.20 hy 2.15 mt 0.46 il 0.46	Meineckenberg, Ilsethal, Harz.	Hampe.	K. A. Lossen, Z. D. G. G., XL, p. 204, 1888.	Granite porphyry.	In W. T., p. 153.
262	I.″4.(1)2.″3.	Q 32.88 or 33.92 ab 24.63 an 4.73 C 0.10 hy 1.53 mt 1.16	Karlsklippe, n. Plessenburg, Brocken, Harz.	Eyme.	O. H. Erdmannsdörfer, Jb. Pr. G. L.-A., XXVII, p. 350, 1906.	Granite porphyry.	
263	I.4.(1)2.3.	Q 28.92 or 34.47 ab 26.20 an 5.00 C 0.20 hy 2.58 mt 1.62 ap 0.34	Schneeloch, Brocken, Harz.	Eyme.	O.H. Erdmannsdörfer, Jb. Pr. G. L.-A., XXVII, p. 342, 1906.	Granite.	
264	I″.″4.(1)2.3.	Q 31.08 or 29.47 ab 26.20 an 4.17 C 1.22 hy 4.13 mt 1.86 ap 0.34	Rehberger Graben, Brocken, Harz.	Eyme.	O. H. Erdmannsdörfer, Jb. Pr. G. L.-A., XXVII, p. 342, 1906.	Granite. porphyry.	
265	I.4.2.3.⊙	Q 28.38 or 31.14 ab 27.25 an 6.95 C 0.31 hy 3.14 mt 1.39 il 0.76 ap 0.34	Klein Birkenkopf, Brocken, Harz.	Jakobs.	O. H. Erdmannsdörfer, Jb. Pr. G. L.-A., XXVII, p. 343, 1906.	Granite.	Micropegmatitic.
266	I.″.″4.2″.3.	Q 28.80 or 27.24 ab 27.25 an 6.95 C 0.21 hy 6.41 mt 0.70 il 0.91 ap 0.34	Wolfsklippen, Brocken, Harz.	Eyme.	O. H. Erdmannsdörfer, Jb. Pr. G. L.-A., XXXII, p. 353, (1911), 1912.	Granite.	
267	I″.4.2.3.	Q 25.38 or 27.80 ab 29.34 an 8.06 C 0.31 hy 5.86 mt 1.16 ap 0.34	Renneckenberg, Brocken, Harz.	Schade.	O. H. Erdmannsdörfer, Jb. Pr. G. L.-A., XXVII. p. 353, 1906.	Granite.	Inclosure in granite.
268	I″.″4.2.3(4).	Q 28.50 or 19.46 ab 29.34 an 10.01 C 0.61 hy 8.54 mt 1.16 il 1.06 ap 0.34	Tannenklinz, Brocken, Harz.	Hesse.	O. H. Erdmannsdörfer, Jb. Pr. G. L.-A., XXVII, p. 354, 1906.	Inclosure in granite.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
269	68.85	14.35	1.00	3.55	0.64	2.21	3.06	4.98	0.71			0.17		SO_3 0.38	99.90	2.682
A3. III	1.148	.141	.006	.050	.016	.039	.049	.053				.001				
270	69.94	13.45	0.49	4.64	0.67	2.26	2.42	4.25	0.77		0.45	0.23		SO_3 0.14	99.71	2.712
A2. II	1.166	.132	.003	.064	.017	.040	.039	.046			.006	.002				
271	72.45	13.19	1.43	1.20	0.77	1.72	3.81	4.50	0.63			0.25			99.95	
A3. III	1.208	.129	.009	.017	.019	.030	.061	.048				.002				
272	71.62	12.74	1.06	1.94	1.37	1.91	3.36	4.76	0.99		0.14	0.53			100.42	
A2. II	1.194	.125	.007	.027	.034	.034	.054	.051			.002	.004				
273	68.64	14.39	1.44	2.76	0.76	1.59	3.95	5.30	0.75		0.17	0.24			100.02	
A2. II	1.144	.141	.009	.039	.019	.029	.064	.056			.002	.002				
274	71.53	13.55	1.20	0.88	1.45	3.21	2.61	3.95	1.75						100.13	
A3. III	1.192	.133	.007	.012	.036	.057	.042	.042								
275	70.44	15.63	1.34	1.12	0.55	1.98	4.03	5.18	0.55						100.82	
A3. III	1.174	.153	.008	.015	.014	.036	.065	.055								
276	67.90	13.93	3.05	0.49	0.94	3.11	3.40	3.67	1.30	0.92	0.76	0.39	trace	ZrO_2 trace F 0.06	99.92	2.621
A2. II	1.132	.137	.019	.007	.024	.055	.055	.039			.010	.003	—			
277	66.86	16.70	1.06	2.07	1.62	2.70	3.32	4.55	0.53		0.43	0.12		S 0.01	99.96	
A2. II	1.114	.164	.007	.029	.041	.048	.053	.049			.003	.002				
278	72.79	13.77	1.69	n. d.	0.28	1.24	3.39	4.38	2.41						99.95	2.416
A4. IV	1.213	.135	.011	(.022)	.007	.022	.055	.047								
279	72.48	12.68	2.31	n. d.	0.73	2.39	3.30	4.35	1.31						99.55	2.458
A4. IV	1.208	.124	.014	(.028)	.018	.043	.053	.047								
280	70.53	15.79	2.08	2.15	0.47	1.81	3.47	3.67	0.29						100.26	
A3. III	1.176	.155	.013	.030	.012	.032	.056	.039								
281	67.99	17.54	1.17	0.82	0.13	1.44	4.92	5.78	0.05						99.84	
A3. III	1.133	.172	.007	.011	.003	.026	.079	.062								
282	65.08	15.95	2.25	2.04	0.53	3.47	4.54	4.31	1.26		0.16	0.13	trace		99.72	
A2. II	1.085	.156	.014	.028	.013	.063	.073	.046			.002	.001	—			
283	70.07	14.46	2.21	1.63	1.17	2.90	3.07	3.98	0.48	0.13	0.49		trace	Cr_2O_3 trace	100.59	2.717
A3. III	1.168	.142	.014	.022	.029	.052	.050	.042			.006		—			10°
284	69.22	14.29	2.12	2.33	1.27	3.16	3.29	3.52	0.69	0.10	0.36				100.35	2.679
A3. III	1.154	.140	.013	.032	.032	.056	.053	.037			.005					10°

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. TOSCANOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
269	I''.4.2.3.	Q 24.24 hy 7.41 or 29.47 mt 1.39 ab 25.68 ap 0.34 an 10.01 C 0.31	Plessenburg, Brocken, Harz.	Eyme.	O. H. Erdmannsdörfer, Jb. Pr. G. L.-A., XXVII, p. 346, 1906.	Granite.	
270	I(II).(3)4.2.3.	Q 31.08 hy 8.96 or 25.58 mt 0.70 ab 20.44 il 0.91 an 9.17 ap 0.67 C 1.43	Elbingerode, Harz.	Fischer.	K. A. Lossen, Z. D. G. G., XL, p. 203, 1888.	Quartz porphyrite.	In W. T., p. 169.
271	I.''4.(1)2.3.	Q 29.04 di 0.68 or 26.69 hy 2.62 ab 31.96 mt 2.09 an 5.56 ap 0.67	Striegau, Silesia.	F. Riegner.	F. Riegner, In. Diss. Bres., p. 25, 1909.	Granite.	Also in Milch and Riegner, N. J. B. B., XXIX, p. 360, 1910.
272	I''.''4.''2.3.	Q 28.26 di 0.22 or 28.36 hy 5.68 ab 28.30 mt 1.62 an 5.56 il 0.30 ap 1.34	Reichenberg, Riesengebirge, Silesia.	F. Riegner.	F. Riegner, In. Diss. Bres., p. 44, 1909.	Aplite.	Schliere in granite.
273	I''.4.(1)2.3.	Q 20.10 hy 5.60 or 31.14 mt 2.09 ab 33.54 il 0.30 an 5.84 ap 0.67	Striegau, Silesia.	F. Riegner.	F. Riegner, In. Diss. Bres., p. 31, 1909.	Border of schliere in granite.	Also in Milch and Riegner, as above. Cf. No. 270, above, and No. 181, I.4.1.3.
274	I''.(3)4.2(3).3.	Q 32.46 di 1.76 or 23.35 hy 3.43 ab 22.01 mt 1.62 an 13.62	Pfaffenberg, Riesengebirge, Silesia.	W. Herz.	L. Milch, N. J. B. B., XII, p. 162, 1899.	Granitite.	In W. T., p. 169.
275	I.4.2.3.⊙	Q 21.84 di 0.68 or 30.58 hy 1.99 ab 34.06 mt 1.86 an 9.17	Topla, S. Carinthia, Austria.	H. V. Graber.	H. V. Graber, Jb. G. R.-A. Wien, XLVII, p. 278, 1897.	Granite.	In W. T., p. 171.
276	I''.4.2''.3''.	Q 27.36 hy 2.40 or 21.68 il 1.06 ab 28.82 hm 3.05 an 11.95 tn 0.39 ap 1.01	Miekinia, n. Cracow, Galicia.	Z. Rozen.	Z. Rozen, B. Ac. Sci. Crac., 1909, (2), p. 810.	Quartz porphyry.	
277	I(II).4.2.3.	Q 21.66 hy 7.27 or 27.24 mt 1.62 ab 27.77 ap 1.01 an 10.56 C 2.45	Bobrau, Moravia, Austria.	C. von John.	von John and Suess, Jb. G. R.-A. Wien, LVIII, p. 262, 1908.	Granitite.	
278	I.''4.''2.3.	Q 31.68 hy 3.60 or 26.13 ab 29.22 an 6.12 C 1.12	Hlinik, Hungary.	A. Lagorio.	A. Lagorio, T. M. P. M., VIII, p. 444, 1887.	Obsidian.	In W. T., p. 171.
279	I''.4.2.3.	Q 29.70 di 4.48 or 26.13 hy 3.21 ab 27.77 an 6.67	Apate, Schemnitz, Hungary.	A. Lagorio.	A. Lagorio, T. M. P. M., VIII, p. 448, 1887.	Liparite.	In W. T., p. 171.
280	I''.''4.2.3''.	Q 30.78 hy 3.44 or 21.68 mt 3.02 ab 29.34 an 8.90 C 2.86	Hauszerstollen, Aranyida, Hungary.	B. Horvath.	Emszt and Horvath, Mt. Ung. G. R.-A., XIX, p. 286, 1912.	Granite.	
281	I.4(5).(1)2.3.	Q 13.68 hy 0.83 or 34.47 mt 1.62 ab 41.40 an 7.23 C 0.51	Halasag, Ditro, Siebenburgen, Hungary.	J. v. Szadeczky.	J. v. Szadeczky, Ref. N. J., 1901, I, p. 402.	Quartz nordmarkite.	In W. T., p. 171.
282	I(II).4''.2.3(4).	Q 14.94 di 5.32 or 25.58 hy 0.23 ab 38.25 mt 3.25 an 10.29 il 0.30 ap 0.34	Oraviczabanya, Krasso-Szöreny, Hungary.	K. Emszt.	Rozloznit and Emszt, Mt. Ung. G. R.-A., XVI, p. 197, 1908.	Gabbro-diorite aplite.	
283	I''.''4.2(3).3.	Q 28.98 di 0.43 or 23.35 hy 2.96 ab 26.20 mt 3.25 an 13.90 il 0.91	Tumpeursteig, Oetzthal, Tyrol.	H. Hirschi.	H. Hirschi, In. Diss. Zür., p. 28, 1901.	Tonalite gneiss.	
284	I(II).4.2(3).3''.	Q 27.72 di 1.36 or 20.57 hy 4.38 ab 27.77 mt 3.02 an 13.90 il 0.76	Lana, n. Meran, Tyrol.	H. Hirschi.	H. Hirschi, In. Diss. Zür., p. 18, 1901.	Tonalite.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
285	71.17	13.07	1.29	2.36	0.88	1.61	3.13	4.20	2.54	0.32	trace	trace	trace		100.57	2.657
A3. III	1.186	.128	.008	.033	.022	.029	.050	.045								
286	69.21	14.71	1.69	2.30	1.37	3.26	3.38	3.83	0.79		0.32	trace	0.04		100.90	2.679
A2. II	1.154	.144	.011	.046	.034	.059	.055	.040			.004	—	—			
287	67.81	15.04	2.34	2.75	1.18	3.01	3.35	4.26	1.01		0.32	trace	trace		100.75	2.71
A2. II	1.130	.147	.015	.039	.030	.054	.054	.046			.004	—	—			
288	66.56	15.26	1.97	1.64	1.15	2.09	3.72	6.38	0.57		0.46	0.15	trace		99.95	
A2. II	1.109	.150	.013	.023	.029	.038	.060	.068			.006	.001	—			
289	71.98	14.35	1.14	0.50	0.64	1.34	4.33	4.51	0.55	0.06	0.16	0.07			99.63	2.62
A2. II	1.200	.141	.007	.007	.016	.024	.069	.048			.002	—				
290	71.40	15.57	0.53	0.41	0.73	2.28	4.10	4.34	0.54	0.03	0.18				100.14	2.65
A3. III	1.190	.153	.003	.006	.018	.041	.066	.046			.002					
291	68.21	16.36	0.77	0.98	0.58	1.86	4.29	5.81	0.60	0.11	0.24				99.91	2.63
A3. III	1.137	.160	.005	.014	.015	.033	.069	.062			.003					
292	66.32	15.29	1.28	1.79	2.27	3.20	3.95	4.56	1.01	0.14	0.47				100.28	2.71
A3. III	1.105	.150	.008	.025	.057	.057	.064	.049			.006					
293	66.19	17.52	1.85	0.89	1.24	3.04	2.62	4.75	1.17	0.07	0.54				99.88	2.73
A3. III	1.103	.172	.012	.013	.031	.054	.042	.051			.007					
294	65.49	15.87	3.51	0.94	0.82	2.20	4.10	4.32	2.10	0.12	0.57				100.04	2.69
A3. III	1.092	.156	.022	.013	.021	.039	.066	.046			.007					
295	71.93	14.71	1.62	0.85	0.24	1.83	3.58	4.21	0.80	0.08	0.45	0.18	0.05		100.53	2.67
A2. II	1.199	.144	.010	.012	.006	.032	.058	.045			.006	.001	—			
296	70.52	15.61	0.50	0.97	0.67	2.32	3.32	4.38	0.92	0.02	0.27	0.24	0.04		99.78	2.70
A2. II	1.175	.153	.003	.014	.017	.041	.053	.047			.003	.002	—			
297	75.40	13.38	n. d.	1.29	0.32	1.28	3.93	4.59	0.51						100.70	
A4. IV	1.257	.131	—	.018	.008	.023	.063	.049								
298	71.25	13.67	1.67	0.43	1.01	2.41	4.22	4.13	0.94	0.20	0.32				100.25	2.691
A3. III	1.188	.134	.010	.006	.025	.043	.068	.043			.004					
299	69.70	14.84	0.22	2.87	0.80	2.32	3.47	4.48	1.80	0.20				CO_2 0.18	100.88	2.652
A3. III	1.162	.146	.001	.040	.020	.041	.056	.048								
300	75.15	13.20	0.37	0.67	0.19	1.49	3.07	5.12	0.57	trace	trace	0.22	0.02		100.07	2.62
A2. II	1.253	.129	.002	.009	.005	.027	.050	.054			—	.002	—			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. TOSCANOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
285	I''.''4.2.3.	Q 30.66 or 25.02 ab 26.20 an 8.06 C 0.41 hy 5.50 mt 1.86	Lana, n. Meran, Ulten Massif, Tyrol.	F. Erben.	F. Becke, Ds. Ak. W. Wien, LXXV, (1), p. 160, 1913.	Quartz porphyrite.	
286	I(II).4.2''.3''.	Q 24.66 or 22.24 ab 28.82 an 13.62 di 2.32 hy 6.33 mt 2.55 il 0.61	Gaul, n. Lana, Ulten Massif, Tyrol.	F. Erben.	F. Becke, Ds. Ak. W. Wien, LXXV, (1), p. 160, 1913.	Quartz diorite.	
287	I''.4.2.''.3.	Q 22.74 or 25.58 ab 28.30 an 13.07 di 1.61 hy 4.84 mt 3.48 il 0.61	Gaul, n. Lana, Ulten Massif, Tyrol.	F. Erben.	F. Becke, Ds. Ak. W. Wien, LXXV, (1), p. 160, 1913.	Concretion in quartz diorite.	
288	I''.4''.(1)2.3.	Q 15.06 or 37.81 ab 31.44 an 6.12 di 2.87 hy 2.06 mt 3.02 il 0.91 ap 0.34	n. Canzacoli, Predazzo, Tyrol.	M. Dittrich.	J. Romberg, Sb. Pr. Ak. Wiss., 1902, I, p. 701.	Monzonite aplite.	
289	I.4.2.3''.	Q 26.04 or 26.69 ab 36.15 an 6.67 hy 1.60 mt 1.16 il 0.30 hm 0.32	Valufirn, Ponteglia Gebiet, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Quartz diorite.	
290	I.4.2.3''.	Q 25.02 or 25.58 ab 34.58 an 11.40 hy 1.93 mt 0.70 il 0.30	Ponteglia Glacier, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Aplite (?).	Acid portion of dike. Cf. No. 183, II.5.3.4.
291	I.4''.2.3.	Q 16.08 or 34.47 ab 36.15 an 8.06 di 0.89 hy 1.86 mt 1.16 il 0.46	Piz Posta Bialla, Ponteglia Gebiet, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Granite.	
292	I(II).4''.2.3''.	Q 15.90 or 27.24 ab 33.54 an 10.29 di 4.42 hy 5.08 mt 1.86 il 0.91	Val Ponteglia, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Granite porphyry.	
293	I''.4.2(3).3.	Q 24.36 or 28.36 ab 22.01 an 15.01 C 2.55 hy 3.10 mt 1.39 il 1.06 hm 0.96	Piz Tumbif, Ponteglia Gebiet, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Granite.	
294	I''.4.2.3''.	Q 19.26 or 25.58 ab 34.58 an 10.84 C 0.51 hy 2.10 mt 1.39 il 1.06 hm 2.56	Piz Ner, Ponteglia Gebiet, Graubünden. Switzerland.	L. Hezner.	U. Grubenmann. pers. com.	Granite porphyry.	
295	I.''4.2.3''.	Q 31.02 or 25.02 ab 30.39 an 8.06 C 1.22 hy 0.60 mt 1.39 il 0.91 hm 0.64 ap 0.34	Tschirva Road, Bernina Gebiet, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Granite.	
296	I.4''.2.3.	Q 28.92 or 26.13 ab 27.77 an 9.45 C 1.94 hy 2.76 mt 0.70 il 0.46 ap 0.67	Tschirvahütte, Bernina Gebiet, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Monzonite aplite.	
297	I.''4.(1)2.3.	Q 31.02 or 27.24 ab 33.01 an 5.28 di 0.96 hy 2.68	Bietschhorn, Aarmassif, Switzerland.	L. Duparc.	E. v. Fellenberg, Btr. G. Kt. Schw., XXI, p. 22, 1893.	Granite gneiss.	Not in W. T.
298	I''.4.''2.3(4).	Q 25.86 or 23.91 ab 35.63 an 6.39 di 4.32 hy 0.50 mt 0.46 il 0.61 hm 1.28	Klein Mutsch, Piz Giuf, Aarmassif, Switzerland.	Not stated.	F. Weber, Btr. G. Kt. Schw., XIV, p. 94, 1904.	Granite. porphyry.	
299	I''.4.2.3.	Q 23.82 or 26.69 ab 29.34 an 11.40 C 0.10 hy 7.15 mt 0.23	Gasteren, Aarmassif, Switzerland.	L. Duparc.	E. v. Fellenberg, Btr. G. Kt. Schw., XXI, p. 45, 1893.	Porphyry.	Not in W. T.
300	I.(3)4.''2.3.	Q 34.62 or 30.02 ab 26.20 an 5.56 C 0.51 hy 1.42 mt 0.46 ap 0.67	Somvix, Gotthardmassif, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Aplite.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
301	74.16	13.73	0.48	0.29	0.13	0.93	3.55	5.65	0.42	0.07					99.41	
A3. III	1.236	.135	.003	.004	.003	.017	.057	.061								
302	73.62	12.96	2.25	0.75	0.45	1.81	3.24	3.92	0.68	0.08	0.33				100.09	2.62
A3. III	1.227	.127	.014	.010	.011	.032	.052	.041			.004					
303	68.64	15.91	0.58	1.35	0.62	2.86	3.49	5.18	0.51	0.14	0.27	0.08	0.04		99.67	2.68
A2. II	1.144	.156	.004	.019	.016	.051	.056	.055			.003	—	—			
304	66.38	14.84	1.09	2.71	1.52	2.98	4.23	4.16	1.94	0.13	0.34				100.32	2.712
A3. III	1.106	.146	.007	.038	.038	.054	.068	.045			.004					
305	69.46	14.08	2.01	0.92	1.04	1.52	2.54	6.08	1.62		0.32				99.59	2.701
A3. III	1.158	.138	.013	.013	.026	.027	.041	.065			.004					
306	68.89	14.05	2.18	1.43	0.83	2.15	4.56	4.30	0.41		0.23	0.03	trace	ZrO_2 trace B_2O_3 0.38 Cl 0.07 F 0.05 FeS_2 0.49 Ce_2O_3 trace BaO 0.58 Cu 0.03 Pb 0.04	101.00	
A4. IV	1.148	.138	.014	.019	.021	.039	.073	.046			.003	—				
307	73.90	15.20	trace	none	trace	1.20	4.49	4.14	0.36	0.07		0.09			99.45	2.60
A4. IV	1.232	.149	—	—	—	.021	.073	.044					—			
308	67.61	16.60	1.12	2.26	1.55	2.61	4.14	4.01	0.88		trace	0.17			100.95	
B2. III	1.127	.163	.007	.032	.039	.046	.067	.042			—	.001				
309	65.71	16.46	0.96	3.04	1.09	3.05	3.03	5.04	1.83		trace				100.21	
A3. III	1.095	.161	.006	.042	.027	.054	.048	.054			—					
310	65.58	15.79	0.94	2.44	1.47	3.08	2.58	5.67	1.16		0.58	trace	trace	SO_3 0.19 Cl trace X 0.73 Li_2O trace	100.21	2.527
A2. II	1.093	.155	.006	.034	.037	.055	.042	.060			.007	—	—			15°
311	65.32	15.34	1.22	2.18	1.51	2.99	2.75	5.70	1.97		0.40		trace	SO_3 0.03 Cl 0.05 X 0.57	101.03	2.552
B2. III	1.089	.150	.008	.030	.038	.053	.044	.061			.005		—			15°
312	65.31	16.36	0.68	1.68	1.06	2.85	2.78	5.97	1.01		0.47	trace	trace	SO_3 none Cl trace FeS_2 1.29 X 0.85	100.31	2.546
A2. II	1.089	.160	.004	.023	.027	.051	.045	.064			.006	—	—			15°
313	64.76	16.48	0.74	2.74	1.74	3.24	2.67	5.49	1.62		0.42	trace	trace	SO_3 0.08 Cl 0.01 X 0.33 Li_2O trace	100.32	2.562
A2. II	1.079	.162	.005	.038	.044	.058	.043	.058			.005	—	—			15°
314	63.15	16.29	1.76	2.40	1.87	3.61	2.46	5.96	2.28		0.30	trace	trace	SO_3 0.11 Cl 0.11 X 0.47 Li_2O trace	100.77	2.615
A2. II	1.053	.160	.011	.033	.047	.064	.040	.063			.004	—	—			15°
315	64.57	16.80	0.97	3.02	1.69	3.53	3.81	4.01	1.28						99.68	2.542
A3. III	1.076	.165	.006	.042	.042	.063	.061	.042								
316	72.30	13.96	0.30	1.70	0.60	2.13	3.00	4.50	0.40		0.20				99.29	
BIII. IV	1.205	.137	.002	.024	.015	.038	.048	.048			.003					

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. TOSCANOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
301	I.4.(1)2.3.	Q 29.40 hy 0.43 or 33.92 mt 0.70 ab 29.87 an 4.73	Banchi, Val Tremola, St. Gotthard, Switzerland.	P. Waindziok.	P. Waindziok, In. Diss. Zür., p. 42, 1906.	Aplite.	
302	I.(3)4.2.3.	Q 35.64 hy 1.10 or 22.80 mt 1.39 ab 27.25 il 0.61 an 8.90 hm 1.28 C 0.20	Gemsboden, St. Gotthard, Switzerland.	P. Waindziok.	P. Waindziok, In. Diss. Zür., p. 21, 1906.	Granite gneiss.	
303	I.4.2.3.⊙	Q 21.30 di 1.50 or 30.58 hy 2.39 ab 29.34 mt 0.93 an 12.51 il 0.46	Santa Maria, St. Gotthard, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Granite.	
304	I(II).4.2.3(4).	Q 16.56 di 4.83 or 25.02 hy 4.98 ab 35.63 mt 1.62 an 9.17 il 0.61	Albula Tunnel, Lower Engadine, Switzerland.	O. Züst.	O. Züst. In. Diss. Zür., p. 15, 1905.	Granite.	Also in U. Grubenmann, Btr. G. Kt. Schw., XXIII, p. 201, 1909.
305	I.4.2.(2)3.	Q 26.52 hy 2.60 or 36.14 mt 2.09 ab 21.48 il 0.61 an 7.51 hm 0.64 C 0.41	St. Stephan, Rofna, Switzerland.	G. Rütschli.	G. Rütschli, In. Diss. Zür., p. 31, 1903.	Granite porphyry.	
306	I″.4.(1)2.3(4).	Q 21.18 di 4.58 or 25.58 hy 0.30 ab 38.25 mt 3.25 an 5.28 il 0.46	Platta Cotschna, Bundner Oberland, Switzerland.	J. R. Hanhart.	A. Bodmer-Beder, N. J. B. B., XI, p. 239, 1897.	Quartz porphyry.	In W. T., p. 171.
307	I.4.(1)2.3(4).	Q 29.28 or 24.46 ab 38.25 an 5.84 C 1.12	Posto di Cavoli, S. Piero in Campo, Elba.	G. d'Achiardi.	G. d'Archiardi, Mem. Soc. Tosc. Sc. Nat., XIX, p. 118, 1903.	Aplite.	
308	I″.4.2.3(4).	Q 19.38 hy 7.20 or 23.35 mt 1.62 ab 35.11 ap 0.34 an 11.95 C 1.12	Monte Capanne, Elba.	E. Manasse.	E. Manasse, Mem. Soc. Tosc. Sc. Nat., XXVIII, p. 184, 1912.	Granite.	
309	I″.4.2(3).3.	Q 18.72 hy 7.45 or 30.02 mt 1.39 ab 25.15 an 15.01 C 0.51	Monte Amiata, Tuscany, Italy.	L. Ricciardi.	L. Ricciardi, Gaz. Chim. It., XVIII, 1888.	Trachyte.	In W. T., p. 171.
310	I(II).4.2″.″3.	Q 18.54 hy 7.50 or 33.36 mt 1.39 ab 22.01 il 1.08 an 14.73	Vivo, Monte Amiata, Tuscany, Italy.	J. F. Williams.	J. F. Williams, N. J. B. B., V, p. 408, 1887.	Trachyte.	In W. T., p. 171.
311	I(II).4.2.(2)3.	Q 18.36 di 1.83 or 33.92 hy 5.15 ab 23.06 mt 1.86 an 12.51 il 0.76	Abbadia S. Salvatore, Monte Amiata, Tuscany, Italy.	J. F. Williams.	J. F. Williams, N. J. B. B., V, p. 411, 1887.	Trachyte.	In W. T., p. 171.
312	I″.4.2″.″3.	Q 17.22 hy 5.21 or 35.58 mt 0.93 ab 23.58 il 0.76 an 14.18	Fosso del Prato, Monte Amiata, Tuscany, Italy.	J. F. Williams.	J. F. Williams, N. J. B. B., V, p. 410, 1887.	Trachyte.	In W. T., p. 171.
313	I(II).4.2(3).″3.	Q 17.10 hy 8.10 or 32.25 mt 1.16 ab 22.53 il 0.76 an 16.12 C 0.31	Poggio Traburzolo, Monte Amiata, Tuscany, Italy.	J. F. Williams.	J. F. Williams, N. J. B. B., V, p. 412, 1887.	Trachyte.	In W. T., p. 171.
314	I(II).″4.2(3).(2)3.	Q 14.82 di 1.57 or 35.03 hy 6.51 ab 20.96 mt 2.55 an 15.85 il 0.61	La Crocina, Monte Amiata, Tuscany, Italy.	J. F. Williams.	J. F. Williams, N. J. B. B., V, p. 413, 1887.	Trachyte.	In W. T., p. 171.
315	I(II).4″.2(3).3″.	Q 15.38 di 0.22 or 23.35 hy 8.81 ab 31.96 mt 1.39 an 17.24	Monte San Vito, Bracciano Latium, Italy.	H. S. Washington.	H. S. Washington, J. G., V, p. 362, 1897.	Toscanite.	In W. T., p. 171.
316	I.″4.2.3.	Q 31.14 hy 4.01 or 26.69 mt 0.46 ab 25.15 il 0.46 an 10.56 C 0.31	Ingortosu, Sardinia.	C. Riva.	C. Riva, Att. Ac. Sc. Nap., (2), XII, No. 9, p. 28, 1905.	Granitite.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
317	72.05	13.07	2.93	0.39	0.66	1.30	3.49	4.55	0.59	0.24	0.40	0.22	0.04	CO_2 none ZrO_2 0.05 SO_3 0.18 BaO 0.06	100.22	
A1. I	1.201	.128	.018	.006	.017	.023	.056	.049			.005	.002	—			
318	71.88	14.90	0.60	1.30	0.93	2.34	3.20	4.55	0.40		0.27				100.37	
A3. III	1.198	.146	.004	.018	.023	.042	.052	.049			.003					
319	70.10	15.77	1.16	n. d.	0.39	2.25	4.21	4.08	1.79		0.10				99.85	
A4. IV	1.168	.155	.007	(.014)	.010	.040	.068	.044			.001					
320	70.03	13.56	3.20	0.89	none	1.43	3.69	4.16	3.04		0.34				100.34	
A3. III	1.167	.133	.020	.013	—	.025	.060	.045			.004					
321	69.36	15.93	1.49	0.40	0.27	3.05	3.18	4.29	0.79		0.54		trace		99.30	
A3. III	1.156	.156	.009	.006	.007	.055	.052	.046			.007				(100.30)	
322	67.78	16.51	1.86	0.52	0.76	2.55	3.37	3.82	2.40		0.43		0.22		100.22	
A2. II	1.130	.162	.012	.007	.019	.046	.055	.040			.005		.003			
323	63.44	17.03	1.97	1.61	0.87	2.78	3.53	5.31	3.31		0.75		0.21		100.81	
A2. II	1.057	.167	.012	.022	.022	.050	.056	.056			.009		.003			
324	62.28	20.30	2.34	0.88	0.35	1.95	4.29	4.95	1.77		0.31		0.21		99.63	
A2. II	1.038	.199	.015	.012	.009	.035	.069	.053			.004		.003			
325	66.61	16.18	0.36	3.75	1.63	1.97	4.15	5.45	n. d.		0.41	0.12			100.53	
A2. II	1.109	.159	.002	.052	.041	.036	.067	.058			.005	.001				
326	66.20	16.18	0.10	3.75	1.28	2.12	3.74	5.15	0.63		0.38	0.12			99.65	
A2. II	1.103	.159	.001	.052	.032	.038	.060	.055			.005	.001				
327	70.41	16.14	n. d.	1.19	0.87	2.47	2.70	5.64	1.28						100.70	
A4. IV	1.174	.158	—	.017	.022	.045	.044	.060								
328	65.49	18.95	2.55	1.36	0.60	2.06	3.45	5.08	0.71	0.37					100.62	
A3. III	1.092	.186	.016	.019	.015	.037	.056	.054								
329	75.76	14.36	0.86	n. d.	0.12	1.20	4.02	3.82	0.37						100.51	
A4. IV	1.263	.141	.005	(.010)	.003	.021	.064	.040								
330	73.20	13.40	1.76	n. d.	0.10	1.46	3.17	4.70	2.77						100.56	
A4. IV	1.220	.131	.011	(.022)	.003	.027	.051	.050								
331	72.74	12.70	1.91	n. d.	0.15	1.59	3.60	4.10	2.92						99.71	
A4. IV	1.212	.124	.012	(.024)	.004	.029	.058	.043								

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. TOSCANOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
317	I.″4.(1)2.3.	Q 31.32 hy 1.70 or 27.24 mt 0.23 ab 29.34 il 0.76 an 4.45 hm 2.72 C 0.71 ap 0.67	Macomer, Sardinia.	H. S. Washington.	H. S. Washington, XII, Cong. G. Int., C. R. 1913, p. 231.	Rhyolite.	
318	I.4.2.3.	Q 28.44 hy 3.75 or 27.24 mt 0.93 ab 27.25 il 0.46 an 11.68 C 0.31	Tempio Pausania, Sardinia.	C. Riva.	C. Riva, Att. Ac. Sc. Nap., (2), XII, No. 9, p. 27, 1905.	Granite.	
319	I.4.2.3(4).	Q 23.58 hy 2.72 or 24.46 il 0.15 ab 35.63 an 11.12 C 0.31	Monte di Cresia, San Antioco, Sardinia.	A. Johnsen.	A. Johnsen, Abh. Pr. Ak. Wiss., Anh. No. 2, p. 48, 1912.	Liparite.	Also in N. J. C. B., 1912, p. 738.
320	I.″4.2.3″.	Q 29.22 mt 2.09 or 25.02 il 0.61 ab 31.44 hm 1.76 an 6.95 C 0.31	Grotta Canargius, San Antioco, Sardinia.	A. Johnsen.	A. Johnsen, Abh. Pr. Ak. Wiss., Anh. No. 2, p. 48, 1912.	Liparite pitchstone.	Also in N. J. C. B., 1912, p. 738.
321	I.4.2(3).3.	Q 27.06 hy 0.70 or 25.58 il 0.91 ab 27.25 hm 1.49 an 15.29 tn 0.14 C 0.31	Fonte Sa Teula, Ittiri, Sardinia.	F. Millosevich.	F. Millosevich, Mem. Ac. Linc. (5), VIII, No. 15, p. 610, 1911.	Trachyda- cite.	
322	I.4.2″.3″.	Q 26.94 hy 1.90 or 22.24 mt 1.16 ab 28.82 il 0.76 an 12.79 hm 1.12 C 2.14	Monte Casellone, n. Ittiri, Sardinia.	F. Millosevich.	F. Millosevich, Mem. Ac. Linc. (5), VIII, No. 15, p. 613, 1911.	Trachyda- cite.	
323	I″.4″.2.3.	Q 15.54 hy 2.73 or 31.14 mt 2.78 ab 29.34 il 1.37 an 13.90 C 0.51	Fonte Corbu, n. Caniga, Alghero, Sardinia.	F. Millosevich.	F. Millosevich, Mem. Ac. Linc. (5), VI, No. 14, p. 412, 1908.	Trachyandes- ite.	Also in Rend. Ac. Linc., XVI, p. 554, 1907.
324	I.4″.2.3″.	Q 13.62 hy 0.90 or 29.47 mt 2.55 ab 36.15 il 0.61 an 9.73 hm 0.64 C 4.28	Nuraghe Sa Patada, n. Sassari, Sardinia.	F. Millosevich.	F. Millosevich, Mem. Ac. Linc. (5), VI, No. 14, p. 424, 1908.	Trachyandes- ite.	
325	I(II).4(5).2.3.	Q 12.42 hy 10.04 or 32.25 mt 0.46 ab 35.11 il 0.76 an 9.17 ap 0.34 C 0.10	Eruption 1888–89, Vulcano, Aeolian Islands.	Pisani.	A. Lacroix, C. R., CXLVII, p. 1453, 1908.	Trachyte.	
326	I(II).4″.2.3.	Q 15.90 hy 9.27 or 30.58 mt 0.23 ab 31.44 il 0.76 an 9.73 ap 0.34 C 0.92	Eruption 1888–89, Vulcano, Aeolian Islands.	Pisani.	A. Lacroix, C. R., CXLVII, p. 1453, 1908.	Trachyte.	Bomb.
327	I.4.2″.″3.	Q 25.26 hy 4.44 or 33.36 ab 23.06 an 12.51 C 0.92	Dych-Ssu Glacier, Central Caucasus.	Loewinson- Lessing.	Loewinson-Lessing, Vh. Russ. Min. Ges., XLII, p. 270, 1905.	Granite.	
328	I.4.2.3⊙	Q 20.40 hy 1.90 or 30.02 mt 3.71 ab 29.34 an 10.29 C 3.98	Gochasa River, Karabagh, Armenia.	Not stated.	A. S. Ginsberg, Ann. Inst. Poly. St. Pet., XX, p. 58, 1913.	Quartz trachyte.	
329	I.(3)4.″2.3(4).	Q 35.04 hy 1.62 or 22.24 ab 33.54 an 5.83 C 1.63	Sidi Zerzor, n. Ménerville, Algeria.	Not stated.	Duparc, Pearce, and Ritter, M. Soc. Ph. Gen., XXXIII, p. 115, 1900.	Liparite.	In W. T., p. 171.
330	I.″4.2.3.	Q 32.10 hy 3.20 or 27.80 ab 26.72 an 7.51 C 0.31	Cap Marsa, n. Ménerville, Algeria.	Not stated.	Duparc, Pearce, and Ritter, M. Soc. Ph. Gen., XXXIII, p. 77, 1900.	Liparite.	In W. T., p. 171.
331	I.″4.″2.3″.	Q 31.56 di 1.46 or 23.91 hy 2.81 ab 30.39 an 6.39	Cap Marsa, n. Ménerville, Algeria.	Not stated.	Duparc, Pearce, and Ritter, M. Soc. Ph. Gen., XXXIII, p. 77, 1900.	Liparite.	In W. T., p. 173.

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
332	72.13	13.28	1.38	n. d.	0.40	1.05	3.60	3.58	4.75						100.17	
A4. IV	1.202	.130	.009	(.018)	.010	.019	.058	.038								
333	72.90	16.70	0.36	n. d.	0.66	1.10	3.66	3.82	0.33						99.53	
A3. III	1.215	.164	.002	(.004)	.016	.020	.059	.040								
334	73.05	14.67	0.89	n. d.	0.26	0.97	3.99	5.11	0.91						99.85	2.211
A4. IV	1.218	.144	.006	(.012)	.007	.018	.064	.055								
335	71.80	14.90	1.10	1.08	0.39	2.20	4.17	4.11	0.60		0.26				100.61	
A3. III	1.197	.146	.007	.015	.010	.039	.068	.044			.003					
336	67.03	14.25	1.96	1.70	trace	1.05	3.85	3.90	5.73				trace		99.47	2.376
A3. III	1.117	.140	.013	.024	——	.019	.062	.041					——			
337	73.38	13.67	1.18	n. d.	0.09	1.17	2.99	6.47	0.67		0.02	0.16	trace	ZrO_2 trace Cl 0.02 F none S 0.37 Cr_2O_3 none Cu 0.02 Pb 0.05	100.26	
A2. II	1.223	.134	.008	(.016)	.002	.021	.048	.069			——	.001	——			
338	71.45	12.97	1.98	0.53	0.44	1.51	3.81	3.53	0.89	1.74	0.47	0.29			99.61	
A2. II	1.191	.127	.013	.007	.011	.027	.061	.037			.006	.002				
339	69.13	12.90	1.54	4.00	0.45	2.86	3.34	3.76	0.41	0.18	1.06	0.21			99.84	
A2. II	1.152	.126	.010	.056	.011	.051	.054	.040			.013	.002				
340	68.34	16.91	1.89	0.25	0.44	1.71	4.65	5.01	n. d.	0.06	0.56	0.17			99.99	
A2. II	1.139	.166	.012	.004	.011	.030	.075	.053			.007	.001				
341	63.69	16.59	1.05	3.29	0.54	2.34	3.81	5.97	1.75	0.24	0.70	0.23			100.20	
A2. II	1.062	.163	.007	.046	.014	.042	.061	.064			.009	.002				
342	72.05	12.79	3.57	0.83	0.47	1.98	2.60	4.46	0.95						99.70	
A3. III	1.201	.125	.023	.011	.012	.036	.042	.048								
343	68.94	11.60	2.01	2.67	0.59	2.40	2.41	4.31	4.95						99.88	
A3. III	1.149	.114	.013	.038	.015	.043	.039	.045								
344	66.40	12.91	3.87	2.56	0.53	2.32	3.30	3.09	3.16	1.09	0.54	0.16	0.09		100.02	
A2. II	1.107	.127	.024	.036	.013	.041	.053	.033			.007	.001	.001			
345	74.20	13.90	0.88	1.25	0.26	1.50	2.49	5.66	0.36		trace				100.50	
A3. III	1.237	.136	.006	.018	.007	.027	.040	.061			——					
346	71.95	14.90	2.32	0.54	0.58	0.87	3.65	4.10	0.93						99.84	
A3. III	1.199	.146	.014	.008	.015	.016	.059	.044								
347	69.90	15.43	0.51	3.22	0.54	1.79	2.51	6.10	0.20		0.35				100.55	
A3. III	1.165	.151	.003	.044	.014	.032	.040	.065			.004					

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. TOSCANOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
332	I.(3)4.″2.3(4).	Q 33.60 hy 3.38 or 21.13 ab 30.39 an 5.28 C 1.53	Cap Marsa, n. Ménerville, Algeria.	Not stated.	Duparc, Pearce, and Ritter, M. Soc. Ph. Gen., XXXIII, p. 77, 1900.	Liparite.	In W. T., p.173.
333	I.(3)4.″2.3(4).	Q 33.66 hy 2.13 or 22.24 ab 30.92 an 5.56 C 4.59	Filfila, n. Philippeville, Algeria.	P. Termier	P. Termier, C. R., CXXXIV, p. 373, 1902.	Aplite.	
334	I.4.(1)2.3.	Q 26.94 hy 2.28 or 30.58 ab 33.54 an 5.00 C 0.71	Teneriffe, Canary Islands.	A. Lagorio.	A. Lagorio, T. M. P. M., VIII, p. 440, 1887.	Obsidian.	In W. T., p. 173.
335	I.4.2.3(4).	Q 26.22 di 1.14 or 24.46 hy 1.10 ab 35.63 mt 1.62 an 9.45 il 0.46	Mount Gbon, Ivory Coast.	Pisani.	A. Lacroix, Nouv. Arch. Mus., III, p. 118, 1911.	Granite.	
336	I.4.″2.3(4).	Q 27.00 hy 1.45 or 22.80 mt 3.02 ab 32.49 an 5.28 C 1.84	Amba Barra, Abyssinia.	G. T. Prior.	G. T. Prior, Min. Mag., XII, p. 270, 1900.	Pitchstone.	In W. T., p. 173.
337	I.4.(1)2.″3.	Q 28.14 hy 2.31 or 38.36 ap 0.34 ab 25.15 an 4.73	Adadle, Somaliland, East Africa.	Not stated.	A. Bodmer-Beder, Vierthft. Nf. Ges. Zür., XXXIX, p. 196, 1894.	Granite.	In W. T., p. 173.
338	I.(3)4.″2.3(4).	Q 33.12 hy 1.10 or 20.57 mt 0.23 ab 31.96 il 0.91 an 5.56 hm 1.92 C 0.92 ap 0.67	Ampisarakissa, Ankaratra, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVI, p. 176, 1913.	Rhyolite.	
339	I(II).″4.2.3″.	Q 28.08 di 2.88 or 22.24 hy 3.97 ab 28.30 mt 2.32 an 8.90 il 1.98 ap 0.67	Andromasy, Sakalave District, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVII, p. 18, 1913.	Olivine rhyolite.	
340	I.4.2.3″.	Q 18.36 hy 1.10 or 29.47 il 0.61 ab 39.30 hm 1.89 an 7.51 ru 0.24 C 1.12 ap 0.34	Sahatsio, n. Antsirabé, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVI, p. 176, 1913.	Trachyte.	
341	I″.4(5).2.3.	Q 11.88 hy 5.36 or 35.58 mt 1.62 ab 31.96 il 1.37 an 9.73 ap 0.67 C 0.31	Madagascar.	Boiteau?.	A. Lacroix, pers. com.	Not named.	
342	I.(3)4.2.3.	Q 34.68 di 0.22 or 26.69 hy 1.10 ab 22.01 mt 2.55 an 9.73 hm 1.92	Manzinyama River, Lebombo Mountains, Swaziland.	R. Reinisch.	J. M. Henderson, Tr. G. Soc. S. Afr., XII, p. 29, 1910.	Rhyolite.	
343	I(II).(3)4.2.3.	Q 31.92 di 2.87 or 25.02 hy 3.24 ab 20.44 mt 3.02 an 8.34	Lebombo Mountains, Swaziland.	R. Reinisch.	J. M. Henderson, Tr. G. Soc. S. Afr., XII, p. 28, 1910.	Pitchstone.	
344	I(II).(3)4.2″.3(4).	Q 29.76 hy 2.09 or 18.35 mt 5.57 ab 27.77 il 1.06 an 10.56 ap 0.34 C 0.31	Indulawane Hill, Zululand.	G. T. Prior.	G. T. Prior, Ann. Natal Mus., II, No. 2, p. 155, 1910.	Toscanite.	
345	I.(3)4.2.(2)3.	Q 33.48 hy 2.28 or 33.92 mt 1.39 ab 20.96 an 7.51 C 0.82	Tatarka River, Jenissei District, Siberia.	Not stated.	A. Meister, Expl. G. Reg. Aurif. Sib., IX, p. 134, 1910.	Granite.	
346	I.(3)4.(1)2.3″.	Q 32.04 hy 1.50 or 24.46 mt 1.86 ab 30.92 hm 0.91 an 4.45 C 2.75	Angara River, Jenissei District, Siberia.	Not stated.	A. Meister, Expl. G. Reg. Aurif. Sib., IX, p. 269, 1910.	Orthogneiss.	
347	I″.4.2.(2)3.	Q 25.20 hy 6.28 or 36.14 mt 0.70 ab 20.96 il 0.61 an 8.90 C 1.43	Jenissei River, Jenissei District, Siberia.	Not stated.	A. Meister, Expl. G. Reg. Aurif. Sib., IX, p. 269, 1910.	Orthogneiss.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
348	65.63	16.20	0.31	3.25	1.13	3.44	3.67	4.23	1.12	0.09	0.40			CO_2 0.36	99.83	
A3. III	1.094	.159	.002	.045	.028	.062	.060	.045			.005					
349	71.83	14.83	0.84	1.39	0.23	1.44	3.99	4.50	0.13		trace		none	CO_2 0.46	99.63	2.58
A3. III	1.197	.145	.005	.019	.006	.026	.065	.048			—		—			
350	72.96	14.57	n. d.	1.62	0.52	1.47	4.59	4.26	0.37			0.07	trace		100.43	
A4. IV	1.216	.143	—	.022	.013	.027	.074	.046				—	—			
351	72.88	14.62	0.43	1.69	0.35	1.51	3.68	4.05	0.65			0.06	0.09		100.01	
A2. II	1.215	.143	.003	.024	.009	.027	.060	.043				—	.001			
352	67.99	14.96	0.40	2.35	trace	1.98	2.79	4.98	4.37						99.82	
A3. III	1.133	.147	.003	.033	—	.036	.045	.053								
353	62.72	12.96	4.67	3.22	0.30	1.87	3.26	5.41	4.43		0.65	0.23	0.03		99.75	
A2. II	1.045	.127	.029	.044	.008	.034	.053	.057			.008	.002	—			
354	74.87	12.88	1.34	1.53	0.15	1.44	3.29	4.16	0.29		0.27		trace		100.22	
A3. III	1.248	.126	.008	.021	.004	.026	.053	.045			.003		—			
355	73.24	12.87	1.01	2.21	0.44	1.56	3.77	4.48	0.40				0.05		100.03	2.646
A3. III	1.221	.126	.006	.031	.011	.028	.061	.048					—			
356	71.25	14.21	0.85	0.43	0.89	2.72	3.11	6.74	0.48						100.68	
A3. III	1.188	.139	.005	.006	.022	.048	.050	.071								
357	69.50	14.52	0.91	3.07	1.66	2.03	3.10	4.48	1.02		0.15	0.22			100.66	
A2. II	1.158	.142	.006	.043	.042	.036	.050	.048			.002	.002				
358	67.75	15.51	2.26	1.22	0.91	2.79	3.22	3.15	2.29	0.45	0.32	trace			99.87	
A3. III	1.129	.152	.014	.017	.023	.050	.052	.034			.004	—				
359	76.48	13.94	trace	none	0.01	1.08	3.70	4.90	0.86						100.97	2.611
B3. IV	1.275	.137	—	—	—	.020	.060	.052								
360	74.00	14.49	1.10	0.45	0.44	0.92	3.29	4.85	0.56	0.18	0.14	0.05	0.08	CO_2 none ZrO_2 none SO_3 none Cl none F none S none Cr_2O_3 none V_2O_3 none NiO none BaO 0.06 SrO trace Li_2O none	100.61	2.630
A1. I	1.233	.142	.007	.007	.011	.016	.053	.052			.002	—	.001			
361	73.98	13.47	0.72	0.97	0.36	0.90	3.39	4.88	0.32	0.12	0.54	0.05	0.03	CO_2 0.04 ZrO_2 0.02 SO_3 none Cl 0.02 F 0.02 S none Cr_2O_3 none V_2O_3 none NiO none BaO trace SrO trace Li_2O none	99.83	2.639
A1. I	1.233	.132	.005	.014	.009	.016	.055	.052			.007	—	—			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. TOSCANOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
348	I(II).4.2″.3.	Q 16.92 di 1.89 or 25.02 hy 6.86 ab 31.44 mt 0.46 an 15.01 il 0.76	Riasanov Trail, Jenissei District, Siberia.	G. Zhukovsky.	A. Meister, Expl. G. Reg. Aurif. Sib., IX, p. 234, 1910.	Banatite.	
349	I.4.″2.3″.	Q 26.82 hy 2.45 or 26.69 mt 1.16 ab 34.06 an 7.23 C 0.61	Zeia River, Amur District, Siberia.	W. Abramov.	E. Ahnert, Expl. G. Reg. Aurif. Sib., X, Tab. VII, 1910.	Quartz porphyry.	
350	I.4.″2.3(4).	Q 24.66 di 0.92 or 25.58 hy 3.75 ab 38.77 an 6.39	Konyam Bay, Siberia.	G. Lindström.	G. Lindström, Ref. N. J., 1885, I, p. 430.	Granite.	In W. T., p. 173.
351	I.″4.2.3″.	Q 30.72 hy 3.80 or 23.91 mt 0.70 ab 31.44 an 7.51 C 1.33	Konyam Bay, Siberia.	G. Lindström.	G. Lindström. Ref. N. J., 1885, I, p. 430.	Granite.	In W. T., p. 173.
352	I.4.2.3.⊙	Q 26.58 hy 3.96 or 29.47 mt 0.70 ab 23.58 an 10.01 C 1.33	Jozankei, Ishikari, Hokkaido, Japan.	Takaminé.	B. G. Soc. Jap.,1884.	Liparite.	S. Kozu, pers. com.
353	I(II).4.(1)2.3.	Q 19.56 di 2.32 or 31.69 hy 0.56 ab 27.77 mt 6.73 an 4.73 il 1.22 ap 0.67	Nakamura, Dogo, Oki Islands, Japan.	K. Yokoyama.	S. Kozu, Sci. Rep. Tohok. Un., (2), I, p. 40, 1913.	Rhyolite.	
354	I.(3)4.2.3.	Q 35.64 hy 1.72 or 25.02 mt 1.86 ab 27.77 il 0.46 an 7.23 C 0.20	Tondano, Menado District, Celebes.	Ledeboer.	R. D. M. Verbeek, Jb. Mijnw. XXXVII, p. 91, 1908.	Obsidian.	
355	I″.″4.(1)2.3.	Q 29.16 di 2.64 or 25.69 hy 3.04 ab 31.96 mt 1.39 an 4.73	Koeantan, Sumatra.	L. Serrurier.	R. D. M. Verbeek, Sum. Westk., p. 232, 1883.	Granitite.	Not in W. T.
356	I″.4.(1)2.″3.	Q 22.44 di 4.75 or 39.43 wo 0.93 ab 26.20 mt 1.16 an 5.00	Lau Biang, Battak Plateau, Sumatra.	W. Herz.	L. Milch, Z. D. G. G., LI, p. 69, 1899.	Liparite.	In W. T., p. 173.
357	I(II).4.2.3.	Q 26.10 hy 8.82 or 26.69 mt.1.39 ab 26.20 il 0.30 an 8.06 C 1.53	Lau Alas, Sumatra.	F. Riegner.	F. Riegner, In. Diss. Bres., p. 48, 1909.	Granite.	
358	I.″4.2(3).3(4).	Q 29.40 hy 2.30 or 18.90 mt 3.02 ab 27.25 il 0.61 an 13.90 hm 0.16 C 1.63	Lai Hrnum, Pakpak Land, Sumatra.	M. Dittrich.	H. Stegmann, N. J. B. B., XXVII, p. 436, 1909.	Quartz trachyte-andesite.	
359	I.″4.(1)2.3.	Q 33.48 or 28.91 ab 31.44 an 5.56 C 0.41	Orr's Gulley, Dargo, Victoria.	A. Howitt.	A. Howitt, Ref. N. J., 1889, I, p. 121.	Aplite.	In W. T., p. 173.
360	I.(3)4.(1)2.3.	Q 33.60 hy 1.10 or 28.91 mt 1.39 ab 27.77 il 0.30 an 4.45 hm 0.16 C 2.14	Tenterfield, New England, New South Wales.	J. C. H. Mingaye.	E. C. Andrews, Rec. G. S. N. S. W., VIII, (3), p. 225, 1907.	Aplitic granite.	
361	I.(3)4.(1)2.3.	Q 32.88 hy 1.16 or 28.91 mt 1.16 ab 28.82 il 1.03 an 4.45 C 0.92	Bolivia, New England, New South Wales.	J. C. H. Mingaye.	E. C. Andrews, Rec. G. S. N. S. W., VIII, (3), p. 220, 1907.	Granite.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
362	70.74	14.91	0.33	2.43	0.89	1.88	3.29	4.07	0.48	0.32	0.37	0.04	0.13	CO_2 0.05 ZrO_2 none SO_3 0.41 Cl none F none S none Cr_2O_3 none V_2O_3 trace NiO none BaO 0.02 SrO trace Sb_2O_3 0.03	100.39	2.678
A1. I	1.179	.146	.002	.033	.022	.034	.053	.044			.005	—	.002			
363	69.55	14.16	0.60	3.33	1.45	2.20	3.14	4.09	0.30	0.20	0.54	0.12	0.23	CO_2 0.04 ZrO_2 none SO_3 0.11 Cl none F none S none Cr_2O_3 trace V_2O_3 none NiO none BaO 0.07 SrO trace CuO trace	100.13	2.658
A1. I	1.159	.139	.004	.046	.036	.039	.051	.044			.007	.001	.003			
364	69.14	14.74	0.70	1.98	1.58	3.14	3.36	4.13	0.38	0.18	0.36	0.18	trace	CO_2 0.23 ZrO_2 none Cl 0.04 Cr_2O_3 none V_2O_3 none NiO trace BaO 0.02 SrO trace LiO_2 trace	100.15	2.696
A1. I	1.152	.145	.004	.028	.040	.056	.054	.043			.005	.001	—			
365	67.61	15.66	1.12	3.31	1.55	2.14	3.03	3.58	0.90	0.30	0.62	0.13	0.12	CO_2 none ZrO_2 trace SO_3 0.12 Cl 0.02 Cr_2O_3 none V_2O_3 none NiO none BaO 0.06 SrO trace Li_2O none Sb_2O_3 trace	100.30	2.722
A1. I	1.127	.154	.007	.046	.039	.038	.048	.038			.008	.001	.002			
366	73.33	12.43	0.10	2.43	0.59	0.98	2.71	5.66	1.41	0.09	0.23	0.11	trace	CO_2 trace ZrO_2 none SO_3 none Cl trace S none Cr_2O_3 none V_2O_3 none NiO none BaO 0.06 SrO none	100.13	2.648
A1. I	1.222	.122	.001	.033	.015	.018	.044	.060			.003	.001	—			
367	71.92	13.83	1.00	1.62	0.54	1.28	2.67	5.61	0.95	0.11	0.28	0.09	0.02	CO_2 0.35 ZrO_2 none Cl trace S none Cr_2O_3 none V_2O_3 none NiO trace BaO 0.05 SrO none	100.32	2.643
A1. I	1.199	.136	.006	.022	.014	.023	.044	.060			.004	—	—			
368	71.27	13.40	1.11	1.89	0.79	2.46	3.08	4.91	0.32	0.18	0.24	0.10	0.07	CO_2 0.03 ZrO_2 none SO_3 none Cl 0.06 S none Cr_2O_3 none NiO 0.01 BaO none SrO trace	99.92	2.687
A1. I	1.188	.131	.007	.026	.020	.044	.050	.052			.003	.001	.001			
369	69.31	13.48	0.85	3.64	1.41	1.75	2.91	4.30	0.88	0.15	0.70	0.24	0.07	CO_2 0.02 S none V_2O_3 none BaO 0.07	99.78	2.708
A1. I	1.155	.132	.005	.051	.035	031	.047	.046			.009	.002	.001			
370	68.25	14.41	2.00	2.07	1.08	3.06	3.19	4.74	0.35	0.19	0.36	0.15	0.16	CO_2 0.05 ZrO_2 none SO_3 none Cl none F none S none Cr_2O_3 none NiO none BaO 0.03 SrO trace CuO 0.01	100.10	2.698
A1. I	1.138	.141	.013	.029	.027	.055	.052	.050			.005	.001	.002			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. TOSCANOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
362	I″.″4.2.3.	Q 28.74, or 24.46, ab 27.77, an 9.45, C 1.53, hy 5.90, mt 0.46, il 0.76	Hillgrove, New England, New South Wales.	J. C. H. Mingaye.	E. C. Andrews, Rec. G. S. N. S. W., VIII, (3), p. 218, 1907.	Granite.	
363	I(II).4.2.3.	Q 26.58, or 24.46, ab 26.72, an 10.01, C 0.82, hy 8.62, mt 0.93, il 1.06, ap 0.34	Hillgrove, New England, New South Wales.	J. C. H. Mingaye.	E. C. Andrews, Rec. G. S. N. S. W., VIII, (3), p. 215, 1907.	Granite.	
364	I″.4.2″.3.	Q 24.60, or 23.91, ab 28.30, an 13.34, di 1.14, hy 5.94, mt 0.93, il 0.76, ap 0.34	Walcha Road, New England, New South Wales.	W. A. Greig.	E. C. Andrews, Rec. G. S. N. S. W., VIII, (3), p. 211, 1907.	Granite porphyry.	
365	I(II).″4.2.3.	Q 28.14, or 21.13, ab 25.15, an 9.73, C 3.37, hy 8.26, mt 1.62, il 1.22, ap 0.34	Trimm's Tunnel, New England, New South Wales.	J. C. H. Mingaye.	E. C. Andrews, Rec. G. S. N. S. W., VIII, (3), p. 217, 1907.	Granite.	
366	I″.4″.(1)2.″3.	Q 31.26, or 33.36, ab 23.06, an 4.17, C 0.31, hy 5.13, mt 0.23, il 0.46, ap 0.34	Canbelego, New South Wales.	H. P. White.	G. W. Card, pers. com.	Rhyolite.	
367	I.″4.″2.″3.	Q 30.18, or 33.36, ab 23.06, an 6.39, C 0.92, hy 2.98, mt 1.39, il 0.61	Overflow station, New South Wales.	W. A. Greig.	G. W. Card. pers. com.	Rhyolite.	
368	I″.4.2.3.	Q 28.14, or 28.91, ab 26.20, an 8.06, di 2.78, hy 2.85, mt 1.62, il 0.46, ap 0.34	Tingha, New South Wales.	H. P. White.	J. E. Carne, G. S. N. S. W., Min. Res., No. 14, p. 64, 1911.	Granite.	
369	I(II).″4.2.3.	Q 28.56, or 25.58, ab 24.63, an 6.67, C 1.53, hy 8.52, mt 1.16, il 1.37, ap 0.67	Enmore Homestead, Uralla, New South Wales.	W. G. Stone.	N. S. W. Dep. Min., A. R. (1913), p. 191, 1914.	Granite.	
370	I(II).4.2.3.	Q 23.70, or 27.80, ab 27.25, an 10.84, di 2.94, hy 2.99, mt 3.02, il 0.76, ap 0.34	Herding Yard Creek, New South Wales.	W. A. Greig.	J. E. Carne, G. S. N. S. W., Min. Res. No. 14, p. 90, 1911.	Granite.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
371	69. 90	14. 09	0. 88	2. 33	0. 98	1. 10	2. 35	5. 99	1. 00	0. 10	0. 40	0. 19	0. 02	CO_2 0. 40 ZrO_2 none Cl 0. 03 F none FeS_2 0. 02 Cr_2O_3 none NiO none BaO 0. 02 SrO trace Li_2O trace CuO 0. 01	99. 81	2. 649
A1. I	1. 165	. 138	. 006	. 032	. 025	. 020	. 038	. 063			. 005	. 001	—			
372	72. 72	12. 76	none	3. 45	0. 10	1. 23	2. 89	4. 75	1. 01		0. 25	0. 22	0. 25	CO_2 0. 02	99. 72	
A2. II	1. 212	. 125	—	. 048	. 003	. 021	. 047	. 051			. 003	. 002	. 004			
373	69. 93	15. 28	2. 96	0. 65	0. 40	2. 30	3. 26	3. 20	0. 97	0. 70	0. 33	0. 21	0. 03	CO_2 none	100. 22	
A2. II	1. 166	. 150	. 019	. 009	. 010	. 041	. 053	. 034			. 004	. 001	—			
374	67. 15	15. 03	1. 86	1. 73	0. 33	2. 85	3. 00	3. 34	3. 85	0. 47	0. 30	0. 16	0. 05	CO_2 none	100. 12	
A2. II	1. 119	. 147	. 012	. 024	. 008	. 051	. 048	. 035			. 004	. 001	—			
375	70. 36	14. 30	2. 40	1. 88	0. 58	1. 10	2. 59	5. 00	0. 88	0. 33	0. 30	0. 40	0. 03		100. 15	
A2. II	1. 173	. 140	. 015	. 026	. 015	. 020	. 042	. 053			. 004	. 003	—			
376	69. 40	15. 27	1. 48	1. 81	1. 16	2. 00	3. 39	3. 49	1. 10	0. 15	0. 44	0. 24	0. 05	CO_2 none	99. 98	
A2. II	1. 157	150	. 009	. 025	. 029	. 036	. 055	. 037			. 006	. 002	—			
377	67. 90	14. 77	2. 36	2. 34	1. 32	2. 20	3. 33	3. 25	0. 10	1. 39	0. 53	0. 32	0. 07	CO_2 0. 20	100. 08	
A2. II	1. 132	. 145	. 015	. 032	. 033	. 039	. 053	. 035			. 007	. 002	. 001			
378	68. 50	14. 35	1. 60	3. 71	0. 93	2. 11	2. 91	3. 83	1. 05	0. 11	0. 80	0. 29	0. 05	SO_3 0. 14	100. 38	
A2. II	1. 142	. 141	. 010	. 051	. 023	. 038	. 047	. 040			. 010	. 002	—			
379	68. 50	14. 29	1. 80	1. 23	0. 88	2. 78	3. 12	2. 92	3. 74	0. 30	0. 34	0. 28	0. 05		100. 23	
A2. II	1. 142	. 140	. 011	. 017	. 022	. 050	. 050	. 031			. 004	. 002	—			
380	73. 55	13. 70	0. 24	2. 36	0. 26	0. 92	3. 59	4. 46	0. 36	0. 08	0. 21		0. 05	CO_2 0. 04	99. 82	
A2. II	1. 223	. 134	. 002	. 033	. 007	. 016	. 058	. 048			. 003		—			
381	71. 10	14. 50	0. 31	3. 10	1. 17	2. 59	3. 25	4. 02	0. 25		0. 46	0. 03			100. 75	
A2. II	1. 185	. 142	. 002	. 043	. 029	. 046	. 053	. 043			. 006	—				

RANG 2. DOMALKALIC. TOSCANASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	69. 06	15. 26	0. 68	2. 53	0. 34	2. 83	4. 83	2. 87	0. 16		0. 74	0. 14			99. 49	2. 685
A2. II	1. 151	. 150	. 004	. 035	. 009	. 050	. 079	. 031			. 009	. 001				
2	73. 33	13. 55	0. 58	1. 53	0. 45	1. 66	5. 01	3. 12	0. 45		0. 17		0. 04		99. 89	
A2. II	1. 222	. 133	. 004	. 021	. 011	. 030	. 081	. 033			. 002		—			
3	70. 00	16. 00	1. 28	0. 51	0. 50	2. 30	5. 34	2. 99	0. 52	0. 07	0. 20	0. 05	0. 08	S 0. 05 Cr_2O_3 none BaO 0. 04 SrO 0. 01	99. 94	
A1. I	1. 167	. 157	. 008	. 007	. 013	. 041	. 086	. 032			. 003	—	. 001			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. TOSCANOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
371	I''.''4.(1)2.(2)3.	Q 28.74, or 35.03, ab 19.91, an 4.73, C 2.04, hy 5.27, mt 1.39, il 0.76, ap 0.34	Cobar, New South Wales.	W. A. Greig.	E. C. Andrews, G. S. N. S. W., Min. Res. No. 17, p. 66, 1913.	Orthoclase porphyry.	
372	I''.(3)4.(1)2.3.	Q 33.24, or 28.36, ab 24.63, an 3.89, C 1.33, hy 6.77, il 0.46, ap 0.67	Mount Rangitoto, Mikonui, New Zealand.	J. S. Maclaurin.	P. G. Morgan, N. Z. G. S. B. 6, p. 135, 1908.	Granite.	
373	I.(3)4.2.3(4).	Q 33.48, or 18.90, ab 27.77, an 10.56, C 2.55, hy 1.00, mt 1.16, il 0.61, hm 2.24, ap 0.34	Kopukairoa, Te Puke District, New Zealand.	Not stated.	J. A. Bartrum, N. Z. Min. Statem., (1912), p. 139, 1913.	Rhyolite.	
374	I.(3)4.2(3).3''.	Q 31.02, or 19.46, ab 25.15, an 13.34, C 1.63, hy 1.86, mt 2.78, il 0.61, ap 0.34	Kirikiri Creek, Te Puke District, New Zealand.	Not stated.	J. A. Bartrum, N. Z. Min. Statem., (1912), p. 140, 1913.	Rhyolite.	
375	I''.(3)4.(1)2.3.	Q 33.66, or 29.47, ab 22.01, an 2.78, C 3.57, hy 2.42, mt 3.48, il 0.61, ap 1.01	Cape Foulwind, Westport District, New Zealand.	Not stated.	P. G. Morgan, pers. com.	Granite.	
376	I''.(3)4.2.3(4).	Q 30.48, or 20.57, ab 28.82, an 8.06, C 2.96, hy 4.22, mt 2.09, il 0.91, ap 0.67	Waimangaroa River, Westport District, New Zealand.	Not stated.	P. G. Morgan, pers. com.	Quartz porphyry.	
377	I(II).(3)4.2.3''.	Q 29.76, or 19.46, ab 27.77, an 8.90, C 2.55, hy 4.75, mt 3.48, il 1.09, ap 0.67	Waimangaroa Valley, Westport District, New Zealand.	Not stated.	P. G. Morgan, pers. com.	Quartz porphyry.	
378	I(II).(3)4.2.3.	Q 30.24, or 22.24, ab 24.63, an 8.62, C 2.35, hy 6.39, mt 2.32, il 1.52, ap 0.67	Mabel Bay, Brighton, Reefton District, New Zealand.	Not stated.	P. G. Morgan, pers. com.	Granite.	
379	I''.(3)4.2(3).3.	Q 32.88, or 17.24, ab 26.20, an 11.95, C 1.63, hy 2.46, mt 2.55, il 0.61, ap 0.67	Aroha, Hauraki, New Zealand.	Surv. lab.	Henderson and Fraser, N. Z. G. S. B. 16, p. 67, 1913.	Dacite.	
380	I.''4.(1)2.3.	Q 31.20, or 26.69, ab 30.39, an 4.45, C 1.21, hy 4.40, mt 0.46, il 0.46	Mount Larsen, Ross Region, Antarctica.	Burrows and Walkom.	J. W. E. David, pers. com.	Not named.	Erratic block.
381	I''.4.2''.3.	Q 27.18, or 23.91, ab 27.77, an 12.79, hy 7.52, mt 0.46, il 0.91	Wandel Island, Graham Land, Antarctica.	Pisani.	G. Gourdon, Exp. Ant. Fr., Petr. vol., p. 144, 1908.	Granite.	

SUBRANG 4. DOSODIC. LASSENOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I''.4.2.4.	Q 22.20, or 17.24, ab 41.39, an 11.12, di 2.38, hy 2.58, mt 0.93, il 1.37, ap 0.34	Siusasigsak, n. Jacobshavn, East Greenland.	A. Lindner.	M. Belowsky, Z. D. G. G., LVIII, p. 24, 1905.	Granite gneiss.	
2	I.4.(1)2.4.	Q 27.72, or 18.35, ab 42.44, an 5.28, di 2.57, hy 1.92, mt 0.93, il 0.30	Methuen Township, Ontario.	M. F. Connor.	Adams and Barlow, Can. G. S., Mem. 6, p. 57, 1910.	Granite gneiss.	
3	I.4.2.4.⊙	Q 21.96, or 17.79, ab 45.06, an 10.84, di 0.43, hy 1.10, mt 0.66, il 0.46, hm 0.48	Rice Bay, Rainy Lake, Ontario.	M. F. Connor.	A. C. Lawson, Can. G. S., Mem. 40, p. 59, 1913.	Acid dike rock (aplite?).	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
4	68.48	12.70	2.41	4.50	0.74	1.41	3.72	3.36	1.13		0.61	0.20	0.05		99.31	2.673
B2. III	1.141	.125	.015	.063	.019	.025	.060	.036			.008	.001	——			
5	64.83	15.02	5.57	0.94	1.47	2.62	3.93	2.36	1.76		0.67		0.29	CO_2 0.55	100.02	
A2. II	1.081	.147	.035	.013	.037	.047	.063	.025			.008		.004			
6	69.76	18.22	0.25	1.59	0.40	2.68	4.06	2.06	0.50	0.15	0.36			CO_2 none	100.02	
A3. III	1.163	.179	.002	.022	.010	.048	.066	.022			.005					
7	73.27	15.51	0.33	1.14	0.15	2.74	4.79	1.66	0.68		0.10	trace	trace		100.37	
A3. III	1.221	.152	.002	.016	.004	.049	.077	.018			.001	——	——			
8	71.34	13.97	1.95	1.00	0.62	1.63	4.83	3.89	0.80	0.09	0.43		trace		100.55	
A3. III	1.189	.137	.012	.014	.016	.029	.077	.041			.005		——			
9	70.64	15.34	1.83	1.10	0.52	1.24	5.23	3.55	0.38	0.14	0.90		trace		100.87	2.632
A3. III	1.177	.150	.011	.014	.013	.022	.084	.038			.011		——			
10	70.62	15.31	1.06	0.43	0.29	1.30	4.55	4.01	0.72	0.16	0.29	0.07		CO_2 0.88	99.69	Fresh?
A2. II	1.177	.150	.007	.006	.007	.023	.074	.042			.004	——				
11	73.32	15.01	0.47	1.19	0.15	1.35	4.27	3.72	0.13		0.06		trace		99.67	
A3. III	1.222	.147	.003	.017	.004	.024	.069	.039			.001		——			
12	72.41	13.85	1.13	1.57	0.45	1.54	4.31	3.68	0.41		0.44	0.07	0.33	ZrO_2 trace Cl none F 0.01 S 0.05 Cr_2O_3 none BaO 0.03	100.28	
A1. I	1.207	.136	.007	.022	.011	.028	.069	.039			.006	——	.005			
13	74.70	15.45	0.08	0.64	0.06	1.70	4.90	2.62	0.10		0.07	0.03	0.05	ZrO_2 0.04 SO_3 0.05 BaO 0.07	100.52	
A1. I	1.245	.151	.001	.009	.002	.030	.079	.028			.001	——	——			
14	68.60	14.72	4.29	1.41	0.38	1.46	4.82	3.52	0.16		0.60	0.16	0.04	ZrO_2 0.01 SO_3 0.18 NiO none BaO 0.18 Cu none Zn none	100.33	
A1. I	1.143	.144	.027	.019	.010	.026	.077	.037			.008	.001	——			
15	72.33	14.56	0.15	2.22	0.91	2.55	3.40	2.82	0.30					CO_2 none	99.24	
B3. IV	1.206	.143	.001	.031	.023	.046	.055	.030								
16	70.90	15.25	1.52	1.53	0.63	2.40	4.32	2.85	0.17		0.42	trace	trace	SO_3 trace	99.99	
A3. III	1.182	.150	.009	.021	.016	.043	.069	.031			.005	——	——			
17	68.90	15.75	1.16	1.49	0.74	2.66	4.76	3.49	0.18		0.36	trace	trace	SO_3 trace	99.49	2.66
A3. III	1.148	.155	.007	.021	.019	.047	.077	.037			.005	——	——			
18	69.55	16.72	0.90	n. d.	0.27	1.69	5.88	3.94	0.27						99.31	2.658
B3. IV	1.159	.164	.006	(.012)	.007	.030	.095	.041								
19	69.36	17.23	1.43	n. d.	0.59	2.14	5.17	4.57	0.33						100.82	2.665
A4. IV	1.156	169	.009	(.018)	.015	.038	.084	.049								18°

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 4. DOSODIC. LASSENOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
4	I(II).4.″2.(3)4.	Q 27.72 hy 7.18 or 20.02 mt 3.06 ab 31.44 il 1.22 an 6.12 ap 0.34 C 0.71	Onaping, Sudbury, Ontario.	E. G. R., Ardagh.	A. P. Coleman, J. G., XV, p. 770, 1907.	Syenite.	
5	I(II).4.2″.4.	Q 25.32 hy 3.70 or 13.90 mt 2.09 ab 33.01 il 1.22 an 13.06 hm 4.16 C 1.22	Titus's mill, Upham, New Brunswick.	W. D. Matthew.	W. D. Matthew, Tr. N. Y. Ac. Sci., XIV, p. 207, 1895.	Granite.	In W. T., p. 173.
6	I.″4.(1)2.4.	Q 30.54 hy 3.64 or 12.23 mt 0.46 ab 34.58 an 13.34 C 4.69	Mount Piper, Belknap Mountains, New Hampshire.	H. S. Washington.	Pirsson and Washington, A. J. S., XXII, p. 446, 1906.	Adamellite aplite.	
7	I.″4.2″.4.	Q 32.16 hy 2.12 or 10.01 mt 0.46 ab 40.35 il 0.15 an 13.62 C 0.82	Moore's quarry, Florence, Massachusetts.	L. G. Eakins.	B. K. Emerson, U. S. G. S. Mon. 32, p. 316, 1898.	Granite.	In W. T., p. 173.
8	I.4.(1)2.(3)4.	Q 25.02 di 2.16 or 22.80 hy 0.60 ab 40.35 mt 2.09 an 5.28 il 0.76 hm 0.48	Stony Brook, Neponset Valley, Massachusetts.	W. T. Hall.	F. Bascom, J. Ac. Nat. Sci. Phila., (2), XV, p. 135, 1912.	Granite.	
9	I.4.(1)2.″4.	Q 23.28 hy 1.30 or 21.13 mt 0.70 ab 44.02 il 0.67 an 6.12 hm 1.28 C 0.61	Marblehead Neck, Essex County, Massachusetts.	H. S. Washington.	H. S. Washington, J. G., VII, p. 292, 1899.	Rhyolite.	In W. T., p. 173.
10	I.4.″2.(3)4.	Q 25.68 hy 0.70 or 23.35 mt 0.46 ab 38.77 il 0.61 an 6.39 hm 0.80 C 1.43 ap 0.34	Becket, Massachusetts.	G. Steiger.	B. K. Emerson, U. S. G. S. B. 228, p. 39, 1904.	Gneissoid granite.	
11	I.″4.″2.(3)4.	Q 30.54 hy 2.12 or 21.68 mt 0.70 ab 36.15 il 0.15 an 6.67 C 1.53	Mohegan Quarry, Peekskill, New York.	E. Waller.	G. S. Rogers, Ann. N. Y. Ac. Sci., XXI, p. 61, 1911.	Granite.	
12	I.4.2.(3)4.	Q 28.68 hy 2.95 or 21.68 mt 1.62 ab 36.15 il 0.61 an 7.78	Saratoga Springs, New York.	E. W. Morley.	H. P. Cushing, pers. com.	Granite gneiss.	
13	I.″4.2.4.	Q 32.04 hy 1.12 or 15.57 mt 0.23 ab 41.39 il 0.15 an 8.34 C 1.43	Cranberry Lake, New Jersey.	R. B. Gage.	J. V. Lewis, N. J. G. S., A. R. (1908), p. 74, 1909.	Granite gneiss.	
14	I″.4.″2.″4.	Q 24.18 hy 1.00 or 20.57 mt 2.55 ab 40.35 il 1.22 an 6.39 hm 2.56 C 0.71 ap 0.34	German Valley, Schooleys Mountain, New Jersey.	R. B. Gage.	J. V. Lewis, N. J. G. S. A. R. (1908), p. 76, 1909.	Granite.	
15	I″.(3)4.2(3).(3)4.	Q 33.06 hy 6.26 or 16.68 mt 0.23 ab 28.82 an 12.79 C 1.22	Kemp Mountain, n. Cid, Davidson County, North Carolina.	J. E. Pogue, jr.	J. E. Pogue, jr., A. J. S., XXVIII, p. 226, 1909.	Dacite.	Also in N. C. G. S. B. 22, p. 57, 1910.
16	I.4.2.4⊙	Q 28.38 hy 2.52 or 17.24 mt 2.09 ab 36.15 il 0.76 an 11.95 C 0.71	Fairfield, Broad River, South Carolina.	Hardin and Robertson.	E. Sloan, S. C. G. S. (IV), B. 2, p. 201, 1908.	Granite.	
17	I.4.2.″4.	Q 20.88 di 1.33 or 20.57 hy 2.42 ab 40.35 mt 1.62 an 11.40 il 0.76	Clover, York County, South Carolina.	Hardin and Robertson,	E. Sloan, S. C. G. S. (IV), B. 2, p. 216, 1908.	Granite.	
18	I.4″.″2.4.	Q 15.96 di 0.46 or 22.80 hy 2.05 ab 49.78 an 7.78	Campbell County, Georgia.	T. L. Watson.	T. L. Watson, A. G., XXVII, p. 216, 1901.	Granite.	Also in Ga. G. S. B. 9A, p. 108, 1902.
19	I.4″.2.(3)4.	Q 15.06 di 0.49 or 27.24 hy 3.61 ab 44.01 an 10.01	Oglesby, Elbert County, Georgia.	T. L. Watson.	T. L. Watson, A. G., XXVII, p. 203, 1901.	Granite.	Also in Ga. G. S. B. 9A. p. 221, 1902.

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
20	69.17	16.47	1.23	n. d.	0.61	2.02	4.89	4.41	1.06						99.86	
A4. IV	1.153	.161	.008	(.016)	.015	.036	.079	.047								
21	69.08	17.67	1.41	n. d.	0.64	3.27	4.56	3.29	0.56						100.48	
A4. IV	1.151	.173	.009	(.018)	.016	.059	.074	.035								
22	68.38	17.79	1.21	n. d.	0.72	2.85	4.36	3.57	0.78						99.66	2.689
A4. IV	1.140	.174	.008	(.016)	.018	.051	.070	.038								
23	73.09	15.40	0.65	2.10	0.12	1.74	4.57	2.01	0.17						99.85	
A3. III	1.218	.151	.004	.029	.003	.031	.074	.021								
24	69.70	18.72	0.65	0.79	0.45	2.25	5.01	1.68	0.71						99.96	
A3. III	1.162	.185	.004	.011	.011	.040	.080	.018								
25	67.42	15.88	1.37	1.14	1.43	3.49	6.42	2.65	0.05						99.92	
A3. III	1.124	.155	.009	.016	.036	.062	.103	.030								
26	66.84	18.22	2.27	0.20	0.81	3.31	5.14	2.80	0.46			trace			100.05	
A3. III	1.114	.179	.014	.003	.020	.059	.083	.030				—				
27	70.05	15.04	0.70	1.32	1.04	2.46	4.03	3.33	1.12	0.70	0.36	0.08	0.03	CO_2 none ZrO_2 0.02 SO_3 none S none BaO 0.10 Li_2O 0.05	100.43	
A1. I	1.168	.147	.004	.018	.026	.044	.065	.035			.005	—	—			
28	67.55	15.68	0.98	1.02	1.11	2.51	4.15	2.86	2.76	0.38	0.34	0.12	trace	CO_2 none ZrO_2 none SO_3 none Cl 0.05 BaO 0.11 SrO 0.03 Li_2O none	99.65	
A1. I	1.126	.153	.006	.014	.028	.045	.062	.030			.004	.001	—			
29	66.28	16.21	0.80	2.06	1.57	3.53	4.36	3.20	0.78	0.12	0.50	0.20	trace	BaO 0.34 SrO 0.05	100.00	
A2. II	1.105	.159	.005	.029	.049	.063	.070	.035			.006	.001	—			
30	69.93	14.95	1.78	0.55	0.60	1.46	5.30	3.99	0.32	0.12	0.33	0.33	trace	BaO 0.29 SrO 0.06 Li_2O none	100.01	
A1. I	1.166	.147	.011	.008	.015	.026	.085	.042			.004	.002	—			
31	65.87	16.82	1.58	1.23	1.54	2.65	4.72	3.15	1.43		0.37		trace		99.36	2.62
B3. IV	1.098	.165	.010	.017	.039	.047	.076	.034			.005		—			
32	62.58	16.42	2.46	1.96	1.84	2.47	4.57	3.91	1.40	0.38	0.40	0.33	0.08	CO_2 0.77 BaO 0.41 SrO 0.10 Li_2O trace	100.08	
A1. I	1.043	.161	.015	.028	.046	.045	.073	.041			.005	.002	.001			
33	69.56	15.29	0.86	2.06	0.69	2.81	3.97	3.36	0.86		0.55	0.16			100.17	
A2. II	1.159	.150	.005	.029	.017	.050	.064	.036			.007	.001				
34	68.95	14.33	1.17	1.23	0.47	2.13	5.08	2.58	3.63	0.28	0.42	0.10	trace	ZrO_2 0.03 BaO 0.08 SrO trace Li_2O trace	100.48	
A1. I	1.149	.140	.007	.017	.012	.038	.082	.028			.005	.001	—			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 4. DOSODIC. LASSENOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
20	I.4″.2.(3)4.	Q 17.64 hy 3.61 or 26.13 ab 41.39 an 10.01	Near Atlanta, Fulton County, Georgia.	T. L. Watson.	T. L. Watson, A. G., XXVII, p. 216, 1901.	Granite.	Also in J. G., IX, p. 119, 1901.
21	I.4.2(3).″4.	Q 20.70 hy 3.98 or 19.46 ab 38.77 an 16.40 C 0.52	Newnan, Coweta County, Georgia.	T. L. Watson.	T. L. Watson, A. G., XXVII, p. 205, 1901.	Granite.	Also in Ga. G. S. B. 9A. p. 87, 1902.
22	I.4.2″.(3)4.	Q 21.36 hy 3.91 or 21.13 ab 36.68 an 14.18 C 1.53	Newnan, Coweta County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9A, p. 85, 1902.	Granite.	
23	I″.(3)4.2.4.	Q 33.48 hy 3.60 or 11.68 mt 0.93 ab 38.77 an 8.62 C 2.55	Marquette, Fox River Valley, Wisconsin.	W. W. Daniells.	Hobbs and Leith, B. Un. Wisc. No. 158, p. 262, 1907.	Aporhyolite porphyry.	
24	I.4.2.4″.	Q 28.56 hy 2.02 or 10.01 mt 0.93 ab 41.92 an 11.12 C 4.79	Kawishiwi River, Minnesota.	A. D. Meeds.	U. S. Grant, Minn. G. S. 21 A. R., p. 43, 1893.	Quartz porphyry.	In W. T., p. 173.
25	I(II).4(5).(1)2.4.	Q 11.94 di 8.83 or 16.68 hy 0.33 ab 53.97 mt 2.09 an 6.22	Kekequabic Lake, Minnesota.	Dodge and Sidener.	U. S. Grant, Minn. G. S. 21 A. R., p. 41, 1893.	Augite granite (porphyritic).	Also in A. G., XI, p. 385, 1893. In W. T., p. 173.
26	I.4.2″.4.	Q 17.88 hy 2.00 or 16.68 mt 0.70 ab 43.49 hm 1.76 an 16.40 C 0.51	Kekequabic Lake, Minnesota.	Dodge and Sidener.	U. S. Grant, Minn. G. S. 21 A. R., p. 41, 1893.	Augite granite.	Also in A. G., XI, p. 385, 1893. In W. T., p. 173.
27	I.4.2.(3)4.	Q 26.70 hy 3.79 or 19.46 mt 0.93 ab 34.06 il 0.76 an 12.23 C 0.31	Anaconda Range, Philipsburg quadrangle, Montana.	G. Steiger.	Emmons and Calkins, U. S. G. S. P. P. 78, p. 106, 1913.	Granodiorite.	
28	I.″4.2″.″4.	Q 27.48 hy 3.33 or 16.68 mt 1.39 ab 32.49 il 0.61 an 11.68 ap 0.34 C 1.92	Big Butte, Butte, Montana.	H. N. Stokes.	W. H. Weed, U. S. G. S. P. P. 74, p. 45, 1912.	Rhyolite-dacite obsidian.	In W. T., p. 175.
29	I(II).4.2″.″4.	Q 17.76 di 0.89 or 19.46 hy 6.84 ab 36.68 mt 1.16 an 15.01 il 0.91 ap 0.51	Sweet Grass Creek, Crazy Mountains, Montana.	W. F. Hillebrand.	J. E. Wolff, U. S. G. S. B. 148, p. 142, 1897.	Porphyrite.	In W. T., p. 173.
30	I.4.(1)2.″4.	Q 21.06 hy 1.50 or 23.35 mt 0.93 ab 44.54 il 0.61 an 5.28 hm 1.12 ap 0.67	North part of Crazy Mountains, Montana.	W. F. Hillebrand.	J. E. Wolff, U. S. G. S. B. 148, p. 142, 1897.	Granite porphyry.	In W. T., p. 173.
31	I″.4.2.″4.	Q 18.12 hy 4.30 or 18.90 mt 2.32 ab 39.82 il 0.61 an 13.07 C 0.82	Castle, Castle Mountains, Montana.	L. V. Pirsson.	Weed and Pirsson, U. S. G. S. B. 139, p. 106, 1896.	Porphyry.	In W. T., p. 173.
32	I(II).4(5).2.(3)4.	Q 13.68 hy 5.79 or 22.80 mt 3.48 ab 38.25 il 0.76 an 10.56 ap 0.67 C 0.92	Near Yogo Peak, Little Belt Mountains, Montana.	W. F. Hillebrand.	L. V. Pirsson, U. S. G. S. A. R. 20, III, p. 514, 1900.	Syenite porphyry.	In W. T., p. 175.
33	I″.4.2″.(3)4.	Q 25.86 hy 3.94 or 20.02 mt 1.16 ab 33.54 il 1.06 an 13.07 ap 0.34 C 0.31	Schafer Butte, Boise County, Idaho.	G. Steiger.	W. Lindgren, U. S. G. S. A. R. 20, III, p. 81, 1900.	Quartz monzonite.	In W. T., p. 175.
34	I.4.2.4. ⊙	Q 24.42 di 1.14 or 15.57 hy 1.30 ab 42.97 mt 1.62 an 8.34 il 0.76 ap 0.34	Nez Perces Region, Idaho.	W. F. Hillebrand.	I. C. Russell, U. S. G. S. B. 228, p. 158, 1904.	Volcanic sand.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
35	68.43	16.08	1.59	n. d.	1.15	2.93	5.36	4.19	0.61	0.11			0.26		100.71	
A4. IV	1.141	.158	.010	(.020)	.029	.052	.086	.045					.004			
36	75.50	13.25	1.02	0.91	0.07	0.90	4.76	2.85	0.41		none	none	none	SO_3 0.32 Li_2O 0.06	100.05	
A2. II	1.258	.130	.006	.012	.002	.016	.077	.031			—	—	—			
37	72.59	13.47	1.58	1.32	1.05	2.12	4.63	2.52	0.18		0.52		none	FeS_2 0.26	100.24	
A2. II	1.255	.132	.010	.018	.026	.038	.074	.026			.006		—			
38	70.52	15.85	2.28	0.36	0.09	2.59	3.93	3.43	0.36		trace	0.17	0.09	SO_3 0.29 Li_2O trace	99.95	
A2. II	1.175	.155	.014	.005	.002	.047	.063	.036			—	.001	.001			
39	70.24	17.36	1.38	0.79	0.53	2.74	3.69	2.65	0.71		trace	trace	none	CO_2 none SO_3 trace Cl none Li_2O none	100.09	
A2. II	1.171	.170	.009	.011	.013	.049	.059	.029			—	—	—			
40	69.24	15.30	1.72	0.69	0.95	2.98	4.46	2.52	1.30		0.65	trace	trace	SO_3 0.27 Li_2O none	100.08	
A2. II	1.154	.150	.011	.010	.024	.053	.072	.027			.008	—	—			
41	67.95	14.98	2.33	0.95	1.42	3.98	4.39	2.86	0.61	0.37	0.45	0.07	0.09	SO_3 0.11 BaO 0.23 SrO trace	100.79	
A1. I	1.133	.147	.015	.013	.036	.071	.071	.030			.006	—	.001			
42	67.49	16.18	1.30	1.22	1.34	2.68	4.37	2.40	2.69		0.13	0.13	0.08		100.01	
A2. II	1.125	.159	.008	.017	.034	.048	.070	.026			.002	.001	.001			
43	66.64	16.22	1.84	1.06	1.25	2.41	5.11	3.86	0.55	0.52	0.29	0.16	trace	CO_2 none ZrO_2 0.01 S trace Cr_2O_3 trace V_2O_3 0.01 BaO 0.27 SrO 0.14	100.34	
A1. I	1.111	.159	.012	.015	.031	.043	.082	.041			.004	.001	—			
44	65.64	17.29	3.07	1.29	1.78	1.98	5.77	2.44	1.03		none	0.23	trace	CO_2 0.17 SO_3 trace Cl trace Li_2O 0.04	100.73	
A2. II	1.094	.170	.019	.018	.045	.036	.093	.026			—	.002	—			
45	64.65	17.80	2.33	2.10	0.81	1.73	4.18	2.83	3.06		trace	trace	trace	SO_3 0.43 Li_2O 0.17	100.09	
A3. III	1.078	.175	.014	.030	.020	.032	.068	.030			—	—	—			
46	67.78	16.67	1.99	0.51	0.71	2.67	4.91	3.43	1.44			0.19	trace		100.30	
A3. III	1.130	.163	.013	.007	.018	.048	.079	.036				.001	—			
47	68.30	16.24	1.60	1.63	1.05	2.79	3.90	3.52	0.71			0.13	0.12	BaO trace SrO 0.04 Li_2O trace	100.03	
A2. II	1.138	.159	.010	.022	.026	.050	.063	.037				.001	.002			
48	67.49	17.76	2.54	0.08	0.35	1.67	5.03	4.40	0.52			trace	trace		99.84	
A3. III	1.125	.174	.015	.001	.009	.030	.080	.047				—	—			
49	66.46	17.91	2.42	0.35	0.49	2.89	4.79	3.74	1.01				trace		100.06	
A3. III	1.108	.175	.015	.005	.012	.051	.077	.039					—			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 4. DOSODIC. LASSENOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
35	I''.4(5).''2.(3)4.	Q 13.38 di 5.78 or 25.02 hy 3.18 ab 45.06 an 7.51	White Knob, Mackay, Idaho.	T. T. Read.	Hemp and Gunther, Tr. Am. Inst. M. E., XXXVII, p. 311, 1907.	Quartz porphyry.	
36	I.(3)4.(1)2.4.	Q 34.20 hy 0.99 or 17.24 mt 1.39 ab 40.35 an 4.45 C 0.61	Obsidian Cliff, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. B. 150, p. 160, 1898.	Rhyolite.	Also in U. S. G. S. Mon. 32, (II), p. 426, 1899. In W. T., p. 175.
37	I''.''4.2.4.	Q 30.42 di 1.30 or 14.46 hy 2.26 ab 38.78 mt 2.32 an 8.90 il 0.91	Near Willow Park, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 426, 1899.	Obsidian.	In W. T., p. 175.
38	I.''4.2.(3)4.	Q 29.46 hy 0.20 or 20.02 mt 1.39 ab 33.01 hm 1.28 an 12.23 ap 0.34 C 1.22	Bunsen Peak, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 87, 1899.	Dacite porphyry.	In W. T., p. 175.
39	I.(3)4.2(3).''4.	Q 31.80 hy 1.56 or 16.12 mt 2.09 ab 30.92 an 13.62 C 3.37	Birch Hills, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 163, 1899.	Dacite porphyry.	In W. T., p. 175.
40	I.4.2.4.⊙	Q 26.04 hy 2.40 or 15.01 mt 0.46 ab 37.73 il 1.22 an 14.18 hm 1.44	Electric Peak, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 116, 1899.	Quartz diorite porphyrite.	Also in U. S. G. S. A. R. 12, p. 627, 1891. In W. T., p. 175.
41	I(II).4.2''.4.	Q 22.44 di 5.40 or 16.68 hy 1.10 ab 37.20 mt 1.86 an 11.79 il 0.91 hm 1.12	Sepulchre Mountain, Yellowstone National Park.	T. M. Chatard.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 272, 1899.	Andesite breccia.	In W. T., p. 175.
42	I''.4.2''.4.	Q 25.02 hy 4.52 or 14.46 mt 1.86 ab 36.68 il 0.30 an 12.51 ap 0.34 C 1.84	Sepulchre Mountain, Yellowstone National Park.	L. G. Eakins.	J. P. Iddings, U. S. G. S. A. R. 12, p. 648, 1891.	Dacite.	Also in U. S. G. S. Mon. 32, (II), p. 135, 1899. In W. T., p. 175.
43	I''.4''.2.''4.	Q 15.96 di 0.86 or 22.80 hy 2.70 ab 42.97 mt 2.55 an 10.01 il 0.61 hm 0.16 ap 0.34	Sulphur Creek Basin, Yellowstone National Park.	W. F. Hillebrand.	Hague and Jaggar, U. S. G. S. B. 168, p. 95, 1900.	Syenite porphyry.	In W. T., p. 175.
44	I''.4''.2.4.	Q 16.62 hy 4.50 or 14.46 mt 4.18 ab 48.73 hm 0.16 an 8.06 ap 0.67 C 2.24	Gray Peak, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 81, 1899.	Andesite porphyry.	In W. T., p. 175.
45	I''.4.2.4.	Q 23.64 hy 4.11 or 16.68 mt 3.24 ab 35.63 an 8.34 C 4.79	Elk Creek, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 325, 1899.	Trachyte-rhyolite.	In W. T., p. 175.
46	I.4.2.4⊙	Q 19.92 hy 1.80 or 20.02 mt 1.62 ab 41.40 hm 0.96 an 12.51 ap 0.34 C 0.31	Garfield Peak, Wyoming.	L. G. Eakins.	W. Cross, U. S. G. S. B. 148, p. 116, 1897.	Dacite.	In W. T., p. 175.
47	I''.4.2''.(3)4.	Q 24.24 hy 4.45 or 20.57 mt 2.32 ab 33.01 ap 0.34 an 13.07 C 1.22	Chicago Mountain, Ten Mile District, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. A. R. 14, p. 227, 1894.	Quartz porphyrite.	In W. T., p. 177.
48	I.4.2.(3)4.	Q 17.64 hy 0.90 or 26.13 mt 0.23 ab 41.92 hm 2.24 an 8.34 C 1.73	Rosita Hills, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. A. R. 17, II, p. 324, 1896.	Dacite.	In W. T., p. 175.
49	I.4.2.''4.	Q 17.88 hy 1.20 or 21.68 mt 1.16 ab 40.35 hm 1.60 an 14.28 C 0.82	Bald Mountain, Rosita, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. A. R. 17, II, p. 324, 1896.	Dacite.	In W. T., p. 177.

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
50	65.71	18.30	1.19	1.53	0.98	2.17	5.00	3.95	1.39				0.02		100.24	
A3. III	1.095	.179	.007	.021	.025	.039	.080	.042								
51	64.72	14.18	1.58	0.40	0.50	2.62	3.88	1.82	6.82	2.68	0.43	0.08	trace	CO_2 trace SO_3 trace Cl trace BaO 0.28 SrO 0.21	100.20	
A1. I	1.079	.139	.010	.006	.013	.046	.063	.020			.005	—	—			
52	61.36	16.36	3.59	1.45	1.75	3.59	4.04	3.64	1.56	1.34	0.51	0.36	0.07	CO_2 0.64 BaO 0.12 SrO 0.12	100.50	
A1. I	1.023	.160	.023	.020	.044	.064	.065	.038			.006	.003	.001			
53	65.30	15.92	1.37	2.19	1.59	3.89	4.01	3.08	0.78	0.34	0.50	0.29	0.05	CO_2 0.27 ZrO_2 none S 0.20 Cr_2O_3 none BaO 0.12 SrO none	99.20	
B1. II	1.088	.156	.009	.031	.040	.070	.065	.033			.006	.002	—			
54	65.27	15.75	2.31	1.85	1.62	4.09	3.92	3.25	0.53	0.21	0.55	0.25	0.10	CO_2 trace ZrO_2 0.02 SO_3 none Cl 0.01 FeS_2 0.02 Cr_2O_3 none BaO 0.11 SrO 0.05 Li_2O trace	99.91	
A1. I	1.088	.155	.014	.026	.041	.073	.063	.035			.007	.002	.001			
55	67.98	15.53	2.68	0.18	1.47	3.39	4.53	3.00	1.05	0.11	0.34	0.33	0.04	CO_2 none S none	100.63	
A2. II	1.133	.152	.017	.003	.037	.061	.073	.032			.004	.002	—			
56	65.78	17.32	3.68	0.46	0.47	1.66	5.23	4.64	0.14		0.27	0.13	0.32		100.10	
A2. II	1.096	.170	.023	.007	.012	.030	.084	.049			.003	.001	.005			
57	63.11	16.75	2.68	1.39	1.22	3.88	4.76	3.48	1.09	0.32	0.80	0.25	0.11	CO_2 none ZrO_2 none S 0.03 BaO 0.16	100.03	
A1. I	1.052	.164	.017	.019	.031	.070	.077	.037			.010	.002	.002			
58	62.36	17.78	2.74	1.66	1.37	4.49	4.75	3.37	0.26	0.11	0.73	0.29	0.12	CO_2 none ZrO_2 none S 0.03 BaO 0.03	100.09	
A1. I	1.039	.174	.017	.023	.034	.080	.077	.036			.009	.002	.002			
59	68.76	15.22	2.72	1.74	0.72	1.68	4.42	3.73	0.66	0.16	0.31	0.15	trace	CO_2 none SO_3 none Cl trace	100.27	2.48
A2. II	1.146	.149	.017	.024	.018	.030	.071	.039			.004	.001	—			
60	66.98	16.47	2.31	2.14	0.52	2.02	5.05	3.32	0.59	0.12	0.35	0.13	trace	CO_2 none SO_3 none Cl trace	100.00	2.48
A2. II	1.116	.161	.014	.029	.013	.036	.082	.035			.004	.001	—			
61	66.85	16.48	2.96	0.43	1.27	3.06	4.70	2.48	1.66	0.09	0.39	0.11		CO_2 none SO_3 none Cl trace	100.48	2.48
A2. II	1.114	.162	.019	.006	.032	.055	.076	.027			.005	.001				
62	66.50	16.55	2.25	2.58	0.87	2.75	4.55	3.36	0.16	0.12	0.59	0.19	trace	CO_2 none SO_3 none Cl trace	100.47	2.56
A2. II	1.108	.162	.014	.036	.022	.049	.074	.036			.007	.001	—			
63	65.99	16.14	2.28	1.84	1.47	3.57	4.73	2.90	0.67	0.15	0.68	0.15		CO_2 none ZrO_2 trace SO_3 none Cl trace	100.57	2.53
A2. II	1.100	.158	.014	.025	.037	.064	.076	.031			.009	.001				

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 4. DOSODIC. LASSENOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
50	I.4″.2.″4.	Q 14.76 hy 4.35 or 23.35 mt 1.62 ab 41.92 an 10.84 C 1.84	Crested Butte, West Elk Mountains, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. A. R. 14, p. 227, 1894.	Quartz porphyrite.	In W. T., p. 177.
51	I.″4.2″.4.	Q 28.05 di 0.22 or 11.12 hy 1.20 ab 33.01 mt 0.23 an 12.79 il 0.76 hm 1.44	Windy Gap, Telluride quadrangle, Colorado.	H. N. Stokes.	W. Cross, U. S. G. S. Fol. 57, p. 6, 1899.	Rhyolite vitrophyre.	Not in W. T.
52	I(II).4.2.(3)4.	Q 16.98 hy 4.40 or 21.13 mt 3.48 ab 34.06 il 0.91 an 10.84 hm 1.28 C 1.84 ap 1.01 Cc 1.50	Porphyry Basin, Ouray quadrangle, Colorado.	G. Steiger.	Cross and Howe, U. S. G. S. Fol. 153, p. 12, 1907.	Quartz monzonite porphyry.	
53	I(II).4.2(3).″4.	Q 19.32 di 1.11 or 18.35 hy 5.71 ab 34.06 mt 2.09 an 16.12 il 0.91 ap 0.67	Troy, Ray District, Arizona.	W. T. Schaller.	F. L. Ransome, U. S. G. S. rec. lab.	Diorite porphyry.	
54	I(II).4.2(3).(3)4.	Q 19.80 di 1.97 or 19.46 hy 3.96 ab 33.01 mt 3.25 an 15.85 il 1.06 ap 0.67	Big Cottonwood Canyon, Park City quadrangle, Utah.	W. F. Hillebrand.	J. M. Boutwell, U. S. G. S. B. 419, p. 122, 1910.	Granite.	
55	I″.4.2.4.	Q 21.90 di 1.51 or 17.79 hy 3.00 ab 38.25 il 0.46 an 13.07 hm 2.68 ap 0.67	Johnsons Mesa, Colfax County, New Mexico.	J. G. Fairchild.	J. B. Mertie, U. S. G. S. rec. lab.	Trachyte.	
56	I″.4(5).″2.(3)4.	Q 13.92 hy 1.20 or 27.24 mt 2.09 ab 44.02 il 0.46 an 7.23 hm 2.24 C 1.02 ap 0.34	San Mateo Mountain, Mount Taylor, New Mexico.	T. M. Chatard.	J. S. Diller, U. S. G. S. B. 148, p. 185, 1897.	Andesite.	In W. T., p. 177.
57	I(II).4(5).2.″4.	Q 13.02 di 4.32 or 20.57 hy 1.10 ab 40.35 mt 2.55 an 13.90 il 1.52 hm 0.96 ap 0.67	Ortiz Mountains, near Albuquerque, New Mexico.	M. W. Adams.	I. H. Ogilvie, J. G., XVI, p. 231, 1908.	Dacite.	
58	I″.4(5).2(3).″4.	Q 11.58 di 2.59 or 20.02 hy 2.20 ab 40.35 mt 3.25 an 16.96 il 1.37 hm 0.80 ap 0.67	Ortiz Mountains, near Albuquerque, New Mexico.	M. W. Adams.	I. H. Ogilvie, J. G., XVI, p. 321, 1908.	Dacite.	
59	I″.4.2.(3)4.	Q 24.66 hy 2.20 or 21.68 mt 3.94 ab 37.20 il 0.61 an 7.51 ap 0.34 C 1.22	Kendrick Peak, San Francisco Mountains, Arizona.	H. H. Robinson.	H. H. Robinson, U. S. G. S. P. P. 76, p. 116, 1913.	Dacite.	
60	I″.4.2.4.	Q 19.44 hy 2.75 or 19.46 mt 3.25 ab 42.97 il 0.61 an 9.17 ap 0.34 C 1.12	O'Leary Peak, San Francisco Mountains, Arizona.	H. H. Robinson.	H. H. Robinson, U. S. G. S. P. P. 76, p. 117, 1913.	Dacite.	
61	I″.4.2″.4.	Q 21.60 hy 3.20 or 15.01 mt 0.23 ab 39.82 il 0.76 an 14.46 hm 2.88 C 0.71 ap 0.34	Mormon Mountain, San Francisco Mountains, Arizona.	H. H. Robinson.	H. H. Robinson, U. S. G. S. P. P. 76, p. 127, 1913.	Dacite.	
62	I″.4.2.″4.	Q 19.14 hy 4.18 or 20.02 mt 3.25 ab 38.77 il 1.06 an 12.79 ap 0.31 C 0.61	San Francisco Peak, San Francisco Mountains, Arizona.	H. H. Robinson.	H. H. Robinson, U. S. G. S. P. P. 76, p. 120, 1913.	Dacite.	
63	I(II).4.2″.4.	Q 18.42 di 2.16 or 17.24 hy 2.96 ab 39.82 mt 3.25 an 14.18 il 1.37 ap 0.34	Bill Williams Mountain, San Francisco Mountains, Arizona.	H. H. Robinson.	H. H. Robinson, U. S. G. S. P. P. 76, p. 129, 1913.	Dacite.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
64	65.92	17.12	4.68	0.15	0.86	2.59	4.49	3.10	0.26	0.10	0.51	0.25		CO_2 none SO_3 none Cl trace	100.05	2.60
A2. II	1.099	.168	.029	.002	.022	.046	.073	.033			.006	.002				
65	64.60	16.60	2.62	2.38	0.93	3.06	5.12	3.43	0.10	0.18	0.80	0.18	0.06	CO_2 none SO_3 none Cl trace BaO 0.04 SrO none	100.10	2.66
A1. I	1.077	.163	.016	.033	.023	.055	.082	.036			.010	.001	—			
66	64.82	18.27	3.48	0.56	0.85	2.89	5.05	2.67	0.20		0.56	0.23	0.20		99.78	
A2. II	1.080	.179	.022	.008	.021	.052	.081	.028			.007	.002	.003			
67	70.95	16.30	1.01	0.36	0.23	1.85	5.16	3.34	0.37	0.26	0.23	trace	trace	ZrO_2 trace SO_3 trace S trace BaO 0.04	100.10	
A2. II	1.183	.160	.006	.005	.006	.033	.083	.035			.003	—	—			
68	69.35	15.71	1.18	0.43	0.36	1.79	4.78	3.63	0.97	1.15	0.19	0.08	trace	ZrO_2 trace S trace BaO 0.07	99.71	
A2. II	1.156	.154	.008	.006	.009	.032	.077	.038			.002	—	—			
69	68.95	15.84	1.14	0.56	0.24	1.96	4.56	3.69	1.49	0.86	0.22	0.08	trace	ZrO_2 0.01 S none BaO 0.07	99.67	
A1. I	1.149	.155	.007	.008	.006	.035	.074	.039			.003	—	—			
70	68.04	17.20	0.34	0.67	1.05	2.21	5.33	2.65	1.23	0.60	0.41	0.12	0.06	ZrO_2 0.01 V_2O_3 trace FeS_2 0.24 CuS 0.02 ZnS 0.03 BaO 0.10 SrO 0.03 MoO none	100.34	
A1. I	1.134	.169	.002	.009	.026	.039	.085	.029			.005	.001	.001			
71	68.04	15.82	2.34	0.84	0.80	3.26	3.93	3.32	0.77	0.37	0.42	0.15	0.07	CO_2 0.04 ZrO_2 none S trace NiO none BaO 0.06 SrO 0.01 Li_2O trace Cu trace	100.24	
A1. I	1.134	.155	.015	.012	.020	.058	.063	.035			.005	.001	.001			
72	63.18	16.47	2.36	2.28	1.33	4.77	4.40	2.93	0.60	0.27	0.60	0.28	0.15	BaO 0.15 SrO 0.09 Li_2O trace	99.86	
A1. I	1.053	.162	.015	.032	.033	.085	.071	.031			.008	.002	.002			
73	67.04	16.71	1.46	2.08	1.09	3.26	5.07	1.84	0.51	0.08	0.51	0.27	0.16	CO_2 none ZrO_2 0.05 S none NiO none BaO 0.03 SrO trace	100.16	
A1. I	1.117	.164	.009	.029	.027	.058	.082	.020			.006	.002	.002			
74	67.01	17.91	1.30	n. d.	0.42	1.86	5.33	4.56	0.48	0.16	0.10	trace	trace	CO_2 none BaO 0.60 SrO 0.13 Li_2O none	99.86	
A2. II	1.117	.175	.008	(.016)[a]	.011	.033	.085	.049			.001	—	—			
75	73.16	12.78	1.43	1.20	0.55	2.00	3.84	3.08	0.87	0.06	0.30	0.15	trace		99.42	
A2. II	1.219	.125	.009	.017	.014	.036	.062	.033			.004	.001	—			
76	72.32	14.53	0.67	1.37	0.58	1.52	4.46	3.51	0.67	0.06	0.30	0.17	0.02		100.18	
A2. II	1.205	.142	.004	.019	.015	.027	.072	.037			.004	.001	—			
77	71.41	14.38	1.33	1.17	1.13	2.51	4.12	2.97	0.30	0.09	0.34	0.13	0.04	CO_2 0.12 BaO 0.03	100.07	2.653
A2. II	1.190	.141	.008	.016	.028	.045	.066	.032			.004	.001	—			
78	75.32	13.17	0.27	0.98	0.42	1.48	4.77	2.14	0.73	0.18	0.16	0.04	trace	CO_2 0.03 ZrO_2 none FeS_2 0.09 BaO 0.23 SrO 0.02	100.03	
A1. I	1.255	.129	.002	.014	.011	.026	.077	.022			.002	—	—			

ORDER 4. QUARDOFELIC, BRITANNARE—Continued.

SUBRANG 4. DOSODIC. LASSENOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
64	I''.4.2.4.	Q 21.78 hy 2.20 or 18.35 il 0.30 ab 38.25 hm 4.68 an 10.84 ru 0.32 C 2.35 ap 0.67	Elden Mountain, San Francisco Mountains, Arizona.	H. H. Robinson.	H. H. Robinson, U. S. G. S. P. P. 76, p. 125, 1913.	Dacite.	
65	I(II).4''.2.4.	Q 14.52 di 1.57 or 20.02 hy 2.46 ab 42.97 mt 3.71 an 12.51 il 1.52 ap 0.34	San Francisco Mountains, Arizona.	H. H. Robinson.	H. H. Robinson, U. S. G. S. P. P. 76, p. 123, 1913.	Dacite.	
66	I''.4.2.4.	Q 18.90 hy 2.10 or 15.57 mt 0.93 ab 42.44 il 1.06 an 12.51 hm 2.88 C 2.55 ap 0.67	San Francisco Mountains, Arizona.	T. M. Chatard.	U. S. G. S. B. 148, p. 188, 1897.	Andesite.	In W. T., p. 177.
67	I.4.2.4⊙	Q 24.18 hy 0.60 or 19.46 mt 0.46 ab 43.49 il 0.46 an 9.17 hm 0.64 C 0.92	Schultze Ranch, Globe District, Arizona.	W. F. Hillebrand.	F. L. Ransome, U. S. G. S. P. P. 12, p. 69, 1903.	Granitite.	
68	I.4.2.''4.	Q 23.58 hy 0.90 or 21.13 mt 1.39 ab 40.35 il 0.30 an 8.90 hm 0.32 C 0.91	Schultze Ranch, Globe District, Arizona.	W. F. Hillebrand.	F. L. Ransome, U. S. G. S. P. P. 12, p. 69, 1903.	Granite porphyry.	
69	I.4.2.(3)4.	Q 23.70 hy 0.60 or 21.68 mt 0.93 ab 38.77 il 0.46 an 9.73 hm 0.48 C 0.71	Hog Ranch, Globe District, Arizona.	W. F. Hillebrand.	F. L. Ransome, U. S. G. S. P. P. 12, p. 69, 1903.	Granite porphyry.	
70	I.4.2.4.⊙	Q 21.00 hy 2.86 or 16.12 mt 0.46 ab 44.54 il 0.76 an 10.01 ap 0.34 C 1.84	Ryerson Mine, Morenci District, Arizona.	W. F. Hillebrand.	W. Lindgren, U. S. G. S. P. P. 43, p. 168, 1905.	Monzonite porphyry.	
71	I.4.2(3).(3)4.	Q 24.96 hy 2.00 or 19.46 mt 1.86 ab 33.01 il 0.76 an 15.29 hm 1.12 C 0.20 ap 0.34	Tombstone, Arizona.	R. C. Wells.	F. L. Ransome, U. S. G. S. rec. lab.	Rhyolite porphyry.	
72	I(II).4''.2(3).4.	Q 15.54 di 4.02 or 17.24 hy 2.82 ab 37.20 mt 3.48 an 16.68 il 1.22 ap 0.67	Sierra Carrizo, Arizona.	W. F. Hillebrand.	W. Cross, U. S. G. S. A. R. 14, p. 165, 1894.	Hornblende porphyrite.	In W. T., p. 225.
73	I''.4.2''.4.	Q 21.48 hy 4.94 or 11.12 mt 2.09 ab 42.97 il 0.91 an 14.46 ap 0.67 C 1.02	Mount Sanford, Copper River Basin, Alaska.	G. Steiger.	W. C. Mendenhall, U. S. G. S. B. 228, p. 271, 1904.	Andesite.	
74	I.4(5).2.(3)4.	Q 13.98 hy 3.08 or 27.24 il 0.15 ab 44.54 an 10.29 C 0.41	Forty Mile Creek, n. Canyon Creek, Alaska.	H. N. Stokes,	J. E. Spurr, A. G., XXV, p. 231, 1900.	Alaskite porphyry.	In W. T., p. 177.
75	I.(3)4.2.''4.	Q 34.08 di 0.68 or 18.35 hy 1.60 ab 32.49 mt 2.09 an 8.34 il 0.61 ap 0.34	Collins Gulch, Tulameen District, British Columbia.	M. F. Connor.	C. Camsell, Can. G. S. Mem. 26, p. 46, 1913.	Granite.	
76	I.4.2.''4.	Q 28.62 hy 2.95 or 20.57 mt 0.93 ab 37.73 il 0.61 an 6.67 ap 0.34 C 0.92	Otter Lake, Tulameen District, British Columbia.	M. F. Connor.	C. Camsell, pers. com., 1913.	Granite.	
77	I.''4.2.''4.	Q 29.16 hy 3.33 or 17.79 mt 1.86 ab 34.58 il 0.61 an 11.68 ap 0.34 C 0.10	Silver Creek, Skagit Range, British Columbia.	M. Dittrich.	R. A. Daly, Can. G. S. Mem. 38, (I), p. 537, 1912.	Granite.	
78	I.(3)4.2.4.	Q 35.28 hy 2.42 or 12.23 mt 0.46 ab 40.35 il 0.30 an 7.23 C 0.41	Bald Mountain, Port Orford quadrangle, Oregon.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. Fol. 89, p. 4, 1903.	Dacite porphyry.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
79	71.87	14.53	1.28	1.02	0.48	1.59	5.08	2.84	0.22	0.06	0.41	0.10	trace	CO_2 none ZrO_2 0.04 SO_3 none Cl trace S none Cr_2O_3 none NiO none BaO 0.08 SrO 0.03 Li_2O trace	99.63	
A1. I	1.198	.142	.008	.014	.012	.029	.082	.030			.005	.001	—			
80	70.77	14.83	1.35	1.25	0.64	2.12	5.07	2.68	0.33	0.07	0.38	0.13	trace	CO_2 none ZrO_2 0.05 SO_3 none Cl 0.11 S none Cr_2O_3 none NiO none BaO 0.08 SrO 0.02 Li_2O trace	99.88	
A1. I	1.176	.145	.009	.018	.016	.038	.082	.029			.005	.001	—			
81	70.10	15.18	1.78	1.09	0.74	2.27	5.15	2.58	0.19	0.10	0.48	0.13	trace	CO_2 none ZrO_2 0.04 SO_3 none Cl 0.03 S none Cr_2O_3 none NiO none BaO 0.08 SrO 0.03 Li_2O trace	99.97	
A1. I	1.168	.149	.011	.015	.019	.041	.083	.027			.006	.001	—			
82	68.17	15.60	2.31	0.94	1.02	2.76	5.15	2.46	0.45	0.09	0.54	0.13	trace	CO_2 none ZrO_2 none SO_3 none Cl trace S none Cr_2O_3 none NiO none BaO 0.06 SrO 0.03 Li_2O trace	99.71	
A1. I	1.136	.153	.014	.013	.026	.049	.083	.027			.007	.001	—			
83	67.41	15.76	1.88	1.76	1.35	3.36	4.54	2.36	0.54	0.09	0.56	0.12	trace	CO_2 none S 0.02 Cr_2O_3 none BaO 0.06 SrO trace Li_2O none	99.81	
A1. I	1.124	.154	.011	.025	.034	.060	.073	.025			.007	.001				
84	70.65	15.57	0.57	1.26	0.48	3.28	4.91	1.77	0.86	0.14	0.21	0.07	0.06	CO_2 trace ZrO_2 0.01 S 0.07 BaO 0.06 SrO trace	99.97	
A1. I	1.178	.153	.004	.018	.012	.059	.079	.020			.003	—	.001			
85	73.18	13.66	0.21	2.24	0.93	2.10	3.70	2.72	0.57	0.10	0.25	0.09	0.07	CO_2 0.17 BaO 0.10 SrO trace Li_2O trace	100.09	
A1. I	1.220	.134	.001	.031	.023	.038	.059	.029			.003	—	.001			
86	73.00	16.38	none	0.99	0.48	2.42	4.53	1.87	0.52						100.19	
A3. III	1.216	.161	—	.014	.012	.043	.072	.020								
87	71.88	15.57	1.07	0.30	0.68	2.03	5.81	1.80	0.68	0.11	0.17	0.08	none	CO_2 none BaO 0.02 SrO 0.08 Li_2O none	100.28	
A1. 1	1.198	.153	.007	.004	.017	.036	.093	.019			.002	—	—			
88	66.28	16.03	1.80	1.88	1.12	3.75	4.10	3.49	0.39	0.10	0.54	0.30	0.05	BaO 0.08 SrO trace Li_2O trace	99.91	
A2. II	1.105	.157	.011	.027	.028	.067	.066	.037			.007	.002	—			
89	70.36	15.47	0.98	1.17	0.87	3.18	4.91	1.71	1.00	0.06	0.20	0.11	trace	BaO 0.06 SrO trace Li_2O trace	100.08	
A2. II	1.173	.152	.007	.017	.022	.057	.079	.018			.003	.001				
90	69.06	16.23	0.88	1.53	1.34	3.17	4.06	3.02	0.45						100.04	
A3. III	1.156	.159	.005	.021	.034	.057	.065	.032								

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 4. DOSODIC. LASSENOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
79	I.4.2.4⊙	Q 27.66 hy 1.33 or 16.68 mt 1.86 ab 42.97 il 0.76 an 7.23 ap 0.34 C 0.41	Llao Rock, Crater Lake, Oregon.	H. N. Stokes.	H. B. Patton, U. S. G. S. P. P. 3, p. 140, 1902.	Dacite.	In W. T., p. 177.
80	I.4.2.4.⊙	Q 25.26 di 0.22 or 16.12 hy 2.03 ab 42.97 mt 2.09 an 9.45 il 0.76 ap 0.34	Llao Rock Flow, Crater Lake, Oregon.	H. N. Stokes.	H. B. Patton, U. S. G. S. P. P. 3, p. 140, 1902.	Dacite.	In W. T., p. 177.
81	I.4.2.4.⊙	Q 24.78 hy 1.90 or 15.01 mt 2.09 ab 43.51 il 0.91 an 10.56 hm 0.32 C 0.10 ap 0.34	Cleetwood Cove, Crater Lake, Oregon.	H. N. Stokes.	H. B. Patton, U. S. G. S. P. P. 3, p. 140, 1902.	Dacite.	In W. T., p. 177.
82	I''.4.2.4.	Q 21.66 di 0.65 or 15.01 hy 2.30 ab 43.49 mt 1.39 an 11.95 il 1.06 hm 1.28 ap 0.34	Wine Glass Grotto Cove, Crater Lake, Oregon.	H. N. Stokes.	H. B. Patton, U. S. G. S. P. P. 3, p. 140, 1902.	Dacite.	In W. T., p. 177.
83	I''.4.2(3).4.	Q 22.98 hy 4.32 or 13.90 mt 2.55 ab 38.25 il 1.06 an 15.57 ap 0.34	South Rim of Crater, Crater Lake, Oregon.	H. N. Stokes.	H. B. Patton, U. S. G. S. P. P. 3, p. 140, 1902.	Secretion in dacite.	
84	I.4.2(3).4.	Q 27.00 di 0.46 or 11.12 hy 2.55 ab 41.39 mt 0.93 an 15.01 il 0.46 ap 0.34	Riddles quadrangle, Oregon.	G. Steiger.	G. F. Kay, U. S. G. S. B. 419, p. 167, 1910.	Dacite porphyry.	
85	I''.(3)4.2.''4.	Q 33.96 hy 5.86 or 16.12 mt 0.23 ab 30.92 il 0.46 an 10.56 C 0.82	Agua Fria Creek, Mariposa County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 17, I, p. 691, 1896.	Soda granite.	Also in J. G., VII, p. 152, 1899. In W. T., p. 179.
86	I.(3)4.2''.4.	Q 33.12 hy 3.05 or 11.12 ab 37.73 an 11.95 C 2.65	Rocklin, Placer County, California.	W. H. Melville.	W. Lindgren, U. S. G. S. B. 150, p. 172, 1898.	Granite.	In W. T., p. 179.
87	I.4.2.4''.	Q 26.22 hy 1.70 or 10.56 mt 0.46 ab 48.73 il 0.30 an 10.01 hm 0.80 C 0.51	Merced River, Mariposa County, California.	G. Steiger.	H. W. Turner, U. S. G. S. A. R. 17, I, p. 721, 1896.	Granite porphyry.	Also in A. G., XVII, p. 387, 1896. In W. T., p. 179.
88	I''.4.''2.(3)4.	Q 20.10 di 1.36 or 20.57 hy 3.46 ab 34.58 mt 2.55 an 15.01 il 0.91 ap 0.67	Lake Tenaya, Yosemite Park, Mariposa County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 14, II, p. 482, 1894.	Granodiorite.	Also in J. G., III, p. 403, 1895. In W. T., p. 179.
89	I.4.2(3).4''.	Q 27.24 hy 3.12 or 10.01 mt 1.62 ab 41.40 il 0.46 an 15.01 ap 0.34 C 0.10	Near Enterprise, Butte County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 14, p. 482, 1894.	Quartz diorite.	In W. T., p. 179.
90	I''.4.2(3).''4.	Q 24.60 hy 5.51 or 17.79 mt 1.16 ab 34.06 an 15.85 C 0.51	Near Lassen Peak, California.	J. W. Shimer.	Hague and Iddings, A. J. S., XXVI, p. 232, 1883.	Dacite.	In W. T., p. 177.

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
91	68.72	15.15	1.16	1.76	1.28	3.30	4.26	2.78	0.74		0.31	0.09	0.11	BaO 0.07 SrO 0.03 Li_2O trace	99.76	
A1. I	1.145	.148	.007	.025	.032	.059	.069	.030			.004	—	.002			
92	68.32	15.26	1.66	1.26	1.32	3.26	4.27	2.81	1.37		0.31	0.12	0.04	BaO 0.07 SrO trace Li_2O trace	100.07	
A2. II	1.139	.150	.010	.018	.033	.058	.069	.030			.004	.001	—			
93	67.89	17.29	2.39	0.21	0.66	3.01	5.11	1.69	1.34		0.21	0.12	0.12	BaO 0.03 SrO 0.04	100.11	
A1. I	1.132	.169	.015	.003	.017	.053	.082	.018			.003	.001	.002			
94	68.10	15.50	3.20	none	0.10	3.02	4.20	3.13	2.72		0.15	0.03	trace	BaO 0.06 SrO trace Li_2O none	100.21	
A2. II	1.135	.152	.020	—	.003	.053	.068	.033			.002	—	—			
95	66.30	17.55	2.19	0.55	0.97	3.12	5.15	2.45	1.25		trace	0.15	trace	SO_3 0.28	99.96	
A3. III	1.105	.172	.014	.008	.024	.055	.083	.026			—	.001	—			
96	68.65	16.34	0.93	1.48	1.29	3.07	4.85	1.85	0.62	0.24	0.28	0.15	0.08	BaO 0.09 SrO 0.07 Li_2O trace	99.99	
A1. I	1.144	.160	.006	.020	.032	.055	.078	.020			.004	.001	.001			
97	71.49	15.06	1.51	0.88	0.35	1.54	4.14	3.39	0.88	0.16	0.20	0.08	trace	CO_2 none SrO trace	99.73	
A2. II	1.192	.148	.009	.013	.009	.028	.068	.036			.003	—	—			
98	67.70	15.95	1.53	1.14	1.23	2.70	4.83	3.74	0.36	0.19	0.23	trace	trace		99.60	
A3. III	1.128	.156	.009	.016	.031	.048	.078	.040			.003	—	—			
99	66.77	17.40	2.87	0.33	1.05	1.49	5.81	2.13	1.14		trace	none	0.12	CO_2 none SO_3 0.87 PbO trace	99.98	
A2. II	1.113	.171	.018	.004	.026	.027	.094	.022			—	—	.002			
100	69.20	15.00	1.57	1.83	0.69	1.88	5.87	1.81	0.67	0.90	0.52	0.10	0.15	CO_2 none	100.19	
A2. II	1.153	.147	.010	.025	.017	.034	.095	.019			.007	.001	.002			
101	70.09	15.13	1.72	1.13	1.22	2.61	3.61	2.75	0.78		0.67	0.11	0.08	CO_2 trace ZrO_2 trace Cl 0.02 FeS_2 0.02 NiO none BaO none Cu 0.04 Pb none	99.98	
A1. I	1.168	.148	.011	.015	.031	.047	.058	.030			.008	.001	.001			
102	69.56	15.65	1.24	0.91	0.82	2.52	4.09	2.19	2.92			0.13			100.03	2.45
A3. III	1.159	.153	.007	.012	.021	.045	.066	.023				.001				
103	71.32	16.52	0.44	0.36	0.54	2.50	4.73	2.42	0.82		0.35	0.10			100.10	2.348
A2. II	1.190	.162	.003	.005	.014	.045	.076	.026			.004	.001				2.62 20°
104	65.23	13.86	4.78	0.52	2.12	4.52	3.96	1.88	2.41			trace		S 0.26	99.54	2.566
A3. III	1.087	.136	.030	.007	.053	.080	.065	.020				—				
105	67.47	16.25	2.22	0.82	0.46	1.36	6.08	3.67	0.69		0.57	0.10	0.03	S 0.09 BaO 0.06	99.87	
A1. I	1.125	.159	.014	.011	.012	.024	.098	.039			.007	.001	—			
106	69.43	15.74	0.93	3.35	1.35	2.07	4.56	2.99	0.10						100.52	
A3. III	1.157	.154	.006	.047	.034	.038	.073	.032								

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 4. DOSODIC. LASSENOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
91	I″.4.2″.4.	Q 23.70 di 2.38 or 16.68 hy 4.22 ab 36.16 mt 1.62 an 13.62 il 0.61	Chaos, Lassen Peak, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 150, p. 218, 1898.	Dacite.	In W. T., p. 177.
92	I″.4.2″.4.	Q 24.12 di 0.86 or 16.68 hy 3.43 ab 36.16 mt 2.32 an 14.18 il 0.61 ap 0.34	West Base of Lassen Peak, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 150, p. 218, 1898.	Dacite.	In W. T., p. 177.
93	I.4.2″.4″.	Q 24.90 hy 1.70 or 10.01 mt 0.46 ab 42.97 il 0.46 an 13.90 hm 2.08 C 1.94 ap 0.34	Buntingville, Lassen County, California.	T. M. Chatard.	J. S. Diller, U. S. G. S. B. 148, p. 195, 1897.	Andesite.	In W. T., p. 177.
94	I.4.2″.″4.	Q 25.32 hy 0.30 or 18.35 hm 3.20 ab 35.63 tn 0.39 an 14.18	Bear Creek Falls, Shasta County, California.	R. B. Riggs.	J. S. Diller, U. S. G. S. B. 150, p. 215, 1898.	Dacite.	In W. T., p. 177.
95	I.4.2″.4.	Q 19.38 hy 2.40 or 14.46 mt 1.86 ab 43.49 il 0.96 an 14.46 ap 0.34 C 1.22	Clear Creek, Shasta County, California.	J. E. Whitfield.	J. S. Diller, U. S. G. S. B. 148, p. 191, 1897.	Dacite porphyry.	In W. T., p. 179.
96	I″.4.2″.4.	Q 24.18 hy 4.65 or 11.12 mt 1.39 ab 40.87 il 0.61 an 14.46 ap 0.34 C 1.02	Indian Valley, Sierra County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 17, I, p. 721, 1896.	Granodiorite.	Also in J. G., III, p. 403, 1895. In W. T., p. 179.
97	I.″4.2.(3)4.	Q 30.48 hy 1.03 or 20.02 mt 2.09 ab 35.63 il 0.46 an 6.95 ap 0.34 C 1.94	Pinenut Range, Nevada.	H. N. Stokes.	J. E. Spurr, J. G., IX, p. 599, 1901.	Rhyolite.	
98	I″.4.2.″4.	Q 17.94 di 2.19 or 22.24 hy 2.60 ab 40.87 mt 2.09 an 10.56 il 0.46	Sing-ats-a Range, n. Watuska, Nevada.	D. T. Smith.	D. T. Smith, Un. Cal., B. Dep. G., IV, p. 20, 1904.	Granite porphyry.	
99	I.4.2.4.⊙	Q 20.22 hy 2.60 or 12.23 mt 1.39 ab 49.25 hm 1.92 an 7.51 C 2.86	Ciudad de Rocas, Durango, Mexico.	H. W. Nichols.	O. C. Farrington, Field Col. Mus., G. Ser., II, p. 205, 1904.	Rhyolite.	
100	I″.4.2.4″.	Q 22.80 hy 3.02 or 10.56 mt 2.32 ab 49.78 il 1.06 an 8.62 ap 0.34 C 0.20	Ancon Hill, Panama, Canal Zone.	G. Steiger.	D. F. McDonald, U. S. G. S. rec. lab.	Rhyolite.	
101	I″.″4.2″.″4.	Q 31.08 hy 3.50 or 16.68 mt 1.62 ab 30.39 il 1.22 an 12.23 hm 0.64 C 1.63 ap 0.34	Mazaruni District, British Guiana.	J. B. Harrison.	J. B. Harrison, G. Goldf. Br. Gui., p. 39, 1908.	Granite gneiss.	In W. T., p. 179.
102	I.″4.2″.4.	Q 30.90 hy 2.76 or 12.78 mt 1.62 ab 34.58 ap 0.34 an 12.51 C 2.24	Guaitara Slope, Loma de Ales, Colombia.	R. Küch.	R. Küch, G. Stud. Colomb., I, p. 147, 1892.	Dacite perlite.	Also in N. J., 1886, I, p. 48. In W. T., p 179.
103	I.4.2.4.⊙	Q 28.80 hy 1.40 or 14.46 mt 0.23 ab 39.82 il 0.61 an 11.68 hm 0.32 C 1.84 ap 0.34	Quebrada de Punin, Cerros de Yaruquies, Ecuador.	A. Lindner.	F. Tannhaüser, in W. Reiss, Ecuador, II, p. 143, 1904.	Dacite.	
104	I(II).4.2(3).4.	Q 23.58 di 6.26 or 11.12 hy 2.40 ab 34.06 mt 1.62 an 14.18 hm 3.68	Laguna de Papallacta, Antisana Volcano, Ecuador.	E. Esch.	E. Esch in W. Reiss, Ecuador, I, p. 90, 1901.	Dacite.	
105	I.4″.(1)2.4.	Q 14.94 hy 1.20 or 21.68 mt 0.93 ab 51.35 il 1.06 an 5.84 hm 1.60 C 0.10 ap 0.34	Cerro Cagual, Patagonia, Chile.	G. Nyblom.	P. D. Quensel, B. G. Inst. Ups., XI, p. 84, 1911.	Comendite granophyre.	
106	I″.4.2.4″.	Q 22.50 hy 8.81 or 17.79 mt 1.39 ab 38.25 an 10.56 C 1.12	Juncal Valley, Argentina.	H. Schlapp.	A. Stelzner, Btr. G. Pal. Arg., I, p. 208, 1885.	Andengranite.	In W. T., p. 179.

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
107	63.18	19.79	1.10	3.23	1.51	4.04	5.12	2.42	0.62						101.01	
B3. IV	1.053	.194	.007	.044	.038	.072	.082	.026								
108	68.12	12.13	n. d.	1.03	trace	1.63	5.34	1.69	9.70						99.64	
A4. IV	1.136	.119	—	.014	—	.029	.086	.018								
109	71.53	12.00	2.90	2.02	0.62	2.33	4.27	3.06	0.36	0.13	0.64	0.17	0.36	NiO 0.02 BaO 0.08	100.49	
A1. I	1.192	.118	.018	.028	.016	.044	.069	.033			.008	.001	.005			
110	74.80	13.89	trace	none	0.05	2.59	5.45	2.74	0.77						100.29	
A3. III	1.247	.136	—	—	.001	.047	.088	.029								
111	71.70	18.60	1.00	n. d.	0.25	1.96	4.05	2.54	0.50						100.60	
A4. IV	1.195	.182	.006	(.012)	.006	.035	.066	.027								
112	69.34	17.71	0.55	0.90	1.24	1.50	5.95	3.01			0.05				100.25	2.538
A3. III	1.156	.174	.003	.013	.031	.027	.096	.032			—					
113	67.70	15.48	2.60	2.94	0.93	2.20	4.48	1.77	1.96				trace		100.07	
A3. III	1.128	.152	.016	.041	.023	.039	.073	.019					—			
114	71.34	12.30	0.67	1.95	0.96	4.19	3.57	2.82	0.91	0.31	0.31				99.33	
B3. IV	1.189	.121	.004	.027	.024	.075	.058	.030			.004					
115	70.47	13.36	0.42	0.91	0.54	1.04	4.01	3.47	6.10				0.21		100.53	
A3. III	1.175	.131	.003	.012	.014	.019	.064	.037					.003			
116	73.47	15.42	1.02	n. d.	0.20	1.35	5.57	3.64	n. d.		0.12				100.79	
A4. IV	1.225	.151	.006	(.012)	.005	.024	.090	.038			.002					
117	65.06	19.41	1.80	1.06	0.47	2.94	6.30	1.69	0.57		0.83			F trace BaO 0.16	100.29	
A2. II	1.084	.190	.011	.015	.012	.053	.102	.018			.010					
118	72.13	14.95	1.10	0.90	0.18	1.97	5.99	2.50	0.28		none	trace	trace	S trace	100.00	
A3. III	1.202	.147	.007	.013	.005	.036	.097	.027			—	—	—			
119	71.66	15.29	1.81	0.51	0.09	1.71	5.75	2.61	0.33		trace	none	trace	S 0.24	100.00	
A3. III	1.194	.150	.011	.007	.002	.030	.093	.028			—	—	—			
120	70.23	15.47	1.96	1.07	0.84	3.03	4.84	1.87	0.50		none	none	trace	S 0.19	100.00	
A2. II	1.171	.152	.012	.015	.021	.054	.078	.020			—	—	—			
121	70.95	15.56	0.42	0.56	0.52	2.25	5.20	2.64	1.68		0.16		trace		99.94	
A3. III	1.183	.153	.003	.008	.013	.040	.084	.028			.002		—			
122	68.91	14.81	2.22	0.53	1.68	1.28	4.95	3.13	1.80		0.19		trace	F 0.07	99.57	
A3. III	1.149	.145	.014	.007	.042	.023	.080	.033			.002		—			
123	64.98	19.50	2.51	0.30	0.50	3.70	6.09	2.01	n. d.						99.59	
A3. III	1.083	.191	.015	.004	.013	.066	.098	.022								

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 4. DOSODIC. LASSENOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
107	I(II).4(5).2(3).4.	Q 11.16 hy 8.68 or 14.46 mt 1.62 ab 42.97 an 20.02 C 1.43	Gualilan, San Juan, Argentina.	B. Wetzig.	F. Tannhaüser, N. J. B. B., XXII, p. 581, 1906.	Dacite.	
108	I.4.(1)2.4″.	Q 27.54 di 3.23 or 10.01 hy 0.13 ab 44.54 an 4.45	Berufiord, Iceland.	C. W. Schmidt.	C. W. Schmidt, Z. D. G. G., XXXVII, p. 778, 1885.	Pitchstone.	In W. T., p. 179.
109	I″.″4.(1)2.″4.	Q 30.24 di 5.07 or 18.35 mt 4.18 ab 36.15 il 1.22 an 4.45 ap 0.34	Ashval, Rum Island, Scotland.	W. Pollard.	A. Harker, G. S. Scot. Mem. Sh. 45, p. 139, 1908.	Quartz felsite.	
110	I.4.(1)2.4.	Q 28.74 wo 3.25 or 16.12 ab 46.11 an 5.28	Stanner, n. Old Radnor, Wales.	G. A. J. Cole.	G. A. J. Cole, G. M., XXIII, p. 223, 1886.	Quartz felsite.	In W. T., p. 179.
111	I.(3)4.2.4.	Q 32.94 hy 2.18 or 15.01 ab 34.58 an 9.73 C 5.51	La Creuse, France.	Pisani.	L. de Launay, B. Sv. Ct. G. Fr., XI, No. 83, p. 76, 1902.	Granulite (granite).	
112	I.4.″2.4.	Q 17.58 hy 4.42 or 17.79 mt 0.70 ab 50.30 an 7.51 C 1.94	Sancy, Mont Dore, Auvergne.	F. Fouqué.	F. Fouqué, B. Soc. Fr. Min., XXV, p. 326, 1902.	Trachyandesite.	
113	I(II).″4.2.4.	Q 27.00 hy 5.60 or 10.56 mt 3.71 ab 38.25 an 10.84 C 2.14	Grand-Mont, n. Mont Blanc, France.	E. Ritter.	E. Ritter, B. Sv. Ct. G. Fr., IX, No. 60, p. 33, 1897.	Microgranulite (granite).	Not in W. T.
114	I(II).(3)4.2.″4.	Q 30.06 di 9.78 or 16.68 mt 0.93 ab 30.39 il 0.61 an 9.17	Mount Tibidabo, Barcelona, Spain.	W. Maier?	W. Maier, In Diss. Bres., 1908.	Granitite.	Ref. N. J., 1911, II, p. 241.
115	I.″4.″2.″4.	Q 30.30 hy 2.98 or 20.57 mt 0.70 ab 33.54 an 5.28 C 1.12	Puerto de Genoves, Cabo de Gata, Almeria, Spain.	A. Osann.	A. Osann, Z. D. G. G., XLIII, p. 689, 1891.	Liparite pumice.	In W. T., p. 179.
116	I.4.″2.4.	Q 23.64 hy 1.82 or 21.12 il 0.15 ab 47.16 an 6.67	Birkrem, Norway.	C. F. Kolderup.	C. F. Kolderup, Berg. Mus. Aarb., 1896, No. 5, p. 96.	Hypersthene granite.	In W. T., p. 179.
117	I.4″.2.4(5).	Q 14.76 hy 1.20 or 10.01 mt 1.16 ab 53.45 il 1.52 an 14.73 hm 0.96 C 1.73	Skougsnoien, n. Lindnaes, Bergen, Norway.	P. Schei.	C. F. Kolderup, Berg. Mus. Aarb., 1903, No. 12, p. 118.	Granite.	
118	I.4.″2.4.	Q 23.28 di 2.57 or 15.01 wo 0.23 ab 50.83 mt 1.62 an 6.39	Svanö, Sogn, Norway.	Landmark.	C. F. Kolderup, Berg. Mus. Aarb., 1911, No. 18, p. 10.	Granodiorite.	Calc. to 100 per cent?
119	I.4.2.4.⊙	Q 24.42 di 0.22 or 15.57 hy 0.10 ab 48.73 mt 1.62 an 8.06 hm 0.64	Risnesö, Sogn, Norway.	Landmark.	C. F. Kolderup, Berg. Mus. Aarb., 1911, No. 18, p. 7.	Granite.	Calc. to 100 per cent?
120	I.4.2″.4.	Q 27.06 hy 2.50 or 11.12 mt 2.78 ab 40.87 an 15.01	Bremangerland, Sogn, Norway.	Landmark.	C. F. Kolderup, Berg. Mus. Aarb., 1911, No. 18, p. 13.	Granodiorite.	Calc. to 100 per cent?
121	I.4.2.4.⊙	Q 24.90 hy 1.70 or 15.57 mt 0.70 ab 44.01 il 0.30 an 11.12 C 0.10	Sulitelma, Norway.	R. Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 256, 1906.	Granite.	
122	I″.4.″2.4.	Q 22.98 hy 4.20 or 18.35 mt 1.16 ab 41.92 il 0.30 an 6.39 hm 1.44 C 0.92	Sulitelma, Norway.	R. Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 256, 1906.	Granite.	
123	I.4(5).2″.4″.	Q 13.08 hy 1.30 or 12.23 mt 0.93 ab 51.35 hm 1.76 an 18.35 C 0.51	Presten, Lofoten Islands. Norway.	T. Matthiesen.	C. F. Kolderup, Berg. Mus. Aarb., 1898, No. 7, p. 28.	Oligoclase rock.	In W. T., p. 179.

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
124	75.05	13.66	0.62	1.11	0.46	1.82	4.78	2.84	0.36						100.70	
A3. III	1.251	.134	.004	.015	.012	.032	.077	.030								
125	68.19	16.88	1.63	n. d.	1.07	2.19	5.34	3.03	1.37				0.14		99.84	
A4. IV	1.137	.166	.010	(.020)	.027	.039	.085	.032					.002			
126	66.46	17.72	2.13	n. d.	0.95	3.44	4.96	2.86	1.50				0.13		100.15	
A4. IV	1.108	.173	.013	(.026)	.024	.061	.080	.030					.002			
127	72.69	14.49	0.75	1.59	0.94	1.79	4.95	1.74	none		0.17	0.61	none		99.72	
A2. II	1.212	.142	.005	.022	.024	.032	.080	.019			.002	.004	—			
128	69.81	15.39	1.12	2.14	0.83	2.32	5.33	1.97	0.64		0.48	0.09	0.06		100.18	
A2. II	1.164	.151	.007	.030	.021	.041	.085	.021			.006	—	.001			
129	69.61	15.00	0.75	2.81	1.11	2.38	4.77	2.45	0.55		0.42	0.15	0.27		100.27	
A2. II	1.160	.147	.005	.039	.028	.043	.077	.026			.005	.001	.004			
130	70.28	14.93	1.42	1.34	0.76	3.29	4.57	2.62	1.44				0.06	FeS_2 1.34	100.71	
A3. III	1.171	.146	.009	.013	.019	.059	.074	.027					—			
131	71.27	13.91	2.42	0.37	0.77	3.03	5.45	1.47	0.78						99.98	
A3. III	1.188	.136	.015	.005	.019	.054	.088	.016								
132	69.94	16.26	1.38	1.32	0.66	2.57	4.30	2.79	0.53	0.10	none	0.11		FeS_2 0.29	100.25	
A2. II	1.166	.159	.009	.018	.017	.046	.069	.030			—	.001				
133	69.73	15.97	1.27	1.23	0.68	3.28	5.30	1.76	0.53	none		0.21			99.96	2.677
A3. III	1.162	.156	.008	.017	.017	.059	.085	.019				.002				
134	68.15	15.94	1.30	1.98	1.30	2.39	4.60	2.73	0.27	0.04	0.48	0.29		CO_2 0.48 SO_3 0.31	100.26	
A2. II	1.136	.156	.008	.028	.033	.043	.074	.029			.006	.002				
135	68.04	17.46	0.71	1.53	0.99	2.40	5.44	2.88	0.16	0.12	0.11			FeS_2 0.11	99.95	
A3. III	1.134	.171	.004	.021	.025	.043	.088	.031			.001					
136	68.11	15.80	1.97	1.87	0.96	2.43	4.41	2.80	0.54	0.16	0.07	0.62		SO_3 0.13	99.87	2.665
A2. II	1.135	.155	.013	.027	.024	.043	.071	.030			.001	.004				
137	76.39	13.87	1.12	n. d.	0.12	2.04	4.18	3.25	0.11						101.08	
A4. IV	1.273	.136	.007	(.014)	.003	.037	.068	.035								
138	70.21	12.94	1.61	2.19	1.45	1.51	4.34	3.77	1.71		0.20	0.21		SO_3 0.11	100.25	2.675
A2. II	1.170	.127	.010	.030	.036	.027	.070	.040			.003	.002				
139	66.01	17.64	0.58	3.01	0.50	2.18	4.66	4.16	1.36				0.19		100.29	
A3. III	1.100	.173	.004	.042	.013	.039	.075	.045					.003			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 4. DOSODIC. LASSENOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
124	I.″4.2.4.	Q 31.62 di 1.14 or 16.68 hy 2.09 ab 40.35 mt 0.93 an 7.51	Harparboda, Linde, Sweden.	D. Hummel.	P. J. Holmquist, B. Un. Ups., VII, p. 260, 1906.	Granite.	
125	I.4.2.4.⊙	Q 18.48 hy 5.60 or 17.79 ab 44.54 an 10.84 C 1.02	Various localities in Smaland, Sweden.	H. Santesson.	O. Nordenskjöld, B. Un. Ups., I, p. 177, 1894.	Quartz syenite porphyry.	Several specimens. In W. T., p. 181.
126	I.4″.2(3).4.	Q 16.44 hy 6.10 or 16.68 ab 41.92 an 16.96 C 0.20	Sjögelö region, Smaland, Sweden.	H. Santesson.	O. Nordenskjöld, B. Un. Ups., I, p. 194, 1894.	Eorhyolite.	Several specimens. In W. T., p. 181.
127	I″.(3)4.″2.4.	Q 32.46 hy 4.38 or 10.56 mt 1.16 ab 41.92 il 0.30 an 5.28 ap 1.34 C 2.45	Junka, Finland.	N. Sahlbom.	V. Hackmann, B. C. G. Fin., No. 15, p. 32, 1905.	Granite gneiss.	
128	I″.4.2.4.	Q 24.48 hy 4.34 or 11.68 mt 1.62 ab 44.54 il 0.91 an 11.40 C 0.41	Haidus, Nystad, Finland.	N. Sahlbom.	V. Hackmann, B. C. G. Fin., No. 15, p. 42, 1905.	Granite.	
129	I(II).4.2.4.	Q 24.06 hy 7.16 or 14.46 mt 1.16 ab 40.35 il 0.76 an 11.12 ap 0.34 C 0.41	Palois, Idensalmi, Finland.	N. Sahlbom.	V. Hackmann, B. C. G. Fin., No. 15, p. 43, 1905.	Granite.	
130	I″.4.2″.4.	Q 25.92 di 3.19 or 15.01 hy 1.66 ab 38.78 mt 2.09 an 12.51	Lammersdorf, n. Aachen, Rhenish Prussia.	L. Schmitz.	Dannenberg and Holzapfel, Jb. Pr. G. L.-A., XVIII, p. 13, 1898.	Granite.	In W. T., p. 181.
131	I.4.2.4″.	Q 27.54 di 4.10 or 8.90 wo 0.35 ab 46.11 mt 1.16 an 8.90 hm 2.32	Hirschberg, n. Neutsch, Hesse.	Survey laboratory.	C. Chelius, Erl. G. Kt. Hess., Bl. Rossdorf, p. 35, 1886.	Granite.	Not in W. T.
132	I.4.2″.4.	Q 27.24 hy 2.89 or 16.68 mt 2.09 ab 36.15 an 12.79 C 1.43	Schenkenberg, Hesse.	Survey laboratory.	C. Chelius, Erl. G. Kt. Hess., Bl. Lindenberg, p. 35, 1901.	Granite.	
133	I.4.2″.4.	Q 24.48 hy 2.89 or 10.56 mt 1.86 ab 44.54 ap 0.67 an 14.46	Melibocus, Odenwald, Hesse.	R. Marzahn.	C. Chelius, Nbl. Ver. Erdk. (1), XIV, p. 2, 1893.	Granite.	In W. T., p. 181.
134	I″.4.2.4.	Q 23.94 hy 5.15 or 16.12 mt 1.86 ab 38.77 il 0.91 an 10.01 ap 0.67 C 1.73	Ober Ramstadt, Bl. Rossdorf, Hesse.	G. Butzbach.	G. Klemm, Erl. G. Kt. Hess., Bl. Rossdorf, p. 58, 1912.	Granite porphyry.	
135	I.4.2.4.⊙	Q 17.58 hy 4.61 or 17.24 mt 0.93 ab 46.11 il 0.15 an 11.95 C 0.92	Rämster, n. Neutsch, Hesse.	Survey laboratory.	C. Chelius, Erl. G. Kt. Hess., Bl. Neunkirchen, p. 13, 1901.	Granite.	
136	I″.4.2.4.	Q 25.92 hy 4.12 or 16.68 mt 3.02 ab 37.20 il 0.15 an 8.34 ap 1.34 C 2.45	Mühlberg, Odenwald, Hesse.	Survey laboratory.	C. Chelius, Nbl. Ver. Erdk. (4), XIV, p. 2, 1893.	Granite.	In W. T., p. 181.
137	I.(3)4.2.″4.	Q 34.08 di 0.96 or 19.46 hy 1.65 ab 35.63 an 9.17	Hechtsberg, Hausach, Schwarzwald, Baden.	H. Schwenkel.	H. Schwenkel, In. Diss. Tüb., p. 46, 1912.	Granulite (granite).	
138	I(II).4.(1)2.(3)4.	Q 22.50 di 0.68 or 22.24 hy 5.51 ab 36.68 mt 2.32 an 4.73 il 0.46 ap 0.67	Ehrenberg, n. Ilmenau, Thuringerwald.	Klüss.	R. Cronacher, In. Diss. Greifs., p. 41, 1909.	Granite.	
139	I.4″.2.(3)4.	Q 14.88 hy 6.71 or 25.02 mt 0.93 ab 39.30 an 10.84 C 1.43	Lemberg, Pfalz, Bavaria.	A. Schwager.	M. Schuster, Geog. Jhft., XXVI, p. 249, 1914.	Quartz-biotite porphyrite.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
140	68.95	16.13	2.53	0.99	0.42	1.29	5.36	3.28	1.29		0.30				100.54	2.659
A3. III	1.149	.158	.015	.014	.011	.023	.086	.035			.004					
141	63.32	15.51	3.53	3.44	0.65	3.64	4.16	3.14	0.46		1.16		0.18	CO_2 0.14 ZrO_2 0.07	99.40	2.736
B2. III	1.055	.152	.022	.048	.016	.065	.067	.033			.015		.003		(99.66)	
142	71.74	14.12	1.75	0.59	1.34	2.32	3.65	2.85	1.45						99.81	
A2. II	1.196	.138	.011	.008	.034	.041	.059	.031								
143	63.8	19.2	4.5	1.3	2.0	2.6	3.5	3.0	0.6						100.5	
B3. IV	1.063	.188	.028	.018	.050	.046	.056	.032								
144	65.06	17.04	1.49	2.80	0.94	3.60	4.76	4.19	0.60			0.09	trace	S 0.01	100.58	
A3. III	1.084	.167	.009	.039	.024	.064	.077	.044				—	—			
145	68.00	14.06	1.64	1.31	1.07	2.94	4.15	3.58	0.66	0.59	0.74	0.65	0.24	F 0.18	99.81	2.602
A2. II	1.133	.138	.010	.018	.027	.053	.067	.038			.009	.005	.003			
146	67.89	16.42	0.85	1.57	0.87	3.79	5.11	1.87	0.54		0.59	0.22	trace	ZrO_2 0.05 F 0.21 BaO 0.01	99.99	
A1. I	1.132	.161	.006	.022	.022	.068	.082	.020			.007	.002	—			
147	75.98	14.25	0.42	0.38	0.20	1.33	5.13	2.50	0.45				trace		100.64	
A3. III	1.266	.140	.003	.005	.005	.023	.082	.027					—			
148	72.87	14.01	0.14	1.09	0.04	1.83	4.55	3.63	1.14	0.50			trace		99.80	2.644
A3. III	1.215	.137	.001	.015	.001	.032	.074	.038					—			
149	65.62	15.64	2.86	1.16	1.29	3.34	4.20	3.83	1.09	0.14	0.79				99.96	2.712
A3. III	1.094	.153	.018	.016	.032	.060	.068	.040			.010					20°
150	67.90	14.46	1.82	1.72	1.54	1.09	4.79	3.53	2.21	0.31	0.32				99.69	2.707
A3. III	1.132	.142	.011	.024	.039	.020	.077	.037			.004					
151	66.26	14.14	3.38	1.86	1.43	1.51	4.35	3.42	2.70	0.23	0.80				100.11	2.721
A3. III	1.104	.139	.021	.026	.036	.027	.070	.036			.010					
152	67.44	18.58	1.03	0.23	0.23	3.22	6.93	2.05	0.84		trace				100.55	2.65
A3. III	1.124	.182	.006	.003	.006	.057	.111	.022			—					
153	65.14	16.15	0.75	2.57	1.47	2.48	4.32	3.08	3.14	0.08	0.44	0.34			99.96	2.68
A2. II	1.086	.158	.005	.036	.037	.045	.069	.033			.006	.002				
154	71.57	16.91	0.47	0.78	0.46	1.22	5.56	3.79	0.29						101.05	2.60
B3. IV	1.193	.166	.003	.011	.012	.021	.090	.036								
155	68.13	14.59	2.04	2.33	1.28	2.70	3.47	3.05	0.85		0.51	0.02	trace		99.03	
B2. III	1.136	.143	.013	.032	.032	.048	.056	.033			.006					

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 4. DOSODIC. LASSENOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
140	I.4.(1)2.4.	Q 21.96 hy 1.10 or 19.46 mt 2.32 ab 45.06 il 0.61 an 6.39 hm 0.80 C 1.43	Muhlenthal, n. Magdeburg, Prussia.	Bodländer.	F. Klockmann, Jb. Pr. G. L.-A., XI, p. 176, 1892.	Quartz porphyry.	In W. T., p. 181.
141	I(II).4.2″.″4.	Q 18.48 di 3.00 or 18.35 hy 1.96 ab 35.11 mt 5.10 an 14.46 il 2.28	Breiterberg, Lüptitz, Saxony.	C. Ambronn.	C. Ambronn, In. Diss.Leip., p. 40, 1907.	Schliere in quartz porphyry.	Cf. No. 39, II.4.2.3.
142	I.(3)4.2″.″4.	Q 32.40 hy 3.40 or 17.24 mt 1.86 ab 30.92 hm 0.48 an 11.40 C 0.71	Bärndorf, Riesengebirge, Silesia.	W. Herz.	L. Milch, N. J. B. B., XII, p. 156, 1899.	Granitite.	In W. T., p. 181.
143	I(II).4.2″.(3)4.	Q 23.58 hy 5.00 or 17.79 mt 4.18 ab 29.34 hm 1.60 an 12.79 C 5.51	Kräherberg, Riesengebirge, Silesia.	W. Herz.	L. Milch, N. J., 1905, II, p. 18.	Quartz porphyry.	
144	I(II).4(5).2.(3)4.	Q 11.64 di 4.21 or 24.46 hy 3.94 ab 40.35 mt 2.09 an 12.79	Nassaberg, Eisengebirge, Bohemia.	C. von John.	von John and Hinterlechner, Jb. G. R.-A. Wien, LIX, p. 146, 1909.	Granitite.	
145	I.4.2.(3)4.	Q 24.30 di 0.65 or 21.13 hy 2.66 ab 35.11 mt 2.32 an 9.17 il 1.37 ap 1.68	Zalas, n. Cracow, Galicia.	Z. Rosen.	Z. Rosen, B. Ac. Sci. Crac., 1906, (2), p. 816.	Porphyry.	
146	I″.4.2(3).4.	Q 22.26 hy 3.39 or 11.12 mt 1.39 ab 42.97 il 1.06 an 16.40 ap 1.01	Kosista, Tatra Mountains, Hungary.	W. Pawlizy.	Z. Weyberg, Ref. N. J., 1912, I, p. 398.	Granite.	
147	I.(3)4.2.4.	Q 33.54 hy 0.76 or 15.01 mt 0.70 ab 42.97 an 6.39 C 0.82	Rotbach, Zillerthal, Tyrol.	W. Claar.	F. Becke, Ds. Ak. W. Wien, LXXV, (1), p. 170, 1913.	Aplite.	
148	I.4.″2.″4.	Q 28.26 di 1.73 or 21.13 hy 0.83 ab 38.77 mt 0.23 an 6.95	Renserspits, n. Maul, Tyrol.	G. Hradil.	G. Hradil, Sb. Ak. W. Wien, CXXI, p. 870, 1912.	Granite.	
149	I(II).4.2.(3)4.	Q 18.54 di 3.24 or 22.24 hy 1.70 ab 35.63 mt 1.39 an 12.51 il 1.52 hm 1.92	Habkernthal, n. Interlaken, Switzerland.	H. Hirschi.	H. Hirschi, In. Diss. Zür., p. 15, 1901.	Granite.	
150	I″.4.(1)2.″4.	Q 21.60 hy 5.09 or 20.57 mt 2.55 ab 40.35 il 0.61 an 5.56 C 0.82	Ardez, Lower Engadine, Switzerland.	H. Hirschi.	U. Grubenmann, Btr. G. Kt. Schw., XXIII, p. 201, 1909.	Granite.	
151	I(II).4.2.″4.	Q 22.68 hy 3.60 or 20.02 mt 3.71 ab 36.68 il 1.52 an 7.51 hm 0.80 C 0.41	Suss Majur, Lower Engadine, Switzerland.	O. Züst.	O. Züst, In. Diss. Zür., p. 13, 1905.	Granite.	Also in U. Grubenmann, Btr. G. Kt. Schw., XXIII, p. 201, 1909.
152	I.4(5).2.4″.	Q 12.84 di 1.30 or 12.23 wo 0.23 ab 58.16 mt 0.70 an 13.62 hm 0.48	Piz Tgietschen, Ponteglia Gebiet, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com., 1913.	Aplite.	
153	I(II).4.2.″4.	Q 20.16 hy 7.00 or 18.35 mt 1.16 ab 36.15 il 0.91 an 10.56 ap 0.67 C 1.84	Tödi, Ponteglia Gebiet, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com., 1913.	Granite-syenite.	
154	I.4.(1)2.4.	Q 22.50 hy 2.26 or 20.02 mt 0.70 ab 47.16 an 5.84 C 1.94	Sella Bridge, St. Gotthard, Switzerland.	P. Waindziok.	P. Waindziok, In. Diss. Zür., p. 13, 1906.	Granite.	
155	I″.″4.2(3).(3)4.	Q 27.66 hy 4.92 or 18.35 mt 3.02 ab 29.34 il 0.91 an 13.34 C 0.61	Val di Rezzo, Valtellina, Lombardy.	M. Dittrich.	W. Rasch, N. J. B. B., XXXII, p. 203, 1911.	Tonalite-granite.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
156	66.13	17.19	2.05	1.58	0.83	1.83	4.88	3.97	0.36		0.59	0.46			99.87	
A2. II	1.102	.168	.013	.022	.021	.032	.079	.042			.007	.003				
157	65.57	18.66	1.30	1.30	1.02	2.28	5.64	3.74	0.50		0.74	0.21			100.96	
A2. II	1.093	.183	.008	.018	.026	.041	.091	.040			.009	.001				
158	77.11	13.31	0.81	n. d.	0.21	1.32	4.39	3.21	0.37	0.05		0.07			100.85	2.659
A4. IV	1.285	.130	.005	(.010)	.005	.023	.071	.034				—				
159	76.28	14.22	trace	none	trace	1.19	4.95	3.90	0.24	0.08		trace			100.86	
A4. IV	1.271	.139	—	—	—	.021	.080	.041				—				
160	71.43	17.02	0.31	n. d.	0.25	3.19	5.31	2.52	0.40	0.25		0.26			100.94	2.642
B3. IV	1.191	.167	.002	(.004)	.006	.057	.085	.027				.002				
161	69.59	13.78	3.68	0.37	0.49	3.07	4.39	3.96	1.02		0.49		trace		100.84	
A3. III	1.160	.135	.023	.005	.012	.055	.071	.042			.006		—			
162	68.03	14.18	3.14	0.89	0.64	3.12	4.71	3.90	1.81		0.43		0.31		101.16	
B2. III	1.134	.139	.020	.013	.016	.055	.076	.041			.005		.004			
163	64.66	16.51	1.42	1.60	1.42	4.55	5.07	3.37	2.20		0.40				101.20	
B3. IV	1.078	.162	.009	.022	.036	.081	.082	.036			.005					
164	75.02	12.86	1.50	n. d.	0.95	1.05	5.01	2.28	0.90		trace				99.57	
A4. IV	1.250	.126	.009	(.018)	.021	.019	.080	.024			—					
165	69.71	16.51	1.50	n. d.	0.34	1.89	4.56	1.35	3.85						99.71	
A4. IV	1.162	.162	.009	(.018)	.008	.034	.073	.014								
166	65.97	17.50	2.17	n. d.	1.20	2.69	4.41	1.76	4.19						99.89	
A4. IV	1.100	.172	.014	(.028)	.030	.048	.071	.018								
167	74.48	15.45	none	none	trace	1.09	6.18	2.03	0.67						99.90	
A4. IV	1.271	.152	—	—	—	.020	.100	.021								
168	67.80	16.92	1.05	1.94	1.31	3.25	4.36	3.35	0.33				0.35		100.66	
A3. III	1.130	.166	.006	.027	.033	.058	.070	.036					.004			
169	63.80	15.62	0.72	2.31	1.15	3.32	5.47	3.26	3.59		1.04	0.19	0.11	Li_2O trace	100.58	
A2. II	1.063	.153	.004	.032	.029	.059	.089	.035			.013	.001	.002			
170	74.25	14.10	0.08	1.50	1.61	2.21	3.98	2.88	0.25		0.26	trace			101.12	
B3. IV	1.238	.138	.001	.021	.040	.039	.065	.031			.003	—				
171	69.75	14.70	0.65	2.48	1.42	3.43	4.79	3.07	none		0.45	trace			100.74	
A3. III	1.163	.144	.004	.035	.036	.061	.077	.033			.006				(100.54)	

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 4. DOSODIC. LASSENOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
156	I.4.(1)2.(3)4.	Q 17.94 hy 2.36 or 23.35 mt 3.02 ab 41.39 il 1.06 an 6.12 ap 1.01 C 2.55	Near Monte Alto, Euganean Hills, Veneto, Italy.	M. Stark.	M. Stark, T. M. P. M., XXV, p. 323, 1906.	Plagioclase trachyte.	
157	I''.4(5).2.4.	Q 12.24 hy 2.73 or 22.24 mt 1.86 ab 47.68 il 1.37 an 10.56 ap 0.34 C 1.43	Near Monte Alto, Euganean Hills, Veneto, Italy.	M. Stark.	M. Stark, T. M. P. M., XXV, p. 325, 1900.	Plagioclase trachyte.	
158	I.(3)4.2.''4.	Q 35.64 hy 1.82 or 18.90 ab 37.20 an 6.39 C 0.20	Monte Capanne, Elba, Italy.	G. d'Achiardi.	G. d'Achiardi, Mem. Soc. Tosc., XIX, p. 114, 1903.	Granite.	
159	I.4.(1)2.''4.	Q 30.36 wo 0.35 or 22.80 ab 41.92 an 5.00	S. Piero in Campo, Elba, Italy.	G. d'Achiardi.	G. d'Achiardi, Pr. Verb. Soc. Tosc., XIV, p. 127, 1904.	Aplitic granite.	
160	I.4.2.4.⊙	Q 24.54 hy 1.13 or 15.01 ap 0.67 ab 44.54 an 13.80 C 0.51	Crocetta, S. Piero in Campo, Elba, Italy.	E. Manasse.	E. Manasse, Pr. Verb. Soc. Tosc., XII, p. 220, 1901.	Granite (gneissoid).	
161	I(II).''2.(3)4.	Q 23.58 di 2.59 or 23.35 wo 2.32 ab 37.20 il 0.76 an 6.12 hm 3.68 tn 0.20	Near San Giorgio, Nurra, Sardinia.	F. Millosevich.	F. Millosevich, Mem. Ac. Linc. (5). VIII, No. 15, p. 610, 1911.	Trachydacite.	
162	I(II).4.''2.(3)4.	Q 20.34 di 3.46 or 22.80 wo 1.97 ab 39.82 mt 2.78 an 6.12 il 0.76 hm 1.28	Riu Mannu, Sassari, Sardinia.	F. Millosevich.	F. Millosevich, Mem. Ac. Linc., (5), VI, No. 14, p. 420, 1908.	Trachydacite.	
163	I(II).4(5).2.4.	Q 12.06 di 8.21 or 20.02 hy 0.73 ab 42.97 mt 2.09 an 12.23 il 0.76	Riu Mannu, Sassari, Sardinia.	F. Millosevich.	F. Millosevich, Mem. Ac. Linc., (5), VI, No. 14, p. 418, 1908.	Trachyandesite.	
164	I.(3)4.''2.4.	Q 32.76 hy 4.78 or 13.34 ab 41.92 an 5.28 C 0.31	Mount Kastel, Crimea, Russia.	R. Prendel.	R. Prendel, Ref. N. J., 1887, II, p. 95.	Liparite.	In W. T., p. 181.
165	I.(3)4.2.4''.	Q 32.76 hy 3.19 or 7.78 ab 38.25 an 9.45 C 4.18	Alouchta, Crimea, Russia.	A. Lagorio.	A. Lagorio, VII Cong. G. Int., Guide, XXXIII, p. 27, 1897.	Keratophyre.	In W. T., p. 181.
166	I.4.2''.4.	Q 24.72 hy 6.70 or 10.01 ab 37.20 an 13.34 C 3.57	Charkha, Crimea, Russia.	A. Lagorio.	A. Largorio, VII, Cong. G. Int., Guide, XXXIII, p. 27, 1897.	Keratophyre.	In W. T., p. 181.
167	I.4.(1)2.4''.	Q 28.50 or 11.68 ab 52.40 an 5.56 C 1.12	Tumagor Kaja, Central Caucasus.	D. Beljankin.	L. Loewinson-Lessing, Mem. Russ. Min. Ges., XLII, p. 261, 1905.	Soda granite.	
168	I''.4.2(3).''4.	Q 19.14 hy 6.73 or 20.02 mt 1.39 ab 36.68 an 16.12 C 0.20	Mount Elbruz, Caucasus.	A. Dannenberg.	A. Dannenberg, T. M. P. M., XIX, p. 233, 1900.	Dacite.	Segregation in dacite. In W. T., p. 181.
169	I(II).4(5).2.4.	Q 11.28 di 6.15 or 19.46 hy 2.12 ab 46.63 mt 0.93 an 8.06 il 1.98 ap 0.34	Mount Elbruz, Caucasus.	A. Schwager.	L. V. Ammon, in G. Merzbacher, Kaukasus, II, p. 783, 1901.	Dacite.	
170	I''.''4.2.''4.	Q 31.62 hy 6.24 or 17.24 mt 0.23 ab 34.06 il 0.46 an 10.84 C 0.31	Santorini, Aegean Sea.	Pisani.	A. Lacroix, C. R., CXL., p. 974, 1905.	Microtinite (andesite).	Inclusion in andesite.
171	I(II).4.2.4.	Q 20.82 di 6.18 or 18.35 hy 3.85 ab 40.35 mt 0.93 an 9.45 il 0.91	Santorini, Aegean Sea.	Pisani.	A. Lacroix, C. R., CXL, p. 974, 1905.	Andesite.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
172	65.91	16.96	1.36	3.47	1.13	2.42	4.60	3.08	0.49	0.05	1.03	0.23			100.73	
A2. II	1.099	.166	.009	.048	.028	.043	.074	.033			.013	.002				
173	65.14	17.67	1.59	3.33	0.95	2.96	5.41	2.18	0.11	0.02	1.12	0.19			100.67	
A2. II	.086	.173	.010	.046	.024	.053	.087	.023			.014	.001				
174	67.50	15.51	0.73	2.94	1.29	1.30	4.86	4.02	0.88		0.99	0.08			100.10	
A2. II	1.125	.152	.005	.041	.032	.023	.078	.042			.012	—				
175	73.96	13.75	0.52	0.99	0.48	1.90	5.62	2.55	0.25		trace	0.17			100.19	
A3. III	1.233	.135	.003	.014	.012	.034	.090	.028			—	.001				
176	73.56	14.06	1.02	0.77	0.46	2.14	5.08	3.00	0.75			0.09			100.93	
A3. III	1.226	.138	.006	.011	.012	.038	.082	.032				—				
177	72.88	13.86	1.52	0.73	0.23	1.82	4.40	3.98	0.52				trace	CO_2 trace	99.94	
A3. III	1.215	.136	.009	.010	.006	.032	.071	.042					—			
178	70.04	15.91	1.41	1.79	0.42	1.24	5.44	3.62	0.96			0.11	trace		100.94	
A3. III	1.167	.156	.009	.025	.011	.022	.088	.038				.001	—			
179	69.27	17.31	1.64	1.34	1.02	1.06	3.85	2.84	0.87			0.10	0.12	NiO 0.23 CuO 0.05	99.70	
A2. II	1.155	.170	.010	.018	.026	.019	.062	.030				.001	.002			
180	68.44	14.52	3.24	2.09	0.65	2.22	5.23	2.59	0.72				trace		99.70	2.67
A3. III	1.141	.142	.020	.029	.016	.039	.084	.028					—			
181	68.16	14.95	0.95	2.92	1.58	2.32	4.13	2.89	1.36	0.30	0.90	none	none	FeS_2 0.03	100.49	2.62
A2. II	1.136	.147	.006	.040	.040	.041	.066	.031			.011	—	—			
182	76.19	13.42	0.41	n. d.	trace	1.35	4.57	2.63	1.15						99.72	
A4. IV	1.270	.131	.003	(.006)	—	.024	.074	.028								
183	63.74	16.61	2.76	1.39	1.60	4.57	4.87	2.53	1.03		0.58				99.68	
A3. III	1.062	.163	.017	.019	.040	.082	.079	.027			.007					
184	72.55	14.13	0.65	1.79	none	3.53	4.47	2.71	0.37			trace			100.20	
A3. III	1.209	.138	.004	.025	—	.063	.073	.029				—				
185	72.55	13.40	0.60	2.02	0.51	2.65	3.62	2.98	0.65	0.20	0.40	0.18	0.33	ZrO_2 0.07 S 0.11	100.27	2.642
A1. I	1.209	.131	.004	.028	.013	.047	.058	.032			.005	.001	.005			
186	71.80	15.11	0.28	2.03	0.20	2.27	3.24	2.93	1.09		0.34	0.24	0.18	ZrO_2 0.02 S 0.05	99.78	
A1. I	1.197	.148	.002	.028	.005	.041	.052	.031			.004	.002	.003			
187	65.59	17.24	3.46	0.56	1.27	3.57	4.72	1.78	0.54		0.51	0.44	0.30	S 0.10	100.08	
A2. II	1.093	.169	.022	.008	.032	.064	.076	.019			.006	.003	.004			
188	72.44	16.51	0.24	0.52	0.05	2.47	4.54	2.13	1.13	0.13	trace				100.16	
A3. III	1.207	.162	.002	.007	.001	.045	.073	.022			—					

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 4. DOSODIC. LASSENOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
172	I(II).4.2.4.	Q 19.86 hy 6.23 or 18.35 mt 2.09 ab 38.77 il 1.98 an 10.01 ap 0.67 C 2.35	Therasia, Santorini, Aegean Sea.	H. S. Washington.	H. S. Washington, XII, Cong. G. Int., C. R., p. 235, 1913.	Andesite.	
173	I''.4''.2''.4.	Q 16.88 hy 5.30 or 12.79 mt 2.32 ab 45.59 il 2.13 an 13.90 ap 0.34 C 1.33	Palaio Kaimeni, (A. D. 46), Santorini, Aegean Sea.	H. S. Washington.	H. S. Washington, XII, Cong. G. Int., C. R., p. 235, 1913.	Andesite.	
174	I(II).4.''2.(3)4.	Q 18.18 hy 6.37 or 23.35 mt 1.16 ab 40.87 il 1.82 an 6.39 C 0.92	Kilometre 171, Konakry-Niger R. R., French Guinea.	Not stated.	Col. Azema, C. R. Cong. Soc. Sav., p. 161, 1912.	Granite.	
175	I.4.(1)2.4.	Q 27.24 di 3.25 or 15.57 hy 1.03 ab 47.16 mt 0.70 an 4.73 ap 0.34	Cheren, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 56, 1909.	Granite.	
176	I.4.''2.4.	Q 27.78 di 3.16 or 17.79 hy 0.33 ab 42.97 mt 1.39 an 6.67	Aratu, Mai Adarté, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 89, 1909.	Granite porphyry.	
177	I.4.''2.(3)4.	Q 28.50 di 1.54 or 23.35 wo 0.23 ab 37.20 mt 2.09 an 6.39	Samoite, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 117, 1909.	Felsoliparite.	
178	I.4.(1)2.4.	Q 20.76 hy 3.21 or 21.13 mt 2.09 ab 46.11 ap 0.34 an 5.28 C 1.12	Adi Saeli, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 70, 1909.	Adamellite.	
179	I''.(3)4.(1)2.''4.	Q 32.10 hy 3.92 or 16.68 mt 2.32 ab 32.49 ap 0.34 an 4.45 C 6.32	Werkh Issetsk, Mursinsk, Perm, Russia.	G. Katerfeld.	W. Nikitin, Mem. C. G. Russ., XXII, p. 95, 1907.	Granite.	Should be on p. 239.
180	I''.4.2.4.	Q 22.44 di 2.04 or 15.57 hy 1.92 ab 44.01 mt 4.64 an 8.34	Marekanka River, n. Okhotsk, Siberia.	Y. F. Gervé.	K. E. Bugdanovitch, Fund. Marek., p. 14, 1904?	Quartz keratophyre.	
181	I(II).4.2.''4.	Q 24.54 hy 7.04 or 17.24 mt 1.39 ab 34.58 il 1.67 an 11.40 C 0.92	Zeia River, Amur District, Siberia.	W. Giers.	E. Ahnert, Expl. G. Reg. Aurif. Sib., X, Taf. VII, 1910.	Aplite.	
182	I.(3)4.2.4.	Q 35.76 hy 0.84 or 15.57 ab 38.78 an 7.78 C 0.51	Unga Island, Kamchatka.	P. Wenjukoff.	P. Wenjukoff, Ref. N. J., 1891, I, p. 281.	Liparite obsidian.	In W. T., p. 181.
183	I(II).4''.2(3).4.	Q 14.82 di 5.40 or 15.01 hy 1.50 ab 41.39 mt 2.78 an 15.85 il 1.06 hm 0.80	Kara Küsül, Thian Shan Mountains, Turkestan.	C. Pfeil.	K. Futterer, Durch Asien, II, (1), p. 180. 1905.	Granite.	Al_2O_3 corrected as in III, (4), p. 23.
184	I''.4.2.4.⊙	Q 28.62 di 5.21 or 16.12 wo 0.70 ab 38.25 mt 0.93 an 10.01	Okuura, Fukai Island, Goto Islands, Japan.	K. Yokoyama.	S. Kozu, pers. com., 1913.	Adamellite porphyry.	
185	I''.''4.2''.(3)4.	Q 32.82 di 0.71 or 17.79 hy 4.10 ab 30.39 mt 0.93 an 11.40 il 0.76 ap 0.34	Manzeisan, Ono, Bizen, Japan.	N. Yoshioka.	S. Kozu, pers. com., 1913.	Granite.	
186	I.(3)4.2.(3)4.	Q 36.06 hy 3.80 or 17.24 mt 0.46 ab 27.25 il 0.61 an 9.45 ap 0.67 C 3.16	Kobata, Makabé, Hitachi, Japan.	T. Ohashi.	S. Kozu, pers. com., 1913.	Granite.	
187	I''.4.2(3).4.	Q 22.98 hy 3.20 or 10.56 mt 1.39 ab 39.82 il 0.91 an 15.01 hm 2.56 C 2.04 ap 1.01	Sambe Volcano, Iwami, Japan.	C. Sugiura.	S. Kozu, pers. com., 1913.	Dacite.	
188	I.''4.2''.4.	Q 32.46 hy 0.76 or 12.23 mt 0.46 ab 38.25 an 12.51 C 2.24	Boekit Kelam, Central Borneo.	M. Dittrich.	J. Schmutzer, Vh. Ac. Wet. Amst., 1908, p. 413.	Microgranite.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
189	71.20	16.12	1.69	n. d.	1.63	1.36	5.72	1.37	1.48	0.22	trace		trace		100.79	2.57
A4. IV	1.187	.158	.011	(.022)	.041	.024	.092	.015			—		—			
190	68.06	15.03	0.28	3.66	0.81	2.71	4.25	3.41	2.12		0.38		trace		100.71	
A3. III	1.134	.147	.002	.051	.020	.048	.069	.036			.005		—			
191	66.26	16.31	3.38	1.36	1.66	2.88	4.11	2.23	n. d.		0.66		0.38	$CaSO_4$ 0.62	99.85	2.438
A2. II	1.104	.160	.021	.019	.042	.052	.066	.023			.008		.005			
192	69.44	15.21	1.74	0.56	0.93	1.99	5.11	4.53	0.77						100.28	
A3. III	1.157	.149	.011	.008	.021	036	.082	.048								
193	71.16	16.19	0.36	0.68	0.60	1.77	4.73	2.03	2.17	0.22	0.11	trace	trace	SO_3 trace Cl trace	100.02	2.665
A3. III	1.186	.159	.002	.009	.015	.032	.076	.021			.001	—	—			
194	67.39	15.22	1.08	3.36	1.49	3.24	4.44	3.33	0.49	0.09	0.48	0.28		CO_2 0.11	101.00	
B2. III	1.123	.149	.007	.047	.037	.058	.072	.035			.006	.002				
195	72.77	13.87	trace	2.79	0.40	1.60	4.18	2.81	0.29	0.02	0.55		0.22	S trace	99.74	2.69
A2. II	1.213	.136	—	.039	.010	.029	.068	.030			.007		.003			
196	72.70	13.85	2.50	n. d.	0.94	3.34	4.60	2.46	n. d.			trace	trace		100.39	
A4. IV	1.212	.136	.016	(.032)	.024	.059	.074	.026				—	—			
197	71.29	15.70	1.50	0.30	0.89	3.41	4.81	2.35	0.07				trace		100.32	
A3. III	1.188	.154	.009	.004	.022	.055	.077	.025					—			
198	63.60	15.84	1.45	2.72	1.14	3.03	4.33	3.26	3.88	0.30	0.70	0.10	trace	CO_2 none Cl trace S trace Cr_2O_3 trace BaO none SrO none Li_2O none	100.35	2.51
A1. I	1.060	.155	.009	.038	.029	.054	.069	.035			.009	.001	—			
199	65.52	14.80	5.72	2.83	0.16	1.10	4.92	3.23	1.76		0.56				100.60	
A3. III	1.092	.145	.036	.039	.004	.020	.079	.034			.007					
200	65.12	16.70	4.00	1.03	0.28	1.25	5.69	3.24	2.54		0.80				100.65	
A3. III	1.085	.164	.025	.014	.007	.022	.092	.034			.010					
201	68.00	17.28	0.07	3.56	0.37	1.67	4.08	3.59	0.46	0.23	0.16	trace	0.05	CO_2 0.27	99.79	
A2. II	1.133	.169	—	.050	.009	.030	.066	.038			.002	—	—			
202	67.71	14.65	1.59	3.29	0.85	2.34	6.09	1.99	0.16		1.00	0.16			99.83	
A2. II	1.129	.142	.010	.046	.021	.042	.098	.021			.013	.001				
203	63.5	17.2	2.7	1.9	1.1	3.0	5.5	3.2	1.7		0.7				100.05	
B3. IV	1.058	.169	.017	.026	.028	.054	.089	.034			.009					

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 4. DOSODIC. LASSENOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
189	I″.4.″2.4(5).	Q 26.04 hy 7.00 or 8.34 ab 48.21 an 6.67 C 2.75	Kali Soeroean, Loh-oelo, Java.	N. Sahlbom.	G. Niethammer, T. M. P. M., XXVIII, p. 221, 1909.	Dacite.	
190	I(II).4.2.(3)4.	Q 21.00 di 1.43 or 20.02 hy 7.08 ab 36.15 mt 0.46 an 11.68 il 0.76	Eruption of 1883, Krakatoa.	A. Schwager.	K. Oebbeke, N. J., 1884, II, p. 33.	Andesite ash.	In W. T., p. **429.**
191	I(II).4.2(3).4	Q 25.44 hy 4.20 or 12.79 mt 3.71 ab 34.58 il 1.22 an 14.46 hm 0.80 C 1.94	Eruption of 1883, Krakatoa.	C. Winkler.	R. D. M. Verbeek, Krakatau, p. 292, 1884.	Andesite ash.	In W. T., p. **429.**
192	I″.4.(1)2.(3)4.	Q 17.94 di 3.67 or 26.68 hy 0.60 ab 42.97 mt 1.86 an 5.28 hm 0.48	Porobbo, Toba Lake, Sumatra.	W. Herz.	L. Milch, Z. D. G. G., LI, p. 69, 1899.	Quartz trachyte-andesite.	In W. T., p. **181.**
193	I.″4.2.4.	Q 31.14 hy 2.29 or 11.68 mt 0.46 ab 39.82 il 0.15 an 8.90 C 3.06	Stawell, Victoria.	Not stated.	A. R. Sec. Mines Vict., (1907), p. 63, 1908.	Feldspathic dike rock.	
194	I(II).4.2.″4.	Q 19.02 di 2.07 or 19.46 hy 7.16 ab 37.73 mt 1.62 an 11.68 il 0.91 ap 0.67	Tingha, New South Wales.	E. Hamilton.	W. N. Benson, pers. com.	Granite.	
195	I″.″4.2.4.	Q 31.32 hy 5.62 or 16.68 il 1.06 ab 35.63 an 8.06 C 0.92	Duffers Creek, Pilbara, West Australia.	J. H. Brooking.	A. G. Maitland, West Aust. G. S. B. 15, p. 12, 1904.	Porphyry.	
196	I″.4.2.4.	Q 27.66 di 5.39 or 14.46 hy 3.91 ab 38.78 an 10.01	Lyttleton, Banks Peninsula, New Zealand.	P. Marshall.	P. Marshall, Tr. N. Z. Inst., XXVI, p. 379, 1894.	Tridymite trachyte.	In W. T., **p. 183.**
197	I.4.2″.4.	Q 26.82 di 0.65 or 13.90 hy 1.90 ab 40.35 mt 0.93 an 14.46 hm 0.80	Lyttleton, Banks Peninsula, New Zealand.	P. Marshall.	P. Marshall, Tr. N. Z. Inst., XXVI, p. 379, 1894.	Tridymite trachyte.	In W. T., **p. 183.**
198	I(II).4.2″.″4.	Q 17.10 hy 5.54 or 19.46 mt 2.09 ab 36.15 il 1.37 an 14.18 ap 0.34	Leleppa Island, New Hebrides.	D. Mawson.	D. Mawson, Pr. Linn. Soc. N. S. W., XXX, p. 470, 1905.	Andesite.	
199	I(II).4.(1)2.4.	Q 22.20 hy 0.40 or 18.90 mt 7.42 ab 41.39 il 1.06 an 5.56 hm 0.64 C 1.22	Perseverance Harbor, Campbell Island.	P. Marshall.	P. Marshall, Subant. Islds., II, p. 695, 1909.	Phonolite.	
200	I″4″.(1)2.4.	Q 16.68 hy 0.70 or 18.90 mt 0.93 ab 48.21 il 1.52 an 6.12 hm 3.36 C 1.63	Garden Cove, Campbell Island.	P. Marshall.	P. Marshall, Subant. Islds., II, p. 691, 1909.	Porphyry.	
201	I″.4.2.(3)4.	Q 23.52 hy 7.24 or 21.13 il 0.30 ab 31.58 an 8.34 C 3.57	Cape Royds, Ross Region, Antarctica.	Burrows and Walkom.	J. W. E. David, pers. com.	Not named.	
202	I(II).4.″2.4″.	Q 18.54 di 3.72 or 11.68 hy 3.28 ab 51.35 mt 2.32 an 6.39 il 1.98 ap 0.34	Deception Island, South Shetland Islands, Antarctica.	Boiteau.	E. Gourdon, pers com., 1913.	Trachyte.	
203	I″.4(5).2.4.	Q 11.52 di 1.73 or 18.90 hy 2.00 ab 46.63 mt 3.94 an 12.79 il 1.37	Wandel Island, Graham Land, Antarctica.	Pisani.	E. Gourdon, C. R., CXLIII, p. 179, 1906.	Trachyandesite.	Also in **Exp.** Ant. Fr., Pet. vol., p. 166, 1908.

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. TOSCANASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	65.41	16.09	3.84	0.95	1.51	2.93	6.54	0.57	1.06	0.13	0.51		0.20	CO_2 0.47	100.21	
A2. II	1.090	.158	.024	.014	.038	.052	.105	.006			.006		.003		(100.01)	
2	69.10	15.05	0.74	2.81	1.63	2.86	4.92	0.89	1.76	0.07	0.26	0.24	0.12	CO_2 trace ZrO_2 trace S 0.08 BaO 0.02	100.55	
A1. I	1.152	.148	.005	.039	.041	.051	.079	.010			.003	.002	.002			
3	70.38	16.32	0.50	0.75	0.60	3.09	6.31	0.03	1.33	0.04	0.14	trace	0.08	S trace	99.57	
A2. II	1.173	.160	.003	.010	.015	.055	.102	——			.002	——	.001			
4	68.00	16.33	0.26	0.70	1.41	5.90	6.20	0.38	0.25	0.06	0.43	0.22	0.02	ZrO_2 0.02 Cl 0.13 F 0.07 S 0.01 Cr_2O_3 none BaO 0.03 SrO 0.03	100.45	
A1. I	1.133	.160	.002	.010	.035	.105	.100	.004			.005	.002	——			
5	74.21	14.47	0.35	0.50	0.28	1.71	7.62	0.10	0.23	0.15	0.30	0.07	none	BaO none SrO trace Li_2O trace	99.99	
A2. II	1.236	.142	.002	.007	.007	.030	.122	.001			.004	——	——			
6	67.88	17.21	2.00	1.62	1.52	3.08	5.71	0.26	0.45		0.20	0.10	0.09	CO_2 none ZrO_2 trace Cl trace	100.12	
A2. II	1.131	.169	.013	.022	.038	.055	.092	.003			.003	.001	.001			
7	67.62	17.03	1.30	1.71	1.51	3.11	5.86	0.63	0.50	0.34	0.34	0.01	trace	CO_2 0.10 S trace	99.72	2.684
A2. II	1.127	.167	.008	.024	.038	.055	.094	.007		.004	.004	——	——			
8	63.75	16.30	4.90	1.45	1.30	4.08	6.00	0.92	1.25						99.95	
A3. III	1.063	.160	.031	.020	.033	.073	.097	.010								
9	72.56	15.13	2.54	n. d.	0.95	2.01	5.06	0.56	0.03	0.93	trace	none	0.46		100.23	
A4. IV	1.209	.148	.016	(.032)	.024	.036	.082	.006			——	——	.007			

RANG 3. ALKALICALCIC. COLORADASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	67.93	16.28	2.85	1.38	0.90	2.81	1.80	5.02	0.53		0.30		0.07		99.87	
A2. II	1.132	.160	.018	.019	.023	.050	.029	.053			.004		.001			
2	68.95	15.58	2.52	1.30	0.80	3.07	1.59	4.79	0.81	0.34	0.40	0.20	0.04	CO_2 none	100.39	
A2. II	1.149	.153	.016	.018	.020	.055	.026	.051			.005	.001	——			

RANG 3. ALKALICALCIC. COLORADASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	65.13	15.50	1.77	4.17	0.54	3.98	2.70	4.53	0.26		1.12	0.06	trace	FeS_2 0.62	100.38	
A2. II	1.086	.152	.011	.058	.014	.071	.044	.048			.014	——	——			
2	68.40	16.34	0.17	1.56	0.64	3.77	3.39	3.91	0.55	0.29	0.29	0.22	0.07	CO_2 none ZrO_2 none S none BaO 0.15 SrO 0.05	99.80	
A1. I	1.140	.160	.001	.022	.016	.068	.055	.041			.004	.002	.001			
3	64.45	17.69	1.33	1.93	0.57	3.73	3.85	3.68	0.80	0.59	0.69	0.16	0.05	S 0.04 BaO 0.19	100.04	
A1. I	1.074	.173	.008	.027	.014	.066	.062	.039			.009	.001	——			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 5. PERSODIC. MARIPOSOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I(II).4.2.5.	Q 17.04 di 1.08 or 3.34 hy 3.60 ab 55.02 mt 1.86 an 13.07 il 0.91 hm 2.56	Hyde Park Tunnel, Neponset Valley, Massachusetts.	W. T. Hall.	F. Bascom, J. Ac. N. Sci. Phila., (2), XV, p. 150, 1912.	Soda trachyte.	
2	I(II).″4.2″.(4)5.	Q 27.36 hy 8.46 or 5.56 mt 1.16 ab 41.39 il 0.46 an 12.23 ap 0.67 C 1.53	Aldham, Pennsylvania.	W. T. Schaller.	F. Bascom, U. S. G. S. rec. lab.	Quartz norite gneiss.	
3	I.4.2(3).5.	Q 25.86 hy 2.16 ab 53.45 mt 0.70 an 15.29 il 0.30 C 0.31	Benning Mine, Dahlonega, Georgia.	E. Everhardt.	S. P. Jones, Ga. G. S. B. 19, p. 74, 1909.	Granite.	
4	I(II).4.2(3).5.	Q 19.02 di 8.31 or 2.22 wo 0.46 ab 52.40 mt 0.46 an 15.57 il 0.76 ap 0.67	Rumsey Mountain, Philipsburg quadrangle, Montana.	W. F. Hillebrand.	Emmons and Calkins, U. S. G. S. P. P. 78, p. 124, 1913.	Pyroxene aplite.	
5	I.4.(1)2.5.	Q 26.46 di 1.76 or 0.56 wo 0.35 ab 63.93 mt 0.46 an 5.28 il 0.61	Near Mariposa, Mariposa County, California.	W. F. Hillebrand.	H. W. Turner, J. G., III, p. 403, 1895.	Aplite.	Also in U.S.G.S. A.R.17, I, p. 721, 1896. In W. T., p. 183.
6	I.4.2(3).5.	Q 24.36 hy 4.72 or 1.67 mt 3.02 ab 48.21 il 0.46 an 14.46 ap 0.34 C 2.24	Towakaima Falls, Barama River, British Guiana.	J. B. Harrison.	J. B. Harrison, Rep. G. N. W. Dist., II, p. 10, 1898.	Granite.	Also in G. Goldf. Br. Gui., p. 76, 1908. In W. T., p. 183.
7	I″.4.2″.″5.	Q 21.66 hy 5.38 or 3.89 mt 1.86 ab 49.26 il 0.61 an 15.29 C 1.12	Essequibo, etc., rivers, British Guiana.	J. B. Harrison.	J. B. Harrison, Rep. G. Ess. Riv., p. 52, 1900.	Granophyre.	Average sample. In W. T., p. 183.
8	I(II).4″.2″.″5.	Q 15.72 di 4.32 or 5.56 hy 1.30 ab 50.83 mt 4.64 an 14.73 hm 1.76	Vrhnik, Bachergebirge, Styria.	B. Trobei.	B. Trobei, Mt. Nw. Ver. Steierm., XLIV, p. 189, (1907), 1908.	Granite porphyry.	
9	I″.(3)4.2.″5.	Q 32.76 hy 7.55 or 3.34 ab 42.97 an 10.01 C 2.45	Ilocos Norte, Luzon, Philippine Islands.	L. A. Salinger.	W. D. Smith, Phil. J. Sci., (A), II, p. 152, 1907.	Granite.	

SUBRANG 2. DOPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I″.(3)4.(2)3.2(3).	Q 31.02 hy 2.30 or 29.47 mt 3.71 ab 15.20 il 0.61 an 13.90 hm 0.32 C 2.86	Grafversfors, Stafsjö, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 262, 1906.	Granite.	
2	I.(3)4.(2)3.2″.	Q 33.78 hy 2.00 or 28.36 mt 3.02 ab 13.62 il 0.76 an 14.46 hm 0.48 C 2.45 ap 0.34	Papamoa, Te Puke District, New Zealand.	Not stated.	J. A. Bartrum, N. Z. Mines Statem. (1912), p. 140, 1913.	Rhyolite.	

SUBRANG 3. SODIPOTASSIC. AMIATOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I(II).4.(2)3.3.	Q 21.36 di 2.64 or 26.69 hy 4.40 ab 23.06 mt 2.55 an 16.68 il 2.13	Cape Camperdown, Bache Peninsula, Ellesmere Land.	P. Schei.	C. Bugge, Rep. 2nd Fram Exp., No. 22, p. 18, 1910.	Quartz syenite.	
2	I.4.(2)3.3″.	Q 24.48 hy 3.98 or 22.80 mt 0.23 ab 28.82 il 0.61 an 16.96 ap 0.67 C 0.31	Royal Mine, Philipsburg quadrangle, Montana.	G. Steiger.	Emmons and Calkins, U. S. G. S. P. P. 78, p. 109, 1913.	Quartz monzonite.	
3	I″.4.(2)3.3(4).	Q 19.08 hy 2.72 or 21.68 mt 1.86 ab 32.49 il 1.37 an 17.51 ap 0.34 C 0.92	Thunderbolt, Montana.	J. G. Fairchild.	A. Knopf, U. S. G. S. rec. lab.	Latite.	

CLASS I. PERSALANE—Continued.

RANG 3. ALKALICALCIC. COLORADASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
4	64.31	15.44	2.43	2.58	2.21	4.22	2.71	4.09	0.79	0.19	0.71	0.22	trace	S trace Cr_2O_3 none NiO none BaO 0.07 SrO trace Li_2O trace	99.97	
A1. I	1.072	.151	.015	.036	.044	.075	.044	.044			.009	.002	—			
5	64.05	15.38	2.20	2.74	2.08	4.30	2.74	4.00	0.83	0.27	0.60	0.21	0.11	CO_2 0.35 S 0.07 BaO 0.08 SrO 0.04 Cu 0.005	100.06	
A1. I	1.068	.150	.014	.038	.052	.077	.044	.042			.007	.001	.002			
6	62.53	19.01	1.96	1.44	1.29	5.17	3.45	3.30	0.45	0.21	0.65	0.17	0.03	CO_2 none SO_3 none BaO 0.13 SrO 0.04 Li_2O trace	99.83	
A1. I	1.042	.186	.013	.020	.032	.093	.056	.035			.008	.001	—			
7	67.53	15.46	2.18	2.42	0.16	3.24	3.24	3.86	0.55	0.23	0.41	0.01	0.10	CO_2 0.03 ZrO_2 0.02 F 0.03 FeS_2 0.09 Cr_2O_3 none NiO none BaO 0.07 SrO none	99.63	
A1. I	1.126	.152	.014	.033	.004	.058	.052	.041			.005	—	.001			
8	64.28	16.99	2.59	2.64	1.13	3.95	3.78	3.51	0.25	0.07	0.49	0.32	0.14	CO_2 none ZrO_2 0.01 F 0.06 S none V_2O_3 0.03 NiO none BaO 0.10 SrO 0.04 Li_2O none	100.38	
A1. I	1.071	.167	.016	.037	.028	.071	.061	.037			.006	.002	.002			
9	65.36	15.46	3.09	1.21	1.53	4.14	3.58	3.41	0.70	0.82	0.52	0.25	0.19	BaO 0.08	100.36	
A2. II	1.089	.152	.019	.017	.038	.074	.058	.036			.007	.002	.003			
10	61.42	17.69	4.24	1.74	1.81	5.29	3.14	3.19	0.97		0.37	0.14	0.19	BaO 0.09	100.28	
A2. II	1.024	.173	.027	.025	.045	.095	.050	.034			.005	.001	.003			
11	63.91	17.07	4.39	1.51	0.81	4.47	3.48	3.74	0.33			0.21			99.92	2.751
A3. III	1.065	.168	.028	.021	.020	.080	.056	.039				.002				14°
12	62.09	16.77	3.96	0.98	1.63	4.26	3.77	3.68	1.32	0.50	0.73	0.25	0.14	ZrO_2 trace S none BaO 0.10 SrO 0.05 Li_2O trace	100.24	
A1. I	1.035	.164	.025	.014	.041	.076	.061	.039			.009	.002	.002			
13	63.03	15.86	3.31	1.74	1.69	4.40	3.17	3.75	1.73	0.43	0.64	0.24	0.10	ZrO none SO_3 none BaO 0.08 SrO 0.03	100.20	
A1. I	1.051	.155	.021	.024	.042	.079	.052	.040			.008	.002	.001			
14	62.64	17.46	3.35	1.03	1.05	4.32	3.97	3.94	0.56	0.84	0.69	0.26	0.09	CO_2 none ZrO_2 0.02 S 0.02 Cr_2O_3 none V_2O_3 0.03 BaO 0.10 SrO 0.06	100.43	
A1. I	1.044	.171	.021	.014	.026	.078	.065	.041			.009	.002	.001			
15	62.60	18.16	0.91	2.72	0.96	5.30	3.02	4.10	0.34	0.28	1.02	0.06	0.50	ZrO_2 trace Cl 0.04	100.01	
A2. II	1.043	.178	.006	.038	.024	.095	.048	.044			.013	—	.007			
16	64.41	15.85	1.92	2.52	1.66	3.71	3.60	3.46	1.09	0.12	0.43	0.23	0.07	CO_2 0.72 SO_3 none	99.79	2.64
A2. II	1.074	.155	.012	.035	.042	.066	.058	.037			.005	.002	.001			
17	58.04	18.96	5.88	1.33	1.11	6.12	2.26	4.08	2.05			0.34		BaO 0.04	100.21	
A3. III	.967	.186	.037	.018	.028	.109	.036	.043				.002				

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. AMIATOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
4	I(II).4.″3.3.	Q 21.54 di 0.68 or 24.46 hy 5.65 ab 23.06 mt 3.48 an 17.51 il 1.37 ap 0.67	Elkhorn, Montana.	H. N. Stokes.	J. S. Barrell, U. S. G. S. A. R. 21, II, p. 536, 1901.	Quartz monzonite.	
5	I(II).4.3.3.	Q 20.04 hy 7.58 or 23.35 mt 3.25 ab 23.06 il 1.22 an 20.57 ap 0.34	Gagnon Mine, Butte, Montana.	H. N. Stokes.	Weed and Tower, U. S. G. S. P. P. 74, p. 33, 1912.	Quartz monzonite.	Also in H. W. Weed, J. G., VII, p. 739, 1899. In W. T., p. 183.
6	I″.4.3.3(4).	Q 17.04 hy 3.20 or 19.46 mt 3.02 ab 29.34 il 1.06 an 25.02 ap 0.34	Hiawatha Creek, Butte District, Montana.	H. N. Stokes.	Weed and Tower, U. S. G. S. B. 168, p. 119, 1900.	Andesite porphyry.	In W. T., p. 183.
7	I.4.(2)3.3.	Q 25.98 hy 2.38 or 22.80 mt 3.25 ab 27.25 il 0.76 an 16.12	Brewery Hill, Breckinridge District, Colorado.	R. C. Wells.	F. L. Ransome, U. S. G. S. P. P. 75, p. 45, 1911.	Quartz monzonite porphyry.	
8	I(II).4.(2)3.3(4).	Q 18.60 hy 5.04 or 20.57 mt 3.71 ab 31.96 il 0.91 an 17.79 ap 0.67 C 0.51	Mount Guyot, Breckenridge District, Colorado.	R. C. Wells.	F. L. Ransome, U. S. G. S. P. P. 75, p. 58, 1911.	Quartz monzonite porphyry.	
9	I″.4.(2)3.3(4).	Q 21.72 di 1.94 or 20.02 hy 2.90 ab 30.39 mt 3.02 an 16.12 il 1.06 hm 0.96 ap 0.67	Mount Carbon, West Elk Mountains, Colorado.	T. M. Chatard.	W. Cross, U. S. G. S. A. R. 14, p. 227, 1894.	Quartz porphyrite.	In W.T., p. 183.
10	I(II).4.3.3″.	Q 17.64 di 0.65 or 18.90 hy 4.20 ab 26.20 mt 5.34 an 24.74 il 0.76 hm 0.64 ap 0.34	Storm Ridge, West Elk Mountains, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. A. R. 14, p. 227, 1894.	Porphyrite.	In W. T., p. 189.
11	I″.4.″3.3″.	Q 19.74 hy 2.00 or 21.68 mt 4.87 ab 29.34 hm 1.12 an 20.29 ap 0.67	Sultan Mountain, Silverton quadrangle, San Juan County, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. A. R. 21, II, p. 82, 1900.	Quartz monzonite.	Also in U. S. G. S. Fol. 120, p. 12, 1905. In W. T., p. 183.
12	I(II).4″.(2)3.3(4).	Q 15.54 di 1.08 or 21.68 hy 3.80 ab 31.96 mt 1.16 an 17.79 il 1.37 hm 3.20 ap 0.67	Pole Creek, Silverton, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. Fol. 120, p. 8, 1905.	Quartz latite.	
13	I(II).4.(2)3.3″.	Q 19.32 di 1.94 or 22.24 hy 3.30 ab 27.25 mt 3.94 an 17.51 il 1.22 hm 0.64 ap 0.67	Falls Creek, Lake City quadrangle, Colorado.	G. Steiger.	W. Cross, U. S. G. S. B. 419, p. 118, 1910.	Andesite.	
14	I″.4″.(2)3.3(4).	Q 14.76 di 1.30 or 22.80 hy 2.00 ab 34.06 mt 1.39 an 18.07 il 1.37 hm 2.40 ap 0.67	Trout Creek, San Cristobal quadrangle, Colorado.	G. Steiger.	W. Cross, U. S. G. S. rec. lab.	Quartz latite.	
15	I(II).4″.3.3.	Q 15.60 di 2.10 or 24.46 hy 4.77 ab 25.15 mt 1.39 an 23.91 il 1.98	Pomeroy Creek, Monarch District, Colorado.	R. M. Butters.	R. D. Crawford, Colo. G. S. B. 4, p. 137, 1913.	Quartz monzonite.	
16	I(II).4.(2)3.3(4).	Q 19.38 hy 6.71 or 20.57 mt 2.78 ab 30.39 il 0.76 an 16.68 ap 0.67	Frisco District, Utah.	R. C. Wells.	B. S. Butler, U. S. G. S. rec. lab.	Quartz monzonite.	
17	I(II).4.3.3.	Q 16.86 hy 2.80 or 23.91 mt 4.18 ab 18.86 hm 3.04 an 28.36 ap 0.67 C 0.51	Stoddard Mountain, Iron Springs District, Utah.	R. D. Hall.	Leith and Harder, U. S. G. S. B. 338, p. 58, 1908.	Andesite.	

CLASS I. PERSALANE—Continued.

RANG 3. ALKALICALCIC. COLORADASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
18	62.33	16.92	3.95	1.24	1.97	4.48	3.62	3.36	0.89	0.46	0.63	0.17	0.07	CO_2 0.04 ZrO_2 0.02 S 0.03 NiO none BaO 0.10 SrO 0.10 Li_2O trace Cu trace	100.38	
A1. I	1.039	.166	.025	.017	.049	.080	.058	.036			.008	.001				
19	67.45	15.51	1.76	2.21	1.10	3.60	3.47	3.66	0.63	0.14	0.58	0.12			100.25	
A2. II	1.124	.152	.011	.031	.028	.064	.056	.039			.007	.001				
20	66.68	15.12	1.66	2.49	1.38	4.09	2.23	4.97	0.51	0.31	0.64	0.21	0.01	CO_2 none S trace SrO trace	100.30	2.715
A2. II	1.111	.148	.010	.035	.035	.073	.035	.053			.008	.001	—			
21	67.60	15.89	1.77	1.82	0.96	3.38	3.39	3.39	0.87	0.23	0.60	0.19	trace	CO_2 none SrO trace	100.09	
A2. II	1.127	.156	.011	.025	.019	.061	.055	.036			.008	.001				
22	65.68	15.87	1.78	1.25	1.79	3.50	3.20	3.37	3.10		0.98	0.23			100.75	
A2. II	1.095	.155	.011	.018	.045	.062	.051	.036			.012	.002				
23	65.13	15.73	2.24	1.86	1.49	3.62	2.93	3.96	1.91	0.52	0.58	0.23	trace	NiO 0.07	100.27	
A2. II	1.086	.154	.014	.026	.037	.064	.047	.042			.007	.002	—			
24	63.16	16.74	3.94	0.47	1.12	4.07	3.88	3.71	0.77	1.12	0.61	0.30	0.04	CO_2 none	99.93	
A2. II	1.053	.164	.024	.007	.028	.073	.063	.039			.008	.002	—			
25	59.99	16.14	4.42	0.13	1.51	4.17	3.04	2.82	4.06	3.35	0.64	0.24	0.05	CO_2 none	100.56	
A2. II	1.000	.158	.028	.002	.038	.075	.049	.030			.008	.002	—			
26	63.08	15.74	4.94	0.42	1.38	4.10	3.16	3.39	0.98	1.70	0.71	0.17	0.07	CO_2 trace ZrO_2 0.02 S trace BaO 0.10 SrO 0.04 Li_2O trace	100.00	
A1. I	1.051	.154	.031	.006	.035	.073	.051	.036			.009	.001	.001			
27	61.69	17.26	3.53	1.91	1.45	5.49	3.05	3.88	0.73			0.34	0.09	Cl 0.03 BaO 0.10	99.55	
A2. II	1.028	.169	.022	.026	.036	.098	.049	.041				.002	.001			
28	68.20	15.83	2.86	0.51	2.14	3.49	3.07	2.88	0.50		0.46	0.01	0.08	CO_2 0.06 FeS_2 0.01	100.10	
A2. II	1.137	.155	.018	.007	.054	.063	.050	.031			.006	—	.001			
29	68.24	16.08	0.81	2.20	0.40	3.42	3.34	3.99	0.83	0.08	0.01	0.03	0.05	CO_2 0.59 ZrO_2 0.12 BaO 0.15	100.34	2.668
A1. I	1.137	.158	.005	.030	.010	.061	.053	.042			—	—	—			
30	72.30	12.91	0.59	2.04	0.82	1.95	3.68	4.63	0.55	0.03	0.37	0.10	0.10	S none NiO none BaO 0.03 Li_2O none	100.10	
A1. I	1.205	.126	.004	.028	.021	.035	.060	.049			.005	.001	.001			
31	70.77	15.30	0.82	2.02	0.94	2.94	2.98	3.22	1.06						100.05	
A3. III	1.180	.150	.005	.028	.024	.053	.048	.034								
32	68.99	15.44	1.11	2.53	1.03	3.19	2.73	3.77	0.97						99.76	
A3. III	1.150	.151	.007	.035	.026	.057	.044	.040								

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. AMIATOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
18	I″.4.3.3(4).	Q 16.62 di 1.08 or 20.02 hy 4.40 ab 30.39 mt 2.32 an 20.02 il 1.22 hm 2.40 ap 0.34	Tombstone, Arizona.	R. C. Wells.	F. L. Ransome, U. S. G. S. rec. lab.	Quartz monzonite.	
19	I″.4.(2)3.3″.	Q 23.70 di 0.89 or 21.68 hy 4.08 ab 29.34 mt 2.55 an 15.85 il 1.06	Pyramid Peak, Eldorado County, California.	G. Steiger.	W. Lindgren, A. J. S., III, p. 306, 1897.	Granodiorite.	In W. T., p. 185.
20	I(II).4.″3.(2)3.	Q 24.06 di 2.20 or 29.47 hy 4.65 ab 18.34 mt 2.32 an 16.68 il 1.22 ap 0.34	Diamond Mesa, Mount Whitney quadrangle, California.	R. C. Wells.	U. S. G. S. rec. lab.	Quartz monzonite.	
21	I″.4.(2)3.3(4).	Q 26.40 hy 2.69 or 20.02 mt 2.55 ab 28.82 il 1.22 an 16.12 ap 0.34 C 0.71	Cherry Creek, Egan Range, Nevada.	H. N. Stokes.	J. E. Spurr, U. S. G. S. B. 228, p. 206, 1904.	Quartz monzonite.	
22	I″.4.(2)3.3″.	Q 25.08 hy 4.50 or 20.02 mt 1.39 ab 26.72 il 1.82 an 15.29 hm 0.80 C 1.33 ap 0.67	Waller Defeat Shaft, Washoe, Nevada.	G. E. Moore.	G. F. Becker, U. S. G. S. Mon. 3, p. 282, 1882.	Andesite.	Also in Hague and Iddings, U. S. G. S. B. 17, p. 33, 1885. In W. T., p. 183.
23	I″.4.″3.3.	Q 23.76 hy 4.36 or 23.35 mt 3.25 ab 24.63 il 1.06 an 15.85 ap 0.67 C 0.82	South of Carbon Ridge, Eureka District, Nevada.	W. H. Melville.	Hague and Iddings, U. S. G. S. Mon. 20, p. 264, 1892.	Andesite.	In W. T., p. 183.
24	I″.4.(2)3.3(4).	Q 17.10 di 0.86 or 21.68 hy 2.40 ab 33.01 il 1.08 an 17.24 hm 3.94 ap 0.67	Black Butte, Goldfield District, Nevada.	G. Steiger.	F. L. Ransome, U. S. G. S. P. P. 66, p. 52, 1909.	Andesite.	
25	I(II).4.3.3(4).	Q 21.12 hy 3.80 or 16.68 il 0.30 ab 25.68 hm 4.42 an 18.90 ru 0.48 C 1.12 ap 0.67	Black Cap Mountain, Goldfield District, Nevada.	G. Steiger.	F. L. Ransome, U. S. G. S. P. P. 66, p. 61, 1909.	Dacite vitrophyre.	
26	I(II).4.″3.3″.	Q 21.36 di 0.65 or 20.02 hy 3.30 ab 26.72 il 0.91 an 18.63 hm 4.94 ru 0.24 ap 0.34	Bullionville, n. Pioche, Nevada.	W. F. Hillebrand.	J. E. Spurr, U. S. G. S. B. 228, p. 208, 1904.	Quartz latite.	
27	I(II).4.3.3.	Q 16.68 di 2.62 or 22.80 hy 2.90 ab 25.68 mt 5.10 an 21.96 il 0.69	Weary Flat, Esau Range, Nevada.	H. Ross.	A. C. Lawson, Un. Cal., Dep. G., B. IV, p. 307, 1906.	Monzonite.	
28	I(II).″4.3.3(4).	Q 28.36 hy 5.40 or 17.24 mt 0.46 ab 26.20 il 0.91 an 17.51 hm 2.56 C 1.12	Essequibo, etc., rivers, British Guiana.	J. B. Harrison.	J. B. Harrison, G. Goldf. Br. Gui., p. 76, 1908.	Granitite.	Average sample. In W. T., p. 191.
29	I.4.(2)3.3.	Q 24.60 hy 4.30 or 23.35 mt 1.16 ab 27.77 an 16.96 C 0.20	Olavarria, Buenos Aires, Argentina.	M. Dittrich.	H. Backlund, Min. Agric. Arg. B. 2 B, p. 28, 1913.	Granodiorite.	
30	I″.4.3(4).3.	Q 27.66 di 3.46 or 27.24 hy 3.02 ab 31.44 mt 0.93 an 4.73 il 0.76 ap 0.34	Huntley, Aberdeenshire, Scotland.	E. G. Radley.	J. J. H. Teall, pers. com., 1913.	Granite.	
31	I″.(3)4.(2)3.3″.	Q 32.10 hy 5.44 or 18.90 mt 1.16 ab 25.15 an 14.73 C 1.53	Near Söderwiken, Ornö, Sweden.	O. Bäckström.	A. G. Högbom, B. G. Inst. Ups., X, p. 166, 1911.	Granite gneiss.	
32	I″.″4.(2)3.3.	Q 28.68 hy 6.30 or 22.24 mt 1.62 ab 22.53 an 15.85 C 1.02	Near Söderwiken, Ornö, Sweden.	O. Bäckström.	A. G. Högbom, B. G. Inst. Ups., X, p. 166, 1911.	Granite gneiss.	

CLASS I. PERSALANE—Continued.

RANG 3. ALKALICALCIC. COLORADASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
33	68.26	14.35	1.30	2.34	1.13	2.85	2.45	3.64	3.17				0.70		100.19	
A3. III	1.138	.141	.008	.032	.018	.051	.040	.038					.010			
34	66.43	15.03	4.55	0.75	1.65	4.61	2.94	2.76	0.80		0.33		0.29		100.14	
A2. II	1.107	.147	.029	.011	.041	.082	.047	.030			.004		.004			
35	64.21	17.39	3.04	2.27	1.21	3.16	2.70	3.82	1.48						99.28	2.68
B3. IV	1.070	.170	.019	.032	.030	.056	.044	.040								
36	70.6	15.1	1.9	1.1	1.4	3.7	2.7	2.9	0.7					CO_2 trace	100.1	
B3. IV	1.177	.148	.012	.015	.035	.066	.044	.031								
37	70.4	13.7	1.8	1.3	1.2	4.5	2.3	4.4	0.7						100.3	
B3. IV	1.173	.134	.011	.018	.020	.080	.037	.046								
38	67.04	16.07	4.72	1.20	3.09	2.04	4.61	0.95							100.92	
B3. IV	1.119	.158	.029	.030	.055	.033	.049									
39	64.45	15.80	1.97	2.89	1.72	4.15	2.89	4.34	1.75	0.12	0.58				100.66	
A3. III	1.074	.155	.012	.040	.043	.074	.047	.046			.007					
40	65.69	16.41	0.73	2.74	1.42	3.36	2.39	5.24	1.20		0.44	trace	trace	Cl 0.03 X 0.77 SO_3 0.17 Li_2O 0.24	100.83	2.581
A2. II	1.095	.161	.005	.038	.036	.060	.039	.056			.006	—	—			15°
41	65.53	16.89	1.00	2.38	1.17	3.24	2.71	4.59	1.98		0.46	trace	trace	SO_3 0.20 Cl 0.09 X 0.61 Li_2O trace	100.85	2.540
A2. II	1.092	.166	.006	.033	.029	.058	.044	.049			.006	—	—			15°
42	62.85	17.97	3.80	2.15	1.24	3.79	3.00	4.69	0.10			0.18			99.77	
A3. III	1.048	.177	.024	.030	.031	.068	.048	.050				.001				
43	62.15	18.07	3.31	2.75	1.54	4.36	2.51	5.00	0.23			0.25			100.15	
A3. III	1.036	.177	.021	.039	.039	.078	.040	.053				.002				
44	69.94	15.97	0.47	1.93	1.15	3.43	2.82	3.88			0.35				100.31	
A3. III	1.166	.157	.003	.026	.029	.061	.045	.041			.004					
45	66.05	15.86	1.75	1.67	1.85	4.10	2.24	4.36	1.78		0.96	0.18	0.03		99.93	2.594
A2. II	1.101	.155	.011	.023	.046	.073	.036	.047			.012	.001	—			
46	63.71	17.28	2.41	1.16	2.93	5.16	2.60	4.22	0.96			trace			100.43	2.707
A3. III	1.062	.169	.015	.016	.073	.092	.042	.045				—				15°
47	63.17	17.15	2.84	1.31	2.17	4.17	3.08	4.19	2.51						100.59	2.525
A3. III	1.053	.168	.018	.018	.054	.074	.050	.045								17°
48	61.93	18.47	1.93	2.23	2.66	4.31	2.92	3.92	2.28						100.65	2.601
A3. III	1.031	.181	.012	.031	.067	.077	.047	.042								18°

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. AMIATOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
33	I″.(3)4.(2)3.3.	Q 30.96 hy 6.29 or 21.13 mt 1.86 ab 20.96 an 14.18 C 1.22	Skrutten, Helsingland, Sweden.	H. Santesson.	F. Svenonius, G. F. F., X, p. 273, 1888.	Andesite breccia.	In W. T., p. 185.
34	I(II).4.3.3(4).	Q 27.12 di 2.59 or 16.68 hy 2.90 ab 24.63 mt 2.55 an 19.46 il 0.61 hm 2.88	Flakulla, Karlskrona, Blekinge, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 268, 1906.	Granite.	
35	I″.4.(2)3.3.	Q 24.66 hy 4.72 or 22.24 mt 4.41 ab 23.06 C 3.06	Innozenzidorf, Lausitz, Saxony.	R. Reinisch.	R. Reinisch, Hab. Schr. Leip., p. 26, 1902.	Granite.	
36	I″.(3)4.3.3″.	Q 33.42 hy 3.90 or 17.24 mt 2.78 ab 23.06 an 18.35 C 0.71	Near Erdmannsdorf, Riesengebirge, Silesia.	W. Herz.	L. Milch, N. J., 1905, II, p. 22.	Quartz porphyry.	Center of dike. Cf. No. 164, II.4.3.4.
37	I(II).″4.(2)3.3.	Q 30.42 di 6.42 or 25.58 hy 0.86 ab 19.39 mt 2.55 an 14.18	Schmiedeberg, Riesengebirge, Silesia.	W. Herz.	L. Milch, N. J. B. B., XV, p. 111, 1902.	Basic granite.	
38	I″.″4.(2)3.(2)3.	Q 29.22 hy 3.00 or 27.24 mt 3.94 ab 17.29 hm 1.92 an 15.29 C 2.14	Wilden Loch, Schladminger Tauern, Styria.	J. P. Ippen.	J. A. Ippen, Mt. Nw. Ver. Steierm., 1901, p. 131.	Granite.	
39	I(II).4.(2)3.3.	Q 18.96 di 2.72 or 25.58 hy 5.74 ab 24.63 mt 2.78 an 17.24 il 1.06	S. of Pontresina, Bernina Gebiet, Switzerland.	L. Hezner.	U. Grubenmann, pers. com., 1913.	Banatite.	
40	I″.4.(2)3.″3.	Q 20.52 hy 7.16 or 31.14 mt 1.16 ab 20.44 il 0.91 an 16.68 C 0.61	Nocchetto, Monte Amiata, Tuscany.	J. F. Williams.	J. F. Williams, N. J. B. B., V, p. 408, 1887.	Trachyte.	In W. T., p. 185.
41	I″.4.(2)3.3.	Q 22.02 hy 5.80 or 27.24 mt 1.39 ab 23.06 il 0.91 an 16.12 C 1.53	Casa la Fornacina, Monte Amiata, Tuscany.	J. F. Williams.	J. F. Williams, N. J. B. B., V, p. 410, 1887.	Trachyte.	In W. T., p. 185.
42	I(II).4.(2)3.3.	Q 17.58 hy 3.89 or 27.80 mt 5.57 ab 25.15 ap 0.34 an 18.07 C 1.43	Montalto, Monti Cimini, n. Viterbo, Italy.	G. Aichino.	V. Sabatini, Vulc. Cim., p. 507, 1912.	"Peperino" (biotite latite).	
43	I(II).4.″3.″3.	Q 16.74 hy 6.28 or 29.47 mt 4.87 ab 20.96 ap 0.67 an 19.74 C 1.33	Bagnaia, Monti Cimini, n. Viterbo. Italy.	G. Aichino.	V. Sabatini, Vulc. Cim., p. 507, 1912.	"Peperino" (biotite latite).	
44	I″.″4.″3.3.	Q 28.80 hy 5.41 or 22.80 mt 0.70 ab 23.58 il 0.61 an 16.96 C 1.02	Arbatax, Capo Bella Vista, Sardinia.	C. Riva.	C. Riva, Atti. Ac. Sc. Nap., (2), XII, No. 9, p. 27, 1905.	Granite.	
45	I(II).4.3.3.	Q 25.02 hy 4.60 or 26.13 mt 2.55 ab 18.86 il 1.82 au 19.46 ap 0.34 C 0.20	Ajuta, Belka Kamennaja Taganrog, Russia.	J. Morozewicz.	J. Morozewicz, Mem. Com. G. Russ., No. 8, p. 53, 1903.	Andesite.	
46	I(II).4.3.3.	Q 17.64 di 2.59 or 25.02 hy 6.23 ab 22.01 mt 3.48 an 22.24	Adami Mine, Laurion, Attica, Greece.	R. Lepsius.	R. Lepsius, Geol. Attika, p. 90, 1893.	Granite.	In W. T., p. 185.
47	I(II).4.″3.3.	Q 16.98 hy 5.40 or 25.02 mt 4.15 ab 26.20 an 20.29	Acropolis, Pergamon, Asia Minor.	H. S. Washington.	H. S. Washington, A. J. S., III, p. 49, 1897.	Dacite.	In W. T., p. 185.
48	I(II).4″.3.3.	Q 15.42 hy 9.21 or 23.35 mt 2.78 ab 24.63 an 21.41 C 1.53	Kara Tash, Smyrna, Asia Minor.	H. S. Washington.	H. S. Washington, A. J. S., III, p. 45, 1897.	Andesite.	In W. T., p. 185.

CLASS I. PERSALANE—Continued.

RANG 3. ALKALICALCIC. COLORADASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
49	67.85	18.39	1.27	n. d.	0.60	4.82	2.38	3.42	2.23						100.96	
A4. IV	1.131	.180	.008	(.016)	.015	.086	.039	.036								
50	66.27	18.66	1.99	n. d.	0.66	4.89	3.65	3.39	0.70						100.21	
A4. IV	1.105	.183	.013	(.026)	.017	.087	.059	.036								
51	65.10	17.21	1.84	2.08	2.91	3.21	2.05	4.08	1.75		0.46				100.69	
A3. III	1.085	.169	.011	.029	.073	.057	.033	.044			.006					
52	68.92	15.26	0.80	3.30	1.64	3.04	2.71	2.93	1.04	0.22	0.70	0.19	trace	CO_2 none SO_3 none Cl none Li_2O trace	100.75	2.688
A2. II	1.149	.150	.005	.046	.041	.054	.044	.031			.009	.001	—			
53	67.75	16.11	0.50	4.00	0.79	2.68	2.60	3.42	0.96	0.20	0.85	0.09	trace	CO_2 none	99.95	2.68
A2. II	1.129	.158	.003	.056	.020	.048	.042	.036		—	.011	—	—			
54	65.36	16.37	1.80	2.68	1.81	3.82	3.40	3.75	0.33	0.09	0.36	0.16	0.16	CO_2 none ZrO_2 trace SO_3 none Cl 0.05 F 0.14 S none V_2O_3 trace Cr_2O_3 trace NiO none BaO 0.14 SrO trace Li_2O trace	100.42	2.71
A1. I	1.089	.160	.011	.038	.045	.068	055	.040			.005	.001	.002			

RANG 3. ALKALICALCIC. COLORADASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	67.74	16.13	1.50	1.96	1.36	4.41	4.92	1.30	0.86	0.10			trace		100.28	
A3. III	1.129	.158	.009	.027	.034	.079	.079	.014					—			
2	68.62	15.70	1.66	1.77	1.28	3.56	5.08	1.31	0.56	0.10	0.26	0.10	0.07	Cl none S 0.03 Cr_2O_3 trace BaO 0.02	100.12	
A1. I	1.144	.154	.010	.025	.032	.064	.082	.014			.003	.001	.001			
3	66.74	16.67	0.67	2.99	1.14	3.55	4.46	2.16	0.78	0.29	0.31	0.10	0.01	CO_2 0.11	99.98	
A2. II	1.112	.163	.004	.042	.029	.064	.072	.023			.004	.001	—			
4	68.94	14.11	1.68	2.88	0.80	4.62	3.53	2.41	1.13	0.22	0.50	0.08	0.05	BaO 0.04	100.99	2.723
B2. III	1.149	.138	.011	.040	.020	.082	.056	.026			.006	—	—			
5	69.48	16.42	0.56	2.60	1.15	3.45	4.59	1.18	0.34		0.40	0.11	0.02	ZrO_2 0.02 SO_3 0.07 N·O none BaO 0.05 SrO none Cu,Zn none	100.45	
A1. I	1.158	.161	.004	.036	.029	.062	.074	.013			.005	.001	—			
6	62.91	19.13	0.98	3.20	1.69	4.28	3.94	3.38	0.63					Li_2O trace	100.14	
A3. III	1.049	.187	.006	.044	.042	.077	.063	.035								
7	63.55	16.57	2.36	1.98	1.53	4.69	3.78	2.78	1.11	0.31	0.42	0.21	0.13	CO_2 0.69 SO_3 0.06 BaO 0.15 SrO 0.04	100.36	
A1. I	1.059	.163	.015	.028	.038	.084	.061	.030			.005	.002	.002			
8	65.23	16.94	1.60	1.91	1.31	3.85	3.57	3.02	0.88	0.18	0.66	0.19	trace	CO_2 0.25 SO_3 none S none BaO 0.19	99.78	
A1. I	1.087	.166	.010	.027	.033	.069	.058	.032			.008	.001	—			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 3. SODIPOTASSIC. AMIATOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
49	I.4.3.3.⊙	Q 28.68, or 20.02, ab 20.44, an 23.91, C 1.94, hy 3.61	Cap Blanc, Menerville, Algeria.	Duparc and Pearce.	Duparc, Pearce, and Ritter, Mem. Soc. Phys. Gen., XXXIII, p. 59, 1900.	Dacite.	In W. T., p. 185.
50	I.4.3.3(4).	Q 19.08, or 20.02, ab 30.92, an 24.19, hy 5.13	Cap Blanc, n. Menerville, Algeria.	Duparc and Pearce.	Duparc, Pearce, and Ritter, Mem. Soc. Phys. Gen., XXXIII, p. 59, 1900.	Dacite.	In W. T., p. 185.
51	I(II).4.″3.″3.	Q 25.44, or 24.46, ab 17.29, an 15.85, C 3.57, hy 8.88, mt 2.55, il 0.91	Koudiat es-Sakra, Beni Toufont, Algeria.	P. Termier.	P. Termier, C. R., CXXXVI, p. 329, 1903.	Microgranite.	
52	I″.(3)4.(2)3.3.	Q 31.44, or 17.24, ab 23.06, an 14.18, C 2.45, hy 8.32, mt 1.16, il 1.37, ap 0.34	Hesket, Macedon, Victoria.	A. G. Hall.	Skeats and Summers, G. S. Vict., B. 24, p. 20, 1912.	Granodiorite.	
53	I(II).(3)4.(2)3.3.	Q 30.18, or 20.02, ab 22.01, an 13.34, C 3.26, hy 7.24, mt 0.70, il 1.67	Gellibrand, Broadmeadow, Victoria.	A. S. Richards.	F. L. Stillwell, Pr. R. Soc. Vict., XXIV, (1), p. 177, 1911.	Granite.	
54	I(II).4.(2)3.3″.	Q 19.20, or 22.24, ab 28.82, an 18.07, hy 7.67, mt 2.55, il 0.76, ap 0.34	Tenterfield, New England, New South Wales.	J. C. H. Mingaye.	E. C. Andrews, Rec. G. S. N. S. W., VIII, (3), p. 203, 1907.	Granite.	

SUBRANG 4. DOSODIC. YELLOWSTONOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I″.4.″3.4(5).	Q 22.62, or 7.78, ab 41.39, an 18.07, di 3.16, hy 3.98, mt 2.09	Opimika Narrows, Lake Temiskaming, Quebec.	F. G. Wait.	G. C. Hoffmann, Can. G. S. A. R., IX, p. 19R (1896), 1898.	Granitite gneiss.	In W. T., p. 185.
2	I″.4.″3.4(5).	Q 24.18, or 7.78, ab 42.97, an 16.12, di 0.68, hy 4.72, mt 2.32, il 0.46, ap 0.34	Hopkins Bay, Rainy Lake, Ontario.	M. F. Connor.	A. W. Lawson, Can. G. S., Mem. 40, p. 93, 1913.	Granite gneiss.	
3	I(II).4.(2)3.4.	Q 21.42, or 12.79, ab 37.73, an 16.96, C 0.71, hy 7.39, mt 0.93, il 0.61, ap 0.34	Stave Island, n. Portland, Maine.	W. C. Wheeler,	U. S. G. S. rec. lab.	Granite porphyry.	
4	I(II).″4.″3.″4.	Q 28.56, or 14.46, ab 29.34, an 15.57, di 6.07, hy 1.99, mt 2.55, il 0.91	Saugus, Essex County, Massachusetts.	M. F. Connor.	C. H. Clapp, pers. com.	Granodiorite.	
5	I″.4.(2)3.4(5).	Q 27.72, or 7.23, ab 38.77, an 16.40, C 1.53, hy 6.46, mt 0.93, il 0.76, ap 0.34	Morris Plains, New Jersey.	R. B. Gage.	J. V. Lewis, N.J. G. S. A. R. (1908), p. 70, 1909.	Granite.	
6	I(II).4″.3.(3)4.	Q 13.62, or 19.46, ab 33.01, an 21.41, C 1.22, hy 9.22, mt 1.39	Dorseys Run, Howard County, Maryland.	W. F. Hillebrand.	C. R. Keyes, U. S. G. S. A. R. 15, p. 722, 1895.	Granite.	In W. T., p. 185.
7	I(II).4.3.″4.	Q 18.96, or 16.68, ab 31.96, an 20.02, di 1.11, hy 4.59, mt 3.48, il 0.76, ap 0.67	Woodchopper Gulch, Marysville District, Montana.	G. Steiger.	J. S. Burrell, U. S. G. S. P. P. 57, p. 55, 1907.	Quartz diorite.	
8	I″.4.″3.(3)4.	Q 22.38, or 17.79, ab 30.39, an 18.35, C 1.02, hy 4.49, mt 2.32, il 1.22, ap 0.34	Willow Creek District, Boise County, Idaho.	G. Steiger.	W. Lindgren, U. S. G. S. A. R. 18, III, p. 640, 1898.	Granite.	In W. T., p. 187.

CLASS I. PERSALANE—Continued.

RANG 3. ALKALICALCIC. COLORADASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
9	67.54	17.02	2.97	0.34	0.13	3.36	4.62	2.28	0.55		0.80	trace	trace	SO_3 0.26 Cl 0.15 Li_2O 0.03	100.05	
A2. II	1.126	.167	.019	.005	.003	.060	.074	.024			.010	—	—			
10	66.05	16.96	2.59	1.38	2.08	3.37	4.20	2.53	0.69		0.34	trace	none	SO_3 0.03 Cl trace Li_2O none	100.22	
A2. II	1.101	.166	.016	.019	.052	0.60	.068	.027			.004	—	—			
11	65.97	16.53	2.59	1.72	2.11	3.37	3.41	2.67	1.23		0.42	trace	none	SO_3 0.13 Cl 0.09 Li_2O 0.09	100.33	
A2. II	1.100	.162	.016	.024	.053	.060	.055	.028			.005	—	—			
12	65.60	17.61	0.95	2.76	1.49	3.72	4.36	2.36	0.59		0.75	0.16	none	SO_3 trace Cl none Li_2O 0.03	100.38	
A2. II	1.093	.173	.006	.038	.038	.066	.070	.025			.009	.001	—			
13	64.85	16.57	2.10	2.15	2.14	4.01	3.71	3.10	0.35		0.91	0.14	none	SO_3 trace Cl none Li_2O none	100.03	
A2. II	1.081	.162	.013	.030	.054	.072	.060	.033			.011	.001	—			
14	65.66	15.61	2.10	2.07	2.46	3.64	3.65	2.03	1.07		1.37	trace	none	SO_3 0.13 Cl 0.12 Li_2O 0.36	100.27	
A2. II	1.094	.153	.013	.029	.062	.065	.059	.021			.017	—	—			
15	64.27	17.84	3.36	1.29	2.00	3.42	3.84	2.48	1.32		0.32	0.16	none	SO_3 trace Cl none Li_2O 0.03	100.33	
A2. II	1.071	.175	.021	.018	.050	.061	.062	.026			.004	.001	—			
16	65.63	17.00	2.55	1.19	2.03	3.48	4.42	1.64	2.00		trace	0.07	none	CO_2 0.27 SO_3 trace Cl trace Li_2O 0.04	100.32	
A2. II	1.094	.167	.016	.017	.051	.062	.071	.018			—	—	—			
17	64.61	18.62	2.78	0.95	0.85	4.20	4.37	2.36	0.93		none	0.30	trace	CO_2 0.25 SO_3 trace Cl trace Li_2O 0.01	100.23	
A2. II	1.077	.182	.017	.014	.021	.075	.071	.025			—	.002	—			
18	64.23	16.34	1.07	1.58	2.47	3.07	3.49	2.59	1.76	0.47	0.50	0.18	trace	CO_2 0.30 FeS_2 1.61 NiO none BaO 0.19 SrO 0.06 Li_2O trace	99.91	
A1. I	1.071	.160	.007	.022	.062	.055	.056	.027			.006	.001	—			
19	63.42	17.16	3.09	1.50	1.64	4.65	4.51	3.04	0.28	0.16	0.35	0.26	0.04	NiO 0.19	100.29	
A2. II	1.057	.168	.019	.021	.041	.083	.073	.032			.004	.002	—			
20	61.50	17.42	4.66	1.09	1.26	5.33	3.99	1.29	2.44		none	0.60	trace	SO_3 0.35 Li_2O 0.03	99.96	
A2. II	1.025	.171	.029	.015	.032	.094	.064	.014			—	.004	—			
21	67.01	18.03	0.66	0.72	0.84	3.99	4.42	3.53	0.91			0.10	0.09	BaO 0.10	100.40	
A2. II	1.117	.177	.004	.010	.021	.071	.071	.037				.001	.001			
22	63.66	17.05	1.97	2.62	1.99	3.89	4.13	3.09	1.19			0.27	0.14	SrO 0.08	100.08	
A2. II	1.061	.167	.013	.036	.050	.070	.066	.033				.002	.002			
23	62.85	16.21	3.08	1.46	1.47	4.72	3.49	3.10	2.03	0.29	0.41	0.48	0.15	BaO 0.11	99.85	
A2. II	1.048	.159	.019	.020	.037	.084	.056	.033			.005	.003	.002			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 4. DOSODIC. YELLOWSTONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
9	I.4.(2)3.4.	Q 24.90 or 13.34 ab 38.77 an 16.68 C 0.92 hy 0.30 il 0.76 hm 2.97 ru 0.40	Electric Peak, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 116, 1899.	Quartz diorite.	Also in U.S.G.S. A.R.12, p.627, 1891. In W. T., p. 187.
10	I(II).4.(2)3.4.	Q 21.54 or 15.01 ab 35.63 an 16.68 C 1.12 hy 5.20 mt 3.48 il 0.61 hm 0.16	Electric Peak, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 116, 1899.	Quartz diorite.	Also in U.S.G.S, A.R.12, p.627, 1891. In W. T., p. 187.
11	I(II).4.″3.″4.	Q 25.56 or 15.58 ab 28.82 an 16.68 C 1.94 hy 5.70 mt 3.71 il 0.76	Electric Peak, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 116, 1899.	Quartz diorite porphyrite.	Also in U.S.G.S. A.R.12, p.627, 1891. In W. T., p. 187.
12	I(II).4.(2)3.4.	Q 20.16 or 13.90 ab 36.68 an 17.51 C 1.53 hy 6.84 mt 1.39 il 1.37 ap 0.34	Electric Peak, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 116, 1899.	Quartz diorite.	Also in U.S.G.S. A.R.12, p.627, 1891. In W. T., p. 187.
13	I(II).4.″3.(3)4	Q 19.50 or 18.35 ab 31.44 an 19.18 hy 16.19 mt 3.02 il 1.67 ap 0.34	Electric Peak, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 116, 1899.	Quartz diorite.	Also in U.S.G.S. A.R.12, p.627, 1891. In W. T., p. 187.
14	I(II).4.″3.4.	Q 25.32 or 11.68 ab 30.92 an 18.07 C 0.82 hy 6.20 mt 3.02 il 2.58	Sepulchre Moutnain, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 135, 1899.	Dacite.	Also in U.S.G.S. A.R.12, p.648, 1891. Li_2O high? In W. T., p. 187.
15	I(II).4.(2)3.4.	Q 22.62 or 14.46 ab 32.48 an 16.12 C 2.96 hy 5.00 mt 3.25 il 0.61 hm 1.12 ap 0.34	Sepulchre Mountain, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 135, 1899.	Andesite.	Also in U.S.G.S. A.R.12, p.648, 1891. In W. T., p. 187.
16	I″.4.″3.4.	Q 23.10 or 10.01 ab 37.20 an 17.24 C 1.63 hy 5.10 mt 3.71	Fan Creek, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 81, 1899.	Andesite porphyry.	In W. T., p. 187.
17	I″.4.″3.4.	Q 20.64 or 13.90 ab 37.20 an 18.90 C 1.84 hy 2.10 mt 3.25 hm 0.48 ap 0.67	Crescent Hill, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 272, 1899.	Andesite.	In W. T., p. 187.
18	I(II).4.(2)3.″4.	Q 23.88 or 15.01 ab 29.34 an 14.46 C 2.55 hy 7.39 mt 1.62 il 0.91 ap 0.34 pr 1.61	Crater Mountain, Yellowstone National Park.	H. N. Stokes.	Hague and Jaggar, U. S. G. S. B. 168, p. 96, 1900.	Granite porphyry.	In W. T., p. 187.
19	I(II).4″.(2)3.4.	Q 14.76 or 17.79 ab 38.25 an 17.79 di 2.59 hy 2.90 mt 3.94 il 0.61 hm 0.32 ap 0.67	Hurricane Ridge, Crandall Basin, Yellowstone National Park.	W. H. Melville.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 261, 1899.	Quartz diorite porphyry.	In W. T., p. 187.
20	I(II).4.2.4″.	Q 21.78 or 7.78 ab 33.54 an 22.52 C 1.12 hy 3.20 mt 3.48 hm 2.13 ap 1.34	Indian Creek Laccolith, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 61, 1899.	Porphyrite.	In W. T., p. 187.
21	I.4.(2)3.(3)4.	Q 18.42 or 20.57 ab 37.20 an 18.63 di 0.22 hy 2.79 mt 0.93 ap 0.34	Copper Mountain, Leadville, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. B. 148, p. 176, 1897.	Diorite porphyry.	In W. T., p. 187.
22	I(II).4″.(2)3.″4.	Q 15.96 or 17.35 ab 34.58 an 17.51 C 0.51 hy 8.30 mt 3.02 ap 0.67	Gold Hill, Ten Mile District, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. A. R. 14, p. 227, 1894.	Quartz porphyrite.	In W. T., p. 187,
23	I(II)4.3.(3)4.	Q 19.98 or 18.35 ab 29.34 an 19.46 di 0.86 hy 3.30 mt 3.94 il 0.76 hm 0.32 ap 1.01	Mount Marcellina, West Elk Mountains, Colorado.	T. M. Chatard.	W. Cross, U. S. G. S. A. R. 14, p. 227, 1894.	Diorite porphyrite.	In W. T., p. 189.

CLASS I. PERSALANE—Continued.

RANG 3. ALKALICALCIC. COLORADASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
24	59.29	21.27	3.33	1.04	1.12	5.25	3.39	3.00	1.63			0.23	0.21		99.76	2.596
A2. II	.988	.208	.020	.014	.028	.094	.055	.032				.002	.003			14.5°
25	64.84	16.49	1.87	2.28	1.58	4.54	4.18	2.46	0.98	0.19	0.50	0.19	0.06	CO_2 trace ZrO_2 0.01 BaO 0.02 SrO none Li_2O none	100.19	
A1. I	1.081	.162	.012	.032	.040	.081	.068	.027			.006	.001	—			
26	62.61	17.54	2.72	1.52	1.39	4.18	4.88	2.21	1.52	0.22	0.60	0.27	0.14	CO_2 none ZrO_2 none S 0.06 BaO 0.18	100.04	
A1. I	1.044	.172	.017	.021	.035	.075	.079	.023			.008	.002	.001			
27	62.48	18.07	2.61	1.97	1.34	4.67	4.69	2.16	0.52	0.12	0.60	0.28	0.17	CO_2 none ZrO_2 none S 0.03 BaO 0.09	99.79	
A1. I	1.041	.177	.016	.028	.034	.084	.076	.023			.008	.002	.001			
28	68.43	15.80	1.06	1.85	1.46	4.08	3.47	2.51	0 53	0.05	0.20	0.07	0.10	BaO 0.09 SrO 0.02	99.72	2.708
A2. II	1.141	.155	.007	.026	.037	.073	.056	.027			.003	—	.001			
29	63.30	17.64	1.58	3.08	1.23	5.03	4.56	1.16	0.51	0.14	0.50	0.27	0.47	BaO 0.05 SrO none	99.52	2.721
A2. II	1.055	.173	.010	.043	.031	.089	.074	.012			.006	.002	.007			
30	66.55	16.21	1.98	1.80	1.32	3.86	4.07	2.84	0.24	0.01	0.40	0.15	0.12	BaO 0.03 SrO 0.01	99.59	2.693
A2. II	1.109	.159	.013	.025	.033	.069	.066	.030			.005	.001	.002			
31	64.44	17.05	1.53	2.40	1.28	4.28	5.16	1.48	0.78	0.02	0.45	0.31	0.03		99.21	
B2. III	1.074	.167	.010	.033	.032	.077	.083	.016			.006	.002	—			
32	71.23	14.61	0.93	1.66	1.01	3.29	4.00	1.92	0.55	0.17	0.34	0.14	0.08	ZrO_2 0.02 S trace BaO 0.08 SrO 0.02 Li_2O trace	100.05	
A1. I	1.187	.143	.006	.023	.025	.059	.065	.020			.004	.001	.001			
33	70.33	15.74	1.43	0.83	0.53	3.38	4.33	1.87	1.16	0.20	0.27	0.06	trace	CO_2 trace ZrO_2 none S trace BaO 0.09 SrO trace	100.22	
A1. I	1.172	.154	.009	.011	.013	.061	.069	.020			.003	—	—			
34	60.88	17.71	2.92	2.17	2.21	4.32	4.17	2.68	1.47	0.54	0.41	0.16	trace	CO_2 none S trace Cr_2O_3 none BaO 0.06 SrO trace	99.70	
A1. I	1.015	.174	.018	.031	.055	.077	.068	.029			.005	.001	—			
35	68.12	16.24	1.26	2.08	1.35	3.80	3.89	2.54	0.40		0.25	0.14	0.10	Cr_2O_3 none BaO 0.09 SrO 0.02 Li_2O trace	100.28	
A1. I	1.135	.159	.008	.030	.034	.068	.063	.027			.003	.001	.001			
36	68.10	15.18	1.34	1.70	2.06	4.66	3.71	1.48	0.55		0.35	0.18	0.20	BaO 0.06	99.57	
A2. II	1.135	.149	.008	.024	.052	.088	.059	.016			.004	.001	.003			
37	64.52	18.31	0.90	2.51	2.35	5.11	4.64	1.25	0.20						99.79	
A3. III	1.075	.179	.006	.035	.059	.091	.075	.014								
38	64.48	19.28	1.40	1.78	1.64	5.06	4.41	1.12	0.06						99.23	
B3. IV	1.075	.189	.009	.025	.041	.090	.071	.012								
39	64.24	18.67	1.40	1.96	1.48	4.11	4.14	1.71	1.18		0.76	0.08	trace	SO_3 0.22 Cl 0.25	100.20	
A2. II	1.071	.183	.009	.028	.037	.073	.067	.018			.009	—	—			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 4. DOSODIC. YELLOWSTONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
24	I″.4″.3.(3)4.	Q 15.84 hy 2.80 or 17.79 mt 3.94 ab 28.82 hm 0.48 an 24.19 ap 0.67 C 3.47	Table Mountain, Denver, Colorado.	L. G. Eakins.	W. Cross, Proc. Colo. Sci. Soc., I, p. 72, 1886.	Andesite.	In W. T., p. 189.
25	I(II).4.(2)3.4.	Q 18.90 di 3.37 or 15.01 hy 4.35 ab 35.63 mt 2.78 an 17.51 il 0.91 ap 0.34	Near Troy, Ray District, Arizona.	R. C. Wells.	F. L. Ransome, U. S. G. S. rec. lab.	Granodiorite.	
26	I(II).4″.(2)3.4.	Q 15.54 hy 3.70 or 12.79 mt 3.02 ab 41.39 il 1.22 an 18.90 hm 0.64 C 0.20 ap 0.67	Ortiz Mountains, n. Albuquerque, New Mexico.	M. W. Adams.	I. H. Ogilvie, J. G., XVI, p. 232, 1908.	Dacite.	
27	I(II).4″.3.4.	Q 15.06 hy 4.19 or 12.79 mt 3.71 ab 39.82 il 1.22 an 21.68 ap 0.67	Ortiz Mountains, n. Albuquerque, New Mexico.	M. W. Adams.	I. H. Ogilvie, J. G., XVI, p. 232, 1908.	Dacite.	
28	I″.4.3.″4.	Q 26.70 hy 5.94 or 15.01 mt 1.62 ab 29.34 il 0.46 an 20.02	Osoyoos Batholith, Okanagan Range, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38, (1), p. 449, 1912.	Granite.	
29	I(II).4.3.4(5).	Q 18.60 hy 7.59 or 6.67 mt 2.32 ab 38.77 il 0.91 an 22.80 ap 0.67 C 0.51	Remmel Batholith, Okanagan Range, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38, (1), p. 444, 1912.	Diorite.	
30	I″.4.(2)3.″4.	Q 21.72 di 0.68 or 16.68 hy 4.16 ab 34.58 mt 3.02 an 17.51 il 0.76 ap 0.34	Similkameen Batholith, Okanagan Range, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38, (1), p. 456, 1912.	Granodiorite.	
31	I(II).4.″3.4″.	Q 17.58 di 0.46 or 8.90 hy 5.21 ab 43.49 mt 2.32 an 18.90 il 0.91 ap 0.67	Siwash Creek, Tulameen District, British Columbia.	M. F. Connor.	C. Camsell, Can. G. S. Mem. 26, p. 77, 1913.	Granodiorite.	
32	I″.″4.(2)3.4.	Q 31.56 hy 4.46 or 11.12 mt 1.39 ab 34.06 il 0.61 an 15.57 ap 0.34 C 0.20	Bald Mountain, n. Sumpter, Oregon.	W. F. Hillebrand.	W. Lindgren, U. S. G. S. A. R. 22, II, p. 587, 1901.	Granodiorite.	
33	I.″4.″3.4.	Q 30.18 hy 1.30 or 11.12 mt 2.09 ab 36.15 il 0.46 an 16.96 C 0.41	Boulder Creek, Port Orford quadrangle, Oregon.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. Fol. 89, p. 4, 1903.	Dacite porphyry.	
34	I(II).4″.″3.4.	Q 13.32 hy 6.56 or 16.12 mt 4.18 ab 35.63 il 0.76 an 20.57 ap 0.34 C 0.31	Brush Creek, n. Bald Mountain Port Orford quadrangle, Oregon.	H. N. Stokes.	J. S. Diller, U. S. G. S. Fol. 89, p. 4, 1903.	Gabbro.	
35	I″.4.″3.4.	Q 25.74 hy 6.04 or 14.01 mt 1.86 ab 33.01 il 0.46 an 18.35 ap 0.34 C 0.31	Crater Peak, Shasta County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 17, I, p. 731, 1896.	Andesite.	Also in J. G., III, p. 407, 1895. In W. T., p. 189.
36	I(II).″4.3.4.	Q 27.84 di 1.36 or 8.90 hy 6.52 ab 30.92 mt 1.86 an 20.57 il 0.61 ap 0.34	Ono, Shasta County, California.	T. M. Chatard.	J. S. Diller, U. S. G. S. B. 148, p. 191, 1897.	Diorite.	In W. T., p. 189.
37	I(II).4.3.4″.	Q 16.26 hy 9.73 or 7.78 mt 1.39 ab 39.30 an 25.30	West base of Mount Shasta, California.	W. H. Melville.	J. S. Diller, U. S. G. S. B. 150, p. 228, 1898.	Hypersthene andesite.	In W. T., p. 189.
38	I″.4.3.4(5).	Q 20.40 hy 6.21 or 6.67 mt 2.09 ab 37.20 an 25.03 C 1.63	Black Butte, Mount Shasta, California.	W. H. Melville.	J. S. Diller, U. S. G. S. B. 150, p. 223, 1898.	Hornblende andesite.	In W. T., p. 189.
39	I″.4.3.4.	Q 22.08 hy 5.02 or 10.01 mt 2.09 ab 35.11 il 1.37 an 20.29 C 2.55	Clear Creek, Shasta County, California.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. B. 150, p. 236, 1898.	Dacite porphyry.	In W. T., p. 189.

CLASS I. PERSALANE—Continued.

RANG 3. ALKALICALCIC. COLORADASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
40	63.81	17.07	2.11	2.15	2.28	4.97	4.08	1.96	1.03		0.38	0.10	0.09	BaO 0.04 SrO 0.03 Li_2O trace	100.10	
A1. I	1.064	.167	.013	.030	.047	.089	.066	.021			.005	.001	.001			
41	67.33	15.93	1.90	1.59	1.63	4.09	3.76	2.46	0.66	0.19	0.36	0.11	0.09	BaO 0.08 SrO trace Li_2O trace	100.18	
A1. I	1.122	.156	.012	.022	.041	.073	.061	.027			.005	.001	.001			
42	66.94	16.49	1.41	1.87	1.98	4.77	3.88	1.65	0.22	0.35	0.30	0.12	0.13	BaO 0.07 SrO 0.05 Li_2O trace	100.23	
A1. I	1.116	.161	.009	.027	.050	.086	.063	.018			.004	.001	.002			
43	66.65	17.61	0.93	1.67	1.26	4.44	4.59	1.70	0.41	0.03	0.33	0.18	0.07	BaO 0.12 SrO trace Li_2O trace	99.99	
A1. I	1.111	.172	.006	.024	.032	.079	.074	.018			.004	.001	.001			
44	66.65	16.15	1.52	2.36	1.74	4.53	3.40	2.65	0.72	0.18	0.38	0.10	0.10	FeS_2 0.02 BaO 0.07 SrO trace Li_2O trace	100.57	
A1. I	1.111	.168	.009	.033	.044	.080	.055	.029			.005	.001	.001			
45	65.43	17.11	2.39	1.19	1.48	3.88	3.66	2.83	0.36	0.20	0.83	trace	0.70	NiO 0.20	100.26	
A2. II	1.091	.168	.015	.017	.037	.070	.059	.030			.010	—	.010			
46	63.86	16.07	1.56	2.31	2.11	4.94	3.59	1.91	0.81	1.47	0.45	0.12	0.05	ZrO_2 0.04 S 0.84 BaO 0.03 Li_2O trace	100.16	
A1. I	1.064	.157	.010	.032	.053	.088	.058	.020			.006	.001	—			
47	63.12	16.13	3.53	3.65	1.86	5.04	2.78	1.08	0.93	0.97	trace	0.39	0.38	SrO 0.03	99.89	
A2. II	1.052	.158	.022	.051	.047	.090	.045	.012			—	.003	.005			
48	63.30	17.81	3.42	0.83	2.07	5.12	4.27	2.26	0.88					Li_2O trace	99.96	
A3. III	1.055	.175	.021	.011	.052	.091	.069	.024								
49	66.02	17.06	2.14	3.01	1.97	4.64	3.98	1.44	0.36		0.05				100.67	2.544
A3. III	1.100	.167	.013	.042	.049	.083	.065	.015			—					
50	65.10	16.16	3.28	0.90	1.82	4.30	3.35	2.40	2.58			0.30			100.19	2.574
A3. III	1.085	.158	.020	.012	.046	.077	.054	.025				.002				
51	68.50	16.00	2.94	n. d.	1.54	3.84	3.68	1.76	1.40	0.28			trace		99.94	
A4. IV	1.142	.157	.018	(.036)	.036	.069	.060	.019					—			
52	59.38	19.86	3.84	2.17	1.18	5.80	4.92	1.15	0.73	0.36	0.49	0.18	trace	CO_2 none SO_3 0.27 Cr_2O_3 trace BaO trace	100.33	
A2. II	.990	.195	.024	.030	.030	.104	.079	.012			.006	.001	—			
53	65.17	15.22	2.08	3.98	1.19	3.79	3.71	1.52	2.57		0.96			CO_2 0.32 SO_3 none	100.57	
A3. III	1.086	.149	.013	.056	.030	.068	.060	.016			.012					
54	69.90	14.16	2.98	1.08	1.38	4.30	3.20	1.95	1.08		0.83	trace			100.86	
A3. III	1.165	.139	.019	.015	.035	.077	.052	.021			.010	—				

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 4. DOSODIC. YELLOWSTONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
40	I(II).4.3.4.	Q 18.96 di 1.36 or 11.68 hy 5.75 ab 34.58 mt 3.02 an 22.24 il 0.76 ap 0.34	Mill Creek, Shasta County, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 148, p. 194, 1897.	Dacite.	In W. T., p. 189.
41	I''.4.''3.4.	Q 24.54 di 0.43 or 15.01 hy 4.69 ab 31.96 mt 2.78 an 18.90 il 0.76 ap 0.34	Mount Ingalls, Plumas County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 17, I, p. 724, 1896.	Granodiorite.	Also in J. G., III, p. 403. 1895. In W. T., p. 189.
42	I(II).4.3.4.	Q 23.46 di 0.65 or 10.01 hy 6.81 ab 33.01 mt 2.09 an 22.24 il 0.61 ap 0.34	Goodyears Bar, Sierra County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 17, I, p. 731, 1896.	Hypersthene andesite.	Also in J. G., III, p. 407, 1895. In W. T., p. 189.
43	I''.4.3.4.	Q 21.24 hy 5.18 or 10.01 mt 1.39 ab 38.78 il 0.61 an 21.13 ap 0.34 C 0.41	Indian Valley, Sierra County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 17, I, p. 724, 1896.	Quartz diorite porphyry.	Also in J. G., III, p. 403, 1895. In W. T., p. 189.
44	I''.4.3.(3)4.	Q 23.34 hy 7.04 or 16.12 mt 2.09 ab 28.82 il 0.76 an 21.41 ap 0.34 C 0.71	Nevada City, Nevada County, California.	W. F. Hillebrand.	W. Lindgren, U. S. G. S. A. R. 17, II, p. 38, 1896.	Granodiorite.	In W. T., p. 189.
45	I''.4.3.''4.	Q 22.68 hy 3.96 or 16.68 mt 3.48 ab 30.92 il 1.52 an 19.46 C 0.92	Clear Lake, California.	W. H. Melville.	G. F. Becker, U. S. G. S. Mon. 13, p. 154, 1888.	Andesite ("asperite").	In W. T., p. 189.
46	I(II).4.3.4.	Q 21.78 di 1.36 or 11.12 hy 6.75 ab 30.39 mt 2.32 an 21.96 il 0.91 ap 0.34	Sept. 14, 1914, Lassen Peak, California.	W. C. Wheeler.	J. S. Diller, U. S. G. S. rec. lab.	Ashes (andesite).	
47	I(II).(3)4.3''.4.	Q 28.14 hy 9.19 or 6.67 mt 5.10 ab 23.58 ap 1.01 an 22.24 C 2.14	Bodega Peninsula, Marin County, California.	V. C. Osmont.	V. C. Osmont, Un. Cal., Dep. G., B. IV, p. 47, 1904.	Quartz-biotite diorite.	
48	I(II).4''.3.4.	Q 16.38 di 2.16 or 13.34 hy 4.20 ab 36.16 mt 2.55 an 22.52 hm 1.60	Mount Rose, Washoe, Nevada.	R. W. Woodward.	G. F. Becker, U. S. G. S. Mon. 3, p. 152, 1882.	Andesite.	In W. T., p. 189.
49	I(II).4.3.4.	Q 22.56 hy 8.73 or 8.34 mt 3.02 ab 34.06 an 23.07	Cerro de Tlapacoya, Lake Chalco, Mexico.	A. Röhrig.	H. Lenk, Btr. G. Mex., II, p. 233, 1899.	Andesite.	In W. T., p. 189.
50	I(II).4.3.''4.	Q 25.50 hy 4.60 or 13.90 mt 2.78 ab 28.30 hm 1.28 an 19.46 ap 0.67 C 0.92	Near Tlaxiaco, Oaxaca, Mexico.	A. Röhrig.	H. Lenk, Btr. G. Mex., II, p. 132, 1899.	Trachyte.	In W. T., p. 189.
51	I''.4.3.4.	Q 27.48 hy 8.35 or 10.56 ab 31.44 an 19.18 C 0.92	Cerro Quemado Volcano, n. Quetzaltenango, Guatemala.	Börner.	A. Bergeat, N. J. Cb., 1903, p. 291.	Andesite pumice.	
52	I(II).4(5).3.4(5).	Q 12.72 hy 3.00 or 6.67 mt 5.57 ab 41.39 il 0.91 an 28.08 ap 0.34 C 0.31	Eruption of October, 1902, Santa Maria Volcano, Guatemala.	E. T. Allen.	U. S. G. S. B. 228, p. 273, 1904.	Volcanic dust (andesite).	
53	I(II).4.3.4.	Q 25.98 hy 7.09 or 8.90 mt 3.02 ab 31.44 il 1.82 an 18.90 C 0.51	Panama, Canal Zone.	R. C. Wells.	D. F. McDonald, U. S. G. S. rec. lab.	Andesite breccia.	
54	I(II).(3)4.3.4.	Q 32.94 di 2.38 or 11.68 hy 2.40 ab 27.25 mt 1.16 an 18.35 il 1.52 hm 2.24	Serro Colorado, Aruba Island, West Indies.	Perlstein.	J. H. Kloos, Samml. G. R. Mus. Leiden, I, p. 19, 1887.	Quartz diorite.	In W. T., p. 191.

CLASS I. PERSALANE—Continued.

RANG 3. ALKALICALCIC. COLORADASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
55	66.28	16.23	2.71	1.62	1.03	4.03	3.36	1.60	2.65						99.51	2.61
A3. III	1.105	.159	.017	.022	.026	.071	.054	.017								
56	66.20	17.58	1.56	2.47	1.80	5.80	3.48	1.40	0.37		0.38				101.04	
B3. IV	1.103	.172	.010	.035	.045	.104	.056	.015			.005					
57	63.70	18.18	2.56	2.33	2.28	5.11	3.47	1.11	0.31		0.31	0.13			99.49	
A2. II	1.062	.178	.016	.032	.057	.091	.056	.012			.004	.001				
58	61.25	19.50	2.40	2.05	0.93	5.82	3.72	1.75	1.82		0.33	0.19			99.76	
A2. II	1.021	.191	.015	.029	.023	.104	.060	.019			.004	.001				
59	67.40	19.06	0.71	1.31	1.90	4.30	3.16	1.52	0.30		0.34	0.02	0.06	CO_2 0.32 FeS_2 trace CuS trace	100.40	
A2. II	1.123	.187	.004	.018	.048	.077	.051	.016			.004	—	—			
60	65.88	15.61	2.42	2.71	1.76	3.70	3.92	2.29	1.05		0.43	0.13	0.08	CO_2 trace ZrO_2 trace Cl 0.02 FeS_2 trace CoO none BaO none CuO trace Pb none	100.00	
A1. I	1.098	.153	.015	.038	.044	.066	.063	.024			.005	.001	.001			
61	62.95	20.81	1.73	0.39	2.66	3.75	4.15	3.46	0.20		trace	0.09	none	CO_2 0.02 S trace	100.22	
A3. III	1.049	.204	.011	.005	.067	.067	.067	.037			—	—	—			
62	68.41	16.08	2.12	1.44	1.14	3.52	4.52	2.24	0.33						99.84	
A3. III	1.140	.157	.013	.020	.029	.062	.072	.020								
63	67.30	17.55	1.47	1.67	1.04	3.48	3.90	2.13	0.80			0.13			99.47	
A3. III	1.122	.172	.009	.024	.026	.063	.063	.022				.001				
64	63.19	18.65	4.01	1.89	1.20	4.86	3.69	1.95	0.07		0.18	0.25	0.13		100.07	
A2. II	1.053	.183	.025	.027	.030	.088	.059	.021			.002	.002	.002			
65	63.18	19.79	1.10	3.23	1.51	4.04	5.12	2.42	0.62						101.01	
B3. IV	1.053	.194	.007	.044	.035	.072	.082	.026								
66	60.71	18.53	2.02	2.16	1.26	5.66	4.82	1.93	2.45		0.77	0.22	trace	Cl trace S trace SrO trace	100.53	2.702
A2. II	1.012	.182	.013	.030	.032	.101	.077	.020			.019	.002	—			
67	65.7	17.2	1.0	2.8	1.6	4.7	3.4	2.5	0.9						99.8	
B3. IV	1.095	.169	.006	.039	.040	.084	.055	.027								
68	66.88	15.69	0.80	2.94	1.17	3.80	3.79	2.80	1.47		0.50	0.15	0.06	S 0.02	100.07	2.70
A2. II	1.115	.154	.005	.041	.029	.068	.061	.030			.006	.001	—			
69	66.64	17.02	0.67	2.55	2.24	3.55	3.88	2.06	0.44		0.88	0.06	trace	CO_2 0.03 Li_2O trace	100.02	
A2. II	1.111	.167	.004	.036	.056	.064	.063	.022			.011	—	—			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 4. DOSODIC. YELLOWSTONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
55	I″ (3)4.3.4.	Q 30.36 hy 3.26 or 9.45 mt 3.94 ab 28.30 an 19.74 C 1.73	Gustavia, St. Barthelemy, West Indies.	P. T. Cleve.	P. T. Cleve, Sver. Vets. Ak. Hndl., IX, No. 12, p. 35, 1871.	Syenite porphyry.	Cf. A. G. Högbom, B. G. Inst., Ups., VI, p. 230, (1903), 1905.
56	I(II).4.3″.4.	Q 24.42 di 0.68 or 8.34 hy 6.81 ab 29.34 mt 2.32 an 28.08 il 0.76	Eruption of Aug. 30, 1902, Mont Pelée, Martinique.	Pisani.	A. Lacroix, Mont Pelée, p. 531, 1904.	Andesite ash.	Collected on Guadeloupe.
57	I″.4.3″.4″.	Q 24.54 hy 7.28 or 6.67 mt 3.71 ab 29.34 il 0.61 an 24.46 ap 0.34 C 2.24	Eruption of Jan. 25, 1903, Mont Pelée, Martinique.	Pisani.	A. Lacroix, Mont Pelée, p. 531, 1904.	Andesite ash.	
58	I″.4.3.4.	Q 18.72 hy 3.62 or 10.56 mt 3.48 ab 31.44 il 0.61 an 28.08 ap 0.34 C 1.12	Parnasse, Martinique, West Indies.	Pisani.	A. Lacroix, Mont Pelée, p. 573, 1904.	Hypersthene andesite.	
59	I″.(3)4.3.4.	Q 30.48 hy 6.25 or 8.90 mt 0.93 ab 26.72 il 0.61 an 21.41 C 4.49	Essequibo River, (average sample), British Guiana.	J. B. Harrison.	J. B. Harrison, Rep. G. Ess. Riv., p. 34, 1900.	Granitite gneiss.	Also in G. Goldf. Br. Gui., p. 39, 1908. In W. T., p. 191.
60	I(II).4.″3.4.	Q 23.22 hy 6.91 or 13.34 mt 3.48 ab 33.01 il 0.76 an 17.51 ap 0.34 C 0.31	Mazaruni District, British Guiana.	J. B. Harrison.	J. B. Harrison, G. Goldf. Br. Gui., p. 60, 1908.	Granitite.	In W. T., p. 191.
61	I″.4″.(2)3.(3)4.	Q 13.44 hy 6.70 or 20.57 mt 1.16 ab 35.11 hm 0.96 an 18.63 C 3.37	Sericambra, Demerara River, British Guiana.	J. B. Harrison.	J. B. Harrison, G. Goldf. Br. Gui., p. 77, 1908.	Syenite.	In W. T., p. 191.
62	I″.4.(2)3.4.	Q 24.60 hy 3.82 or 12.79 mt 3.02 ab 37.73 an 17.44	Paramo, Azufral de Tuquerres, Colombia.	R. Küch.	R. Küch, G. Stud. Colomb., I, p. 159, 1892.	Dacite.	In W. T., p. 191.
63	I″.4.″3.4.	Q 27.06 hy 4.58 or 12.23 mt 2.09 ab 33.01 ap 0.34 an 16.68 C 2.75	Paramo, Azufral de Tuquerres, Colombia.	R. Küch.	R. Küch, G. Stud. Colomb., I, p. 155, 1892.	Dacite.	In W. T., p. 191.
64	I(II).4.3.4.	Q 22.74 hy 3.26 or 11.68 mt 5.80 ab 30.92 il 0.30 an 22.52 ap 0.67 C 2.14	Monte Tajumbina, Peru.	C. Hoepfner.	C. Hoepfner, In. Diss. Halle, p. 32, 1881.	Dacite.	In W. T., p. 191.
65	I(II).4(5).(2)3.4.	Q 11.34 hy 8.38 or 14.46 mt 1.62 ab 42.97 an 20.02 C 1.43	Gualilan, San Juan Province, Argentina.	B. Wetzig.	A. Stelzner, Btr. G. Arg. Rep., I, p. 186, 1885.	Dacite.	In W. T., p. 191.
66	I(II).4(5).3.4.	Q 13.14 di 1.94 or 11.12 hy 2.30 ab 40.35 mt 2.55 an 23.63 il 2.89 hm 0.32	Rio Blanco, Rioja, Argentina.	P. Jannasch.	F. Tannhäuser, N. J. B. B., XXII, p. 613, 1906.	Diorite porphyrite.	
67	I(II).4.3.″4.	Q 21.72 hy 8.36 or 15.01 mt 1.39 ab 28.82 an 23.35 C 0.31	Vallée de Brousset, Pic du Midi d'Ossan, Pyrenees.	Not stated.	J. de Lapparent, B. Soc. Min. Fr., XXXIV, p. 292, 1911.	Quartz microdiorite.	
68	I(II).4.″3.″4.	Q 22.74 hy 6.99 or 16.68 mt 1.16 ab 31.96 il 0.91 an 18.07 ap 0.34	Langfirsan, Sala, Sweden.	G. Nyblom.	H. S. Sjögren, G. F. F., XXXII, p. 1371, 1910.	Porphyrite.	
69	I(II).4.″3.4.	Q 23.76 hy 8.37 or 12.23 mt 0.93 ab 33.01 il 1.67 an 17.79 C 1.84	Appmannsberg, Bayrischer Wald, Bavaria.	A. Schwager.	Oebbeke and Schwager, Geogn. Jhft., XIV, p. 249, 1901.	Granite-diorite.	

CLASS I. PERSALANE—Continued.

RANG 3. ALKALICALCIC. COLORADASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
70	64.78	17.45	1.53	2.35	2.04	4.07	3.12	1.83	1.97		1.07		0.03	S 0.13	100.37	
A2. II	1.080	.171	.009	.033	.051	.073	.050	.019			.013		—			
71	61.93	18.83	3.24	1.24	2.37	4.46	4.16	2.76	1.83						100.78	2.62
A3. III	1.032	.185	.020	.017	.059	.080	.067	.030								
72	59.44	18.97	5.25	1.72	0.85	6.85	3.08	2.46	1.22						99.84	2.65
A3. III	.991	.186	.033	.024	.021	.122	.050	.027								
73	68.91	14.70	0.87	1.35	1.61	2.99	3.65	2.80	1.03	0.60	trace		0.87		99.39	2.67
B3. IV	1.149	.144	.005	.019	.040	.054	.059	.030			—		.012			
74	70.02	16.52	0.41	2.69	1.04	3.86	3.49	1.78	0.41		trace	0.47	trace	S 0.03	100.82	
B3. IV	1.167	.162	.003	.038	.026	.069	.056	.019			—	.003	—			
75	64.85	16.67	2.81	1.96	1.87	4.51	3.79	2.75	0.52		0.34	trace			100.07	
A3. III	1.081	.163	.018	.027	.047	.080	.061	.029			.004	—				
76	67.10	15.87	1.67	1.98	1.32	3.12	3.90	2.04	1.66		0.59	0.21	0.14	F 0.20 BaO 0.06 Li_2O 0.03	99.89	
A1. I	1.118	.156	.010	.028	.033	.055	.063	.021			.007	.001	.002			
77	61.59	18.91	1.57	2.44	1.61	5.06	4.46	1.87	1.25		1.18	0.22	0.16	BaO 0.09 Li_2O 0.01	100.42	
A2. II	1.027	.185	.010	.034	.040	.090	.072	.020			.015	.002	.002			
78	68.83	16.45	0.92	2.16	0.96	3.08	3.36	2.12	1.70					S 0.05	100.36	
A3. III	1.147	.161	.006	.030	.024	.055	.054	.022								
79	65.44	17.73	1.17	3.45	1.45	3.99	3.58	2.17	1.18		0.39		0.18		100.73	
A2. II	1.091	.174	.008	.048	.036	.071	.058	.023			.005		.003			
80	63.62	17.72	3.24	3.40	1.49	4.83	2.29	1.99	1.09						99.67	
A3. III	1.060	.174	.020	.048	.037	.086	.037	.021								
81	66.35	17.47	0.33	3.23	1.03	4.18	3.80	3.41	0.31		0.66				100.77	
A3. III	1.106	.171	.002	.044	.026	.075	.061	.036			.008					
82	60.14	16.65	2.94	2.39	1.16	5.21	3.41	2.51	3.98	0.54	0.62	0.07	0.06		99.68	
A2. II	1.002	.163	.018	.033	.029	.093	.055	.027			.008	.001	—			
83	67.98	14.39	3.73	0.62	1.58	2.86	3.58	1.86	1.74			0.07	1.19	SO_3 none NiO none CuO 0.04	99.64	
A2. II	1.133	.141	.023	.009	.040	.051	.058	.020				—	.017			
84	63.97	19.12	2.42	1.93	1.05	4.55	4.21	1.89	0.46						99.60	
A3. III	1.066	.187	.015	.026	.026	.081	.068	.020								
85	67.34	15.96	3.38	0.80	0.88	2.98	4.12	1.66	2.20		0.56				99.78	2.462
A3. III	1.122	.156	.021	.011	.022	.053	.066	.018			.007					

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 4. DOSODIC. YELLOWSTONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
70	I(II).″4.3.4.	Q 28.08 or 10.56 ab 26.20 an 20.29 C 2.96 hy 6.55 mt 2.09 il 1.98	Hauzenberg, Bayrischer Wald, Bavaria.	G. Vervnert.	A. Frentzel, Geogn. Jhft., XXIV, p. 166, 1911.	Diorite porphyrite.	
71	I(II).4″.3.4.	Q 13.86 or 16.68 ab 35.11 an 22.24 C 0.82 hy 5.90 mt 3.94 hm 0.48	Kesselsdorf, Saxony.	W. Bruhns.	W. Bruhns, Z. D. G. G., XXXVIII, p. 750, 1886.	Porphyry.	In W. T., p. 191.
72	I(II).4.3″.(3)4.	Q 16.62 or 15.01 ab 26.20 an 30.30 di 2.81 hy 0.80 mt 5.57 hm 1.44	Kaufbach, Saxony.	W. Bruhns.	W. Bruhns, Z. D. G. G., XXXVIII, p. 754, 1886.	Porphyrite.	In W. T., p. 191.
73	I″.4.(2)3.″4.	Q 26.46 or 16.68 ab 30.92 an 15.01 hy 7.43 mt 1.16	Bohuliby, Eule, Bohemia.	H. L. Barvir.	H. L. Barvir, Ref. N. J., 1904, I, p. 49.	Porphyry.	
74	I″.(3)4.3.4.	Q 32.28 or 10.56 ab 29.34 an 16.40 C 2.86 hy 7.22 mt 0.70 ap 1.01	Dutsch-Branitz, Brünn, Moravia.	C. von John.	von John and Suess, Jb. G. R.-A., Wien, LVIII, (1), p. 249, 1908.	Granitite.	
75	I(II).4.3.″4.	Q 20.16 or 10.12 ab 31.96 an 20.29 di 1.54 hy 4.63 mt 4.18 il 0.61	Vaskö, Com. Krasso-Szoreny, Hungary.	K. Emszt.	Rozlozsnik and Emszt, Mt. Ung. G. A., XVI, p. 187, 1908.	Banatite.	
76	I″.″4.(2)3.4.	Q 27.84 or 11.68 ab 33.01 an 14.46 C 2.04 hy 5.02 mt 2.32 il 1.06 ap 0.34	Mount Goryczkowy, Posredni, Tatra Mountains, Hungary.	Z. Weyberg.	Z. Weyberg, Ref. N. J., 1912, I, p. 398.	Granite.	
77	I(II).4″.3.4.	Q 15.48 or 11.12 ab 37.73 an 23.07 C 1.02 hy 5.45 mt 2.32 il 2.28 ap 0.67	Suchy Kondracki, Tatra Mountains, Hungary.	Z. Weyberg.	Z. Weyberg, Ref. N. J., 1912, I, p. 398.	Granitite.	
78	I″.(3)4.″3.4.	Q 31.98 or 12.23 ab 28.30 an 15.29 C 3.06 hy 5.57 mt 1.39	Koflraster Alp, Ultenthal, Tyrol.	C. von John.	W. Hammer, Jb. G. R.-A., Wien, LIII, p. 79, 1904.	Quartz porphyrite.	
79	I(II).4.3.4.	Q 23.34 or 12.79 ab 30.39 an 19.74 C 2.24 hy 8.62 mt 1.86 il 0.76	Adamello, Tyrol.	Z. Weyberg.	Z. Weyberg, Ref. N. J., 1912, I, p. 398.	Tonalite.	
80	I(II).″4.3(4).(3)4.	Q 28.38 or 11.68 ab 19.39 an 23.91 C 3.06 hy 7.40 mt 4.64	Monte Colmo, Adamello, Tyrol.	C. Riva.	C. Riva, Ref. N. J., 1897, II, p. 65.	Quartz porphyrite.	In W. T., p. 191.
81	I″.4.″3.(3)4.	Q 18.90 or 20.02 ab 31.96 an 20.57 di 0.25 hy 6.96 mt 0.46 il 1.22	Nuoro, Sardinia.	C. Riva.	C. Riva, Att. Ac. Sc. Nap., (2), XII, No. 9, p. 28, 1905.	Granitite.	
82	I(II).4.3.″4.	Q 18.12 or 15.01 ab 28.82 an 22.52 di 2.00 hy 2.99 mt 4.18 il 1.22 ap 0.34	Monte Furru, n. Bosa, Sardinia.	H. S. Washington.	H. S. Washington, A. J. S., XXXVI, p. 587, 1913.	Vitroandesite.	Not described.
83	I(II).(3)4.(2)3.4.	Q 31.20 or 11.12 ab 30.39 an 14.18 C 1.22 hy 4.40 mt 5.34	Werkh Issetsk, Mursinsky, Ural Mountains.	G. Katerfeld.	W. Nikitin, Mem. Com. G. Russ., XXII, p. 95, 1907.	Granite.	MnO high.
84	I″.4.3.4.	Q 20.34 or 11.12 ab 35.63 an 22.52 C 1.84 hy 4.05 mt 3.48	Dewdorak Glacier, Kasbek, Caucasus.	Sewastjanow.	F. L.-Lessing, Mat. G. Russ., XXI, p. 107, 1901.	Andesite-dacite.	
85	I″.″4.(2)3.4.	Q 29.40 or 10.01 ab 34.58 an 14.73 C 1.94 hy 2.20 mt 0.93 il 1.06 hm 2.72	Kolantziki, Megara, Greece.	A. Röhrig.	H. S. Washington, J. G., III, p. 150, 1895.	Dacite.	In W. T., p. 191.

CLASS I. PERSALANE—Continued.

RANG 3. ALKALICALCIC. COLORADASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
86	64.83	17.60	4.95	1.82	1.61	5.26	2.52	1.53	0.20		0.08				100.40	2.539
A3. III	1.081	.172	.031	.025	.040	.094	.041	.016			.001					
87	67.27	16.31	3.13	1.15	0.84	3.48	3.61	2.91	1.16		0.40				100.26	
A3. III	1.121	.160	.019	.016	.021	.063	.058	.031			.005					
88	68.61	16.08	1.03	1.60	1.00	3.48	3.62	3.07	0.18	0.31	0.59	0.20			99.77	
A2. II	1.144	.158	.006	.022	.025	.063	.058	.033			.007	.001				
89	65.52	17.17	4.16	0.12	1.18	3.52	3.32	2.23	2.66				0.13		100.01	2.59
A3. III	1.092	.168	.026	.002	.030	.063	.054	.024					.002			
90	62.80	20.42	3.99	0.45	1.86	4.04	3.78	1.82	0.52				0.17		99.85	2.63
A3. III	1.047	.200	.025	.007	.047	.072	.061	.020					.002			
91	66.30	15.07	0.54	3.26	0.75	3.10	4.14	2.28	4.56						100.00	
A3. III	1.105	.148	.003	.045	.019	.055	.067	.024								
92	64.96	19.12	0.60	2.69	0.81	5.10	4.72	1.48	1.58						101.06	
B3. IV	1.083	.187	.004	.038	.020	.091	.076	.016								
93	62.80	16.70	2.13	4.11	0.84	4.98	2.95	1.22	4.42						100.25	
A3. III	1.047	.164	.013	.057	.021	.089	.048	.013								
94	64.38	16.96	1.72	3.22	1.27	5.20	3.28	1.60	1.52		0.51	trace	0.24	S 0.03	99.93	
A2. II	1.073	.166	.011	.044	.032	.093	.053	.017			.006	——	.003			
95	66.16	15.39	1.25	1.72	0.90	3.47	3.94	2.00	4.94		0.50				100.27	
A3. III	1.103	.151	.008	.024	.023	.063	.064	.021			.006					
96	65.72	15.06	1.35	1.80	1.57	4.18	4.24	1.07	3.77	0.69	0.69				99.93	
A3. III	1.095	.147	.009	.011	.039	.075	.068	.011			.009					
97	62.6	19.5	4.0	0.3	1.4	4.5	3.9	2.4	0.9						99.5	
B3. IV	1.043	.191	.025	.004	.035	.080	.063	.025								
98	69.4	15.9	1.2	2.2	1.1	3.4	4.2	2.3	1.0						100.7	
B3. IV	1.157	.156	.008	.031	.028	.061	.068	.024								
99	68.51	15.96	2.61	1.09	1.07	3.14	4.01	1.82	n. d.		0.82		0.28	Sol. salts 1.34	100.65	2.329
A2. II	1.142	.156	.016	.015	.027	.056	.064	.020			.010		.004			
100.	65.04	14.01	4.47	2.82	1.20	3.34	4.23	0.97	2.74		0.62				99.44	
A3. III	1.084	.137	.028	.039	.030	.060	.068	.010			.008					

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 4. DOSODIC. YELLOWSTONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
86	I.(3)4.3(4).4.	Q 30.66 hy 4.00 or 8.90 mt 5.57 ab 21.48 il 0.15 an 26.13 hm 1.12 C 2.12	Panagia, Methana, Greece.	A. Röhrig.	H. S. Washington, J. G., III, p. 150, 1895.	Dacite.	In W. T., p. 191.
87	I''.4.''3.''4.	Q 26.40 hy 2.10 or 17.24 mt 2.55 ab 30.39 il 0.76 an 17.51 hm 1.28 C 0.82	Island of Cos, Aegean Sea.	F. Millosevich.	F. Millosevich, Rend. Ac. Linc., XXI, p. 310, 1912.	Dacite.	
88	I''.4.(2)3.(3)4.	Q 26.46 hy 4.08 or 18.35 mt 1.39 ab 30.39 il 1.06 an 16.68 ap 0.34 C 0.71	Andriantana, Madagascar.	Not stated.	A. Lacroix, pers. com., 1913.	Granite.	
89	I''.''4.3.4.	Q 28.08 hy 3.00 or 13.34 mt 0.93 ab 28.30 hm 3.52 an 17.51 C 2.75	Chrebet, Bjelyi Range, Kamchatka.	Not stated.	K. Bogdanovich, Pet. Mitth., L, p. 123, 1904.	Dacite.	
90	I''.4.3.4.	Q 22.20 hy 4.70 or 11.12 mt 2.09 ab 31.96 hm 2.56 an 20.02 C 4.79	Choa-schen Volcano, Kamchatka.	Not stated.	K. Bogdanovich, Pet. Mitth., L, p. 98, 1904.	Andesite	
91	I''.4.(2)3.4.	Q 23.28 hy 7.44 or 13.34 mt 0.70 ab 35.11 an 15.29 C 0.20	Utanobori, Kitami, Hokkaido, Japan.	Takaminé?	G. Soc. Jap., 1884.	Liparite.	
92	I''.4.3.4''.	Q 17.70 hy 6.49 or 8.90 mt 0.93 ab 39.82 an 25.30 C 0.41	Oshima, Hokkaido, Japan.	Takaminé?	G. Soc. Jap., 1884.	Dacite.	
93	I(II).''4.3''.4.	Q 26.28 hy 7.91 or 7.23 mt 3.02 ab 25.15 an 24.74 C 1.43	Komagatake, Oshima, Hokkaido, Japan.	Takaminé?	G. Soc. Jap., 1884.	Andesite pumice.	
94	I(II).4.3''.4.	Q 24.30 hy 7.16 or 9.45 mt 2.55 ab 27.77 il 0.91 an 25.85 C 0.31	Hakachi, Mihamamura, Izu, Japan.	T. Ohashi.	S. Kozu, pers. com., 1913.	Dacite.	
95	I''.4.''3.4.	Q 26.04 hy 3.62 or 11.68 mt 1.86 ab 33.54 il 0.91 an 17.15 C 0.31	Soengi Sebelit, n. Kebijan, Muller Mountains, Borneo.	M. Dittrich.	J. Schmutzer, Jh. K. Ac. Wet. Amst., 1908, p. 400.	Dacite.	
96	I''.4.3.4(5).	Q 26.34 di 1.51 or 6.12 hy 3.20 ab 35.63 mt 0.46 an 18.90 il 1.37 hm 1.12	Soengi Embahoe, n. Nangah Pemali, Muller Mountains, Borneo.	M. Dittrich.	J. Schmutzer, Jh. K. Ac. Wet. Amst., 1908, p. 406.	Dacite.	
97	I''.4.3.4.	Q 19.20 hy 3.50 or 13.90 mt 0.93 ab 33.01 hm 3.36 an 22.24 C 2.35	Sago Volcano, Sumatra.	H. Hoppe.	H. Hoppe, In. Diss. Bres., p. 25, 1903.	Andesite.	
98	I''.4.(2)3.4.	Q 25.92 hy 5.84 or 13.34 mt 1.86 ab 35.63 an 16.96 C 0.31	Eruption of 1883, Krakatoa.	T. H. Waller.	J. W. Judd, Rep. Erup. Krak. R. Soc., p. 38, 1888.	Andesite pumice.	Not in W. T.
99	I''.''4.(2)3.4.	Q 29.94 hy 2.70 or 11.12 mt 2.09 ab 33.54 il 1.52 an 15.57 hm 1.12 C 1.63	Eruption of 1883, Krakatoa.	C. Winkler.	R. D. M. Verbeek, Krakatau, p. 292, 1884.	Andesite pumice.	In W. T., p. 193.
100	I(II).''4.''3.4(5).	Q 27.84 di 0.22 or 5.56 hy 3.30 ab 35.63 mt 6.50 an 16.40 il 1.22	Eruption of 1883, Krakatoa.	A. Renard.	R. D. M. Verbeek, Krakatau (French ed.), p. 320, 1885.	(Andesite) Ash.	Not in W. T.

CLASS I. PERSALANE—Continued.

RANG 3. ALKALICALCIC. COLORADASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
101	64.19	17.18	4.08	1.58	2.10	4.95	3.65	1.07	1.81		0.60				100.39	2.64
A3. III	1.070	.168	.026	.010	.053	.089	.059	.011			.008					
102	65.80	16.87	3.97	1.08	1.76	3.16	2.54	1.05					trace		99.68	
A3. III	1.097	.165	.025	.015	.044	.056	.027						—			
103	67.56	16.39	1.25	1.86	1.48	5.08	3.54	1.77		0.17			0.79		99.89	2.678
A3. III	1.126	.160	.008	.026	.037	.091	.057	.020					.011			
104	65.55	16.77	2.24	1.58	2.57	2.90	3.58	1.96	1.28	0.55	0.69	0.06	0.06	CO_2 none SO_3 0.03	99.82	
A2. II	1.093	.164	.014	.022	.064	.052	.058	.021			.008	—	—			
105	60.65	19.55	2.39	1.16	1.16	7.40	4.27	1.98	0.87		0.35		0.08		99.86	
A2. II	1.011	.192	.015	.016	.029	.132	.069	.021			.004		.001			
106	66.39	17.62	1.01	2.21	1.32	3.79	4.49	2.13	0.39		0.33				99.68	
A3. III	1.107	.173	.006	.030	.033	.068	.073	.022			.004					

RANG 3. ALKALICALCIC. COLORADASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	65.02	18.37	1.21	2.06	1.49	6.20	3.96	0.64	0.42	0.09	0.33	0.14	0.09	CO_2 none BaO trace	100.02	
A2. II	1.084	.180	.008	.029	.037	.111	.064	.007			.004	.001	.001			
2	69.66	17.57	0.21	1.04	0.58	4.54	4.91	0.71	0.50	0.05	0.21	0.03	trace	CO_2 none FeS_2 trace NiO none BaO 0.03 SrO 0.05 Li_2O none	100.09	
A1. I	1.161	.172	.001	.014	.015	.081	.079	.008			.003	—	—			
3	68.14	17.00	2.84	0.22	1.07	3.83	4.94	0.83	1.06		0.52				100.45	
A3. III	1.136	.167	.018	.003	.027	.068	.080	.009			.007					
4	63.51	18.07	3.22	1.09	2.19	5.14	4.08	0.88	0.60	1.07	0.33	0.19	0.06	CO_2 none ZrO_2 none Cl 0.01 F none S 0.01 V_2O_3 trace BaO 0.03	100.48	2.52
A1. I	1.059	.177	.020	.015	.055	.092	.066	.009			.004	.001	—			
5	68.12	19.66	0.18	n. d.	none	4.67	6.38	0.69	0.29						99.99	2.61
A3. III	1.135	.193	.001	(.002)	—	.084	.103	.007								
6	70.96	16.64	0.22	1.48	1.29	3.46	4.59	0.24	0.68		0.38	0.01	0.10	CO_2 0.42 S trace	100.47	2.737
A2. II	1.178	.163	.001	.021	.032	.061	.074	.002			.005	—	.001			
7	64.28	15.47	3.04	3.51	trace	5.02	3.46	0.55	4.68						100.01	
A3. III	1.071	.152	.019	.049	—	.089	.056	.006								
8	68.11	15.77	0.11	2.99	1.75	3.79	4.58	0.76	0.86	0.11	0.74	0.28	0.16	CO_2 0.21 FeS_2 0.17	100.39	2.74
A2. II	1.135	.155	.001	.042	.044	.068	.074	.008			.009	.002	.002			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 4. DOSODIC. YELLOWSTONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
101	I(II).4.3.4″.	Q 25.14 hy 5.30 or 6.12 mt 0.46 ab 30.92 il 1.22 an 24.74 hm 3.84 C 0.92	Kampong Dijah, Sumbawa.	Tielmans.	G. Rack, N. J. B. B., XXXIV, p. 47, 1912.	Dacite.	
102	I(II).4.(2)3.″4.	Q 26.48 hy 4.40 or 15.01 mt 3.48 ab 29.34 hm 1.60 an 15.57 C 2.65	Healesville, Macedon, Victoria.	H. C. Jenkins.	J. W. Gregory, Pr. R. Soc. Vict., XIV, p. 201, 1902.	Dacite.	
103	I(II).4.3.4.	Q 25.44 di 1.83 or 11.12 hy 6.63 ab 29.87 mt 1.86 an 23.07	Moruya, New South Wales.	A. Liversidge.	A. Liversidge, J. R. Soc. N. S. W., XVI, p. 42, 1883.	Granite.	In W. T., p. 193.
104	I(II).″4.(2)3.4.	Q 27.06 hy 6.40 or 11.68 mt 3.25 ab 30.39 il 1.22 an 14.46 C 3.37	McMahon Creek, Maimai, Reefton District, New Zealand.	Not stated.	P. G. Morgan, pers. com.	Quartz porphyry.	
105	I(II).4(5).3.4.	Q 12.48 di 6.26 or 11.68 wo 0.12 ab 36.15 mt 3.02 an 28.36 il 0.61 hm 0.48	Paritutu, Taranaki, New Zealand.	J. S. Maclaurin.	E. D. Clarke, G. S. N. Z. B. 14, p. 23, 1912.	Andesite.	
106	I″.4.″3.4.	Q 20.88 hy 5.94 or 12.23 mt 1.39 ab 38.25 il 0.61 an 18.90 C 1.02	Sounding, Lat 70°S., Lon. 81° W(Paris), Antarctica.	Lassieur.	E. Gourdon, pers. com., 1913.	Quartz diorite.	Dredged block.

SUBRANG 5. PERSODIC. AMADOROSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I″.4.3(4).(4)5.	Q 23.22 hy 6.08 or 3.89 mt 1.86 ab 33.54 il 0.61 an 30.02 ap 0.34	Monson, Hampden County, Massachusetts.	W. F. Hillebrand.	T. N. Dale, U. S. G. S. B. 470, p. 259, 1911.	Monzonite gneiss.	
2	I.4.3.″5.	Q 27.12 hy 2.82 or 4.45 mt 0.23 ab 41.40 il 0.46 an 22.52 C 0.41	Tuolumne River, Amador County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 17, I, p. 702, 1896.	Quartz diorite aplite.	In W. T., p. 193.
3	I.4.″3.(4)5.	Q 26.34 hy 2.70 or 5.00 mt 0.93 ab 41.92 il 0.46 an 18.90 hm 2.24 C 1.02	Ventura quadrangle, California.	R. C. Wells.	J. A. Pemberton, U. S. G. S. rec. lab.	Igneous rock.	
4	I(II).4.3.(4)5.	Q 22.20 hy 5.50 or 5.00 mt 2.78 ab 34.58 il 0.61 an 25.58 hm 1.28 C 1.02 ap 0.34	Cocooi Island, Panama.	R. C. Wells.	R. D. McDonald, U. S. G. S. rec. lab.	Dacite porphyry.	
5	I.4″.″3.″5.	Q 18.42 hy 0.26 or 3.89 ab 53.97 an 23.07 C 0.10	Reef Island, East of Tortola, West Indies.	A. Bygden.	A. Bygden, B. G. Inst. Ups., VII, p. 9, (1905), 1906.	Oligoclase graphic granite.	
6	I″.(3)4.3.5.	Q 32.58 hy 5.18 or 1.11 mt 0.46 ab 38.78 il 0.76 an 16.96 C 2.65	Potaro River (average sample), British Guiana.	J. B. Harrison.	J. B. Harrison, Rep. G. Ess. Riv., p. 52, 1900.	Porphyrite.	Also in G. Goldf. Br. Gui., p. 61, 1908. In W. T., p. 193.
7	I″.″4.3″.(4)5.	Q 29.46 hy 3.96 or 3.34 mt 4.41 ab 29.34 an 24.74 C 0.10	Chibishinai, Kunishiri, Chishima, Japan.	Takaminé?	G. Soc. Jap., 1884.	Andesite.	
8	I(II).4.″3.(4)5.	Q 26.58 hy 8.89 or 4.45 mt 0.23 ab 38.77 il 1.37 an 16.96 ap 0.67 C 1.22	Ravensthorpe, Phillips River District, West Australia.	E. S. Simpson.	Simpson and Glanert, W. Aust. G. S. B. 35, p. 21, 1909.	Granite.	

CLASS I. PERSALANE—Continued.

RANG 4. DOCALCIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	60.10	18.93	4.15	2.70	1.77	6.94	3.32	1.01	0.62		0.54	0.16			99.96	
A2. II	1.002	.186	.026	.038	.044	.124	.053	.011			.007	.001				
2	61.97	18.98	4.19	2.29	1.95	7.07	2.95	1.02	0.19		trace	trace			100.61	2.579
A3. III	1.033	.186	.026	.032	.049	.127	.048	.011			—	—				
3	63.09	18.89	3.48	2.02	1.97	6.18	3.14	1.30	0.63						100.70	
A3. III	1.052	.185	.022	.028	.049	.111	.051	.014								
4	54.02	14.82	7.12	2.67	5.64	9.07	2.63	0.71	1.92		1.60	trace	trace		100.20	
A3. III	.900	.145	.044	.037	.141	.163	.042	.008			.020	—	—			

CLASS I. PERSALANE.

RANG 1. PERALKALIC. NORDMARKASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	62.03	16.39	0.72	0.86	1.60	3.60	1.08	12.38	0.61	0.24	0.53	0.13			100.17	
A2. II	1.034	.161	.005	.012	.040	.064	.018	.132			.007	.001				

RANG 1. PERALKALIC. NORDMARKASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	65.52	16.49	0.14	0.18	0.11	0.76	1.89	10.87	0.23	0.09	none	0.12	0.06	CO_2 0.07 ZrO_2 none SO_3 trace Cl 0.02 FeS_2 1.08 Cr_2O_3 none V_2O_3 none NiO none BaO 0.08 SrO trace CuS 0.78 ZnO 1.01 PbS 0.78	100.28	2.633
A1. I	1.092	.161	.001	.003	.003	.014	.031	.116			—	.001	—			

RANG 1. PERALKALIC. NORDMARKASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	65.42	15.80	2.75	0.91	0.53	1.33	5.18	6.26	2.46						100.64	
A3. III	1.090	.155	.017	.013	.013	.024	.084	.067								
2	64.15	19.04	1.02	0.93	0.37	1.37	5.37	7.10	0.27			0.10	0.16		100.58	
A2. II	1.069	.187	.006	.013	.009	.025	.087	.076				.001	.002			
3	65.43	16.11	1.15	2.85	0.40	1.49	5.00	5.97	0.39	0.19	0.50	0.13	0.23	ZrO_2 0.11 Cl 0.05 F 0.08 FeS_2 0.07 BaO 0.03	100.18	
A1. I	1.091	.158	.009	.039	.010	.027	.081	.064			.008	.001	.003			
4	64.88	16.24	1.37	2.70	0.89	1.92	5.00	5.61	0.46	0.19	0.69	0.13	0.14	CO_2 none ZrO_2 0.13 Cl 0.04 F 0.08 FeS_2 none NiO none BaO 0.06	100.53	
A1. I	1.081	.159	.008	.038	.022	.034	.081	.060			.009	.001	.002			
5	63.71	18.30	2.08	2.52	0.09	1.18	6.39	6.21	0.17	0.09	trace		trace		100.74	
A3. III	1.062	.180	.013	.035	.002	.021	.103	.065			—		—			
6	61.05	18.81	2.02	3.06	0.42	1.30	6.56	6.02	0.78		0.34		trace	BaO none	100.04	2.655 .12°
A3. III	1.018	.183	.013	.043	.011	.023	.106	.064			.004		—			

ORDER 4. QUARDOFELIC. BRITANNARE—Continued.

SUBRANG 4-5. PRESODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I(II).4.(3)4.4″.	Q 19.38 di 0.43 or 6.12 hy 4.86 ab 27.77 mt 6.03 an 33.92 il 1.06	Vallée aux Écrevisses, Martinique, West Indies.	Pisani.	A. Lacroix, Mont. Pelée, p. 573, 1904.	Andesite.	
2	I(II).4.″4.4.	Q 22.20 hy 5.69 or 6.12 mt 6.03 ab 25.15 an 35.31	Paluquillo, Guamani Volcano, Ecuador.	Tietze.	E. Esch in W. Reiss, Ecuador, I, p. 106, 1901.	Andesite.	
3	I(II).4.(3)4.4.	Q 23.10 hy 5.69 or 7.78 mt 5.10 ab 26.72 an 30.86 C 0.92	Wistra, Carinthia.	H. Krczmar.	F. Becke, T. M. P. M., XVIII, p. 94, 1899.	Tonalite gneiss.	In W. T., p. 193.
4	I″.4.(3)4.4″.	Q 12.06 di 14.69 or 4.45 hy 7.30 ab 22.01 mt 3.94 an 26.41 il 3.04 hm 4.32	Tumleo, Kaiser Wilhelm Land, New Guinea.	E. Ludwig.	S. Richarz, N. J. B. B., XXIX, p. 445, 1910.	Andesite.	

ORDER 5. PERFELIC. CANADARE. (C. I. P. W., 1902.)

SUBRANG 1. PERPOTASSIC. HETTOSE. (C. W. WRIGHT, 1915.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I(II).5.1″.1(2).	Q 1.32 di 8.64 or 73.39 wo 1.16 ab 9.43 mt 1.16 an 3.06 il 1.06 ap 0.34	Tombs Basin, Copper Mountain Area, Prince of Wales Island, Alaska.	C. Palmer.	C. W. Wright, U. S. G. S. P. P. 87, 1915, p. 40.	Orthoclasite.	

SUBRANG 2. DOPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.(4)5.1″.2.	Q 10.98 hy 0.56 or 64.50 mt 0.23 ab 16.24 ap 0.34 an 3.06 pr 1.08 C 0.31	Rupee Mine, Broken Hill, New South Wales.	H. P. White.	D. Mawson, Mem. R. Soc. S. Aust., II (4), p. 297, 1912.	Pegmatite.	

SUBRANG 3. SODIPOTASSIC. PHLEGROSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I″.(4)5.1.3.	Q 8.58 di 2.81 or 37.25 wo 0.81 ab 44.01 mt 3.02 an 1.11 hm 0.64	Bristol Township, Porcupine Area, Ontario.	Not stated.	A. G. Burrows, Rep. Bur. Min. Ont., XXI, (1), p. 218, 1912.	Granite porphyry.	
2	I.5.1.3.⊙.	Q 3.66 hy 2.09 or 42.26 mt 1.39 ab 45.59 ap 0.34 an 1.67 C 1.84	Monmouth Township, Ontario.	N. N. Evans.	Adams and Barlow, Tr. R. Soc. Can., II, (4), p. 30, 1909.	Nephelite syenite.	Also in Can. G. S. Mem. 6, p. 259, 1910.
3	I(II).(4)5.1(2).3.	Q 8.82 di 2.64 or 35.58 hy 3.21 ab 42.44 mt 2.09 an 3.61 il 0.91 ap 0.34	Mount Ascutney, Vermont.	W. F. Hillebrand.	R. A. Daly, U. S. G. S. B. 209, p. 59, 1903.	Nordmarkite.	In W. T., p. 193.
4	I(II).(4)5.1(2).3″.	Q 8.46 di 3.03 or 33.36 hy 3.71 ab 42.44 mt 1.86 an 5.00 il 1.37 ap 0.34	Mount Ascutney, Vermont.	W. F. Hillebrand.	R. A. Daly, U. S. G. S. B. 209, p. 59, 1903.	Nordmarkite.	In W. T., p. 193.
5	I″.5.1″.3(4).	Q 0.42 di 2.20 or 36.14 hy 1.95 ab 53.97 mt 2.32 an 3.34	Salem Neck, Essex County, Massachusetts.	H. S. Washington.	H. S. Washington, J. G., VI, p. 806, 1898.	Pulaskite.	In W. T., p. 193.
6	I″.5.1″.3(4).	or 35.58 di 2.38 ab 47.68 ol 2.50 an 3.61 mt 3.02 ne 4.26 il 0.61	Coney Island, Salem Harbor, Essex County, Massachusetts.	H. S. Washington.	H. S. Washington, J. G., VII, p. 118, 1899.	Sölvsbergite.	Cf. No. 7, I.5.1.4. In W. T., p. 193.

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. NORDMARKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
7	60.13	20.03	2.36	1.33	0.76	0.87	6.30	5.97	1.41	0.16	1.15	0.06	trace	CO_2 none ZrO_2 0.05 SO_3 0.14	100.72	
A1. I	1.002	.196	.015	.018	.019	.016	.102	.064			.014	—	—			
8	64.51	16.75	2.05	1.00	0.60	1.38	6.08	5.74	0.46	0.31	0.75	0.14	0.21	Cl 0.04	100.02	
A2. II	1.075	.164	.013	.014	.015	.025	.098	.061			.009	.001	.003			
9	66.22	16.22	1.98	0.16	0.77	1.32	6.49	5.76	0.24	0.08	0.22	0.10	trace	SO_3 0.02 Cl 0.04 F trace BaO 0.29 SrO 0.06	99.97	
A1. I	1.104	.159	.012	.002	.019	.023	.105	.062			.003	.001	—			
10	66.03	18.49	2.18	0.22	0.39	0.96	5.22	5.86	0.85			0.04	trace	CO_2 trace	100.24	
A3. III	1.101	.181	.014	.003	.010	.017	.084	.063				—	—			
11	68.96	15.42	1.99	0.16	0.22	0.25	6.59	5.48	0.30	0.22	0.12	trace	0.07	CO_2 0.13 ZrO_2 0.04 SO_3 none Cl 0.01 BaO trace SrO none	99.96	
A1. I	1.149	.151	.013	.002	.006	.004	.106	.059			.002	—	.001			
12	62.59	17.23	1.51	2.02	1.30	1.99	5.50	6.74	0.30		0.54	0.11		CO_2 trace SO_3 trace Cl trace	99.83	
A2. II	1.043	.169	.009	.028	.033	.036	.089	.071			.007	.001				
13	68.01	17.48	0.41	n. d.	0.46	trace	5.77	7.08	0.73						99.94	2.60
A4. IV	1.134	.171	.003	(.006)	.012	—	.093	.075								
14	60.50	18.20	1.20	1.08	0.26	0.68	5.10	5.23	7.00		0.39				99.64	
A3. III	1.008	.178	.008	.015	.007	.012	.082	.055			.005					
15	53.83	16.08	0.07	1.69	2.47	5.27	5.01	6.16	0.16	0.32	1.01	0.06		CO_2 7.69	99.82	
A2. II	.897	.159	—	.024	.062	.095	.081	.066			.175	—				
16	64.54	18.13	2.63	0.97	0.67	0.62	6.60	5.99	0.31		trace	trace	trace	BaO 0.42	100.88	
A3. III	1.076	.178	.016	.013	.017	.011	.106	.064			—	—	—			
17	64.56	16.22	2.87	1.73	0.63	1.21	5.61	5.77	0.18		0.90	0.16	0.12	S 0.03	99.99	
A2. II	1.076	.159	.018	.024	.016	.021	.090	.062			.011	.001	.002			
18	62.93	16.40	4.47	1.56	0.31	0.65	3.60	8.51	0.37		0.85	0.23	0.01	S 0.02	99.91	
A2. II	1.049	.161	.028	.022	.008	.012	.058	.090			.011	.002	—			
19	64.83	20.28	0.29	0.14	0.21	1.01	6.10	6.80	0.39	0.05	trace	trace	trace	CO_2 0.12	100.22	
A3. III	1.081	.199	.002	.002	.005	.018	.098	.072			—	—	—			
20	63.97	19.90	0.60	0.94	0.16	1.24	5.86	6.44	0.36	0.03	0.24	trace	0.03	CO_2 0.05	99.82	
A2. II	1.066	.195	.004	.013	.004	.022	.095	.068			.003	—	—			
21	63.45	15.16	2.50	2.66	1.25	1.29	4.70	6.60	1.32		0.60	0.23	0.15	CO_2 0.20 ZrO_2 0.05	100.16	2.627
A2. II	1.058	.149	.016	.037	.031	.023	.076	.070			.008	.002	.002			

ORDER 5. PERFELIC. CANADARE—Continued.

SUBRANG 3. SODIPOTASSIC. PHLEGROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
7	I.5.1″.3(4).	or 35.58 ol 1.33 ab 49.26 mt 0.93 an 4.45 il 2.13 ne 1.99 hm 1.76 C 1.53	Braddock's quarry, Fourche Mountain, Little Rock, Arkansas.	H. S. Washington.	H. S. Washington, J. G., IX, p. 610, 1901.	Foyaite.	In W. T., p. 195.
8	I″.5.1.3(4).	Q 4.56 di 3.24 or 33.92 hy 0.58 ab 51.35 mt 1.86 an 1.39 il 1.37 hm 0.80 ap 0.34	Hueco Tanks, El Paso County, Texas.	G. Steiger.	G. B. Richardson, U. S. G. S. Fol. 166, p. 7, 1909.	Syenite porphyry.	
9	I″.5.1.3(4).	Q 4.74 ac 3.70 or 34.47 di 4.10 ab 50.83 wo 0.12 il 0.46 hm 0.64 ap 0.34	Gray Butte, Bear Paw Mountains, Montana.	H. N. Stokes.	Weed and Pirsson, A. J. S., I, p. 295, 1896.	Quartz syenite porphyry.	In W. T., p. 197.
10	I″.(4)5.1(2).3.	Q 10.50 hy 1.00 or 35.03 mt 0.70 ab 44.02 hm 1.76 an 4.73 C 1.73	Game Ridge, Rosita Hills, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. A. R. 17, II, p. 324, 1896.	Trachyte.	Also in Pr. Colo. Sci. Soc., II, p. 237, 1887. In W. T., p. 195.
11	I.(4)5.1.3(4).	Q 10.74 ac 6.01 or 32.80 us 0.12 ab 48.21 di 0.86 hy 0.30 il 0.30	Near Mount Waas, La Sal Mountains, Utah.	W. F. Hillebrand.	L. M. Prindle, U. S. G. S. B. 228, p. 191, 1904.	Syenite porphyry.	
12	I(II).5.1.3.	or 39.48 di 5.37 ab 46.63 hy 1.43 an 2.50 ol 0.62 mt 2.09 il 1.06 ap 0.34	Rossland, British Columbia.	M. Dittrich.	R. M. Brock, Can. G. S. Rep., 1902, p. 104A.	Pulaskite.	Also in R. A. Daly, Can. G. S. Mem. 38, (1), p. 359, 1912
13	I.″5.1.3.	Q 6.48 hy 1.99 or 41.70 ab 48.73 C 0.31	Goodwick, n. Fishguard, Pembrokeshire, Wales.	F. E. Tadman.	F. R. C. Reed, Q. J. G. S., LI, p. 177, 1895.	Felsite.	In W. T., p. 195.
14	I.(4)5.1″.3(4).	Q 9.18 hy 0.96 or 30.58 mt 1.86 ab 42.97 il 0.76 an 3.34 C 2.96	Mont Dore, Auvergne.	Pisani.	A. Lacroix, C. R., CXLVII, p. 780, 1908.	Trachyte pumice.	Fresh?
15	I.5.1″.3.	or 36.70 il 1.98 ab 41.39 RCO_3 14.55 an 3.34 ne 0.57	Mount Axpé, n. Bilbao, Spain.	H. S. Washington.	Unpublished.	Calcite trachyte.	Calcite primary?
16	I.5.1.3(4).	Q 1.20 di 0.65 or 35.58 hy 1.40 ab 55.54 mt 3.02 an 2.22 hm 0.48	Lövas Bay, Farrisvand, Norway.	P. Schei.	W. C. Brögger, Eg. Kg., III, p. 198, 1899.	Pulaskite.	In W. T., p. 197.
17	I″.″5.1.3″.	Q 7.38 di 2.38 or 34.47 hy 0.50 ab 47.16 mt 3.48 an 1.95 il 1.67 hm 0.48 ap 0.34	Parvavara, Gellivare, Sweden.	G. Nyblom.	A. G. Högbom, G. F. F., XXXII, p. 569, 1910.	Syenite.	
18	I″.″5.1.(2)3.	Q 8.58 hy 0.80 or 50.04 mt 2.55 ab 30.39 il 1.67 an 1.39 hm 2.72 C 0.82 ap 0.67	Wällkomman, Gellivare, Sweden.	G. Nyblom.	A. G. Högbom, G. F. F., XXXII, p. 569, 1910.	Syenitic gneiss.	
19	I.5.1(2).3″.	Q 1.20 hy 0.50 or 40.03 mt 0.46 ab 51.35 an 5.00 C 1.12	Laacher See, Rheinland.	R. Brauns.	R. Brauns, N. J. B. B., XXXIV, p. 154, 1912.	Sanidinite.	
20	I.5.1(2).3″.	Q 2.04 hy 1.19 or 37.81 mt 0.93 ab 49.78 il 0.46 an 6.12 C 1.02	Laacher See, Rheinland.	R. Brauns.	R. Brauns, N. J. B. B., XXXIV, p. 148, 1912.	Sanidinite.	
21	I(II).″5.1.3.	Q 7.02 di 2.94 or 38.92 hy 3.65 ab 39.82 mt 3.71 an 0.83 il 1.22 ap 0.67	Haselberg, Ammelshain, Saxony.	C. Amtmann.	C. Amtmann, In. Diss. Leip., p. 49, 1907.	Granite porphyry.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. NORDMARKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
22	63.24	16.83	4.86	0.07	0.57	0.72	4.02	7.37	1.13			0.16		SO_3 0.43	99.40	
B3. IV	1.054	.165	.030	.001	.014	.013	.065	.079				.001				
23	62.87	17.45	1.19	0.79	0.76	2.81	4.23	8.87	0.34		0.36	trace	0.20		99.87	
A2. II	1.048	.171	.008	.011	.019	.050	.068	.095			.005	—	.003			
24	59.24	18.63	3.30	1.20	0.12	2.06	4.87	9.14	0.86		0.56	0.15		CO_2 none ZrO_2 0.10 SO_3 0.17 Cl 0.08 BaO 0.06	100.54	2.509
A1. I	.987	.183	.021	.017	.003	.037	.079	.097			.007	.001				
25	61.88	18.06	2.19	1.38	0.61	1.15	6.89	6.72	0.37		0.69	0.07		CO_2 none ZrO_2 0.08 SO_3 0.05 Cl 0.30 BaO 0.08	100.39	
A1. I	1.031	.178	.014	.019	.015	.021	.111	.071			.009	—				
26	61.62	18.11	2.36	1.28	0.56	1.44	5.77	7.60	0.78		0.87	0.13		CO_2 none Cl 0.15	100.67	
A2. II	1.027	.177	.015	.018	.014	.026	.093	.081			.011	.001				
27	60.33	18.27	2.84	1.29	0.38	1.15	7.15	7.30	0.56		0.43	0.04		CO_2 none Cl 0.43	100.17	
A2. II	1.006	.179	.018	.018	.010	.021	.115	.078			.005	—				
28	59.79	19.05	2.95	1.08	0.36	1.19	6.79	7.10	0.24		0.56	0.10		CO_2 none Cl 0.53	99.74	
A2. II	.997	.187	.019	.015	.009	.021	.110	.076			.007	.001				
29	65.94	16.11	2.56	0.82	0.60	1.06	5.27	6.49	0.25	0.36	1.21		0.06		100.73	
A2. II	1.099	.158	.016	.011	.015	.019	.085	.069			.015		—			
30	60.43	18.35	1.64	0.91	0.17	1.41	6.15	8.68	0.62	0.34	0.36	trace	0.16	CO_2 none ZrO_2 0.21 SO_3 0.22 Cl none BaO 0.08 SrO 0.02	99.75	
A1. I	1.007	.180	.010	.013	.004	.025	.099	.093			.005	—	.002			
31	63.28	17.48	2.89	1.41	0.66	0.52	5.86	6.18	0.35	0.30	0.95	0.25			100.15	
A2. II	1.055	.171	.018	.019	.017	.009	.095	.066			.012	.002				
32	61.92	18.20	0.27	2.90	1.01	1.65	5.55	6.17	1.44		0.38				99.49	
A3. III	1.032	.178	.002	.040	.025	.030	.090	.066			.005					
33	57.39	20.01	2.19	4.29	0.59	1.53	5.26	5.62	1.83	0.17	0.70	0.23			99.78	
A2. II	.957	.196	.014	.060	.015	.027	.085	.060			.009	.002				
34	58.89	17.61	2.44	3.47	0.65	2.11	4.57	7.86	1.80		0.58	0.11		SO_3 trace	100.09	2.640
A2. II	.982	.173	.015	.049	.016	.038	.074	.084			.007	.001				
35	63.06	16.23	5.63	0.65	0.29	0.49	6.80	5.60	0.85				0.61		100.21	
A3. III	1.051	.159	.035	.009	.007	.009	.110	.060					.009			
36	61.45	19.64	2.19	0.22	1.00	0.60	4.10	7.58	2.37		0.40				99.55	
A3. III	1.024	.193	.014	.003	.025	.011	.066	.081			.005					

ORDER 5. PERFELIC. CANADARE—Continued.

SUBRANG 3. SODIPOTASSIC. PHLEGROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
22	I''.(4)5.1''.3.	Q 9.36 hy 1.40 or 43.92 mt 0.23 ab 34.06 hm 4.64 an 2.78 ap 0.34 C 1.12	Blitzengrund, Sudetische Mulde, Bohemia.	Böhm.	G. Berg, Jb. Pr. G. L.-A., XXVIII, p. 239, (1907), 1910.	Felsite.	
23	I(II).5.1.''3.	or 52.82 di 4.35 ab 33.54 wo 2.44 an 2.50 mt 1.86 ne 1.14 il 0.76	Viezzena Thal, Monte Mulatto, Predazzo, Tyrol.	Dittrich and Pohl.	J. Romberg, Anh. Abh. Pr. Ak. Wiss., 1904, p. 94.	Syenite.	
24	I''.5''.1.3.	or 53.93 di 0.65 ab 26.78 wo 2.44 an 2.78 mt 2.32 ne 6.96 il 1.06 hl 0.12 hm 1.76 th 0.28 ap 0.34	Via Aurelia, Vico Volcano, n. Viterbo.	H. S. Washington.	H. S. Washington, J. G., IV, p. 849, 1896.	Phonolitic trachyte.	Also in R. C. R., p. 23, 1906. Block in tuff. In W. T., p. 195.
25	I''.5.1.3(4).	or 39.48 di 3.24 ab 46.63 wo 0.46 ne 5.11 mt 2.32 hl 0.47 il 1.37 hm 0.64 ap 0.17	Marecocco, Ischia, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 20, 1906.	Trachyte.	Incomplete in A. J. S., VIII, p. 289, 1899. In W. T., p. 195.
26	I''.5.1.3.	or 45.04 di 3.03 ab 41.39 wo 0.46 an 1.39 mt 1.62 ne 3.40 il 1.67 hl 0.23 hm 1.28 ap 0.34	Monte Rotaro, Ischia, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 28, 1906.	Trachyte obsidian.	Incomplete in A. J. S., VIII, p. 289, 1899. In W. T., p. 195.
27	I(II).5(6).1.3''.	or 43.37 ac 3.70 ab 35.37 di 2.91 ne 9.51 wo 0.93 hl 0.70 mt 2.32 il 0.76	Monte Nuovo, Phlegrean Fields, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 23, 1906.	Phonolitic trachyte.	Incomplete in A. J. S., VIII, p. 287, 1899. In W. T., p. 195.
28	I''.5(6).1.3''.	or 42.26 di 1.94 ab 39.30 wo 0.46 an 2.22 mt 1.86 ne 7.95 il 1.06 hl 0.82 hm 1.76	Monte di Cuma, Phlegrean Fields, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 23, 1906.	Phonolitic trachyte.	Incomplete in A. J. S., VIII, p. 287, 1899. In W. T., p. 195.
29	I''.''5.1.3.	Q 8.22 di 2.38 or 38.36 hy 0.40 ab 44.54 il 1.67 an 1.11 hm 2.56 tn 0.78	Conca Cannas, Monte Arci, Sardinia.	H. S. Washington.	H. S. Washington, A. J. S., XXXVI, p. 584, 1913.	Trachyte.	
30	I(II).5(6).1.3.	or 51.71 ac 4.62 ab 25.94 ns 0.24 ne 10.65 di 3.35 wo 1.28 il 0.68	Monte Tinzosu, Monte Ferru, Sardinia.	H. S. Washington.	H. S. Washington, A. J. S., XXXIX, p. 520, 1915.	Phonolite.	
31	I''.5.1.3''.	Q 4.08 hy 1.70 or 36.70 mt 1.62 ab 49.78 il 1.82 an 0.56 hm 1.76 C 0.82 ap 0.67	Mont Antsutrotro, Madagascar.	Boiteau.	A. Lacroix, pers. com., 1913.	Aegirite micro-syenite.	
32	I''.5.1(2).3''.	or 36.70 di 1.89 ab 47.16 hy 2.58 an 6.12 ol 2.47 mt 0.46 il 0.76	Lokobé, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., I, p. 101, 1902.	Pulaskite.	
33	I(II).5.1(2).3''.	or 33.36 hy 5.16 ab 44.54 ol 0.92 an 5.56 mt 3.25 C 3.16 il 1.37 ap 0.67	Mont Bezavona, Madagascar.	Boiteau.	A. Lacroix, pers. com., 1913.	Larvikite.	
34	I(II).5.1''.3.	or 46.70 di 4.74 ab 32.49 ol 2.06 an 4.17 mt 3.48 ne 3.41 il 1.06 ap 0.34	Karissimbi, Kivu Lake District, German East Africa.	Eyme.	L. Finckh, Wiss. Erg. D. Zentaf. Exp., I (1), p. 4, 1912.	Trachyte.	
35	I(II).5.1.3(4).	Q 2.22 ac 5.08 or 33.36 di 1.51 ab 51.87 wo 0.23 mt 4.18 hm 0.96	Kya River, Jenissei District, Siberia.	Not stated.	A. Meister, Reg. Aurif. Sib., IX, p. 300, 1910.	Sölvsbergite.	
36	I.''5.1''.3.	Q 5.70 hy 2.50 or 45.04 il 0.46 ab 34.58 hm 2.19 an 3.06 ru 0.16 C 3.57	Barabatuwa, n. Maros, Celebes.	Hinden.	C. Schmidt in Sarasin, Ins. Celebes, IV, p. 16, 1901.	Trachyte.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. NORDMARKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
37	61.15	22.07	1.05	1.02	0.40	0.75	5.86	7.01	0.71		0.20				100.22	
A3. III	1.019	.217	.006	.014	.010	.014	.095	.074			.003					
38	63.37	16.47	4.45	1.21	0.51	1.27	5.88	5.57	0.76						99.49	2.67
A3. III	1.056	.161	.028	.017	.013	.023	.095	.060								
39	65.90	16.74	1.72	1.99	0.06	0.09	6.35	5.77	0.43	0.27	0.25	none	0.06	CO_2 none ZrO_2 0.29 SO_3 none Cl trace F 0.16 S none NiO 0.01 BaO none SrO none	100.09	
A1. I	1.098	.164	.011	.028	.002	.002	.103	.062			.003	—	—			
40	64.63	16.55	2.93	1.16	0.16	0.46	5.23	6.11	1.35	1.05	0.58	none	0.08	ZrO_2 0.07 SO_3 none Cl trace NiO trace BaO none SrO none	100.36	
A1. I	1.077	.162	.018	.016	.004	.008	.084	.065			.007	—	.001			
41	64.31	15.05	3.39	2.33	0.14	1.54	4.77	6.59	0.39	0.79	1.25	none	0.09	CO_2 none ZrO_2 0.09 SO_3 none Cl 0.02 F 0.10 S none NiO 0.03 BaO none SrO none	100.88	
A1. I	1.072	.148	.021	.032	.004	.028	.077	.070			.016	—	.001		(100.98)	
42	63.94	16.77	1.80	1.98	1.61	0.92	5.34	4.97	1.79	0.41	0.15	0.27	0.07	CO_2 0.02 ZrO_2 none SO_3 none Cl none F none S none Cr_2O_3 none NiO none BaO 0.09 SrO trace V_2O_3 none CuO none	100.13	2.629
A1. I	1.066	.164	.011	.028	.040	.016	.086	.053			.002	.002	.001			
43	62.42	17.69	2.72	2.19	0.20	1.53	5.93	6.29	0.69	0.24	0.35	none	0.08	CO_2 none ZrO_2 0.20 SO_3 0.05 S none NiO trace BaO none SrO none	100.58	
A1. I	1.040	.173	.017	.031	.005	.027	.095	.067			.004	—	.001			
44	59.54	18.00	3.30	1.62	0.18	2.08	5.97	5.91	1.86	0.28	0.36	0.12	0.03	CO_2 0.30 ZrO_2 0.02 SO_3 0.06 Cl 0.03 F 0.09 Cr_2O_3 none V_2O_3 none NiO none BaO 0.06 SrO trace	99.81	2.630
A1. I	.992	.176	.021	.022	.005	.038	.097	.063			.005	.001	—			
45	64.58	17.52	2.56	0.96	0.22	0.39	6.41	6.23	0.30	0.11	0.13	trace	0.08	CO_2 0.08 ZrO_2 0.21 SO_3 none Cl 0.08 S 0.08 Cr_2O_3 none NiO 0.03 BaO none SrO trace Li_2O none	99.97	2.62
A1. I	1.076	.172	.016	.014	.006	.007	.103	.066			.002	—	.001			
46	57.00	18.56	4.58	2.76	0.41	1.05	6.34	6.13	2.96						99.79	
A3. III	.950	.182	.029	.039	.010	.019	.102	.065								
47	61.22	18.01	1.32	4.51	0.44	1.88	6.49	5.93	0.46		0.42		trace		100.68	2.210
A3. III	1.020	.177	.008	.063	.011	.034	.105	.063			.005		—			
48	60.20	17.86	1.10	2.02	0.32	3.60	6.36	5.94	2.46						99.86	
A3. III	1.003	.175	.007	.028	.008	.064	.103	.063								

ORDER 5. PERFELIC. CANADARE—Continued.

SUBRANG 3. SODIPOTASSIC. PHLEGROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
37	I.5.1″.3″.	or 41.14 ol 1.21 ab 45.59 mt 1.39 an 3.89 il 0.46 ne 2.27 C 3.47	Maros, Celebes.	Hinden.	C. Schmidt in Sarasin, Ins. Celebes, IV, p. 19, 1901.	Bostonite.	
38	I″.5.1.3(4).	Q 5.04 di 2.81 or 33.36 wo 0.46 ab 49.78 mt 3.94 an 1.67 hm 1.76	Carapook, Victoria.	J. Dennant.	J. Dennant, Pr. R. Soc. Vict., XIX (1), p. 13, 1901.	Trachyte.	
39	I.5.1.3(4).	Q 5.34 ac 0.46 or 34.47 di 0.49 ab 53.45 hy 1.92 Z 0.37 mt 2.32 il 0.46	Timur Rock, Warrumbungle Mountains, New South Wales.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXII, p. 616, 1907.	Arfvedsonite trachyte.	
40	I.(4)5.1.3.	Q 9.78 hy 0.40 or 36.14 mt 2.32 ab 44.01 il 1.06 an 2.22 hm 1.28 C 0.51	Mount Ningadhun, Nandewar Mountains, New South Wales.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXII, p. 903, 1907.	Trachyte.	
41	I(II).″5.1.3.	Q 9.54 di 0.86 or 38.92 wo 2.67 ab 40.35 mt 3.94 an 0.28 il 2.43 hm 0.64	Deriah Mountain, Nandewar Mountains, New South Wales.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXII, p. 903 (1907), 1908.	Trachyte.	
42	I(II).(4)5.1.3(4).	Q 9.48 hy 6.11 or 29.47 mt 2.55 ab 45.06 il 0.30 an 2.50 ap 0.67 C 1.63	Murrumbridgee River, n. Yass, New South Wales.	H. P. White.	L. F. Harper, Rec. G. S. N. S. W., IX, (1), p. 31, 1909.	Feldspar porphyry.	
43	I″.5.1″.3″.	Q 0.84 di 3.81 or 37.25 mt 3.94 ab 49.78 il 0.61 an 3.06	Mount Berum Buckle, Warrumbungle Mountains, New South Wales.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXII, p. 616, 1907.	Pseudoleucite phonolite.	
44	I″.5.1″.3(4).	or 35.03 di 1.08 ab 47.68 wo 1.63 an 4.45 mt 3.94 ne 1.70 il 0.76 hm 0.64 ap 0.34	Bushrangers Hill, Dubbo, New South Wales.	Not stated.	A. R. Dep. Min. N. S. W., (1907), p. 185, 1908.	Soda syenite.	
45	I.5.1.3(4).	Q 2.64 di 0.86 or 36.70 hy 0.20 ab 53.97 mt 3.02 an 0.83 il 0.30 hm 0.48	Mount Beerwah, Glass House Mountains, Queensland.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXI, p. 168, 1906.	Trachyte.	
46	I(II).5″.1″.3(4).	or 36.14 di 0.92 ab 41.92 ol 1.38 an 4.17 mt 6.73 ne 6.25	Logans Point, Dunedin, New Zealand.	P. Marshall.	P. Marshall, Q. J. G. S., LXII, p. 402, 1906.	Trachytoid phonolite.	
47	I(II).5″.1.3(4).	or 35.03 di 6.07 ab 45.32 ol 3.45 an 2.50 mt 1.86 ne 5.25 il 0.76	Goughs Island, South Atlantic.	L. V. Pirsson.	L. V. Pirsson, A. J. S., XLV, p. 382, 1893.	Trachyte obsidian.	In W. T., p. 195
48	I(II).5(6).1.3(4).	or 35.03 di 6.93 ab 41.39 wo 3.02 an 2.50 mt 1.62 ne 6.82	Mount Tapioi, Raiatea, Society Islands.	P. Marshall.	P. Marshall, Rep. Aust. A. A. S., XIII, p. 199, 1912.	Phonolite.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. NORDMARKASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	65.43	16.96	1.55	1.53	0.22	1.36	5.95	5.36	0.82		0.16	0.02	0.40	CO_2 none SO_3 0.06 Cl 0.04 BaO none	99.86	
A1. I	1.091	.166	.010	.021	.006	.024	.096	.057			.002	—	.006			
2	59.96	19.12	1.85	1.73	0.65	2.24	6.98	4.91	1.10		0.66	0.14	0.49	CO_2 none SO_3 0.08 Cl 0.14 BaO 0.12	100.17	
A1. I	.999	.183	.012	.024	.016	.040	.113	.052			.008	.001	.007			
3	61.77	18.05	1.77	1.75	0.89	1.54	6.83	5.21	1.10		0.74	0.15	0.08		99.88	
A2. II	1.030	.177	.011	.025	.022	.028	.110	.055			.009	.001	.001			
4	60.39	22.57	0.42	2.26	0.13	0.32	8.44	4.77	0.57				0.08	CO_2 trace	99.95	
A3. III	1.007	.221	.003	.032	.003	.006	.136	.051					.001			
5	62.12	17.57	2.16	2.59	0.86	2.37	6.78	4.79	0.48	0.09	0.84	0.23			100.88	
A2. II	1.035	.172	.014	.036	.022	.043	.110	.051			.010	.002				
6	63.09	18.44	2.90	1.36	0.16	1.00	7.25	5.23	0.62	0.21	0.45		trace	ZrO_2 0.06	100.77	
A2. III	1.052	.180	.018	.019	.004	.018	.117	.056			.006		—			
7	60.60	18.28	2.85	2.67	0.52	0.99	6.66	5.73	0.69		0.71	0.15			99.85	
A2. II	1.010	.180	.018	.037	.013	.018	.107	.061			.009	.001				
8	59.31	22.50	1.93	1.40	0.17	0.46	7.98	4.08	1.12	0.15	0.32		trace		99.42	2.599
B3. IV	.989	.221	.012	.019	.004	.008	.129	.043			.008		—			
9	62.46	17.10	2.49	2.65	0.28	1.27	6.84	5.44	0.49	0.15	0.38	0.11	0.18	ZrO_2 0.10 S none BaO none SrO trace Ce_2O_3 0.03	99.97	2.581
A3. III	1.041	.168	.016	.037	.007	.023	.110	.058			.010	.001	.003			
10	61.08	18.71	1.91	0.63	0.08	1.58	8.68	4.63	2.21		0.18		trace	SO_3 trace Cl 0.12 BaO 0.05	99.86	2.582
A2. II	1.018	.183	.012	.009	.002	.029	.140	.049			.002		—			
11	64.33	17.52	3.06	0.94	0.34	0.56	7.30	4.28	0.95	0.04	trace	trace	0.35		99.67	
A3. III	1.072	.172	.019	.013	.009	.010	.118	.046			—	—	.005			
12	62.17	18.58	2.15	1.05	0.73	1.57	7.56	3.88	1.63	0.07	trace	0.11	trace		99.50	
A3. III	1.036	.182	.013	.015	.018	.028	.122	.041			—	.001	—			
13	63.24	17.98	2.67	0.85	0.63	0.93	6.27	5.47	0.80	0.37	0.38	0.22	0.04	CO_2 none ZrO_2 trace S trace Cr_2O_3 none V_2O_3 0.01 NiO none BaO 0.25 SrO 0.03	100.14	
A1. I	1.054	.176	.017	.012	.016	.016	.101	.059			.005	.002	—			
14	65.08	16.65	2.01	1.08	0.21	1.49	7.31	5.14	0.30	0.32	0.20		0.13	CO_2 none ZrO_2 0.03 S 0.02 Cr_2O_3 none V_2O_3 none NiO none BaO 0.03 SrO 0.03	100.07	
A1. I	1.085	.163	.013	.015	.005	.027	.118	.054			.003		.002			

ORDER 5. PERFELIC. CANADARE—Continued.

SUBRANG 4. DOSODIC. NORDMARKOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I″.″5.1″.(3)4.	Q 6.90 di 2.64 or 31.69 hy 1.22 ab 50.30 mt 2.32 an 3.61 il 0.30	Shefford Mountain, Quebec.	M. F. Connor.	J. A. Dresser, A. G., XXVIII, p. 209, 1901.	Nordmarkite.	Also in Can. G. S. A. R. XIII, p. 214, (1900), 1903.
2	I(II).5.1(2).″4.	or 28.91 di 4.36 ab 50.83 ol 0.65 an 5.00 mt 2.78 ne 4.54 il 1.22 ap 0.34	Shefford Mountain, Quebec.	M. F. Connor.	J. A. Dresser, A. G., XXVIII, p. 211, 1901.	Pulaskite.	
3	I″.5.1″.″4.	or 30.58 di 2.91 ab 55.28 ol 1.14 an 3.34 mt 2.55 ne 1.28 il 1.37 ap 0.34	Brome Mountain, Quebec.	M. F. Connor.	J. A. Dresser, A. J. S., XVII, p. 354, 1904.	Syenite.	Also in Can. G. S. A.R., XVI, p. 12 G., (1904), 1906.
4	I.5(6).1.4.	or 28.36 ol 3.27 ab 52.40 mt 0.70 an 1.67 ne 10.22 C 2.86	Litchfield, Maine.	L. G. Eakins.	W. S. Bayley, B. G. Soc. Am., III, p. 241, 1892.	Litchfieldite.	In W. T., p. 195.
5	I(II).5.1(2).″4.	or 28.36 di 5.47 ab 56.59 ol 0.72 an 3.34 mt 3.25 ne 0.57 il 1.52 ap 0.67	Tripyramid Mountain, Waterville, New Hampshire.	C. J. Monahan.	L. V. Pirsson, A. J. S., XXXI, p. 408, 1911.	Umptekite.	
6	I″.5.1.″4.	or 31.14 di 0.86 ab 59.21 wo 0.81 an 1.95 mt 3.02 ne 1.14 il 0.91 hm 0.80	Salem Neck, Essex County, Massachusetts.	H. S. Washington.	H. S. Washington, J. G., VI, p. 806, 1898.	Pulaskite.	In W. T., p. 195.
7	I″.5.1″.(3)4.	or 33.92 di 0.68 ab 51.09 ol 1.69 an 3.34 mt 4.18 ne 2.70 il 1.37 ap 0.34	Coney Island, Salem Harbor, Essex County, Massachusetts.	M. Dittrich.	H. Rosenbusch, Elem. Gest., 1898, p. 199.	Syenite porphyry (sölvsberg-ite).	Cf. No. 6, I.5.1.3. In W. T., p. 195.
8	I.5.1.4.⊙	or 23.91 ol 0.59 ab 59.21 mt 2.78 an 2.22 il 0.61 ne 4.54 C 4.18	Great Haste Island, Salem Harbor, Essex County, Massachusetts.	H. S. Washington.	H. S. Washington, J. G., VI, p. 803, 1898.	Foyaite.	In W. T., p. 197.
9	I″.5.1.″4.	or 32.25 di 4.74 ab 56.59 mt 3.71 ne 0.57 il 1.52 ap 0.34	Santiago Mountain, Trans-Pecos, Texas.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 228, p. 75, 1904.	Pulaskite.	
10	I″.5(6).1.4.	or 27.24 ac 2.77 ab 52.40 di 0.68 ne 9.66 wo 3.02 mt 1.39 il 0.30	Devils Tower, Black Hills, South Dakota.	L. V. Pirsson.	L. V. Pirsson, A. J. S., XLVII, p. 344, 1894.	Phonolite.	In W. T., p. 197.
11	I.5.1.4.⊙	Q 3.66 di 0.43 or 25.58 hy 0.70 ab 61.83 mt 3.94 an 2.28 hm 0.32	Sixteen-mile Creek, Crazy Mountains, Montana.	W. H. Melville.	Wolff and Tarr, B. Mus. Comp. Zool., XVI, p. 232, 1893.	Acmite trachyte (sölvsberg-ite).	In W. T., p. 197.
12	I.5.1(2).4.	or 22.80 di 1.30 ab 63.93 hy 0.20 an 5.28 ol 0.90 mt 3.02 ap 0.34	North part of Crazy Mountains, Montana.	W. H. Melville.	Wolff and Tarr, B. Mus. Comp. Zool., XVI, p. 232, 1893.	Acmite trachyte (sölvsberg-ite).	In W. T., p. 197.
13	I.5.1″.(3)4.	Q 3.12 hy 1.60 or 32.80 mt 1.62 ab 52.92 il 0.76 an 3.61 hm 1.60 C 0.31 ap 0.67	Dike Mountain, Yellowstone National Park.	W. F. Hillebrand.	Hague and Jaggar, U. S. G. S. B. 168, p. 98, 1900.	Biotite trachyte.	In W. T., p. 197.
14	I(II).5.1.″4.	Q 1.86 ac 4.16 or 30.02 di 3.07 ab 57.11 wo 1.63 mt 0.93 il 0.46	Beaver Creek, Uncompahgre quadrangle, Colorado.	G. Steiger.	E. S. Larsen, U. S. G. S. rec. lab.	Soda syenite.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. NORDMARKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
15	62.79	19.10	2.29	0.36	0.40	0.87	6.23	5.58	0.84	0.25	0.71	0.12	0.07	CO_2 trace ZrO_2 0.02 SO_3 none Cl trace FeS_2 0.10 BaO 0.14 SrO 0.03	99.90	
A1. I	1.047	.187	.014	.005	.010	.016	.100	.060			.009	.001	.001			
16	62.64	17.36	2.79	0.63	0.53	1.70	7.00	4.97	0.53	0.43	0.43	0.12	0.04	CO_2 0.54 ZrO_2 0.02 SO_3 0.06 Cl 0.03 S none BaO 0.10 SrO 0.07 Li_2O none	99.99	
A1. I	1.044	.170	.018	.009	.013	.030	.113	.053			.005	.001	—			
17	65.51	16.89	1.41	2.52	0.39	1.19	6.42	5.02	0.16		0.92	0.07	0.31		100.81	
A2. II	1.092	.165	.009	.035	.010	.021	.103	.054			.011	—	.004			
18	66.50	16.24	1.43	3.39	0.08	0.86	6.06	4.36	0.42		0.30	0.03	0.10	ZrO_2 0.11 BaO 0.02	99.90	
A1. I	1.108	.159	.009	.047	.002	.015	.098	.047			.004	—	.001			
19	66.70	16.60	2.33	0.87	1.08	1.48	5.80	4.60	n. d.		0.40	0.06			99.92	
A2. II	1.112	.163	.008	.013	.027	.027	.094	.049			.005	—				
20	66.17	16.09	2.88	none	0.32	1.69	6.58	4.83	0.14		0.94	0.16	0.34	SO_3 none BaO 0.09	100.23	
A2. II	1.103	.158	.018	—	.008	.030	.106	.051			.012	.001	.005			
21	65.55	16.81	2.26	1.11	0.41	2.07	6.58	4.18	n. d.		0.68	0.07			99.72	
A2. II	1.093	.165	.014	.015	.010	.038	.106	.044			.009	—				
22	65.88	16.03	2.56	1.84	0.29	0.25	7.44	4.66	0.34		trace	0.02		ZrO_2 0.45	99.76	
A2. II	1.098	.157	.016	.025	.007	.005	.120	.050			—	—				
23	66.50	16.25	2.04	0.19	0.18	0.85	7.52	5.53	0.50		0.70	trace	0.20		100.46	
A2. II	1.108	.159	.013	.003	.005	.015	.121	.059			.009	—	.003			
24	64.92	16.30	3.62	0.84	0.22	1.20	6.62	4.98	0.50				0.40		99.60	
A3. III	1.082	.160	.023	.012	.006	.021	.106	.053					.006			
25	57.52	18.46	2.23	2.44	1.08	2.12	7.58	4.08	1.80		0.92	0.21			99.64	
A2. II	.959	.181	.014	.034	.027	.038	.122	.043			.012	.001				
26	67.79	15.29	1.05	0.59	1.70	3.03	6.89	2.79	0.23		0.63	0.02	0.06	S 0.01 BaO 0.06	100.14	
A1. I	1.130	.150	.007	.008	.043	.054	.111	.030			.008	—	—			
27	64.74	19.94	0.61	1.10	0.18	0.94	8.20	4.02	0.33		0.06	0.11	0.04	CO_2 0.15 S 0.09	100.51	
A2. II	1.079	.196	.004	.015	.005	.017	.132	.042			.001	.001	—			
28	63.76	17.37	0.10	1.11	0.93	1.72	6.69	5.97	0.40		0.70	0.16	0.37	CO_2 none	99.28	
B2. IV	1.063	.170	.001	.015	.023	.030	.108	.064			.009	.001	.005			
29	66.06	16.46	2.25	1.10	0.19	0.79	6.81	5.52	0.62				0.55		100.35	
A3. III	1.101	.161	.014	.015	.005	.014	.109	.059					.008			

ORDER 5. PERFELIC. CANADARE—Continued.

SUBRANG 4. DOSODIC. NORDMARKOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
15	I.5.1″.(3)4.	Q 3.06 hy 1.00 or 33.36 il 0.91 ab 52.40 hm 2.29 an 3.61 ru 0.24 C 1.43 ap 0.34	Portland Mine, Cripple Creek, Colorado.	W. F. Hillebrand.	Lindgren and Ransome, U. S. G. S. P. P. 54, p. 79, 1906.	Biotite trachyte.	
16	I″.5.1.″4.	Q 0.24 di 2.81 or 29.47 wo 1.16 ab 59.21 mt 0.93 an 1.11 il 0.76 hm 2.24 ap 0.34	Near Mount Waas, LaSal Mountains, Utah.	W. F. Hillebrand.	L. M. Prindle, U. S. G. S. B. 228, p. 191, 1904.	Pulaskite.	
17	I″.5.1.″4.	Q 5.52 di 3.10 or 30.02 hy 1.92 ab 53.97 mt 2.09 an 2.22 il 1.67	San Mateo Mountain, Mount Taylor Region, New Mexico.	T. M. Chatard.	J. S. Diller, U. S. G. S. B. 148, p. 185, 1897.	Andesite.	In W. T., p. 197.
18	I.(4)5.1″.″4.	Q 10.38 hy 4.82 or 26.13 mt 2.09 ab 51.35 il 0.61 an 3.89	Cerro Balmaceda, Patagonia, Chile.	R. Mauzelius.	P. D. Quensel, B. G.Inst. Un. Ups., XI, p. 41, 1911.	Nordmarkite.	
19	I.(4)5.1(2).(3)4.	Q 10.80 di 1.51 or 27.24 hy 2.00 ab 49.25 mt 1.86 an 5.56 il 0.76	Puy de Dome, Auvergne.	Pisani.	A. Lacroix, C. R., CXLVII, p. 830, 1908.	Biotite domite.	
20	I″.″5.1.″4.	Q 7.92 di 1.73 or 28.36 wo 1.28 ab 55.54 il 0.76 an 0.28 hm 2.88 tn 1.37 ap 0.34	Puy de Dome, Auvergne.	P. Holland.	Dickson and Holland, Pr. Liverp. G. Soc., VIII, p. 412, 1899.	Domite.	
21	I″.″5.1″.4.	Q 7.80 di 2.16 or 24.46 wo 1.51 ab 55.54 mt 1.39 an 4.17 il 1.37 hm 1.28	Puy de Dome, Auvergne.	Pisani.	A. Lacroix, C. R., CXLVII, p. 830, 1908.	Hornblende domite.	
22	I(II).5.1.″4.	Q 3.96 ac 6.01 or 27.80 di 1.21 ab 56.07 hy 2.98 Z 0.73 mt 0.70	Cevedaes, Alemtejo, Portugal.	M. Dittrich.	H. Rosenbusch, Elem. Gest., 1898, p. 484.	Arfvedsonite gneiss.	Not in W. T.
23	I″.5.1.(3)4.	Q 4.86 ac 6.01 or 32.80 ns 0.98 ab 52.40 di 1.08 wo 0.81 il 0.91 tn 0.59	Kvelle Kerke, Lougendal, Norway.	V. Schmelck.	W. C. Brögger, Eg. Kg., III, p. 216, 1898.	Lestiwarite.	In W. T., p. 197.
24	I″.″5.1.″4.	Q 6.00 di 1.30 or 29.47 wo 1.63 ab 55.54 mt 4.18 an 0.28 hm 0.80	Sölvsberget, Gran, Norway.	L. Schmelck.	W. C. Brögger, Eg. Kg., I, p. 78, 1894.	Sölvsbergite.	In W. T., p. 197.
25	I(II).5″.1″.4.	or 23.91 di 4.23 ab 49.78 ol 1.25 an 4.45 mt 3.25 ne 7.67 il 1.82 ap 0.34	Skirstad Lake, Gran, Norway.	L. Schmelck.	W. C. Brögger, Eg. Kg., I, p. 181, 1894.	Hedrumite (foyaite).	In W. T., p. 253.
26	I(II).(4)5.1.4.	Q 10.68 di 9.29 or 16.68 wo 0.23 ab 58.16 mt 0.23 an 2.50 il 1.22 hm 0.96	Kirunavaara, Lapland, Sweden.	R. Mauzelius.	P. Geijer, G. Kir. Dist., p. 49, 1910.	Syenite porphyry.	
27	I.5.1″.4.	or 23.35 ol 1.37 ab 69.17 mt 0.93 an 3.89 il 0.15 C 0.82 ap 0.34	Broängen, Almunge, Sweden.	N. Sahlbom.	P. D. Quensel, B. G. Inst. Un. Ups., XII, p. 159, (1913), 1914.	Aplitic umptekite.	Marginal zone of No. 8, II.5.1.3.
28	I″.5.1.(3)4.	or 35.58 ac 0.46 ab 52.40 ns 0.12 ne 2.27 di 6.12 ol 0.66 il 1.22 ap 0.34	Ahvenvaara, Kuusamo, Finland.	N. Sahlbom.	V. Hackman, B. C. G. Fin., No. 11, p. 35, 1900.	Pyroxene syenite.	In W. T., p. 197.
29	I″.5.1.(3)4.	Q 4.32 ac 3.23 or 32.80 di 3.38 ab 53.45 hy 0.86 mt 1.62	Hohenburg, n. Berkum, Bonn, Rheinland.	S. Laspeyres.	S. Laspeyres, Vh. Nh. Ver. Rhld., X, p. 394, 1883.	Liparite (trachyte).	Not in W. T. In W. R. T., p. 25.

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. NORDMARKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
30	63.61	16.34	4.30	2.08	0.37	1.42	6.21	5.54	0.77				trace	Cl 0.18	100.82	
A3. III	1.060	.160	.027	.030	.009	.025	.100	.059					—			
31	62.15	20.97	1.68	1.01	0.41	1.56	7.88	3.02	1.02		0.14	0.58			100.42	
A2. II	1.036	.206	.011	.014	.010	.028	.127	.032			.002	.004				
32	62.04	17.44	4.22	0.36	1.88	0.57	6.31	4.20	1.63		0.71	0.37		SO_3 0.12	99.85	2.620
A2. II	1.034	.171	.026	.005	.047	.010	.102	.045			.009	.003				
33	58.41	21.09	1.52	0.92	0.21	1.32	7.07	5.83	2.82		trace	0.24	trace	CO_2 trace	99.43	
B3. IV	.974	.207	.009	.013	.005	.023	.115	.062			—	.002	—			
34	57.94	20.83	1.60	1.38	0.31	1.72	6.92	5.94	2.28		0.21	0.48	0.21	CO_2 trace SO_3 0.20	100.02	
A2. II	9.66	.204	.010	.019	.008	.030	.111	.063			.003	.003	.003			
35	63.43	16.31	2.04	3.14	0.78	1.70	6.71	4.31	0.18	0.26	1.19	0.20	0.04	CO_2 none ZrO_2 0.06 SO_3 0.05 BaO 0.05	100.45	
A1. I	1.057	.160	.013	.043	.020	.030	.108	.046			.015	.001	—			
36	63.30	16.38	2.54	2.36	0.84	1.62	6.36	4.41	0.83	0.10	0.71	0.30			99.75	
A2. II	1.055	.161	.016	.033	.021	.029	.103	.047			.009	.002				
37	63.44	17.85	2.82	1.79	0.37	0.69	7.36	5.48	0.76						99.56	
A3. III	1.057	.175	.018	.025	.009	.013	.119	.059								
38	64.95	17.80	2.69	1.22	1.09	1.08	5.65	4.90			0.83	0.22			100.43	
A2. II.	1.083	.174	.017	.017	.027	.019	.091	.052			.010	.002				
39	59.20	20.40	2.03	1.09	1.40	0.82	8.22	5.02	2.06		0.25	trace		Cl 0.20	100.69	
A2. II	.987	.200	.013	.015	.035	.014	.132	.053			.003	—				
40	61.81	19.20	0.73	1.64	0.52	0.20	7.90	6.75	1.00		0.06	trace	0.05	Cl 0.54	100.40	
A2. II	1.030	.188	.004	.023	.013	.004	.127	.072			.001	—	—			
41	67.4	16.2	0.8	1.8	1.1	2.4	6.6	3.2	0.6		0.6				100.7	
B3. IV	1.123	.157	.005	.025	.028	.043	.106	.034			.008					
42	63.74	17.86	4.27	0.30	0.10	0.83	7.23	5.19	0.83		trace		0.19		100.54	
A3. III	1.062	.175	.027	.004	.003	.015	.117	.056			—		.003			
43	67.0	17.7	1.9	2.0	0.2	0.8	6.5	4.3	0.5						100.9	2.60
B3. IV	1.117	.174	.012	.028	.005	.014	.105	.046								
44	65.54	19.84	1.78	0.16	trace	0.25	6.01	5.25	0.71	0.16	0.23	0.11			100.04	
A2. II	1.092	.195	.011	.002	—	.004	.097	.056			.003	.001				

ORDER 5. PERFELIC. CANADARE—Continued.

SUBRANG 4. DOSODIC. NORDMARKOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
30	I(II).5.1.(3)4.	Q 4.98 di 2.69 or 32.80 wo 1.04 ab 50.83 mt 6.26 an 1.11 hl 0.35	Kühlsbrunnen, Siebengebirge.	W. Bruhns.	W. Bruhns, Vh. Nh. Ver. Bonn, LIII, p. 44, 1896.	Aegirite trachyte.	In W. T., p. 197.
31	I.5.1.4.⊙	Q 2.44 hy 1.13 or 17.77 mt 2.55 ab 66.55 il 0.30 an 4.17 ap 1.34 C 3.26	Haarweiden, Westerwald, Hesse Nassau.	H. Schneiderhöhn.	H. Schneiderhöhn, Jb. Pr. G. L.-A., XXX, (II), p. 306, (1909), 1910.	Trachyte.	
32	I(II).''5.1.4.	Q 6.30 hy 4.70 or 25.02 il 0.76 ab 53.45 hm 4.22 C 2.45 ru 0.32 ap 1.01	Near Rothemühle, Thüringerwald, Germany.	Hampe.	H. Loretz, Jb. Pr. G. L.-A., (1888), p. 300, 1889.	Biotite porphyrite.	In W. T., p. 197.
33	I.5(6).1''.(3)4.	or 34.47 ol 0.76 ab 44.01 mt 2.09 an 4.45 ap 0.67 ne 8.80 C 1.43	Münzberg, Polzengebiet, N. Bohemia.	K. H. Scheumann.	K. H. Scheumann, Abh. Säch. Ges. W., XXXII, p. 756, 1913.	Trachytoid phonolite.	
34	I.5(6).1(2).(3)4.	or 35.03 ol 1.48 ab 41.39 mt 2.32 an 5.56 il 0.46 ne 9.09 ap 1.01 C 2.04	Münzberg, Polzengebiet, N. Bohemia.	K. H. Scheumann.	K. H. Scheumann, Abh. Säch. Ges. W., XXXII, p. 756, 1913.	Trachytoid phonolite.	
35	I(II).5.1.4.	Q 3.90 di 4.83 or 25.58 hy 1.59 ab 56.59 mt 3.02 an 1.67 il 2.28 ap 0.34	Montagna Grande, Pantelleria.	H. S. Washington.	H. S. Washington, J. G., XXI, p. 688, 1913.	Trachyte.	
36	I(II).''5.1''.''4.	Q 5.58 di 2.48 or 26.13 hy 1.96 ab 53.97 mt 3.71 an 3.06 il 1.37 ap 0.67	Monte Gibele, Pantelleria.	H. S. Washington.	H. S. Washington, J. G., XXI, p. 688, 1913.	Trachyte.	
37	I''.5.1.''4.	or 32.80 ac 1.39 ab 56.33 di 3.03 ne 2.41 ol 0.52 mt 3.48	Lagoa Sete Cidades, Sao Miguel, Azores.	R. Reinisch.	R. Reinisch, Deutsch. Sud. Pol. Exp., II, (7), p. 659, 1912.	Katoforite trachyte.	
38	I''.(4)5.1''.(3)4.	Q 10.44 hy 2.70 or 28.91 mt 1.62 ab 47.68 il 1.52 an 3.34 hm 1.60 C 1.94 ap 0.67	Gebel Siroua Volcano, Morocco.	Pisani.	L. Gentil, C. R. CXLVI, p. 186, 1908.	Biotite trachyte.	
39	I.5(6).1''.4.	or 29.47 ol 2.45 ab 47.68 mt 2.78 an 3.88 il 0.46 ne 10.79 hm 0.16 hl 0.35 C 0.41	Ain Anou Daousderm, Gebel Siroua, Morocco.	Pisani.	L. Gentil, C. R., CXLVI, p. 187, 1908.	Phonolite.	
40	I.5''.1.(3)4.	or 40.03 ac 1.39 ab 44.54 di 0.92 ne 8.80 ol 2.71 hl 0.94 mt 0.23 il 0.15	Rouma, Los Islands, French Guinea.	Pisani.	A. Lacroix, Nouv. Arch. Mus., III, p. 38, 1911.	Syenite pegmatite.	Also in B. Soc. Fr. Min., XXXV, p. 20, 1912.
41	I(II).(4)5.1(2).4.	Q 10.98 di 5.88 or 18.90 hy 1.53 ab 55.54 mt 1.16 an 4.73 il 1.22	Gebel Doukhan, Red Sea, Egypt.	Not stated.	C. Couyat, C. R., CXL, CXLVII, p. 868, 1908.	Microgranite.	
42	I''.5.1.''4.	Q 0.24 di 0.65 or 31.14 wo 1.16 ab 61.31 mt 1.62 an 0.56 hm 3.20	Edda Gijorgis, Abyssinia.	G. T. Prior.	G. T. Prior, Min. Mag., XII, p. 266, 1900.	Sölvsbergite.	In W. T., p. 197.
43	I.(4)5.1''.4.	Q 9.72 hy 2.61 or 25.58 mt 2.78 ab 55.02 an 3.89 C 0.92	Arto, French Somali.	H. Arsandaux.	H. Arsandaux, Roches Est Afr., p. 75, 1906.	Aegirite microsyenite.	
44	I.(4)5.1.(3)4.	Q 10.32 [illegible] 0.30 or 31.14 hm 1.78 ab 50.83 ru 0.08 an 0.28 ap 0.34 C 4.18	Betankilanton (?), Madagascar.	Boiteau.	A. Lacroix, pers. com., 1913.	Micronordmarkite.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. NORDMARKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
45	63.20	19.29	1.48	0.38	0.13	0.86	7.48	5.22	1.15	0.37	0.23	0.07		Cl 0.02	99.88	
A2. II	1.053	.189	.009	.006	.003	.015	.121	.055			.003	—				
46	62.91	18.25	2.08	1.47	0.20	0.87	6.87	5.85	0.47		0.94	0.19			100.10	
A2. II	1.049	.179	.013	.021	.005	.016	.111	.063			.012	.001				
47	60.95	19.50	1.85	1.19	0.15	1.88	7.17	5.20	1.07	0.16	0.42	0.08		SO_3 0.03 Cl 0.15	99.80	
A2. II	1.016	.191	.012	.017	.004	.034	.116	.055			.005	—				
48	60.90	18.42	2.02	2.93	0.40	0.97	6.38	5.56	0.80	0.65	0.47	0.13			99.63	
A2. II	1.015	.180	.013	.040	.010	.017	.103	.060			.006	.001				
49	60.81	18.73	2.60	2.37	0.42	1.52	7.76	4.69	0.31	0.16	0.15	0.11			99.63	
A2. II	1.014	.184	.016	.033	.011	.027	.126	.050			.002	.001				
50	60.30	20.62	1.53	0.51	0.19	1.49	8.06	5.64	0.31	0.12	0.25	0.08	0.20	SO_3 0.18 Cl 0.31	99.79	
A2. II	1.005	.202	.009	.007	.005	.027	.130	.060			.003	—	.003			
51	61.49	18.25	1.77	3.13	0.41	1.65	6.78	5.47	0.26		0.51	0.09			99.81	
A2. II	1.025	.179	.011	.043	.010	.030	.110	.059			.006	.001				
52	66.71	15.82	0.71	0.32	2.05	3.92	7.12	2.42	1.01						100.08	
A3. III	1.112	.155	.004	.004	.051	.070	.114	.025								
53	65.46	17.49	3.00	1.60	0.09	0.76	6.51	4.74	0.35	0.52	0.24	none	trace	SO_3 none Cl trace	100.67	2.59
A2. II	1.091	.171	.019	.022	.002	.014	.105	.050			.003	—	—			
54	63.82	17.85	2.75	1.67	0.06	0.59	7.13	5.51	0.20	0.66	0.25	none	0.04	CO_2 none Cl trace NiO none BaO none SrO none	100.53	
A1. I	1.064	.175	.017	.024	.002	.011	.115	.059			.003	—	—			
55	60.32	18.32	3.55	1.96	0.01	1.12	7.01	6.25	1.31	0.35	0.25	none	0.03	CO_2 trace ZrO_2 0.38 SO_3 0.11 Cl none NiO 0.05 BaO none	101.02	
B1. II	1.005	.180	.022	.027	—	.020	.113	.067			.003	—	—			
56	66.04	18.38	1.05	n. d.	0.69	0.96	7.22	5.09	1.50						100.93	
B3. IV	1.101	.180	.007	(.014)	.017	.017	.116	.054								
57	61.69	17.33	5.30	0.07	0.16	1.05	7.47	3.47	1.93	0.42	0.67	0.05	0.21	CO_2 none ZrO_2 0.16 S 0.02 BaO 0.07 SrO 0.03	100.10	
A1. I	1.028	.170	.033	.001	.004	.019	.120	.037			.008	—	.001			
58	61.07	17.77	2.18	1.49	0.88	1.30	6.80	5.58	1.71	0.11	0.94	none	0.05	CO_2 none ZrO_2 0.12 SO_3 none BaO none	100.00	
A1. I	1.018	.174	.014	.021	.022	.023	.110	.060			.012	—	—			
59	60.50	18.20	1.34	1.89	1.18	1.75	7.25	4.45	2.30		0.92				99.78	
A3. III	1.008	.178	.008	.026	.030	.031	.117	.048			.012					
60	67.05	15.43	3.25	1.25	0.16	1.06	6.12	5.32	0.56		0.10	0.04			100.34	
A2. II	1.118	.151	.020	.018	.004	.019	.098	.056			.001	—				

ORDER 5. PERFELIC. CANADARE—Continued.

SUBRANG 4. DOSODIC. NORDMARKOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
45	I.5.1″.4.	or 30.58 di 0.43 ab 59.21 ol 0.07 an 3.61 mt 0.70 ne 2.27 il 0.46 hm 0.96	Betankilastra, Madagascar.	Not stated.	A. Lacroix, pers. com., 1913.	Syenite.	
46	I″.5.1.(3)4.	or 35.03 di 1.08 ab 55.80 wo 0.35 an 1.39 il 1.82 ne 1.28 hm 0.64 ap 0.34	Angorong, Madagascar.	Boiteau.	A. Lacroix, pers. com., 1913.	Aegirite trachyte.	
47	I.5.1(2).″4.	or 30.58 di 0.86 ab 51.87 wo 1.16 an 5.56 mt 2.78 ne 4.83 il 0.76	Iliazadramosa, Ankaratra, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVI, p. 176, 1913.	Phonolitic trachyte.	
48	I″.5.1″.(3)4.	or 33.36 ol 2.84 ab 52.92 mt 3.02 an 3.89 il 0.91 ne 0.57 ap 0.34 C 0.31	Androhilé, Madagascar.	Boiteau.	A. Lacroix, pers. com., 1913.	Sölvsbergite.	
49	I″.5″.1.4.	or 27.80 di 3.75 ab 53.45 ol 0.89 an 2.22 mt 3.71 ne 6.82 il 0.30 ap 0.34	Tsiafakafokely, Ankaratra, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVI, p. 176, 1913.	Phonolite.	
50	I.5(6).1″.″4.	or 33.36 di 1.08 ab 45.59 wo 0.35 an 5.28 mt 1.62 ne 10.22 il 0.46 hl 0.47 hm 0.32 th 0.43	Kitia, Itasy, Madagascar.	Boiteau,	A. Lacroix, C. R., CLVI, p. 179, 1913.	Phonolite.	
51	I(II).5.1.(3)4.	or 32.80 di 4.05 ab 50.83 ol 1.78 an 2.78 mt 2.55 ne 3.69 il 0.91 ap 0.34	Ravin des Fleurs Jaunes, Reunion Island.	Boiteau.	A. Lacroix, C. R., CLV, p. 541, 1912.	Phonolitic trachyte.	
52	I(II).″5.1(2).4.	Q 8.46 di 11.02 or 13.90 wo 0.35 ab 59.74 mt 0.93 an 4.45	Deleng Baros, Sumatra.	W. Herz.	L. Milch, Z. D. G. G., LI, p. 66, 1899.	Dacite.	In W. T., p. 203.
53	I.″5.1″.″4.	Q 7.86 hy 0.20 or 27.80 mt 4.41 ab 55.02 il 0.46 an 3.89	Camel's Hump, Macedon, Victoria.	A. G. Hall.	Skeats and Summers, G. S. Vc. B. 24, p. 20, 1912.	Sölvsbergite.	
54	I.5.1.″4.	Q 0.12 di 1.43 or 32.80 wo 0.46 ab 60.26 mt 3.94 an 0.28 il 0.46	Timor Rock, Warrumbungle Mountains, New South Wales.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXII, p. 617, 1907.	Aegirite trachyte.	
55	I″.5″.1.(3)4.	or 37.25 di 0.49 ab 46.11 wo 2.09 ne 7.10 mt 5.10 Z 0.55 il 0.46	Mount Bingy Grumble, Warrumbungle Mountains, New South Wales.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXII, p. 616, 1907.	Nosean phonolite.	
56	I.5.1.″4.	Q 1.38 di 1.61 or 30.02 hy 2.75 ab 60.78 an 2.78	Portobello, Dunedin, New Zealand.	P. Marshall.	P. Marshall, Q. J. G. S., LXII, p. 399, 1906.	Trachyte.	
57	I″.5.1″.4.	Q 3.00 di 0.43 or 20.57 hy 0.20 ab 62.88 il 0.61 an 3.61 hm 5.30 tn 0.78	Lahaina, Maui Island, Hawaiian Islands.	G. Steiger.	W. Cross, U. S. G. S. P. P. 88, p. 27, 1915.	Trachyte.	
58	I(II).5.1.(3)4	or 33.36 di 4.10 ab 51.35 ol 0.07 an 1.11 mt 2.07 ne 3.41 il 1.82 hm 0.80	Taiarapu, Tahiti.	H. S. Washington.	J. P. Iddings, pers. com.	Trachyte.	
59	I″.5.1″.4.	or 26.69 di 3.99 ab 54.49 ol 1.35 an 3.61 mt 1.86 ne 3.69 il 1.82	Vairao, Tahiti.	Pisani.	A. Lacroix, B. Soc. G. Fr., X, p. 112, 1910.	Tinguaite.	
60	I″.(4)5.1.(3)4.	Q 10.62 ac 1.39 or 31.14 di 0.86 ab 49.78 wo 1.74 mt 3.94 il 0.15	Green Mountain, Ascension Island.	R. Reinisch.	R. Reinisch, D. Sudpol. Exp., II, (7), p. 648, 1912.	Aenigmatite trachyte.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. NORDMARKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
61	66.12	15.51	3.27	0.93	0.17	1.05	6.31	5.40	1.98						100.65	
A3. III	1.102	.152	.020	.013	.004	.019	.102	.057								
62	63.98	16.00	2.57	2.12	0.64	1.58	6.45	5.18	0.61		0.28				99.41	
A3. III	1.066	.157	.016	.029	.016	.029	.104	.055			.004					
63	63.02	15.75	0.52	3.15	0.38	1.49	6.11	5.21	4.83						100.46	
A3. III	1.050	.155	.003	.044	.010	.027	.098	.055								

RANG 1. PERALKALIC. NORDMARKASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	67.53	18.57	1.13	0.08	0.24	0.55	11.50	0.10	0.31	0.15	0.07	0.11	trace	SrO trace	100.34	
A2. II	1.126	.182	.007	.001	.006	.010	.185	.001			.001	.001	—			
2	63.32	17.30	2.03	1.82	0.94	2.42	8.73	1.38	0.24		1.72	trace	0.05	S 0.03	99.98	
A2. II	1.055	.170	.013	.025	.024	.043	.140	.015			.022	—	—			
3	67.07	18.85	0.91	n. d.	1.53	1.09	10.84	0.48	n. d.		0.23		o		101.00	
A4. IV	1.118	.185	.006	(.012)	.038	.020	.175	.005			.003					
4	62.53	18.72	3.26	0.34	0.08	0.54	11.77	0.79	0.68				0.16	ZrO_2 1.08	99.95	2.699
A2. II	1.042	.184	.020	.005	.002	.010	.190	.008					.002			
5	68.36	18.74	none	1.15	0.54	0.39	10.22	0.07	0.03	none			0.45		100.02	2.64
A3. III	1.139	.184	—	.016	.014	.007	.165	.001					.006			

RANG 2. DOMALKALIC. PULASKASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	58.21	18.88	4.07	0.87	0.98	3.58	2.57	9.17	0.74		0.82	0.20		CO_2 none	100.09	
A2. II	.970	.185	.026	.013	.025	.064	.042	.098			.010	.001				
2	57.95	19.33	3.03	1.12	1.12	3.93	3.10	8.55	0.54	0.11	0.82	0.20		CO_2 none	99.80	
A2. II	.966	.189	.019	.015	.028	.070	.050	.091			.010	.001				
3	56.19	20.75	1.71	2.19	1.14	3.53	2.86	10.47	0.70	0.30	0.65	0.24		CO_2 none	100.73	
A2. II	.936	.203	.011	.031	.029	.063	.046	.112			.008	.002				
4	55.17	19.60	3.27	2.74	1.58	3.73	2.27	9.58	0.99		0.69	0.20		CO_2 none	99.82	
A2. II	.920	.192	.020	.038	.040	.067	.037	.102			.009	.001				
5	58.35	19.83	0.98	2.37	0.90	3.67	3.59	9.10	0.96		0.30	trace		Cl trace	100.05	
A2. II	.973	.194	.006	.033	.023	.066	.058	.097			.004	—				
6	57.58	19.39	3.22	1.62	1.17	4.08	3.12	8.68	0.50	0.44	0.31	0.21		Cl 0.17	100.49	
A2. II	.960	.190	.020	.022	.029	.073	.050	.093			.004	.001				

ORDER 5. PERFELIC. CANADARE—Continued.

SUBRANG 4. DOSODIC. NORDMARKOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
61	I″.(4)5.1.(3)4.	Q 8.34 ac 3.23 or 31.69 di 0.86 ab 49.78 wo 1.74 mt 3.02	Dark Slope, Ascension Island.	R. Reinisch.	R. Reinisch, D. Sudpol. Exp., II, (7), p. 649, 1912.	Trachyte.	
62	I(II).5.1.(3)4.	Q 3.60 ac 0.92 or 30.58 di 6.18 ab 53.45 wo 0.23 mt 3.25 il 0.61	Cross Hill, n. Georgetown, Ascension Island.	R. Reinisch.	R. Reinisch, D. Sudpol. Exp., II, (7), p. 649, 1912.	Katoforite trachyte.	
63	I(II).5.1.(3)4.	Q 3.36 di 6.04 or 30.58 hy 3.27 ab 51.35 mt 0.70 an 0.56	Riding School, Ascension Island.	R. Reinisch.	R. Reinisch, D. Sudpol. Exp., II, (7), p. 650, 1912.	Trachyte pumice.	

SUBRANG 5. PERSODIC. TUOLUMNOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.5.1.5.⊙	Q 0.18 ac 1.39 or 0.56 di 1.30 ab 95.37 wo 0.12 mt 0.23 il 0.15 hm 0.32 ap 0.34	Moccasin Creek, Tuolumne County, California.	H. N. Stokes.	H. W. Turner, U. S. G. S. A. R. 17, I, p. 727, 1896.	Soda syenite porphyry.	Also in A. G., XVII, p. 387, 1896. In W. T., p. 199.
2	I(II).5.1″.(4)5.	Q 2.58 di 5.18 or 8.34 wo 0.46 ab 73.36 mt 0.70 an 4.17 il 3.34 hm 1.60	Tingsvallakulla, Gellivare, Sweden.	G. Nyblom.	A. G. Högbom, G. F. F., XXXII, p. 569, 1910.	Syenite.	
3	I.5.1.5.⊙	or 2.78 di 3.34 ab 89.34 ol 2.43 an 1.39 il 0.46 ne 1.28	Koswinsky, Kitlim District, Ural Mountains.	Not stated.	Duparc and Pamfil, B. Soc. Min. Fr., XXXIII, p. 369, 1910.	Albitite.	
4	I″.5(6).1.5.	or 4.45 ac 6.47 ab 73.88 di 0.68 ne 9.94 wo 0.81 Z 1.46 mt 1.39	Mariupol, Sea of Azof, Russia.	J. Morozewicz.	J. Morozewicz, T. M. P. M., XXI, p. 241, 1902.	Mariupolite.	Not typical, too little nephelite. In W. T., p. 199.
5	I.5.1.5.⊙	Q 5.58 hy 4.30 or 0.56 ab 86.46 an 1.95 C 1.12	Moolyella, Pilbara, West Australia.	E. S. Simpson.	A. G. Maitland, W. Aust. G. S. B. 15, p. 12, 1904.	Pegmatite.	

SUBRANG 2. DOPOTASSIC. VULSINOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I″.5.2.2.	or 54.49 di 3.24 ab 22.01 hy 1.00 an 12.51 mt 0.70 il 1.52 hm 3.68 ap 0.34	Bolsena, n. Orvieto, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 31, 1906.	Vulsinite.	Incomplete in J. G., IV, p. 552, 1896. TiO_2 and P_2O_5 from next. In W. T., p. 199.
2	I″.5.2.2(3).	or 50.60 di 3.89 ab 24.10 ol 0.70 an 13.34 mt 1.16 ne 1.14 il 1.52 hm 2.24 ap 0.40	Bolsena, n. Orvieto, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 31, 1906.	Vulsinite.	Same locality as above, different specimen.
3	I″.5(6).2.2.	or 62.27 di 2.44 ab 5.76 ol 2.42 an 12.51 mt 2.55 ne 9.94 il 1.22 ap 0.68	Sorgente di Garignano, Lake Vico, n. Viterbo, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 36, 1906.	Viterbite (leucite trachyte).	
4	I(II).5.2.2.	or 56.71 di 2.22 ab 11.53 ol 2.95 an 14.73 mt 4.64 ne 4.26 il 1.37 ap 0.40	Below San Rocco, Monte Vico, n. Viterbo, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 36, 1906.	Viterbite (leucite trachyte).	Incomplete in J. G., V, p. 370, 1897. In W. T., p. 199.
5	I(II).5″.2.2(3).	or 53.93 di 6.28 ab 17.29 ol 1.62 an 10.84 mt 1.39 ne 7.10 il 0.61	Astroni Volcano, Phlegrean Fields, Italy.	C. Riva.	De Lorenzo and Riva, Atti. Ac. Sc. Nap., XI, p. 19, 1902.	Vulsinite. pumice.	
6	I(II).5.2.2(3).	or 51.71 di 4.32 ab 21.48 ol 0.63 an 13.62 mt 4.18 ne 1.98 il 0.61 hl 0.23 hm 0.32 ap 0.40	Caprara, Astroni Volcano, Phlegrean Fields.	C. Riva.	De Lorenzo and Riva, Atti. Ac. Sc. Nap., XI, p. 43, 1902.	Vulsinite.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. PULASKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
7	57.50	18.80	4.37	0.62	1.20	3.84	3.16	8.39	0.61	0.38	0.50	0.28	0.57	Cl 0.03	100.21	
A2. II	.958	.184	.028	.009	.030	.069	.051	.089			.006	.002	.008			
8	58.44	20.79	0.58	3.85	0.43	2.24	2.85	9.83	1.36						100.37	
A3. III	.974	.204	.004	.054	.011	.040	.046	.104								
9	55.00	20.91	2.05	3.73	0.63	3.32	2.80	8.66	1.87		0.35	trace	0.77	CO_2 0.33 S 0.61	101.03	
B2. III	.917	.205	.013	.051	.016	.059	.045	.092			.004	—	.011			

RANG 2. DOMALKALIC. PULASKASE.

1	60.75	19.55	1.54	2.98	0.81	2.29	4.89	5.90	0.08	0.24	0.63	0.13	trace		99.79	
A2. II	1.013	.192	.010	.041	.020	.041	.079	.063			.008	.001	—			
2	63.45	18.31	0.42	3.56	0.35	2.93	5.06	5.15	0.30		0.07	trace	none	BaO 0.13	99.73	2.717
A2. II	1.058	.179	.003	.050	.009	.051	.081	.056			.001	—	—			200
3	64.64	15.92	1.14	4.65	0.23	2.12	4.38	6.06	0.43	0.04	0.42	trace	0.03	ZrO_2 trace S 0.06 BaO 0.10	100.22	
A1. I	1.077	.156	.007	.065	.006	.038	.071	.065			.005	—	—			
4	63.65	20.46	2.20	n. d.	1.50	3.28	4.75	4.58	0.42						100.84	
A4. IV	1.061	.200	.013	(.026)	.038	.058	.076	.049								
5	61.18	19.72	3.71	1.32	trace	2.64	5.28	5.66	0.32						99.83	
A3. III	1.020	.193	.023	.018	—	.047	.085	.061								
6	60.20	20.40	1.74	1.88	1.04	2.00	6.30	6.07	0.23	0.10	0.14	0.15	trace	CO_2 none ZrO_2 trace SO_3 0.13 Cl 0.09 S none	100.47	
A1. I	1.003	.200	.011	.026	.026	.036	.102	.065			.002	.001	—			
7	60.03	20.76	4.01	0.75	0.80	2.62	5.96	5.48	0.53	0.06		0.07	trace		101.07	2.656
B3. IV	1.001	.203	.025	.010	.020	.046	.096	.059				—	—			
8	65.54	17.81	0.74	1.15	0.98	1.92	5.55	5.58	0.54		0.11		trace	Li_2O trace	99.92	
A3. III	1.092	.175	.005	.016	.025	.034	.090	.059			.001		—			
9	57.18	18.54	3.65	1.15	0.69	2.31	4.48	8.58	2.10		0.30	0.05	trace	SO_3 0.06 Cl 0.77 BaO 0.49 SrO trace	100.35	
A1. I	.953	.182	.023	.016	.017	.041	.072	.091			.004	—	—			
10	56.45	20.08	1.31	4.39	0.63	2.14	5.61	7.13	1.51	0.26	0.29	0.13	0.09	Cl 0.43 NiO trace	100.45	
A2. II	.941	.197	.008	.061	.016	.038	.090	.075			.004	.001	.001			
11	61.41	17.99	2.93	1.39	1.20	4.75	4.01	4.59	0.68	0.11	0.53	0.19	0.16	SO_3 0.05 BaO 0.11 SrO 0.1	100.24	
A1. I	1.024	.176	.018	.019	.030	.085	.065	.049			.007	.001	.002			
12	60.89	17.14	3.32	0.95	1.16	3.58	4.54	5.71	1.22	0.39	0.49	0.27	0.09	NiO 0.19	99.94	
A2. II	1.015	.168	.020	.015	.029	.064	.071	.061			.006	.002	.001			

ORDER 5. PERFELIC. CANADARE—Continued.

SUBRANG 2. DOPOTASSIC. VULSINOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
7	I(II).5.2.2(3).	or 49.48, ab 25.15, an 12.23, ne 0.85, di 3.89, ol 0.84, mt 0.70, il 0.91, hm 4.00, ap 0.67	Pagliaroni, Astroni Volcano, Phlegrean Fields.	C. Riva.	De Lorenzo and Riva, Atti. Ac. Sc. Nap., XI, p. 48, 1902.	Vulsinite.	
8	I''.5.2.2.	or 57.82, ab 19.39, an 11.12, ne 2.56, C 1.43, ol 5.87, mt 0.93	Near Kandy, Ceylon.	W. C. Hancock.	A. K. Coomaraswamy, Geol. Mag., (IV), X, p. 349, 1903.	Corundum syenite.	
9	I(II).5.2.2''.	or 51.15, ab 16.77, an 16.40, ne 3.69, C 0.92, ol 5.71, mt 3.02, il 0.61	Regatta Point, Port Cygnet, Tasmania.	F. P. Paul.	F. P. Paul, T. M. P. M., XXV, p. 295, 1906.	Mica sölvsbergite.	

SUBRANG 3. SODIPOTASSIC. PULASKOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I''.5.''2.3.	Q 1.56, or 35.03, ab 41.39, an 10.56, C 1.22, hy 7.15, mt 0.46, il 1.22, ap 0.34	Mount Belknap, New Hampshire.	H. S. Washington.	Pirsson and Washington, A. J. S., XXII, p. 450, 1906.	Syenite.	In W. T., p. 199.
2	I''.5.2.3''.	Q 5.06, or 31.14, ab 42.44, an 11.68, di 2.15, hy 6.11, mt 0.70	Loon Lake, Franklin County, New York.	E. W. Morley.	H. P. Cushing, B. G. S. A., X, p. 183, 1899.	Augite syenite.	In W. T., p. 199.
3	I(II).(4)5.(1)2.3.	Q 8.64, or 36.14, ab 37.20, an 5.56, di 4.40, hy 5.28, mt 1.62, il 0.76	Black Horse Hill, Pennsylvania.	R. C. Wells.	F. Bascom, U. S. G. S. rec. lab.	Granite gneiss.	
4	I''.''5.2''.3(4).	Q 7.86, or 27.24, ab 39.82, an 16.12, C 1.73, hy 7.23	Coweta station, Coweta County, Georgia	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9A, p. 93, 1902.	Granite.	Also in J. G., IX, p. 119, 1901.
5	I.5.2.3''.	Q 3.00, or 33.92, ab 44.54, an 13.07, mt 4.18, hm 0.80	Near Wausau, Wisconsin.	W. W. Daniells.	S. Weidman, J. G., XII, p. 552, 1904.	Quartz syenite.	
6	I''.5''.''2.3(4).	or 36.14, ab 42.44, an 9.17, ne 5.96, ol 3.15, mt 2.55, il 0.30, ap 0.34	Fourche Mountain, n. Little Rock, Arkansas.	H. S. Washington.	H. S. Washington, J. G., IX, p. 609, 1901.	Pulaskite.	In W. T., p. 199.
7	I.5.2.3(4).	or 32.80, ab 46.11, an 12.79, ne 2.27, ol 1.40, mt 2.32, hm 2.40	Fourche Mountain, n. Little Rock, Arkansas.	R. N. Brackett.	J. F. Williams, Ark. G. S. A. R. (1890), II, p. 88, 1891.	Pulaskite.	In W. T., p. 199.
8	I.''5.(1)2.3(4).	Q 6.18, or 32.80, ab 47.16, an 7.23, di 1.79, hy 2.96, mt 1.16, il 0.15	Highwood Peak, Highwood Mountains, Montana.	Pirsson and Mitchell.	Weed and Pirsson, A. J. S., I, p. 295, 1896.	Quartz syenite.	Also in Pirsson, U. S. G. S. B. 237, p. 63, 1905. In W. T., p. 199.
9	I''.5.''2.3.	or 50.60, ab 26.20, an 8.34, ne 3.12, hl 1.29, di 2.38, ol 0.42, mt 2.78, il 0.61, hm 1.76	South Mountain, Highwood Mountains, Montana.	H. W. Foote.	L. V. Pirsson, U. S. G. S. B. 237, p. 123, 1905.	Sölvsbergite porphyry.	In W. T., p. 199.
10	I''.5(6).''2.3.	or 41.70, ab 28.82, an 9.73, ne 8.24, hl 0.70, ol 6.22, mt 1.86, il 0.61	Square Butte, Highwood Mountains, Montana.	W. H. Melville.	Lindgren and Melville, A. J. S., XLV, p. 296, 1893.	Sodalite syenite.	In W. T., p. 201.
11	I(II).(4)5.2(3).3''.	Q 9.96, or 27.24, ab 34.06, an 17.24, di 4.32, hy 1.00, mt 2.78, il 1.06, hm 0.96, ap 0.34	Gem, Coeur d'Alene District, Idaho.	G. Steiger.	Ransome and Calkins, U. S. G. S. P. P. 62, p. 47, 1908.	Quartz monzonite.	
12	I(II).''5.2.3.	Q 6.06, or 33.92, ab 37.20, an 10.01, di 4.54, hy 0.80, mt 2.32, il 0.91, hm 1.60, ap 0.67	Stinkingwater River, Yellowstone National Park.	W. H. Melville.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 349, 1899.	Quartz banakite.	Also in J. G., III, p. 947, 1895. In W. T., p. 201.

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. PULASKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
13	57.73	18.93	1.97	1.92	0.91	2.78	5.52	6.11	2.93	0.22	0.33	0.25	0.06	CO_2 0.26 ZrO_2 trace FeS_2 0.02 Cr_2O_3 trace V_2O_3 0.01 BaO 0.16 SrO 0.09	100.20	
A1. I	.962	.185	.013	.027	.023	.050	.089	.065			.004	.002	—			
14	55.14	18.98	2.60	1.62	0.32	3.96	5.38	6.64	3.70	0.63	0.50	0.17	trace	SO_3 0.10 Cl trace S 0.03	99.77	
A2. II	.919	.186	.016	.022	.008	.071	.087	.070			.006	.001	—			
15	65.41	18.78	0.94	0.72	0.16	1.58	5.91	5.41	1.38			trace	trace		100.29	
A3. III	1.090	.184	.006	.010	.004	.029	.095	.058				—	—			
16	58.94	17.19	2.63	1.98	1.52	4.45	4.20	3.90	4.53		0.27	0.23	0.10		99.94	
A2. II	.982	.169	.016	.028	.038	.079	.068	.041			.003	.002	.001			
17	62.64	17.82	3.91	0.31	0.47	3.22	4.47	4.99	0.65	0.58	0.59	0.25	0.04	ZrO_2 0.08 BaO 0.28 SrO 0.07	100.37	
A1. I	1.044	.175	.024	.004	.012	.057	.073	.053			.007	.002	—			
18	62.04	17.63	1.98	1.57	0.99	1.75	4.73	6.74	1.18	0.12	0.72	0.17	trace	CO_2 0.20	99.82	2.497
A2. II	1.034	.173	.013	.022	.025	.031	.076	.071			.009	.001	—			
19	62.91	16.43	3.27	0.99	1.36	3.08	5.13	4.81	0.14		1.41	0.25	0.16	SO_3 0.05 BaO 0.06	100.05	
A1. I	1.049	.161	.021	.014	.034	.055	.082	.051			.013	.002	.002			
20	62.50	19.10	2.27	1.51	0.38	1.67	5.22	5.25	1.25		0.83				100.16	
A3. III	1.042	.187	.014	.021	.010	.030	.084	.056			.010					
21	60.20	20.50	1.58	1.01	0.39	1.96	4.75	5.57	3.00		0.51				99.47	
A3. III	1.003	.201	.010	.014	.010	.035	.077	.060			.006					
22	62.60	18.07	2.28	2.25	1.16	2.27	5.49	5.22	0.50						99.84	
A3. III	1.043	.177	.014	.031	.029	.041	.089	.056								
23	61.51	17.31	3.50	3.03	0.69	2.41	4.53	5.18	0.59		0.39		0.46		99.60	
A2. II	1.025	.170	.022	.042	.017	.043	.073	.055			.005		.007			
24	63.57	19.69	1.26	0.96	0.43	1.37	6.08	5.86	0.79	0.01	0.28	trace	trace	CO_2 0.02	100.32	
A3. III	1.060	.193	.008	.014	.011	.025	.098	.063			.004	—	—			
25	61.25	17.70	2.95	1.40	0.07	3.10	3.40	8.08	1.35		0.05	1.10			100.45	
A2. II	1.021	.174	.018	.019	.002	.055	.055	.086			—	.008				
26	62.26	18.10	2.28	2.87	1.22	1.32	4.70	6.05	0.60	0.03				SO_3 0.44	99.87	
A3. III	1.038	.177	.014	.040	.031	.023	.076	.065								
27	59.95	17.87	4.66	2.59	1.21	2.75	3.02	6.88	0.74						99.68	
A3. III	.999	.175	.029	.036	.030	.049	.048	.073								

ORDER 5. PERFELIC. CANADARE—Continued.

SUBRANG 3. SODIPOTASSIC. PULASKOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
13	I″.5.2.3.	or 36.14 di 2.72 ab 38.77 ol 1.76 an 8.62 mt 3.02 ne 4.26 il 0.61 ap 0.67	Dike Mountain, Yellowstone National Park.	W. F. Hillebrand.	Hague and Jaggar, U. S. G. S. B. 168, p. 98, 1900.	Biotite trachyte.	In W. T., p. 201.
14	I(II).5(6).2.″3.	or 38.92 di 1.73 ab 28.30 wo 3.94 an 8.06 mt 3.71 ne 9.37 il 0.91 ap 0.34	Warren Peaks, Sundance quadrangle, Wyoming.	G. Steiger.	W. S. T. Smith, U. S. G. S. Fol. 127, p. 6, 1905.	Trachytoid phonolite.	
15	I.″5.″2.3(4).	Q 6.36 hy 0.93 or 32.25 mt 1.39 ab 49.78 an 8.06 C 0.20	Rosita Hills, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. A. R. 17, (II), p. 324, 1896.	Trachyte.	Also in Proc. Colo. Sc. Soc., II, p. 233, 1887. In W. T., p. 201.
16	I(II).″5.2(3).3(4).	Q 8.88 di 2.65 or 22.80 hy 3.86 ab 35.63 mt 3.71 an 16.68 il 0.46 ap 0.67	Pringle Hill, Rosita Hills, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. A. R. 17, (II), p. 324, 1896.	Andesite.	In W. T., p. 201.
17	I″.(4)5.2.3.	Q 10.62 hy 1.20 or 30.02 il 0.61 ab 37.73 hm 3.91 an 13.62 tn 0.20 ru 0.16 ap 0.67	Bare Hills, Pikes Peak, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 148, p. 163, 1897.	Andesite.	In W. T., p. 201.
18	I″.5.(1)2.3.	Q 4.38 di 0.43 or 39.48 hy 2.30 ab 39.82 mt 3.02 an 7.23 il 0.30 ap 0.34	Near Midway, Rock Creek, Midway Mountains, British Columbia.	M. Dittrich.	R. A. Daly, Can. G. S. Mem. 38, (1), p. 419, 1912.	Pulaskite porphyry.	
19	I(II).″5.″2.3(4).	Q 8.46 di 4.32 or 28.36 hy 1.40 ab 42.97 mt 0.70 an 7.78 il 1.98 hm 2.88 ap 0.67	Grand Cascade, Mont Dore, Auvergne.	P. Holland.	Dickson and Holland, Pr. Liv. G. Soc., VIII, p. 412, 1899.	Trachyte.	Not in W. T.
20	I.″5.″2.3(4).	Q 7.92 hy 1.00 or 31.14 mt 2.55 ab 44.01 il 1.52 an 8.34 hm 0.46 C 1.73	Puy Gros, Mont Dore, Auvergne.	Pisani.	Michel Levy and Lacroix, C. R., CXLVIII, p. 1723, 1909.	Trachyte.	
21	I.5.2.3″.	Q 6.06 hy 1.00 or 33.36 mt 1.86 ab 40.35 il 0.91 an 9.73 hm 0.32 C 2.96	Lusclade, Mont Dore, Auvergne.	Pisani.	Michel Levy and Lacroix, C. R., CXLVIII, p. 1723, 1909.	Phonolitic trachyte.	
22	I(II).5.″2.3(4).	Q 3.24 di 2.04 or 31.14 hy 4.15 ab 46.64 mt 3.25 an 8.90	Ullernas, Norway.	G. Forsberg.	W. C. Brögger, Z. K., XVI, p. 49, 1890.	Akerite porphyry.	In W. T., p. 201.
23	I(II).″5.2.3″.	Q 8.16 hy 4.34 or 30.58 mt 5.10 ab 38.25 il 0.76 an 11.68	Waggeryd, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 268, 1906.	Granite.	
24	I.5.(1)2.3(4).	Q 1.86 hy 1.36 or 35.03 mt 1.86 ab 51.35 il 0.61 an 6.95 C 0.71	Gleeser Feld, Laacher See, Rheinland.	R. Brauns.	R. Brauns, N. J. B. B., XXXIV, p. 151, 1912.	Sanidinite.	
25	I″.″5.″2.(2)3.	Q 6.42 hy 0.21 or 47.82 mt 4.18 ab 28.82 il 0.15 an 7.78 ap 2.69 C 0.51	Scheerkopf, Siebengebirge, Rheinland.	Geller.	Laspeyres, Vh. Nh. Ver. Bonn, LVII, p. 561, 1900.	Trachyte.	P_2O_5 high? Not in W. T.
26	I(II).5.(1)2.3.	Q 5.34 hy 6.53 or 36.14 mt 3.25 ab 39.82 an 6.39 C 1.33	Korna, Verespatak, Hungary.	B. Ruzitska.	G. v. Szadeczky, F. K., XXXIX, p. 457, 1909.	Dacite.	
27	I(II).″5.2.(2)3.	Q 8.28 hy 3.92 or 40.59 mt 6.73 ab 25.15 an 13.62 C 0.51	Malga Gardone, Predazzo, Tyrol.	J. A. Ippen.	J. A. Ippen, N. J., 1903, II, p. 13.	Syenite.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. PULASKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
28	58.86	17.24	5.75	1.52	1.76	2.72	2.87	6.54	1.41		0.78	0.39		CO_2 0.17	100.01	
A2. II	.981	.169	.036	.021	.044	.048	.047	.069			.010	.003				
29	62.66	17.34	0.54	2.16	1.44	3.17	4.51	6.34	1.67			trace	0.12		99.94	
A?3. III	1.044	.170	.003	.030	.036	.057	.072	.067				——	.002			
30	55.07	20.83	2.12	1.99	1.00	3.37	4.00	8.65	0.77	0.59	0.82	0.19		CO_2 none ZrO_2 0.04 SO_3 trace Ce_2O_3 0.03 BaO 0.20 SrO 0.06	99.73	
A1. I	.918	.204	.013	.028	.025	.060	.065	.093			.010	.001				
31	58.61	20.20	0.47	2.48	1.51	2.66	5.20	8.66	n. d.		0.39	trace		Cl 0.64	100.82	
A2. II	.977	.198	.003	.035	.038	.048	.084	.092			.005	——			(100.62)	
32	57.60	19.43	2.49	1.92	1.06	4.17	3.55	8.71	0.32	0.32	0.46	0.20	0.23		100.50	
A2. II	.960	.190	.016	.026	.027	.075	.057	.093			.006	.001	.003			
33	61.07	19.47	2.50	0.71	0.46	1.45	4.84	7.07	0.96	0.42	0.69	0.04			99.68	
A2. II	1.018	.191	.016	.010	.012	.026	.078	.076			.009	——				
34	58.43	18.58	3.00	1.22	0.13	3.50	4.78	5.82	0.94	1.63	1.11	0.19	0.09	CO_2 none ZrO_2 0.24 SO_3 0.11 BaO 0.14 SrO 0.06	99.97	
A1. I	.974	.182	.019	.017	.003	.063	.077	.062			.014	.001	.001			
35	60.34	20.69	1.53	1.15	0.38	1.97	3.94	8.15	1.38		0.62				100.15	
A3. III	1.006	.203	.010	.016	.010	.036	.064	.087			.008					
36	58.85	20.86	1.34	1.04	0.36	1.50	6.74	7.01	1.15		0.50	0.02		Cl .060	100.01	
A2. II	.981	.204	.008	.014	.009	.027	.109	.074			.006	——				
37	59.16	19.13	1.70	3.04	0.61	2.83	5.56	5.20	1.44	0.25	0.51	0.23			99.75	
A2. II	.986	.187	.011	.042	.016	.050	.090	.055			.006	.002				
38	64.24	17.35	2.33	2.05	1.04	3.52	4.79	5.02	0.35		0.25	0.17			101.01	
B2. III	1.071	.170	.014	.029	.026	.063	.077	.053			.003	.001				
39	62.88	17.47	1.17	2.94	0.73	2.17	4.55	5.80	1.55		0.91	0.31	trace		100.48	
A2. II	1.048	.171	.008	.041	.018	.039	.074	.062			.011	.022	——			
40	61.83	17.08	2.14	2.71	0.89	2.24	4.93	5.37	1.60		0.30	0.35	0.12		99.56	
A2. II	1.031	.167	.013	.038	.022	.040	.079	.057			.004	.003	.002			
41	58.79	19.55	1.82	1.43	0.74	2.37	4.21	8.69	1.05	0.06	0.54	0.11	0.40	ZrO_2 none Cl 0.12 F 0.03 S 0.02 Cr_2O_3 none BaO 0.08 SrO 0.12	100.13	
A1. I	.980	.192	.011	.019	.019	.043	.068	.093			.007	.001	.006			
42	58.61	21.62	1.16	0.79	0.16	1.71	6.60	6.82	1.42	0.19	0.17	0.04	0.40	ZrO_2 0.01 Cl 0.07 F 0.01 S trace Cr_2O_3 none BaO 0.01 SrO 0.02	99.81	
A1. I	.977	.212	.007	.011	.004	.030	.106	.072			.002	——	.006			

ORDER 5. PERFELIC. CANADARE—Continued.

SUBRANG 3. SODIPOTASSIC. PULASKOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
28	I(II).(4)5.2.(2)3.	Q 8.70 hy 4.40 or 38.36 mt 4.87 ab 24.63 hm 2.40 an 13.34	Capello Peak, Predazzo, Tyrol.	Dittrich and Pohl.	J. Romberg, Anh. Abh. Pr. Ak. Wiss., 1904, p. 81.	Bostonite.	
29	I(II).5.2.3.	Q 3.42 di 5.94 or 37.25 hy 4.51 ab 37.73 mt 0.70 an 8.62	Monte Ciliano, n. Viterbo, Italy.	L. Ricciardi.	A. Verri, B. Soc. G. It., VIII, p. 403, 1889.	Trachyte andesite.	In W. T., p. 201.
30	I''.5(6).2.''3.	or 51.71 di 2.22 ab 14.15 ol 1.35 an 12.79 mt 3.02 ne 10.79 il 1.52 ap 0.36	Proceno, n. Acquapendente, Lake Bolsena, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 43, 1906.	Leucite trachyte.	
31	I.5(6).''2.3.	or 51.15 di 3.89 ab 20.44 ol 4.00 an 8.62 mt 0.70 ne 10.22 il 0.76 hl 1.05	Pollena, Monte Somma, Vesuvius.	Pisani.	A. Lacroix, Nouv. Arch. Mus., (4), IX, p. 138, 1907.	Phonolitic trachyte.	
32	I(II).5''.2.(2)3.	or 51.71 di 6.83 ab 19.12 mt 3.71 an 11.12 il 0.91 ne 5.82 ap 0.34	Rotondella, Astroni Volcano, Phlegrean Fields, Italy.	C. Riva.	Di Lorenzo and Riva, Att. Ac. Sc. Nap., XI, p. 52, 1902.	Vulsinite.	
33	I.5.(I)2.3.	Q 2.52 hy 1.20 or 42.26 mt 0.23 ab 40.87 il 1.37 an 7.23 hm 2.40 C 1.12	Sennariolo, Monte Ferru, Sardinia.	H. S. Washington.	H. S. Washington, A. J. S., XXXIX, p. 517, 1915.	Trachyte.	
34	I''.5.2.3.	Q 2.04 di 0.65 or 34.47 wo 1.63 ab 40.35 mt 0.93 an 11.95 il 2.13 hm 2.56 ap 0.34	Cuglieri, Monte Ferru, Sardinia.	H. S. Washington.	H. S. Washington, A. J. S., XXXIX, p. 517, 1915.	Trachyte.	
35	I.5.2.''3.	Q 1.08 hy 1.00 or 48.37 mt 1.86 ab 33.54 il 1.22 an 10.01 hm 0.32 C 1.63	Mont Caffé, Sao Thomé Island, Guinea Coast.	A. Lindner.	W. Boese, N. J. B. B., XXXIV, p. 259, 1912.	Aegirite trachyte.	3 decimals.
36	I.5(6).(1)2.3(4).	or 41.14 ol 0.63 ab 36.15 mt 1.86 an 7.51 il 0.91 ne 9.09 hl 0.94 C 0.20	Tamara, Los Islands, Guinea Coast.	Lassieur.	A. Lacroix, Nouv. Arch. Mus., III, p. 64, 1911.	Nephelite syenite.	Also in B. Soc. Fr. Min., XXXV, p. 20, 1912.
37	I''.5.2.3(4).	or 30.58 di 0.25 ab 47.16 hy 2.38 an 11.68 ol 1.78 mt 2.55 il 0.91 ap 0.67	Mount Tsarakanina, Madagascar.	Boiteau.	A. Lacroix, pers. com., 1913.	Phonolitic trachyte.	
38	I(II).(4)5.2.3''.	Q 9.18 di 4.51 or 29.47 hy 1.99 ab 40.35 mt 3.25 an 11.12 il 0.46 ap 0.34	Ilaka, Antsirabe, Madagascar.	Not stated.	Dupare et al., Mem. Soc. Ph. Gen., XXXVI (3), p. 303, 1910.	Granite.	
39	I''.''5.2.3.	Q 7.6 hy 4.70 or 34.47 mt 1.86 ab 38.77 il 1.67 an 8.90 ap 0.67 C 0.31	Tohuki-yama, Dogo, Oki Islands, Japan.	K. Yokoyama.	S. Kozu, Sc. Rep. Tohoku Un. (2), I, p. 47, 1913.	Trachyte.	
40	I(II).5''.2.3''.	Q 6.48 hy 5.24 or 31.69 mt 3.02 ab 41.39 il 0.61 an 8.62 ap 1.01	Kurokimara, Dozen, Oki Islands, Japan.	K. Yokoyama.	S. Kozu, Sc. Rep. Tohoku Un.(2), I, p. 33, 1913.	Quartz syenite.	
41	I''.5.''2.''3.	or 51.71 di 2.69 ab 25.15 ol 1.11 an 8.62 mt 2.55 ne 5.68 il 1.06 ap 0.34	Gentungen, Pic de Maros, Celebes.	E. W. Morley.	Iddings and Morley, J. G., XXIII, p. 240, 1915.	Trachyte.	
42	I.5(6).(1)2.3(4).	or 40.03 ol 1.10 ab 35.11 mt 1.62 an 8.34 il 0.30 ne 11.08 C 0.41	Pic de Maros, Celebes.	E. W. Morley.	Iddings and Morley, J. G., XXIII, p. 240, 1915.	Sodalite trachyte.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. PULASKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
43	57.15	19.13	3.24	2.04	2.25	2.90	4.15	7.05	1.57		0.38	0.38			100.19	
A2. II	.952	.187	.020	.028	.056	.052	.067	.075			.005	.003				
44	55.52	20.05	2.52	2.40	2.10	3.15	3.44	7.49	1.42		0.70	0.51			99.30	
B2. III	.925	.196	.016	.033	.053	.056	.055	.080			.009	.004				
45	61.27	16.00	2.59	4.04	0.39	1.93	4.25	6.31	0.36	0.64	1.02	trace	0.10	CO_2 0.16 NiO trace BaO none SrO trace	99.06	
B2. III	1.021	.157	.016	.056	.010	.034	.069	.067			.013	—	.001			
46	59.52	18.06	3.76	2.27	0.78	1.98	5.38	5.03	0.96	0.88	0.67	0.27	trace	SO_3 none Cl trace Li_2O trace	99.56	2.621
A2. II	.992	.177	.024	.032	.020	.036	.087	.053			.008	.002	—			
47	60.58	18.06	3.05	1.38	0.23	1.74	5.01	6.87	0.90	0.99	0.83		0.04	NiO 0.07	99.75	
A2. II	1.010	.177	.019	.019	.006	.031	.081	.073			.010		—			

RANG 2. DOMALKALIC. PULASKASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	57.44	19.43	1.69	2.70	1.16	2.66	6.48	4.28	1.03		1.97	0.60	0.25	Cl trace	99.69	
A2. II	.958	.190	.011	.038	.029	.047	.105	.046			.025	.004	.004			
2	60.07	19.70	0.21	4.89	0.55	2.27	6.23	4.54	0.48		0.49		0.43		99.86	
A2. II	1.001	.193	.001	.068	.014	.041	.100	.048			.006		.006			
3	58.27	23.75	1.86	n. d.	trace	1.89	6.90	5.17	2.30						100.14	
A4. IV	.971	.232	.012	(.024)	—	.034	.111	.056								
4	59.70	19.52	1.89	4.92	0.78	3.36	5.31	4.14	0.52				0.09		100.23	2.674
A3. III	.995	.191	.012	.068	.020	.060	.085	.044					.001			
5	60.03	21.38	0.50	0.25	0.19	4.59	5.80	2.81	0.66	0.16	3.66	0.39	0.01	CO_2 trace S trace	100.90	
A2. II	1.001	.210	.003	.004	.005	.082	.094	.030			.046	.003	—			
6	67.62	16.29	2.31	n. d.	0.78	2.37	5.42	4.58	0.32						99.69	2.687
A4. IV	1.127	.160	.014	(.028)	.020	.042	.090	.048								
7	65.47	17.93	2.15	0.43	0.06	1.10	6.21	5.21	0.41	0.19	0.29	0.19	trace	ZrO_2 0.07 S trace BaO 0.16 SrO trace Ce_2O_3 0.05	99.92	2.557
A1. I	1.091	.176	.014	.006	.002	.020	.100	.055			.004	.001	—			
8	57.48	20.04	5.64	3.76	0.40	1.70	7.25	3.65	0.25						100.17	
A3. III	.958	.196	.035	.052	.010	.030	.117	.039								
9	64.40	16.90	1.86	1.37	1.13	2.60	5.79	4.56	0.39	0.16	0.23	0.21	0.07	CO_2 none ZrO_2 0.02 NiO none BaO 0.27 SrO 0.14 Li_2O trace	100.10	
A1. I	1.073	.166	.012	.019	.027	.047	.093	.049			.003	.001	.001			

ORDER 5. PERFELIC. CANADARE—Continued.

SUBRANG 3. SODIPOTASSIC. PULASKOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
43	I(II).5.2.3.	or 41.70 ol 4.23 ab 33.27 mt 4.64 an 11.68 il 0.76 ne 0.99 ap 1.01 C 0.31	Near Maros Peak, Celebes.	Hinden.	C. Schmidt in Sarasin, Ins. Celebes, IV, p. 14, 1901.	Trachy-dolerite.	
44	I(II).5.2.″3.	or 44.48 ol 4.53 ab 28.56 mt 3.71 an 11.95 il 1.37 ne 0.14 ap 1.34 C 1.84	Maros, Celebes.	Hinden.	C. Schmidt, in Sarasin, Ins. Celebes, IV, p. 20, 1901.	Gauteite (bostonite).	
45	I(II).″5.(1)2.3.	Q 6.72 di 3.10 or 37.25 hy 3.11 ab 36.15 mt 3.71 an 5.84 il 1.98	Oakey Creek, Nandewar Mountains, New South Wales.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXII, p. 903, 1908.	Phonolite.	
46	I(II).5.″2.3(4).	Q 4.44 hy 2.00 or 29.47 mt 5.57 ab 45.59 il 1.22 an 8.06 ap 0.67 C 0.82	Turritable Falls, Upper Macedon, Victoria.	A. G. Hall.	Skeats and Summers, G. S. Vict. B. 24, p. 25, 1912.	Trachyte.	
47	I″.5.(1)2.3.	Q 1.56 di 1.30 or 40.59 wo 0.23 ab 42.44 mt 2.09 an 6.39 il 1.52 hm 1.60	Mount Flinders, Queensland.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXIV, p. 91, 1909.	Trachyte.	

SUBRANG 4. DOSODIC. LARVIKOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I(II).5.2.4.	or 25.58 ol 2.64 ab 50.30 mt 2.55 an 9.73 il 3.80 ne 2.56 ap 1.34 C 0.41	Mount Johnson, Quebec.	N. N. Evans.	F. D. Adams, J. G., XI, p. 271, 1903.	Pulaskite.	
2	I″.5.2.″4.	or 26.69 ol 7.81 ab 51.35 mt 0.23 an 11.40 il 0.91 ne 0.56 C 0.41	Pic Island, Port Coldwell, Ontario.	E. L. C. Foster.	H. L. Kerr, Rep. Bur. Min. Ont., XIX (I), p. 211, 1910.	Syenite.	
3	I.5″.2.″4.	or 31.14 ol 2.45 ab 43.49 an 9.45 ne 7.95 C 3.16	Methuen Township, Peterborough County, Ontario.	W. G. Miller.	W. G. Miller. Rep. Can. Bur. Mines, VIII (II), p. 207, 1899.	Nephelite syenite.	In W. T., p. 201.
4	I(II).5.2″.″4.	Q 1.44 hy 9.52 or 24.46 mt 2.78 ab 44.54 an 16.68 C 0.20	Tupper Lake, Franklin County, New York.	E. W. Morley.	H. P. Cushing, N. Y. St. Mus., A. R., LIV (I), p. R69, 1902.	Augite syenite.	Iron oxides corrected; op. cit., LX (2), p. 514, 1907.
5	I.″5.2(3).4.	Q 6.48 hy 0.50 or 16.68 il 0.61 ab 49.25 hm 0.50 an 20.02 ru 3.36 C 1.43 ap 1.01	Roseland, Nelson County, Virginia.	W. M. Thornton.	Watson and Taber, Va. G. S. B. 3A, p. 76, 1913.	Syenite.	
6	1″.(4)5.(1)2.(3)4.	Q 11.28 di 4.92 or 26.69 hy 3.21 ab 47.16 an 5.84	Sparta, Hancock County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9A, p. 175, 1902.	Granite.	Also in J. G., IX, p. 119, 1901.
7	I.″5.(1)2.(3)4.	Q 7.50 hy 0.20 or 30.58 mt 0.46 ab 52.40 il 0.61 an 4.73 hm 1.92 C 0.41 ap 0.34	Iron Mountain, n. Marathon, Texas.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 228, p. 75, 1904.	Syenite porphyry.	
8	I(II).5.″2.4.	or 21.68 ol 2.43 ab 54.49 mt 8.12 an 8.34 ne 3.69 C 1.02	Wausau, Wisconsin.	W. W. Daniells.	S. Weidman, J. G., XII, p. 552, 1904.	Syenite.	
9	I(II).″5.(1)2.(3)4.	Q 7.20 di 4.82 or 27.24 hy 1.16 ab 48.73 mt 2.78 an 6.67 il 0.46 ap 0.34	Copper Creek basin, Yellowstone National Park.	W. F. Hillebrand.	Hague and Jaggar, U. S. G. S. B. 168, p. 95, 1900.	Syenite porphyry.	In W. T., p. 201.

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. PULASKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
10	63.07	17.47	2.09	1.38	1.44	2.27	5.77	4.59	0.43	0.25	0.38	0.18	0.03	CO_2 none ZrO_2 trace FeS_2 0.02 Cr_2O_3 trace V_2O_3 trace NiO none BaO 0.32 SrO 0.15	99.84	
A1. I	1.051	.171	.013	.019	.036	.041	.093	.049			.005	.001	—			
11	63.49	18.40	2.44	1.09	0.66	2.30	5.70	4.62	1.04		trace	trace	0.16	CO_2 trace	99.90	
A3. III	1.058	.180	.015	.015	.017	.041	.092	.049			—	—	.002			
12	60.30	18.12	2.45	1.25	0.28	3.89	5.83	5.01	0.71	0.75	0.55	0.25	0.12	CO_2 none ZrO_2 0.01 SO_3 0.06 BaO 0.26	99.84	
A1. I	1.005	.178	.015	.018	.007	.070	.094	.053			.007	.002	.002			
13	56.74	19.32	2.37	1.65	0.27	1.98	8.05	5.88	1.12	0.32	0.40	0.03	0.07	CO_2 1.50 ZrO_2 0.02 SO_3 0.12 F trace S 0.05 BaO 0.16 SrO 0.12	100.17	
A1. I	.946	.189	.015	.023	.007	.036	.130	.063			.005	—	.001			
14	60.98	19.09	1.76	1.15	0.65	3.67	6.70	3.53	0.44	0.48	0.36	0.10	0.15	CO_2 0.52 BaO 0.43 SrO 0.28 Li_2O trace	100.29	
A1. I	1.016	.187	.011	.016	.016	.066	.108	.037			.005	.001	.002			
15	57.70	19.63	3.30	1.60	1.21	5.14	5.42	3.74	0.24	0.13	1.10	0.29	0.17	CO_2 none ZrO_2 none S 0.06 BaO 0.09	99.77	
A1. I	.962	.192	.021	.022	.030	.092	.087	.039			.014	.002	.002			
16	52.24	19.28	4.34	1.13	1.85	4.43	6.34	2.40	4.63	0.80	0.73	0.59	trace	CO_2 0.35 BaO 0.36 SrO 0.42	99.89	2.528
A2. II.	.871	.189	.027	.016	.046	.079	.102	.026			.009	.004				
17	62.31	18.63	2.38	1.33	0.60	5.91	4.97	3.52	0.07	0.16		0.07			99.98	
A3. III	1.039	.183	.015	.018	.015	.105	.081	.037				—				
18	63.43	18.64	2.78	1.02	1.38	1.68	6.77	3.82	0.24		0.28	0.18	0.09	Cl 0.04 S 0.01	100.36	
A2. II	1.057	.183	.018	.014	.035	.030	.109	.040			.004	.001	.001			
19	63.74	17.35	2.15	1.62	1.06	3.13	5.70	4.36	0.78		0.71	0.05	trace	S 0.03 SrO trace	100.68	2.660
A2. II	1.062	.170	.013	.022	.027	.055	.092	.047			.009	—	—			
20	62.96	21.26	2.48	0.46	0.19	2.81	5.47	3.49	0.88	0.22	0.33				100.55	
A3. III	1.049	.208	.016	.007	.005	.050	.089	.037			.004					
21	65.10	17.70	1.44	1.27	0.79	2.32	6.61	4.30	n. d.		0.53	0.06			100.12	
A2. II	1.085	.174	.009	.018	.020	.041	.106	.045			.007	—				
22	60.10	17.96	1.34	1.53	0.26	2.20	6.25	3.80	5.62		0.46	0.05			99.57	
A2. II	1.002	.176	.008	.021	.007	.039	.101	.040			.006	—				
23	64.44	18.33	2.77	0.13	0.41	1.81	6.04	4.76	0.26		0.65	0.19	0.17	SO_3 0.02 Cr_2O_3 none V_2O_3 trace BaO 0.06	100.04	
A1. I	1.074	.180	.018	.002	.010	.032	.097	.050			.008	.001	.002			
24	64.06	20.38	2.35	0.56	0.65	1.33	6.27	4.96	(0.88)		0.19				100.75	
A3. III	1.068	.200	.014	.008	.016	.023	.102	.053			.002					
25	63.10	19.80	0.40	0.81	0.38	2.16	6.12	4.95	0.75		1.47				99.94	
A3. III	1.052	.194	.003	.011	.010	.039	.098	.053			.018					

ORDER 5. PERFELIC. CANADARE—Continued.

SUBRANG 4. DOSODIC. LARVIKOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
10	I″.5.″2.(3)4.	Q 5.70, or 27.24, ab 48.73, an 8.06, di 1.94, hy 2.83, mt 3.02, il 0.76, ap 0.34	Copper Creek basin, Yellowstone National Park.	W. F. Hillebrand.	Hague and Jaggar, U. S. G. S. B. 168, p. 95, 1900.	Quartz syenite.	In W. T., p. 201.
11	I.″5.2.(3)4.	Q 6.90, or 27.24, ab 48.21, an 10.84, hy 1.96, mt 3.48	Pringle Hill, Rosita Hills, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. A. R. 17 (II), p. 324, 1896.	Andesite.	Also in Pr. Colo. Sc. Soc., II, p. 250, 1887. In W. T., p. 201.
12	I(II).5.″2.(3)4.	Q 1.20, or 29.47, ab 49.25, an 8.62, di 1.51, wo 3.13, mt 3.02, il 1.06, hm 0.32, ap 0.67	Idaho Springs, Colorado.	G. Steiger.	S. H. Ball, U. S. G. S. P. P. 63, p. 83, 1908.	Syenite porphyry.	
13	I.5(6).(1)2.″4.	or 35.03, ab 39.30, an 8.34, ne 5.96, nc 3.61, di 1.36, ol 0.41, mt 3.48, il 0.76	Beaver Creek, Uncompahgre quadrangle, Colorado.	G. Steiger.	E. S. Larsen, U. S. G. S. rec. lab.	Cancrinite syenite.	
14	I″.5.2.4.	Q 1.38, or 20.57, ab 56.59, an 11.68, di 3.95, wo 0.35, mt 2.55, il 0.76, ap 0.34	Mount Pennell, Henry Mountains, Utah.	W. F. Hillebrand.	W. Cross, U. S. G. S. A. R. 14, p. 227, 1894.	Augite porphyry.	In W. T., p. 201.
15	I(II).5.2(3).4.	Q 1.50, or 21.68, ab 45.59, an 18.35, di 4.10, hy 1.10, mt 1.86, il 2.13, hm 2.40, ap 0.67	Ortiz Mountains, east of Albuquerque, New Mexico.	M. W. Adams.	I. H. Ogilvie, J. G., XVI, p. 234, 1908.	Diorite.	
16	I(II).5.2″.4.	or 14.46, ab 47.16, an 16.96, ne 3.41, di 1.08, ol 2.80, mt 1.62, il 1.37, hm 4.64	Shackan, Rock Creek, Midway Mountains, British Columbia.	M. Dittrich.	R. A. Daly, Can. G. S. Mem. 38 (I), p. 414, 1912.	Shackanite (analcite rhomben porphyry).	
17	I(II).(4)5.2(3).″4.	Q 8.58, or 20.57, ab 42.44, an 18.07, di 3.99, wo 2.55, mt 3.48	San José, Tamaulipas, Mexico.	G. I. Finlay.	G. I. Finlay, Ann. N. Y. Ac. Sci., XIV, p. 271, 1904.	Andesite.	Also in Tr. Am. Inst. M. E. 1905, 892.,
18	I″.5.(1)2.4.	Q 4.44, or 22.24, ab 57.11, an 7.51, C 0.61, hy 3.50, mt 2.55, il 0.61, hm 1.12, ap 0.34	Masafuera, Juan Fernandez Islands, Chile.	N. Sahlbom.	P. D. Quensel, B. G. Inst. Ups., XI, p. 284, 1912.	Soda trachyte.	
19	I″.″5.″2.″4.	Q 6.90, or 26.13, ab 48.21, an 8.62, di 5.18, hy 0.30, mt 3.02, il 1.37	Cerro del Morro, San Luis, Argentina.	P. Jannasch.	F. Tannhäuser, N. J. B. B., XXII, p. 595, 1906.	Hornblende andesite.	
20	I.(4)5.2.4.	Q 11.28, or 20.57, ab 46.63, an 13.90, C 3.26, hy 0.50, mt 0.70, il 0.61, hm 2.08	Cnoc-na-Sroine, Assynt, Scotland.	A. Gemmel.	A. Gemmel, Tr. Edin. G. Soc., IX (5), p. 418, 1910.	Melanite syenite.	
21	I″.5.(1)2.4.	Q 5.58, or 25.02, ab 55.54, an 6.39, di 3.92, hy 0.40, mt 2.09, il 1.06	Puy de Dome, Auvergne.	Pisani.	A. Lacroix, C. R., CXLVII, p. 830, 1908.	Hornblende domite.	
22	I.5.2.4.⊙	Q 4.32, or 22.24, ab 52.92, an 9.73, di 0.92, hy 0.70, mt 1.86, il 0.91	Puy de Dome, Auvergne.	Pisani.	A. Lacroix, C. R., CXLVII, p. 830, 1908.	Domite pumice.	
23	I.″5.″2.″4.	Q 7.44, or 27.80, ab 50.83, an 8.06, C 0.41, hy 1.00, il 0.61, hm 2.77, ru 0.32, ap 0.34	Puy de Sarcoui, Puy de Dome, Auvergne.	P. Holland.	Dickson and Holland, Pr. Liv. G. Soc., VIII, p. 412, 1899.	Domite.	Not in W. T.
24	I.5.(1)2.″4.	Q 4.56, or 29.47, ab 53.45, an 6.39, C 2.24, hy 1.60, mt 1.39, il 0.30, hm 1.28	Pignon, Cantal, Auvergne.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 328, 1902.	Trachyandesite.	
25	I.5.2.(3)4.	Q 3.48, or 29.47, ab 51.35, an 10.84, C 0.41, hy 1.00, il 1.67, hm 0.40, ru 0.56	Établissement, Mont Dore, Auvergne.	Pisani.	Michel Levy and Lacroix, C. R., CXLVIII, p. 1723, 1909.	Trachyte.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. PULASKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
26	60.80	18.60	0.38	2.17	1.28	2.78	5.95	4.75	1.25		1.53				99.49	
A3. III	1.013	.182	.002	.031	.032	.050	.096	.051								
27	63.00	18.41	2.05	0.65	0.66	3.02	6.30	5.18	0.55						100.11	
A3. III	1.050	.180	.013	.009	.017	.054	.102	.055								
28	56.19	20.25	2.76	2.32	1.12	4.30	6.33	4.19	0.65		0.57	0.54		SO_3 0.16 Cl 0.09	99.47	2.674
A2. II	.937	.198	.017	.032	.028	.077	.102	.045			.007	.004				
29	60.72	19.90	3.56	0.85	1.25	2.75	6.24	4.16	0.61						100.04	
A3. III	1.012	.195	.022	.012	.031	.049	.101	.044								
30	59.38	19.35	4.97	0.13	0.91	4.36	5.15	3.88	0.90		1.36	0.38			100.77	
A2. II	.990	.190	.031	.002	.023	.078	.083	.041			.017	.003				
31	58.82	21.06	3.26	0.70	1.38	3.03	6.83	3.70	1.26						100.04	
A3. III	.980	.207	.020	.010	.035	.054	.110	.039								
32	57.59	22.38	3.09	0.78	2.34	3.23	6.11	3.40	0.70						99.62	
A3. III	.960	.220	.019	.011	.059	.058	.099	.036								
33	57.33	20.30	4.95	1.03	1.93	2.67	6.05	4.76	0.68						99.80	
A3. III	.967	.199	.031	.014	.048	.048	.098	.051								
34	56.85	21.56	3.44	1.14	0.85	5.26	6.07	3.66	0.52						99.35	
B3. IV	.948	.211	.022	.014	.021	.094	.098	.039								
35	57.12	21.69	1.63	3.65	1.55	4.03	5.93	3.48	0.58						99.66	
A3. III	.952	.213	.010	.051	.039	.072	.096	.037								
36	56.31	20.35	2.78	3.49	1.49	3.76	6.01	4.12	n. d.		0.73	0.50		S 0.54	100.08	
A2. II	.938	.200	.018	.049	.037	.067	.097	.044			.008	.004				
37	65.70	17.24	1.56	2.37	1.13	2.64	6.95	1.89	0.58		0.33	trace	trace		100.35	
A3. III	1.095	.169	.010	.033	.028	.047	.112	.020			.004	——	——			
38	65.01	18.27	0.84	0.83	0.80	1.50	6.79	4.34	1.74						100.12	
A3. III	1.083	.179	.005	.011	.020	.027	.109	.046								
39	61.19	21.24	1.62	n. d.	trace	1.87	6.80	5.97	0.93		0.39				100.01	
A4. IV	1.020	.208	.010	(.020)	——	.034	.108	.064			.005					
40	60.85	17.53	3.44	2.43	0.46	1.89	6.13	4.62	1.33		0.46	0.27		FeS_2 0.51	99.96	
A2. II	1.014	.172	.021	.033	.012	.034	.098	.049			.006	.002				
41	60.58	19.48	4.71	1.55	0.86	2.74	5.55	3.89	0.63		0.28				100.27	2.667
A3. III	1.010	.191	.029	.022	.022	.049	.090	.041			.004					
42	57.20	20.04	2.90	1.20	0.40	3.19	7.85	4.12	2.20		trace	0.22	trace	SO_3 trace Cl 0.10	99.42	2.578
A3. III	.953	.196	.018	.017	.010	.057	.127	.043			——	.002	——			

ORDER 5. PERFELIC. CANADARE—Continued.

SUBRANG 4. DOSODIC. LARVIKOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
26	I(II).5.2.(3)4.	Q 0.24 di 3.37 or 28.36 hy 2.89 ab 50.30 mt 0.46 an 9.73 il 2.89	Établissement, Mont Dore, Auvergne.	Pisani.	Michel Levy and Lacroix, C. R., CXLVIII, p. 1723, 1909.	Trachyte.	
27	I″.5.(1)2.(3)4.	Q 0.84 di 3.67 or 30.58 wo 1.63 ab 53.45 mt 2.09 an 6.39 hm 0.64	Lusclade, Mont Dore, Auvergne.	Pisani.	Michel Levy and Lacroix, C. R., CXLVIII, p. 1723, 1909.	Aegirite trachyte.	
28	I(II).5″.2.4.	or 25.02 di 2.69 ab 42.44 ol 1.70 an 14.45 mt 3.94 ne 5.96 il 1.06 ap 1.34	Ferrera, Columbretes Islands, Spain.	R. Pfohl.	F. Becke, T. M. P. M., XVI, p. 177, 1896.	Tephritic trachyte.	In W. T., p. 203.
29	I″.5.2.4.	Q 0.78 hy 3.10 or 24.46 mt 2.78 ab 52.92 hm 1.60 an 13.62	Notterö, n. Tönsberg, Norway.	G. Forsberg.	W. C. Brögger, Z. K., XVI, p. 35, 1890.	Rhomben porphyry.	In W. T., p. 203.
30	I(II).5.2″.″4.	Q 5.34 hy 2.30 or 22.80 il 0.30 ab 43.49 hm 4.97 an 18.35 tn 0.39 ru 1.04 ap 1.01	Bollaerene, n. Tönsberg, Norway.	V. Schmelck.	W. C. Brögger, Eg. Kg., III, p. 329, 1899.	Tönsbergite.	In W. T., p. 203.
31	I″.5.2.4.	or 21.68 ol 2.45 ab 52.40 mt 2.32 an 15.01 hm 1.60 ne 2.84 C 0.41	Slotsberg, n. Tönsberg, Norway.	G. Forsberg.	W. C. Brögger, Z. K., XVI, p. 35, 1890.	Rhomben porphyry.	In W. T., p. 203.
32	I″.5.2.4.	or 20.02 ol 4.13 ab 51.88 mt 2.55 an 16.12 hm 1.28 C 2.75	Notterö, n. Tönsberg, Norway.	G. Forsberg.	W. C. Brögger, Z. K., XVI, p. 35, 1890.	Augite syenite.	In W. T., p. 203.
33	I″.5.2.(3)4.	or 28.35 ol 3.36 ab 45.06 mt 3.25 an 13.34 hm 2.72 ne 3.40	Notterö, n. Tönsberg, Norway.	G. Forsberg.	W. C. Brögger, Z. K., XVI, p. 35, 1890,	Rhomben porphyry.	In W. T., p. 203.
34	I″.5.2(3).″4.	or 21.68 di 4.42 ab 43.49 mt 3.25 an 20.57 hm 1.28 ne 4.26	Notterö, n. Tönsberg, Norway.	G. Forsberg.	W. C. Brögger, Z. K., XVI, p. 30, 1890.	Laurvikite.	In W. T., p. 203.
35	I″.5.2(3).4.	or 20.57 ol 6.91 ab 46.64 mt 2.32 an 20.02 ne 1.99 C 0.82	Frederiksvärn, Norway.	G. Forsberg.	W. C. Brögger, Z. K., XVI, p. 30, 1890.	Laurvikite.	In W. T., p. 203.
36	I(II).5.2.4″.	or 24.46 ol 4.83 ab 44.80 mt 4.18 an 15.01 il 1.37 ne 3.27 ap 1.34 C 0.51	Tunaes, n. Bergen, Norway.	Lillejord.	C. F. Kolderup, Berg. Mus. Aarb., 1903, No. 12, p. 114.	Soda syenite.	
37	I(II).(4)5.2.4(5).	Q 10.32 di 2.29 or 11.12 hy 4.18 ab 58.69 mt 2.32 an 10.29 il 0.61	Suhankojarvi, Finland.	N. Sahlbom.	V. Hackmann, B. Com. G. Fin., No. 15, p. 48, 1905.	Soda granite.	
38	I.5.(1)2.4.	Q 4.56 di 0.68 or 25.58 hy 2.46 ab 57.12 mt 1.16 an 6.67	Frohnfeld, n. Kelberg, Eifel.	K. Vogelsang.	K. Vogelsang, Z. D. G. G., XLII, p. 10, 1890.	Trachyte.	In W. T., p. 203.
39	I.5″.″2.(3)4.	or 35.58 ol 1.53 ab 45.06 il 0.76 an 9.45 ne 6.25 C 0.20	Laacher See, Rheinland.	W. Bruhns.	W. Bruhns, Vh. Nh. Ver. Bonn, XLVIII, p. 324, 1891.	Sanidinite.	In W. T., p. 203.
40	I″.5.(1)2.″4.	Q 3.72 di 0.43 or 27.24 hy 1.79 ab 51.35 mt 4.87 an 6.95 il 0.91 ap 0.67	Sporneiche, Odenwald, Hesse.	W. Sonne.	G. Klemm, Nbl. Ver. Erdk. Darm. (4), XXVI, p. 17, 1905.	Trachyte.	Mean of 3 anals.
41	I″.″5.2.″4.	Q 6.24 hy 2.20 or 22.80 mt 4.18 ab 47.16 il 0.61 an 13.62 hm 1.76 C 1.12	Boscampo, Predazzo, Tyrol.	J. K. Ippen.	J. K. Ippen, N. J. Cb., 1902, p. 372.	Aplite.	
42	I″.5(6).(1)2.4.	or 23.91 di 2.16 ab 46.63 wo 1.63 an 7.23 mt 3.94 ne 10.79 hm 0.16 ap 0.67	Viezzena Valley, Predazzo, Tyrol.	M. Dittrich.	Osann and Hlawatsch, T. M. P. M., XVII, p. 560, 1898.	Nephelite syenite porphyry.	In W. T., p. 215.

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. PULASKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
43	61.5	19.9	n. d.	1.6	1.1	2.2	7.2	2.8	4.4		0.2				100.9	
B4. IV	1.025	.195	——	.022	.028	.039	.116	.030			.003					
44	60.75	19.81	2.53	1.07	0.78	3.82	5.34	4.69	0.67	0.15					99.61	
A3. III	1.012	.195	.016	.015	.020	.068	.086	.050								
45	61.99	20.14	1.25	2.87	0.38	1.35	6.02	4.87	0.98						99.85	
A3. III	1.033	.197	.008	.040	.010	.024	.097	.052								
46	65.43	17.20	1.57	1.06	0.36	2.14	6.14	3.78	1.82		0.19	0.16	trace	S 0.04	99.94	2.504
A2. II	1.091	.169	.010	.015	.009	.038	.099	.040			.002	.001	——			
47	63.08	19.22	1.99	0.73	0.36	2.09	5.76	4.26	0.58	0.64	0.94	0.42			100.07	
A2. II	1.051	.188	.013	.010	.009	.038	.093	.046			.012	.003				
48	54.20	19.90	2.60	3.65	1.41	3.12	5.42	4.82	3.37		1.15	0.23			99.87	
A2. II	.903	.195	.016	.051	.035	.055	.087	.051			.014	.002				
49	61.98	17.79	3.34	2.61	0.59	2.82	5.59	3.65	0.37		0.72	0.29			99.80	
A2. II	1.033	.174	.021	.036	.015	.050	.090	.039			.009	.002				
50	62.36	17.95	1.55	2.62	0.72	2.75	5.60	4.16	0.87		0.66	0.25	0.48		100.10	
A2. II	1.039	.176	.010	.036	.018	.049	.090	.047			.008	.002	.007			
51	64.4	19.3	2.1	0.5	1.1	3.3	5.7	3.4	0.3						100.1	
B3. IV	1.073	.189	.013	.007	.028	.059	.092	.036								
52	60.10	18.38	2.22	3.34	1.30	2.28	5.30	4.57	0.43	0.96	0.69	0.33	none	SO_3 trace Cl none Li_2O trace	99.90	2.651
A2. II	1.002	.180	.014	.046	.033	.041	.085	.049			.009	.002	——			
53	59.44	17.98	2.28	3.34	0.78	2.32	5.36	4.77	1.57	0.70	0.79	0.30	trace	SO_3 none Cl trace Li_2O trace	99.63	2.590
A2. II	.991	.176	.014	.046	.020	.041	.086	.051			.010	.002	——			
54	57.42	18.83	4.89	3.56	0.59	1.75	6.23	5.46	2.36						101.09	
B3. IV	957	.185	.031	.050	.015	.031	.100	.058								
55	54.88	22.80	3.66	3.26	0.38	2.24	7.53	3.65	0.91						99.94	
A3. III	.915	.223	.023	.045	.010	.040	.121	.039								
56	66.19	17.45	2.95	n. d.	trace	1.16	5.55	4.90	1.61						99.81	
A4. IV	1.103	.171	.019	(.038)	——	.021	.090	.052								
57	60.83	23.92	0.11	2.14	0.07	3.39	6.11	2.96	0.07	0.12	0.36	0.93		CO_2 none	100.91	
B2. III	1.014	.234	.001	.029	.002	.061	.098	.032			.005	.007			(100.08,	
58	56.09	20.79	1.54	3.84	1.26	3.18	7.33	3.91	0.39	0.19	1.23	0.38	0.05	Cl 0.17	100.35	
A2. II	.935	.204	.009	.053	.032	.057	.118	.041			.015	.003	——			

ORDER 5. PERFELIC. CANADARE—Continued.

SUBRANG 4. DOSODIC. LARVIKOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
43	I.5.2.4.⊙	Q 1.44 hy 5.31 or 16.68 il 0.46 ab 60.78 an 10.84 C 1.02	Ustica, Aeolian Islands.	M. Stark.	M. Stark, T. M. P. M., XXIII, p. 521, 1904.	Pumice.	
44	I″.5.2.(3)4.	Q 2.94 di 1.94 or 27.80 hy 1.10 ab 45.06 mt 3.48 an 16.40 hm 0.16	Mount Sopipir, Karabagh, Armenia.	Not stated.	A. S. Ginsberg, Ann. Inst. Polyt. St. Pet., XX, p. 54, 1913.	Vulsinite.	
45	I″.5.(1)2.(3)4.	Q 2.94 hy 5.22 or 28.91 mt 1.86 ab 50.83 an 6.67 C 2.45	Furnas, Sao Miguel, Azores.	R. Reinisch.	R. Reinisch, D. Sudpol. Exp., II (7), p. 660, 1912.	Trachyte obsidian.	
46	I.(4)5.″2.4.	Q 10.80 di 1.11 or 22.24 hy 0.76 ab 51.87 mt 2.32 an 8.34 il 0.30 ap 0.34	Gran Curral, Madeira.	Eyme.	C. Gagel, Z. D. G. G., LXIV, p. 415, 1911.	Trachyte.	
47	I.(4)5.2.″4.	Q 9.12 hy 0.90 or 25.58 il 1.59 ab 48.73 hm 1.99 an 7.78 ru 0.16 C 2.14 ap 1.01	Ambohivorona, Ankaratra, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVI, p. 176, 1913.	Biotite trachyte.	
48	I(II).5.2.(3)4.	or 28.36 ol 4.59 ab 39.30 mt 3.71 an 13.62 il 2.13 ne 3.41 ap 0.67 C 0.82	Andevenanaomby, Bezavona, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., II, p. 210, 1903.	Nephelite syenite.	Cf. No. 48, III. 6. 4.
49	I″.(4)5.2.4.	Q 9.12 hy 2.29 or 21.68 mt 4.87 ab 47.16 il 1.37 an 11.95 ap 0.37 C 0.20	Bras des Demoiseles, Reunion Island.	Boiteau.	A. Lacroix, C. R., CLV, p. 541, 1912.	Phonolitic trachyte.	
50	I.(II).5.2.(3)4.	Q 5.58 di 0.71 or 26.13 hy 4.74 ab 47.16 mt 2.32 an 10.84 il 1.22 ap 0.67	Matsu-Shima, Hizen, Kiushiu, Japan.	K. Takayanagi.	S. Kozu, J. G., XIX, p. 559, 1911.	Soda trachyte.	
51	I(4)5.2″.4.	Q 9.54 hy 2.80 or 20.02 mt 1.62 ab 48.21 hm 0.96 an 16.40 C 0.20	Merapi Volcano, Sumatra.	H. Hoppe.	H. Hoppe, In. Diss. Breslau, p. 47, 1903.	Andesite.	
52	I(II).5.2.(3)4.	Q 4.44 hy 6.34 or 27.24 mt 3.25 ab 44.54 il 1.37 an 9.45 ap 0.67 C 1.22	Mount Eliza, Macedon, Victoria.	A. G. Hall.	Skeats and Summers, G. S. Vict. B. 24, p. 25, 1912.	Trachyte.	
53	I(II).5.2.(3)4.	Q 3.54 hy 5.90 or 28.36 mt 3.25 ab 45.06 il 1.50 an 9.45 ap 0.67 C 0.51	Newham, Macedon, Victoria.	A. G. Hall.	Skeats and Summers, G. S. Vict. B. 24, p. 25, 1912.	Trachyte.	
54	I(II).5.(1)2.(3)4.	or 32.25 di 0.92 ab 43.49 ol 2.64 an 7.51 mt 7.19 ne 4.83	Signal Hill, Dunedin, New Zealand.	P. Marshall.	P. Marshall, Q. J. G. S., LXII, p. 402, 1906.	Trachytoid phonolite.	
55	I″.5(6).2.4.	or 21.68 ol 2.94 ab 45.06 mt 5.34 an 11.12 ne 9.94 C 2.35	Butlers Peaks, Mount Cargill, Dunedin, New Zealand.	J. A. Bartrum.	J. A. Bartrum, Tr. N. Z. Inst., XLIV, p. 71, 1912.	Phonolite.	
56	I.(4)5.(1)2.(3)4.	Q 10.26 hy 5.02 or 28.91 ab 47.16 an 5.84 C 0.82	Tafagagai, Tutuila, Samoa.	Hobein.	M. Weber, Abh. Bay. Ak. Wiss., XXIV, p. 297, 1909.	Trachyte.	
57	I″.″5.2.4.	Q 7.98 hy 3.24 or 17.79 mt 0.23 ab 51.35 il 0.76 an 10.56 ap 2.35 C 6.73	Mount Erebus, S. Victoria Land, Antarctica.	Burrows and Walkom.	J. W. E. David, pers. com.	Anorthoclase rock (trachyte).	
58	I(II).5(6).2.4.	or 22.80 di 0.46 ab 42.97 ol 5.00 an 12.51 mt 2.09 ne 10.22 il 2.28 ap 1.01	Cape Royds, Ross Island, S. Victoria Land, Antarctica.	G. T. Prior.	G. T. Prior, Br. Nat. Ant. Exp., I, p. 113, 1907.	Leucite kenyte.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. PULASKASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	68.28	19.53	0.10	0.11	0.02	2.90	8.53	0.26	0.07		0.15	0.02	trace	S 0.01	99.98	
A2. II	1.138	.191	.001	.002	—	.052	.137	.003			.002	—	—			
2	60.40	19.04	5.61	0.14	0.73	3.09	8.94	0.22	0.17	1.92					100.26	
A3. III	1.007	.187	.035	.002	.018	.055	.144	.002								
3	62.90	22.80	1.05	n. d.	0.40	3.55	8.49	0.53	0.90						100.62	
A4. IV	1.048	.223	.007	(.014)	.010	.063	.137	.005								

RANG 3. ALKALICALCIC. PIEDMONTASE. (WATSON AND TABER, 1912.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	59.33	20.46	1.66	0.22	0.83	7.09	2.58	7.03	0.36		0.10	0.05	0.16	CO_2 trace ZrO_2 none Cl 0.06 FeS_2 0.02 CoO 0.01 BaO none CuO 0.05 Pb 0.01	100.02	
A1. I	.989	.200	.010	.003	.021	.127	.042	.074			.001	—	.002			

RANG 3. ALKALICALCIC. PIEDMONTASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	59.26	23.63	0.30	0.57	0.31	5.93	4.94	4.78	0.74						100.46	2.625
A3. III	.988	.231	.002	.008	.008	.105	.079	.051								31°

RANG 3. ALKALICALCIC. PIEDMONTASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	61.51	23.17	0.37	0.26	0.26	5.96	4.64	3.94	0.32	0.08	0.29	0.10	trace	CO_2 trace Cl none F none	100.90	
A2. II	1.025	.227	.002	.004	.007	.106	.075	.042			.004	.001	—			
2	59.92	24.23	0.29	0.24	0.23	6.47	5.03	2.93	0.28	0.08	0.22	0.09	trace	CO_2 trace S trace	100.01	
A2. II	.999	.237	.002	.003	.006	.116	.081	.031			.003	—	—			
3	59.84	20.59	0.55	0.71	0.76	4.48	5.23	2.57	0.75	0.18	3.75	0.35	0.02	CO_2 trace	99.78	
A2. II	.997	.202	.003	.010	.019	.080	.084	.028			.047	.002	—			
4	54.83	25.49	1.61	1.65	1.96	6.08	5.69	1.87	1.18					CO_2 0.18	100.54	
A3. III	.914	.250	.010	.023	.049	.109	.092	.020								
5	58.28	19.37	1.35	2.98	1.30	4.78	4.40	3.75	1.78	0.44	0.96	0.35	0.87	CO_2 0.33 BaO 0.25 SrO 0.09	100.48	
A1. I	.971	.190	.009	.042	.033	.086	.071	.040			.012	.002	.001			
6	54.08	21.87	5.22	0.88	2.69	5.53	5.46	2.88	none	0.16	0.98	0.91	0.09	CO_2 none S none	100.75	
A2. II	.901	.214	.033	.012	.067	.098	.088	.031			.012	.006	.001			
7	57.34	24.90	1.10	0.94	0.25	7.99	5.37	1.23	0.33			trace		S 0.40	100.25	
A2. II	.956	.244	.007	.013	.006	.143	.087	.013								

RANG 3. ALKALICALCIC. PIEDMONTASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	59.71	25.47	0.17	0.22	none	8.24	5.48	0.22	0.86			trace	none	CO_2 trace Li_2O none	100.37	
A3. III	.995	.250	.001	.003	—	.147	.089	.002				—				

ORDER 5. PERFELIC. CANADARE—Continued.

SUBRANG 5. PERSODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.(4)5.2.5.	Q 11.76 il 0.30 or 1.67 hm 0.16 ab 71.79 an 14.18	Flogberg, S. Dalecarlia, Sweden,	R. Mauzelius.	H. E. Johanssen, G. F. F., XXXII, p. 414, 1910.	Plagioclase granulite.	Igneous?
2	I(II).5.2.5.	Q 1.02 di 3.03 or 1.11 hy 0.40 ab 75.45 mt 0.46 an 11.40 hm 5.28	Koppand, Tur-Toroczko Range, Hungary.	S. v. Szentpetery.	S. v. Szentpetery, Mus. Füz., I, p. 238, 1912.	Albite-oligoclase porphyrite.	Cf. No. 29. Porphyrite, p. 1015.
3	I.5.2.5.⊙.	Q 2.76 hy 2.85 or 2.78 ab 71.78 an 17.51 C 1.84	Jablanica, Narenta River, Herzegowina.	C. v. John?	C. v. John, Jb. Wien. G. R. A., XXXVIII, p. 346, 1888.	Diorite.	In W. T., p. 205.

SUBRANG 2. DOPOTASSIC. MAZARUNOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I″.5.″3.2(3).	Q 3.66 di 4.54 or 41.14 wo 2.55 ab 22.01 mt 0.93 an 23.35 il 0.15 hm 0.96	Mazaruni District, British Guiana.	J. B. Harrison.	J. B. Harrison, G. Goldf. Br. G., p. 77, 1908.	Syenite.	In W. T., p. 205.

SUBRANG 3. SODIPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.5.3.3(4).	or 28.36 di 0.92 ab 40.35 ol 0.83 an 28.08 mt 0.46 ne 0.57	Table Mountain, n. Denver, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. B. 148, p. 159, 1897.	Augite andesite.	Pebble. In W. T., p. 205.

SUBRANG 4. DOSODIC. PIEDMONTOSE. (WATSON AND TABER, 1912.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.″5.3.(3)4.	Q 6.60 hy 0.70 or 23.35 il 0.61 ab 39.30 hm 0.32 an 28.63 ap 0.34 C 0.11	Rose's mill, Nelson County, Virginia.	W. M. Thornton.	Watson and Taber, B. Phil. Soc. Un. Va., I, p. 331, 1913.	Soda syenite.	Also in Va. G. S. B. IIIA, p. 76, 1913.
2	I.5.3.4.⊙.	Q 5.34 hy 0.60 or 17.24 il 0.46 ab 42.44 hm 0.24 an 32.25 C 0.92	Rose's mill, Nelson County, Virginia.	W. M. Thornton.	W. M. Thornton, A. J. S., XXXI, p. 219, 1911.	Pegmatite.	Also in Va. G. S. B. IIIA, p. 76, 1913.
3	I″.(4)5.(2)3.4.	Q 9.60 hy 1.90 or 15.57 mt 0.70 ab 44.01 il 1.06 an 20.29 ru 3.20 C 1.73 ap 0.67	Roseland, Nelson County, Virginia.	W. M. Thornton.	Watson and Taber, U. S. G. S. B. 430, p. 208, 1910.	Syenite.	Also in Va. G. S. B. IIIA, p. 76, 1913.
4	I″.5.3.4″.	or 11.12 ol 4.76 ab 47.16 mt 2.32 an 30.30 ne 0.57 C 2.96	Horse Race, Menominee River, Wisconsin.	R. B. Riggs.	G. H. Williams, U. S. G. S. B. 62, p. 113, 1890.	Diorite porphyry.	In W. T., p. 205.
5	I(II).5.″3.(3)4.	Q 5.58 hy 6.07 or 22.24 mt 1.86 ab 37.20 il 1.82 an 21.96 ap 0.67	Shields River basin, Crazy Mountains, Montana.	W. F. Hillebrand.	J. E. Wolff, U. S. G. S. B. 148, p. 143, 1897.	Diabase porphyrite.	In W. T., p. 205.
6	I″.5.3.4.	or 17.24 ol 4.76 ab 45.59 il 1.82 an 21.68 hm 5.22 ne 0.28 ap 2.02 C 1.73	Johnsons Park, Colfax County, New Mexico.	J. G. Fairchild.	J. B. Mertie, U. S. G. S. rec. lab.	Andesite.	
7	I.5.3.″4.	Q 4.38 hy 0.73 or 7.23 mt 1.62 ab 45.59 il 0.76 an 39.75	Alvaerstrommen, n. Bergen, Norway.	Lillejord.	C. F. Kolderup, Berg. Mus. Aarb., 1903, No. 12, p. 36.	Andesine rock.	

SUBRANG 5. PERSODIC. KITLIMOSE. (H. S. WASHINGTON, 1916.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.(4)5.3(4).5	Q 9.18 hy 0.26 or 1.11 mt 0.23 ab 46.63 an 40.87 C 1.22	Near Pala, San Diego County, California.	W. T. Schaller.	W. T. Schaller, U. S. G. S. rec. lab.	Albitite.	

CLASS I. PERSALANE—Continued.

RANG 3. ALKALICALCIC. PIEDMONTASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
2	60.80	24.06	0.42	0.39	0.21	5.78	7.64	0.33	0.45						100.08	
A3. III	1.013	.236	.003	.006	.005	.104	.123	.004								
3	59.48	24.10	0.66	n. d.	0.39	8.21	6.67	0.49	n. d.						100.00	
A3. III	.991	.236	.004	(.008)	.010	.146	.107	.005								

RANG 4. DOCALCIC. LABRADORASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	53.43	28.01	0.75	n. d.	0.63	11.24	4.85	0.96	trace						99.87	
A4. IV	.891	.275	.005	(.010)	.016	.201	.078	.010								
2	54.62	26.50	0.76	0.57	0.74	9.88	4.50	1.23	0.91						99.71	2.70
A3. III	.910	.260	.005	.008	.019	.177	.073	.013								
3	54.47	26.45	1.30	0.67	0.69	10.80	4.37	0.92	0.53						100.20	2.72
A3. III	.908	.260	.008	.009	.017	.193	.071	.010								
4	51.62	24.25	1.65	5.30	1.21	9.97	3.49	1.27	0.72				0.10		99.78	2.80
A3. III	.860	.237	.010	.074	.030	.179	.056	.014					.001			
5	52.86	26.68	1.03	0.74	0.38	10.93	4.44	0.92	1.49	0.11	0.25	0.33	0.02	CO_2 trace ZrO_2 trace S 0.05 BaO 0.03	100.26	
A1. I	.881	.262	.006	.010	.010	.195	.072	.010			.003	.002	—			
6	49.78	29.37	0.34	0.60	1.01	11.86	4.39	0.46	1.76		none		0.08	BaO none SrO none	99.80	2.676
A2. II	.830	.288	.002	.008	.025	.211	.071	.005			—		.001			
7	53.42	28.36	1.80	n. d.	0.31	10.49	4.82	0.84	n. d.						100.04	
A4. IV	.890	.278	.011	(.022)	.008	.187	.077	.009								
8	53.02	27.75	2.92	n. d.	0.93	10.12	4.67	0.81	n. d.		0.12				100.36	
A4. IV	.884	.273	.018	(.036)	.023	.180	.076	.009			.002					
9	52.80	28.57	0.19	0.43	0.27	12.17	4.82	0.56	n. d.			none		S 0.24	100.05	
A3. III	.880	.280	.001	.006	.007	.218	.077	.006				—				
10	47.31	28.52	0.21	4.50	0.19	14.55	2.59	0.81	0.93		0.05	0.08	0.09	ZrO_2 trace	99.93	2.695
A2. II	.789	.280	.001	.063	.005	.260	.042	.009			—	—	.001			
11	55.01	28.31	n. d.	0.73	0.40	10.42	4.52	0.61							100.00	
A4. IV	.917	.277	—	.010	.010	.185	.072	.006								
12	48.25	27.68	0.31	1.38	3.76	13.15	3.08	0.20	1.64		0.22	0.02	0.06		99.75	
A2. II	.804	.271	.002	.019	.094	.235	.050	.002			.003	—	—			

RANG 5. PERCALCIC. CANADASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	45.78	30.39	1.33	1.22	2.14	16.66	1.66	0.10	0.51						99.79	2.83
A3. III	.763	.298	.008	.017	.054	.297	.027	.001								

ORDER 5. PERFELIC. CANADARE—Continued.

SUBRANG 5. PERSODIC. KITLIMOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
2	I.5.3.5.⊙.	Q 2.10 hy 0.90 or 2.22 mt 0.70 ab 64.45 an 28.91 C 0.51	Kamenouchky, Ural Mountains.	Not stated.	Duparc and Pamfil, B. Soc. Min. Fr., XXXIII, p. 369, 1910.	Plagiaplite.	
3	I.5.3.5.⊙.	Q 1.86 di 4.15 or 2.78 wo 0.46 ab 56.07 an 34.47	Koswinsky, Kitlim District, Ural Mountains.	Not stated.	Duparc and Pamfil, B. Soc. Min. Fr., XXXIII, p. 369, 1910.	Plagiaplite.	

SUBRANG 4-5. PRESODIC. LABRADOROSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.5.″4.(4)5.	or 5.56 di 3.19 ab 35.14 ol 1.00 an 51.99 ne 3.12	Nain, Labrador.	A. Wichmann.	A. Wichmann, Z. D. G. G., XXXVI, p. 491, 1884.	Anorthosite.	In W. T., p. 205.
2	I.5.″4.4(5).	Q 1.26 di 0.65 or 7.23 hy 2.00 ab 38.25 mt 1.16 an 48.37	Mount Marcy, Adirondack Mountains. New York.	A. R. Leeds.	A. R. Leeds, N. Y. St. Mus. A. R. XXX, p. 92, 1878.	Norite.	Not in W. T.
3	I.5.4.(4)5.	Q 1.92 di 3.06 or 5.56 hy 0.40 ab 37.20 mt 1.86 an 49.76	Mount Marcy, Adirondack Mountains, New York.	A. R. Leeds.	A. R. Leeds, N. Y. St. Mus. A. R. XXX, p. 92, 1878.	Norite.	Not in W. T.
4	I(II).5.4.4.	or 7.78 di 0.49 ab 29.34 hy 8.74 an 49.21 ol 1.85 mt 2.32	Rand Hill, Altona, Clinton County, New York.	E. W. Morley,	H. P. Cushing, N. Y. St. Mus. A. R. LIII, p. R58 (1899), 1901.	Quartz gabbro.	
5	I.5.″4.(4)5.	Q 0.60 di 1.76 or 5.56 hy 0.30 ab 37.73 mt 1.39 an 50.04 il 0.46 ap 0.67	Forest, Pennsylvania.	W. T. Schaller.	F. Bascom, U. S. G. S. rec. lab.	Anorthosite gneiss.	
6	I.5.4.″5.	or 2.78 ol 2.46 ab 28.82 mt 0.46 an 58.66 ne 4.54	Carlton Peak, Minnesota.	A. N. Winchell.	A. N. Winchell, A. G., XXVI, p. 281, 1900.	Plagioclasite.	In W. T., p. 205.
7	I.5.4.(4)5.	or 5.00 ol 2.80 ab 38.25 an 51.99 ne 1.14 C 0.51	Ogne, n. Ekersund, Norway.	C. F. Kolderup.	C. F. Kolderup, Berg. Mus. Aarb., 1896, No. 5, p. 96.	Labradorite rock.	In W. T., p. 205.
8	I.5.4.″5.	or 5.00 ol 5.08 ab 37.73 il 0.30 an 50.04 ne 1.14 C 0.82	Near Lister, Norway.	C. F. Kolderup.	C. F. Kolderup, Berg. Mus. Aarb., 1896, No. 5, p. 113.	Labradorite rock.	In W. T., p. 205.
9	I.5.4.″5.	or 3.34 di 2.75 ab 34.58 wo 1.04 an 54.77 mt 0.23 ne 3.12	Holsenö, n. Bergen, Norway.	Lillejord.	C. F. Kolderup, Berg. Mus. Aarb., 1903, No. 12, p. 36.	Labradorite rock.	
10	I(II).5.4″.4″.	or 5.00 di 7.63 ab 14.67 ol 3.68 an 63.66 mt 0.23 ne 3.98	Hutberg, Neurode, Silesia.	O. Hauser.	F. Tannhäuser, Sb. Pr. Ak. Wis., 1908, II, p. 1074.	Gabbro aplite.	
11	I.5.4.″5.	Q 3.54 hy 2.32 or 3.34 ab 37.73 an 51.43 C 1.43	Turtschinka, Nolhynia, Russia.	J. Morozewicz.	W. Tarassenko, Ref. N. J., 1899, I, p. 463.	Labradorite rock.	In W. T., p. 205.
12	I(II).5.4.5.	or 1.11 di 3.52 ab 23.06 ol 6.92 an 60.88 mt 0.46 ne 1.70 il 0.46	New Caledonia	Boiteau.	A. Lacroix, C. R., CLII, p. 820, 1911.	Diorite (leucocratic).	

SUBRANG. NOT NEEDED.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I(II).5.″5.0.	or 0.56 di 5.96 ab 12.05 ol 2.68 an 75.06 mt 1.86 ne 1.14	Burnt Head, Monhegan Island, Maine.	E. C. E. Lord.	E. C. E. Lord, A. G., XXVI, p. 340, 1900.	Anorthosite.	In W. T., p. 207.

CLASS I. PERSALANE—Continued.

RANG 5. PERCALCIC. CANADASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
2	45.0	32.5	0.2	3.0	0.7	17.1	0.8	0.2	n. d.		0.3				100.8	
B3. IV	.750	.319	.001	.042	.018	.305	.013	.002			.004					
3	49.03	27.89	1.47	1.89	1.89	14.11	1.33	0.49	0.74	0.07	0.60	0.29		CO_2 0.17 SO_3 0.25	100.22	
A2. II	.817	.274	.009	.026	.047	.252	.021	.005			.008	.002				
4	47.11	28.57	2.66	n. d.	0.98	17.01	1.05	0.11	2.11						99.60	2.640
A4. IV	.785	.280	.017	(.034)	.025	.304	.017	.001								
5	47.60	29.77	0.35	1.60	1.21	14.80	1.98	0.34	0.64	0.36	0.10		0.37		99.12	2.70
B2. III	.793	.292	.002	.022	.030	.264	.032	.004			.001		.005			
6	44.59	33.71	0.29	n. d.	0.26	17.80	0.97	0.39	1.63	0.36		0.16			100.16	2.693
A4. IV	.743	.330	.002	(.004)	.007	.318	.016	.004				.001				
7	47.70	32.80	0.90	0.40	0.15	15.50	2.00	0.50	0.50						100.45	2.75
A3. III	.795	.322	.006	.006	.004	.277	.032	.005								
8	45.73	33.54	0.11	0.47	0.29	17.67	1.30	0.14	0.80		0.02	0.03			100.10	
A2. II	.762	.329	.001	.007	.007	.316	.021	.001			——	——				

CLASS I. PERSALANE.

RANG 1. PERALKALIC. MIASKASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	53.56	24.43	2.19	1.22	0.31	1.24	6.48	9.50	0.93				0.10		99.96	
A3. III	.893	.240	.014	.017	.008	.022	.104	.101					.001			
2	55.11	21.28	2.64	1.29	0.59	2.82	6.24	8.36	0.58	0.14	0.48	0.27	0.08	CO_2 0.08	99.96	2.666
A2. II	.919	.209	.017	.018	.015	.050	.101	.089			.006	.002	.001			
3	53.09	21.16	1.89	2.04	0.32	3.30	6.86	8.42	1.13	0.24	0.11	0.15	0.20	CO_2 0.82 ZrO_2 0.04 SO_3 none Cl 0.02 S 0.08 BaO 0.61	100.48	
A1. I	.885	.208	.012	.028	.008	.059	.111	.089			.001	.001	.003			
4	58.89	19.67	1.79	1.23	0.17	1.31	4.41	11.00	1.11				0.59		100.17	2.557
A3. III	.982	.193	.011	.017	.004	.023	.071	.117					.008			
5	55.87	20.85	2.34	1.10	0.48	3.07	4.81	10.49	0.34		0.79	0.11		CO_2 none ZrO_2 0.07 SO_3 0.14 BaO 0.09	100.55	2.551
A1. I	.931	.204	.015	.015	.012	.055	.077	.112			.010	.001				
6	54.50	21.70	0.80	1.98	0.54	3.20	6.40	9.14	0.89		0.27			Cl 0.49	99.91	
A2. II	.908	.213	.005	.028	.014	.057	.103	.098			.003					
7	59.47	19.25	1.92	0.94	0.52	1.66	6.86	6.89	1.28		0.66			ZrO_2 (0.20)	99.65	
A3. III	.991	.189	.012	.013	.013	.030	.111	.073			.008					
8	56.10	22.03	0.30	4.50	0.72	0.70	6.73	6.54	1.40		0.50		0.30		99.82	
A2. II	.935	.216	.002	.063	.018	.013	.108	.069			.006		.004			

ORDER 5. PERFELIC. CANADARE—Continued.

SUBRANG. NOT NEEDED—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
2	I″.5.5.0.	or 1.12 hy 5.46 ab 6.81 ol 0.92 an 84.79 mt 0.23 il 0.61	Saint Vincent, West Indies.	Arsandaux.	A. Lacroix, Mont Pelee, p. 598, 1904.	Troctolite.	Inclusion in andesite.
3	I(II).″5.″5.0.	Q 6.90 hy 5.89 or 2.78 mt 2.09 ab 11.00 il 1.22 an 68.11 ap 0.67 C 0.31	Nieder Ramstadt, Bl. Rossdorf, Hesse.	Stadler.	G. Klemm, Erl. G. Kt. Hess., Bl. Rossdorf, p. 29, 1912.	Gabbro.	
4	I(II).5.″5.0.	Q 3.12 di 9.84 or 0.56 hy 2.02 ab 8.91 an 72.84	Schlumpskoppe, Neurode, Silesia.	O. Hauser.	F. Tannhäuser, Sb. Pr. Ak. Wiss., 1908, II, p. 1071.	Anorthosite.	
5	I″.5.(4)5.0.	Q 0.18 di 1.86 or 2.22 hy 5.24 ab 16.77 mt 0.46 an 71.17 il 0.15	Richterhof, S. Bohemia.	E. Donath.	W. Bergt, Z. D. G. G., LXI, p. 78, 1909.	Anorthosite.	
6	I.5.5.0.⊙	or 2.22 di 1.14 ab 7.07 ol 0.48 an 86.18 ap 0.34 ne 0.71	Crocetta, S. Piero in Campo, Elba.	E. Manasse.	E. Manasse, Pr. Soc. Tosc., XII, p. 222, 1901.	Anorthitic inclusions in granite.	
7	I.5.(4)5.0.	Q 0.90 hy 0.40 or 2.78 mt 1.39 ab 16.77 an 77.01 C 0.82	Statue of Khephren, Near Assuan, Egypt.	J. Couyat.	J. Couyat, B. Soc. Fr. Min., XXXI, p. 340, 1908.	Anorthosite.	
8	I.5.5.0.⊙	or 0.56 di 2.07 ab 10.48 ol 0.34 an 85.35 mt 0.23 ne 0.28	New Caledonia.	Boiteau.	A. La Croix, C. R., CLII, p. 819, 1911.	Anorthosite.	

ORDER 6. LENDOFELIC: RUSSARE. (C. I. P. W., 1902.)

SUBRANG 3. SODIPOTASSIC. BEEMEROSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.6.1(2).3.	or 56.15 ol 0.86 ab 3.67 mt 3.24 an 6.12 ne 27.55 C 1.33	Beemersville, Sussex County, New Jersey.	L. G. Eakins.	J. P. Iddings, U. S. G. S. B. 150, p. 211, 1898.	Nephelite syenite.	In W. T., p. 207.
2	I(II).6.1″.3.	or 49.48 di 3.24 ab 13.86 wo 1.04 an 5.28 mt 3.02 ne 21.16 il 0.91 hm 0.64 ap 0.67	Kruger Mountain, Okanagan Range, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38 (1), p. 453, 1912.	Nephelite syenite.	
3	I(II).6″.1.3.	or 49.48 di 5.45 ab 8.12 wo 0.81 an 2.22 mt 2.78 ne 27.12 il 0.15 cc 1.80 ap 0.34	Diamond Joe Quarry, Magnet Cove, Arkansas.	H. S. Washington.	H. S. Washington, J. G., IX, p. 611, 1901.	Foyaite.	In W. T., p. 207.
4	I.(5)6.1.3(4).	or 65.05 di 4.34 ab 12.05 mt 2.55 an 1.39 ne 13.63	Picota, Serra de Monchique, Portugal.	A. Zilliacus.	Kraatz-Koschlau and Hackmann, T. M. P. M., XVI, p. 252, 1896.	Leucite-tinguaite vitrophyre.	In W. T., p. 207.
5	I(II).6.1″.″3.	or 62.27 di 2.59 ab 3.67 wo 3.02 an 4.73 mt 1.16 ne 19.32 il 1.52 th 0.28 hm 1.44	Poggio Muratella, Lake Bracciano, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 47, 1906.	Leucite phonolite.	Incomplete in J. G., V, p. 49, 1897. In W. T., p. 207.
6	I(II).6.1″.3.	or 54.49 di 7.98 ab 2.36 wo 0.46 an 5.28 mt 1.16 ne 25.98 il 0.46 hl 0.82	Eruption of 79, Pompeii, Vesuvius.	Pisani.	A. Lacroix, N. Arch. Mus. (4), IX, p. 129, 1907.	Leucite phonolite pumice.	
7	I″.(5)6.1.3(4).	or 40.59 di 2.81 ab 37.20 wo 1.39 an 1.39 mt 1.39 ne 11.36 il 1.22 hm 0.96	Near Castel Ferru, Monte Ferru, Sardinia.	H. S. Washington.	H. S. Washington, A. J. S., XXXIX, p. 520, 1915.	Phonolite.	
8	I″.″6.1″.3(4).	or 38.36 ol 7.28 ab 31.44 mt 0.46 an 3.61 il 0.91 ne 13.63 C 2.65	Tscheremschanka River, Ilmen Mountains, Russia.	Z. Weyberg.	Z. Weyberg, Ref. N. J., 1912, I, p. 398.	Miascite.	

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CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. MIASKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
9	58.72	21.50	1.78	n. d.	0.75	1.72	7.10	7.48	0.68		0.19			Cl trace	99.92	
A4. IV	.979	.211	.011	(.022)	.019	.030	.115	.080			.002					
10	55.38	23.74	0.63	1.26	0.81	0.67	5.29	10.05	1.12	0.38	trace	0.06	trace	CO_2 0.05 ZrO_2 0.06 Cl trace SO_3 0.07 BaO trace	99.57	
A2. II	.923	.233	.004	.018	.020	.012	.085	.107			—	—	—			
11	56.26	21.19	0.75	1.37	1.87	0.49	5.86	11.42	n. d.		0.15		0.06	CO_2 0.24 NaCl 0.09 F 0.25	100.00	
A2. II	.938	.208	.005	.019	.047	.009	.095	.121			.002		.001			
12	58.00	22.52	1.37	1.01	0.85	0.90	6.93	7.72	1.71		0.19				101.20	
B3. IV	.967	.221	.009	.014	.021	.016	.111	.082			.002					

RANG 1. PERALKALIC. MIASKASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	56.31	20.11	3.93	1.45	0.36	0.62	8.76	4.65	1.13		2.82	0.13	0.60	ZrO_2 in TiO_2 Cl 0.15	101.02	2.67
A2. II	.939	.197	.024	.020	.009	.011	.141	.050			.035	.001	.008			
2	59.68	23.48	0.59	0.37	0.21	0.26	9.52	4.68	0.66		none	none	none	CO_2 0.04	99.49	
A2. II	.995	.230	.004	.005	.005	.005	.153	.050			—	—	—			
3	58.30	21.38	1.05	2.04	0.22	0.95	8.66	6.06	0.45	0.35	0.10	0.04	trace	CO_2 none ZrO_2 0.02 SO_3 0.08 Cl 0.35 BaO none	100.05	
A1. I	.972	.210	.007	.029	.006	.017	.140	.065			.001	—	—			
4	58.77	22.53	1.54	1.04	0.19	0.74	9.62	4.89	0.90	0.07	0.31		trace	ZrO_2 0.11 BaO none	100.71	2.596
A2. II	.980	.220	.010	.014	.005	.013	.155	.052			.004		—			
5	56.75	20.69	3.52	0.59	0.11	0.37	11.45	2.90	3.18	0.04	0.30		trace	SO_3 trace Cl 0.28 BaO none	100.18	2.474
A2. II	.946	.203	.022	.008	.003	.007	.185	.031			.004		—			
6	54.22	20.20	2.35	1.02	0.29	0.70	9.44	4.85	5.57	0.42	0.38	0.11	0.19	CO_2 trace SO_3 none BaO trace	99.74	
A2. II	.904	.198	.015	.014	.007	.012	.152	.052			.005	.001	.003			
7	54.77	21.41	2.46	0.68	0.18	0.47	9.53	4.97	4.61	0.17	0.08	0.07	0.68	CO_2 0.03	100.11	
A2. II	.913	.210	.015	.010	.005	.008	.153	.053			.001	—	.010			
8	53.57	22.46	1.01	0.92	0.37	1.49	10.22	5.14	2.97	0.43	0.20	0.11	0.56	CO_2 0.95 S 0.17	100.57	
A2. II	.893	.220	.006	.013	.009	.027	.165	.054			.003	.001	.008			
9	54.79	22.87	1.74	3.24	1.92	trace	10.75	4.06	n. d.				trace	ZrO_2 0.07 Cl 0.54 F 0.08	99.75	
A3. III	.913	.224	.011	.045	.048	—	.174	.043					—			
10	58.60	20.98	2.22	0.44	0.33	1.13	8.38	5.49	1.92						99.69	
A3. III	.977	.205	.014	.006	.008	.020	.135	.059								
11	57.86	20.26	2.35	0.39	0.04	0.89	9.47	5.19	2.40	0.21	0.22	0.03	0.21	CO_2 none ZrO_2 0.15 SO_3 0.06 Cl 0.08 S 0.03 BaO 0.09 SrO 0.04	99.97	
A1. I	.964	.199	.015	.005	.001	.016	.153	.055			.003	—	.003			

ORDER 6. LENDOFELIC. RUSSARE—Continued.

SUBRANG 3. SODIPOTASSIC. BEEMEROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
9	I.6.1.3″.	or 44.48 di 3.25 ab 25.68 ol 2.16 an 4.45 il 0.30 ne 18.74	Nosy Komba, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., I, p. 19, 1902.	Ditroite.	
10	I.6.1.3.⊙.	or 59.49 ol 2.83 ab 9.43 mt 0.93 an 3.34 ne 19.03 C 2.96	Near Itschan, East Cape, Siberia.	H. S. Washington.	H. S. Washington, A. J. S., XIII, p. 176, 1901.	Nephelite syenite.	
11	I(II).6(7).1.″3.	or 58.38 ac 2.31 lc 6.98 ns 0.37 ne 24.71 di 2.04 hl 0.09 ol 4.60 il 0.30	Zerafshan, Turkestan.	Not stated.	J. Preobrajensky, Ann. Inst. Pet. Grt., XV, p. 316, 1911.	Sodalite syenite.	
12	I.″6.1″.3″.	or 45.59 ol 1.78 ab 27.25 mt 2.09 an 4.45 il 0.30 ne 16.76 C 1.22	Maros Peak, Celebes.	Hinden.	C. Schmidt, in Sarasin, Ins. Celebes, IV, p. 18, 1901.	Phonolite.	

SUBRANG 4. DOSODIC. MIASKOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I″.″6.1.4.	or 27.80 il 4.26 ab 44.54 hm 3.84 an 1.67 pf 0.27 ne 15.90 ru 0.40 ap 0.34	Naujakasik, Ilimausak Region, Greenland.	C. Detlefsen.	N. V. Ussing, G. Julhb., p. 132, 1911.	Foyaite.	
2	I.″6.1.(3)4.	or 27.80 ol 0.45 ab 49.25 mt 0.93 an 1.39 ne 16.76 C 2.24	Blue Mountain, Methuen Township, Renfrew County, Ontario.	N. N. Evans.	Adams and Barlow, Can. G. S. Mem. 6, p. 295, 1910.	Nephelite syenite.	Also in Tr. R. Soc. Can., II, (4), p. 52, 1909.
3	I.6.1.″4.	or 36.14 di 1.67 ab 35.11 ol 2.19 an 2.78 mt 1.62 ne 19.31 il 1.15 hl 0.59	Red Hill, New Hampshire.	H. S. Washington.	Pirsson and Washington, A. J. S., XXIII, p. 273, 1907.	Nephelite syenite.	In W. T., p. 207.
4	I.6.1.4.⊙.	or 28.91 ol 0.35 ab 42.97 mt 2.32 an 3.61 il 0.61 ne 20.73	Salem Neck, Essex County, Massachusetts.	H. S. Washington.	H. S. Washington, J. G., VI, p. 803, 1898.	Foyaite.	In W. T., p. 207.
5	I(II).6.1.4(5).	or 17.24 ac 6.01 ab 46.64 di 0.65 ne 23.57 wo 0.46 mt 0.93 il 0.61 hm 0.80	Pickards Point, Manchester, Essex County, Massachusetts.	H. S. Washington.	H. S. Washington, A. J. S., VI, p. 185, 1898.	Analcite tinguaite.	Also in J. G., VII, p. 120, 1899. In W. T., p. 207.
6	I″.6.1.4.	or 28.91 ac 2.77 ab 33.54 di 2.26 ne 23.28 mt 2.09 il 0.76 ap 0.34	Southboro, Massachusetts.	H. N. Stokes.	U. S. G. S. B. 148, p. 77, 1897.	Phonolite (tinguaite).	Cf. H. S. Washington, J. G., VII, p. 121, 1899. In W. T., p. 207.
7	I.6.1.4.⊙.	or 29.47 di 0.92 ab 35.63 ol 0.41 an 1.11 mt 3.48 ne 24.14 il 0.15	Mount Solon, Augusta County, Virginia.	J. W. Watson.	Watson and Cline, B. G. S. A., XXIV, p. 316, 1913.	Nephelite. syenite.	
8	I″.6(7).1.4.	or 30.02 di 4.92 ab 25.15 wo 0.35 an 0.28 mt 1.39 ne 33.23 il 0.46 ap 0.34	Mount Solon, Augusta County, Virginia.	J. G. Dinwiddie.	Watson and Cline, B. G. S. A., XXIV, p. 316, 1913.	Nephelite syenite.	
9	I(II).6″.1.4.	or 23.91 ol 6.83 ab 36.94 mt 2.55 ne 28.26 hl 0.94 C 1.53	Near Wausau, Wisconsin.	W. W. Daniells.	S. Weidman, J. G., XII, p. 552, 1904.	Sodalite-nephelite syenite.	
10	I.″6.1.4.	or 32.80 di 1.73 ab 41.40 wo 0.12 an 3.06 mt 1.39 ne 15.90 hm 1.28	Black Hills, South Dakota.	H. N. Stokes.	W. Cross, U. S. G. S. B. 148, p. 114, 1897.	Phonolite.	Same as next below, No. 11. In W. T., p. 209.
11	I″.6.1.4.	or 30.58 ac 4.16 ab 38.51 di 0.22 ne 20.02 wo 1.74 mt 0.70 il 0.46 hm 0.48	Black Hills, South Dakota.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 150, p. 193, 1898.	Phonolite.	Same as next above, No. 10. In W. T., p. 209.

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. MIASKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
12	58.70	19.26	3.37	0.58	0.76	1.41	8.55	4.53	2.57	0.07	trace	0.10	0.10		100.00	
A3. III	.978	.189	.021	.008	.019	.025	.138	.048			—	.001	.001			
13	59.13	22.20	2.04	0.33	none	0.58	10.20	4.35	1.23	0.37	0.07	0.05	0.05	CO_2 none ZrO_2 0.02 F 0.20 S none V_2O_3 none BaO none SrO none	100.82	2.639
A1. I	.986	.218	.013	.005	—	.010	.165	.047			.001	—	—			
14	60.02	20.98	2.21	0.51	trace	1.18	8.83	5.72	0.70			trace	trace	Cl trace	100.15	2.576
A3. III	1.000	.206	.014	.007	—	.021	.142	.061				—	—			13°
15	59.38	19.47	1.60	1.19	0.36	1.96	7.80	5.83	0.69	0.11	0.58	0.08	0.15	ZrO_2 0.10 SO_3 0.37 Cl 0.22 BaO 0.13 SrO 0.03 Li_2O trace	100.05	
A1. I	.990	.191	.010	.017	.009	.035	.126	.062			.007	—	.002			
16	59.00	20.07	1.58	0.65	0.10	1.05	8.34	5.63	2.03	0.24	0.29	0.05	0.12	CO_2 0.26 ZrO_2 0.20 SO_3 0.07 Cl 0.24 BaO trace SrO none Li_2O trace	99.92	
A1. I	.983	.197	.010	.009	.003	.019	.134	.060			.004	—	.002			
17	58.98	20.54	1.65	0.48	0.11	0.67	9.95	5.31	0.97	0.19	0.24	0.04	0.26	ZrO_2 0.20 SO_3 0.20 Cl 0.28 BaO none SrO none Li_2O trace	100.07	
A1. I	.983	.201	.010	.007	.003	.012	.161	.056			.003	—	.004			
18	58.78	20.03	1.87	0.49	0.16	0.83	9.36	5.50	1.57	0.31	0.29	0.03	0.15	ZrO_2 0.17 SO_3 0.12 Cl 0.58 BaO none SrO none Li_2O trace	100.24	
A1. I	.980	.196	.012	.007	.004	.014	.151	.059			.004	—	.002			
19	58.64	19.62	2.17	0.42	0.37	1.24	8.39	5.26	2.40	0.34	0.20	0.03	0.20	CO_2 0.23 ZrO_2 0.09 Cl 0.14 BaO trace SrO trace Li_2O trace	99.74	2.52
A1. I	.977	.192	.014	.006	.009	.022	.135	.056			.003	—	.003			
20	58.99	19.01	1.74	0.59	0.27	2.02	9.11	5.07	1.24	0.38	0.21	0.04	0.08	CO_2 none ZrO_2 0.07 SO_3 0.96 Cl 0.15 BaO 0.02 SrO 0.02 Li_2O trace	99.97	
A1. I	.983	.185	.011	.008	.007	.036	.147	.054			.003	—	.001			
21	56.24	21.43	2.01	0.55	0.15	1.38	10.53	5.74	0.86	0.12	0.26	0.06	0.08	ZrO_2 0.09 SO_3 0.10 Cl 0.12 F trace S 0.03 Cr_2O_3 none NiO none BaO 0.08 SrO 0.03 Li_2O trace	99.86	2.619
A1. I	.937	.210	.013	.008	.004	.025	.170	.061			.003	—	.001			22°
22	52.83	20.70	2.84	1.19	0.41	1.00	9.94	4.87	5.13	0.37	0.16	0.03	trace	CO_2 0.15 SO_3 trace Cl 0.06	99.68	
A2. II	.880	.203	.018	.017	.010	.018	.160	.052			.002	—	—			
23	54.92	20.81	1.28	1.36	0.37	0.95	8.95	7.26	1.34		0.43	trace	none	CO_2 0.12 SO_3 0.07 Cl 1.28	99.65	2.581
A2. II	.915	.204	.008	.019	.009	.017	.145	.078			.005	—	—			
24	56.43	22.25	2.66	0.97	trace	1.35	11.12	2.77	2.05			trace	trace		99.66	2.54
A3. III	.941	.218	.017	.014	—	.025	.179	.030				—	—			

ORDER 6. LENDOFELIC. RUSSARE—Continued.

SUBRANG 4. DOSODIC. MIASKOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
12	I″.(5)6.1.4.	or 26.69 di 4.10 ab 48.47 mt 2.09 an 0.83 hm 1.92 ne 12.92 ap 0.34	Shields River, Crazy Mountains, Montana.	W. H. Melville.	Wolff and Tarr, B. Mus. Comp. Zool., XVI, p. 232, 1893.	Acmite trachyte.	In W. T., p. 209.
13	I.6.1.4.⊙.	or 26.13 wo 0.46 ab 46.89 mt 0.93 an 1.67 il 0.15 ne 21.44 hm 1.44	Near Libby, Montana.	G. Steiger.	E. S. Larsen, U. S. G. S. ec. lab.	Nephelite syenite.	
14	I.6.1.4.⊙.	or 33.92 wo 2.09 ab 42.70 mt 1.62 an 0.83 hm 1.12 ne 17.18	Bet. Florissant and Manitou, El Paso County, Colorado.	L. G. Eakins.	W. Cross, Pr. Colo. Sc. Soc., II, p. 169, 1887.	Phonolite.	Also in U. S. G. S. A. R. 16, p. 39, 1895. In W. T., p. 209.
15	I″.(5)6.1.″4.	or 34.47 di 2.44 ab 42.44 wo 1.51 an 3.06 mt 2.32 ne 10.51 il 1.06 hl 0.35 th 0.71	Bull Cliff, Cripple Creek, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. A. R. 16, p. 43, 1895.	Phonolite.	In W. T., p. 209.
16	I.(5)6.1.″4.	or 33.36 di 0.65 ab 43.75 wo 1.04 an 1.95 mt 1.62 ne 13.20 il 0.61 hl 0.35 hm 0.48 th 0.14	Big Bull Mountain, Cripple Creek, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. A. R. 16, p. 39, 1895.	Phonolite.	In W. T., p. 209.
17	I″.6.1.4.	or 31.14 ac 4.16 ab 39.30 di 2.64 ne 19.88 il 0.46 hl 0.47 th 0.43	Mitre Peak, Cripple Creek, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. A. R. 16, p. 39, 1895.	Phonolite.	In W. T., p. 209.
18	I.6.1.4.⊙.	or 32.80 ac 1.85 ab 41.65 di 0.86 ne 16.33 wo 1.16 hl 0.94 mt 1.16 th 0.28 il 0.61 hm 0.48	Straub Mountain, Cripple Creek, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. A. R. 16, p. 39, 1895.	Phonolite.	In W. T., p. 209.
19	I″.″6.1.4.	or 31.14 di 1.94 ab 44.54 wo 1.39 an 0.28 mt 1.39 ne 14.20 il 0.46 hl 0.23 hm 0.28	Rhyolite Mountain, Cripple Creek, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. A. R. 16, p. 39, 1895.	Phonolite.	In W. T., p. 209.
20	I″.″6.1.4.	or 30.02 ac 0.92 ab 45.32 di 1.51 ne 12.64 wo 3.36 hl 0.23 mt 1.39 th 1.70 il 0.46 hm 0.48	Mount Waas, La Sal Mountains, Utah.	W. F. Hillebrand.	L. M. Prindle, U. S. G. S. B. 228, p. 191, 1904.	Noselite syenite porphyry.	
21	I(II).6″.1.4.	or 33.92 ac 6.01 ab 23.58 ns 0.93 ne 29.54 di 2.10 wo 1.86 il 0.46	Pleasant Valley, Colfax County, New Mexico.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 168, p. 171, 1900.	Phonolite.	In W. T., p. 211.
22	I(II).6(7).1.4.	or 28.91 ac 4.16 ab 25.68 di 3.65 ne 28.97 wo 0.26 mt 2.09 il 0.30	San José, Tamaulipas, Mexico.	H. S. Washington.	G. I. Finlay, Ann. N. Y. Ac. Sci., XIV, p. 281, 1903.	Tinguaite.	Also in J. F. Kemp, Tr. Am. Inst. M. Eng., 1905, p. 894. In W. T., p. 211.
23	I.6.1.″4.	or 43.37 di 2.51 ab 22.53 ol 0.34 an 1.67 mt 1.86 ne 21.87 il 0.76 hl 2.11 th 0.99	Cabo Frio, Rio Janeiro, Brazil.	F. E. Wright.	F. E. Wright, T. M. P. M., XX, p. 288, 1901.	Nephelite aplite.	
24	I.6.1.4(5).	or 16.68 wo 1.86 ab 48.21 mt 3.25 an 2.50 hm 0.48 ne 24.71	Wolf Rock, n. Lands End, Cornwall.	Phillips.	Cited in J. J. H. Teall, Brit. Petrog., p. 368, 1888.	Phonolite.	Not in W. T.

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. MIASKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
25	59.52	21.24	2.71	0.48	0.12	0.48	10.72	3.92	0.50		trace		trace	CO_2 0.21 ZrO_2 0.16	100.06	
A3. III	.992	.208	.017	.007	.003	.009	.173	.041			—		—			
26	56.67	22.42	1.82	0.80	1.33	0.28	8.52	7.32	1.18		0.24	0.01	trace	Cl trace	100.59	
A2. II	.945	.220	.011	.011	.033	.005	.137	.078			.003	—	—			
27	53.96	21.78	0.62	2.55	0.54	1.93	8.61	7.02	2.29		1.03	trace	0.15	Cl trace S trace SrO trace Li_2O trace	100.48	2.578
A2. II	.899	.214	.004	.036	.014	.034	.139	.074			.013	—	.002			18.5°
28	56.44	20.52	2.72	4.51	0.28	1.23	9.01	4.80	0.75	0.12	0.12	0.10	0.06	Cl 0.06 S 0.07	100.49	
A2. II	.941	.201	.017	.063	.007	.022	.145	.051			.002	.001	—			
29	52.04	23.92	1.46	4.18	1.50	2.38	8.36	2.37	2.21		0.26	0.26	0.11	CO_2 0.58	99.63	
A2. II	.867	.234	.009	.058	.038	.043	.135	.025			.003	.002	.002			
30	56.40	21.36	2.96	2.39	0.90	1.81	8.57	4.83	0.01		0.84		0.49		100.56	
A2. II	.940	.209	.018	.033	.023	.032	.138	.051			.010		.007			
31	52.24	20.46	3.82	0.68	0.14	2.39	10.05	6.18	1.84		0.32	0.05	0.09	CO_2 1.69 ZrO_2 trace S trace NiO 0.05 BaO 0.06 SrO 0.09	100.15	
A1. I	.871	.201	.024	.009	.004	.043	.162	.066			.004	—	.001			
32	56.43	20.58	2.88	1.28	0.28	1.45	8.62	4.23	2.90			0.06	0.66	SO_3 0.22 Cl 0.07 F trace	99.58	2.499
A2. II	.941	.202	.018	.018	.007	.026	.139	.045				—	.009			
33	55.92	20.35	2.16	0.94	0.62	2.21	8.35	4.83	3.51		trace	0.18	0.50	SO_3 0.23 Cl 0.06 F trace Ce_2O_3 trace Cu 0.18	100.04	2.452
A1. I	.932	.200	.014	.013	.016	.039	.135	.052			—	.001	.007			
34	55.01	21.67	1.95	1.86	0.13	2.12	9.78	3.54	2.17		0.27	0.08	0.22	SO_3 0.41 Cl 0.08 F trace Ce_2O_3 trace Cu 0.12	99.41	2.513
B1. II	.917	.213	.012	.026	.003	.038	.158	.037			.003	—	.003			
35	55.79	19.53	2.07	2.13	0.40	3.68	7.39	5.01	2.72		none	0.11	0.51	CO_2 0.43 SO_3 none Cl 0.12	99.89	2.529
A2. II	.930	.191	.013	.029	.010	.066	.119	.053			—	.001	.007			
36	55.46	24.49	2.63	1.06	0.05	0.92	9.78	5.16	0.07		0.20	trace	trace		99.82	
A3. III	.924	.240	.016	.015	.001	.016	.158	.056			.003	—	—			
37	55.31	21.74	1.77	1.02	0.47	1.57	8.77	6.49	1.94		0.07		trace	CO_2 0.11 Cl 0.60	99.86	
A3. III	.922	.213	.011	.014	.012	.029	.142	.069			.001		—			
38	53.19	22.57	1.98	1.72	0.49	2.55	8.86	6.60	1.47		trace	trace		CO_2 0.11 Cl 0.37	99.91	
A3. III	.887	.221	.013	.024	.012	.046	.143	.070			—	—				
39	56.10	22.90	0.47	1.49	0.26	1.73	8.50	7.10	0.99		trace	trace		Cl 0.58	100.32	
A3. III	.935	.225	.003	.021	.007	.030	.137	.076			—	—				

ORDER 6. LENDOFELIC. RUSSARE—Continued.

SUBRANG 4. DOSODIC. MIASKOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
25	I.6.1.4.⊙.	or 22.80 ac 2.77 ab 49.25 di 0.65 ne 20.73 wo 0.70 Z 0.18 mt 1.62 hm 0.64	Cevedaes, Alemtejo, Portugal.	M. Dittrich.	A. Osann, N. J., 1907, II, p. 123.	Aegirite-nephelite gneiss.	
26	I.6.1.(3)4.	or 43.37 ol 2.31 ab 23.06 mt 1.86 an 1.39 il 0.46 ne 26.41 hm 0.48	Between Monchique and Caldas, Serra de Monchique, Portugal.	O. Heidenreich.	Kraatz-Koschlau and Hackmann, T. M. P. M., XVI, p. 228, 1896.	Nephelite syenite.	In W. T., p. 211.
27	I(II).6(7).1.″4.	or 41.14 di 7.77 ab 14.15 ol 0.17 an 0.28 mt 0.93 ne 31.81 il 1.98	Picota, Serra de Monchique, Portugal.	P. Jannasch.	P. Jannasch, N. J., 1884, II, p. 13.	Nephelite syenite.	In W. T., p. 211.
28	I(II).6.1.4.	or 28.36 di 3.41 ab 37.73 ol 3.61 an 1.39 mt 3.94 ne 20.73 il 0.30 ap 0.34	Lilla Ellringe, Almunge, Sweden.	N. Sahlbom.	P. Quensel, B. G. Inst. Un. Ups., XII, p. 190 (1913), 1914.	Canadite gneiss.	
29	I(II).″6.1(2).4″.	or 13.90 ol 7.28 ab 47.16 mt 2.09 an 6.12 il 0.46 ne 12.78 ap 0.67 cc 1.40 C 5.30	Upptorp, Almunge, Sweden.	N. Sahlbom.	P. Quensel, B. G. Inst. Ups., XII, p. 185, 1914.	Nephelite syenite.	Marginal facies of No. 19, II, 6. 2. 4.
30	I″.6.1(2).4.	or 28.36 di 2.72 ab 37.20 ol 1.87 an 5.56 mt 4.18 ne 19.03 il 1.52	Poutelitschorr, Kola Peninsula, Finland.	F. Eichleiter.	F. Eichleiter, Vh. Wien. G. R.-A., XXVII, p. 218, 1893.	Nephelite syenite.	Cf. V. Hackmann, Fennia, XI, No. 2, p. 139, 1894. In W. T., p. 211.
31	I″.6.1.4.	or 36.70 di 0.86 ab 22.27 wo 3.13 an 3.34 mt 1.39 ne 22.86 il 0.61 nc 4.11 hm 2.88	Pyhakuru, Kuolajarvi, Finland.	I. G. Sundell.	I. G. Sundell, B. C. G., Fin. No. 16, p. 5, 1905.	Cancrinite syenite.	
32	I″.″6.1″.4.	or 25.02 di 1.86 ab 44.01 ol 0.72 an 5.00 mt 4.18 ne 15.62	Magdeburg, Hegau.	G. F. Föhr.	G. F. Föhr, In. Diss. Wurz., p. 32, 1883.	Phonolite.	In W. T., p. 211.
33	I″.6.1.4.	or 28.91 di 4.94 ab 36.68 wo 0.12 an 3.61 mt 3.25 ne 18.46 ap 0.34	Staufen, Hegau.	G. F. Föhr.	G. F. Föhr, In. Diss. Wurz., p. 28, 1883.	Phonolite.	In W. T., p. 211.
34	I″.6.1(2).4.	or 20.57 di 3.62 ab 40.35 ol 1.62 an 6.39 mt 2.78 ne 21.58 il 0.46 th 0.71	Hohentwiel, Hegau.	J. F. Föhr.	G. F. Föhr, In. Diss. Wurz., p. 8, 1883.	Phonolite.	In W. T., p. 213.
35	I(II).″6.1(2).4.	or 29.47 di 7.87 ab 34.06 wo 1.28 an 5.28 mt 3.02 ne 15.34 ap 0.34	Donnersberg, Bohemia.	F. Hanusch.	J. E. Hibsch, T. M. P. M., XXIV, p. 287, 1905.	Phonolite.	
36	I.6.1″.4.	or 31.14 ol 0.07 ab 31.44 mt 2.78 an 4.45 il 0.46 ne 27.83 hm 0.64 C 1.02	Gy. Szt. Miklos, Czanod, Siebenbürgen, Hungary.	J. v. Szadeczky.	J. v. Szadeczky, Ref. N. J., 1901, I, p. 402.	Tinguaite.	In W. T., p. 213.
37	I″.6.1.″4.	or 38.36 di 3.09 ab 24.63 wo 0.58 an 2.78 mt 2.55 ne 24.71 il 0.15 hl 0.94	Monte Mulatto, Predazzo, Tyrol.	M. Dittrich.	J. Romberg, Sb. Pr. Ak. Wiss., 1902, I, p. 748.	Tinguaite.	
38	I(II).6(7).1.″4.	or 38.92 di 5.32 ab 14.15 wo 1.16 an 3.61 mt 3.02 ne 31.52 hl 0.59	Val dei Coccoletti, Monte Mulatto, Predazzo, Tyrol.	M. Dittrich.	J. Romberg, Sb. Pr. Ak. Wiss., 1902, I, p. 748.	Nephelite syenite porphyry.	
39	I.6.1″.(3)4.	or 42.26 di 2.42 ab 22.79 ol 1.30 an 5.56 mt 0.70 ne 24.28 hl 0.94	Pollena Ravine, Monte Somma, Italy.	Pisani.	A. Lacroix, Nouv. Arch. Mus. (4), IX, p. 141, 1907.	Phonolite.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. MIASKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
40	56.10	22.65	0.59	1.48	0.62	2.27	8.27	7.09	0.10		0.07	trace		Cl 0.50	99.74	
A2. II	.935	.223	.004	.021	.016	0.41	.134	.076			.001	——				
41	54.35	22.90	0.75	1.50	0.14	1.66	9.34	6.94	1.00		0.13			Cl 1.13	99.84	
A2. II	.906	.225	.005	.021	.003	.030	.151	.073			.002					
42	59.46	19.49	1.45	2.30	1.05	1.66	9.34	4.34	0.26	0.21	0.45		0.24	Cl 0.38	100.63	
A2. II	.991	.191	.009	.032	.026	.030	.151	.046			.006		.003			
43	57.46	22.34	2.10	2.16	0.46	0.91	9.84	4.48	0.42			0.17		Cl 0.06	100.40	
A3. III	.958	.219	.013	.030	.012	.016	.159	.048				.002				
44	57.25	22.33	1.39	1.97	0.38	1.16	9.85	5.88	0.32			0.04			100.57	
A3. III	.954	.219	.009	.028	.010	.021	.159	.063				——				
45	56.10	21.80	2.26	0.87	0.83	0.88	9.85	4.35	1.66		0.21		0.58	ZrO_2 0.31 Cl 0.45	100.15	
A2. II	.935	.214	.014	.012	.021	.016	.159	.047			.003		.008			
46	55.65	20.30	1.28	1.73	0.54	2.15	9.93	6.03	1.00			0.10		SO_3 0.85 Cl 0.79	100.35	
A2. II	.928	.199	.008	.024	.014	.039	.160	.064				.001				
47	55.55	23.70	2.27	1.73	0.93	0.86	9.43	4.44	1.04		0.26	trace	0.66		100.85	
A2. II	.926	.232	.014	.024	.023	.015	.152	.047			.003		.009			
48	55.54	21.81	1.56	2.15	0.52	1.38	8.32	4.73	2.97			0.06		Cl 0.50	99.54	
A3. III	.926	.214	.010	.030	.013	.025	.134	.050				——				
49	57.7	20.1	1.0	2.2	0.2	1.2	10.6	5.4	1.3		0.2			Cl 0.4	100.3	
B3. IV	.962	.197	.006	.031	.005	.021	.171	.057			.003					
50	54.52	22.00	1.69	1.20	0.26	0.91	9.38	6.29	2.55	1.16	0.23	trace	0.20	Cl 0.71	101.10	
B2. III	.909	.216	.011	.017	.007	.016	.152	.067			.003	——	.003			
51	58.62	21.50	0.47	3.65	0.88	0.56	7.95	5.47	1.12		0.06			Cl none	100.28	
A3. III	.977	.211	.003	.051	.022	.010	.128	.058			.001					
52	58.61	21.80	1.76	1.77	0.62	0.30	9.45	5.21	0.75					Cl trace	100.27	
A3. III	.977	.214	.011	.025	.016	.005	.153	.055								
53	58.25	21.00	0.48	3.22	0.99	1.60	8.01	5.86	0.62		0.06			Cl trace	100.09	
A3. III	.971	.206	.003	.044	.025	.029	.129	.063			.001					
54	58.10	21.10	2.36	1.77	0.73	0.66	7.81	5.51	1.75		0.06			Cl none	99.85	
A3. III	.968	.207	.015	.025	.018	.012	.126	.059			.001					
55	54.97	21.27	2.25	1.02	0.33	1.65	8.87	6.15	2.44	0.31	0.35	0.14			99.78	
A2. II	.913	.209	.014	.014	.008	.030	.144	.066			.004	.001				

ORDER 6. LENDOFELIC. RUSSARE—Continued.

SUBRANG 4. DOSODIC. MIASKOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
40	I.6.1″.(3)4.	or 42.26 di 4.89 ab 17.82 ol 0.93 an 5.56 mt 0.93 ne 26.41 il 0.15 hl 0.82	Pollena Ravine, Monte Somma, Italy.	Pisani.	A. Lacroix, Nouv. Arch. Mus. (4), IX, p. 141, 1907.	Phonolite.	
41	I.6″.1″.4″.	or 40.59 di 3.16 ab 17.82 ol 0.38 an 4.73 mt 1.16 ne 29.82 il 0.30 hl 1.87	Monte Somma, Italy.	Pisani.	A. Lacroix, Nouv. Arch. Mus. (4), IX, p. 143, 1907.	Sodalitic sanidinite.	
42	I(II).6.1.4.	or 25.58 ac 0.46 ab 46.11 di 6.90 ne 16.19 ol 1.45 hl 0.59 mt 1.86 il 0.91	Pico de Teyde, Teneriffe, Canary Islands.	N. Sahlbom.	H. Preiswerk, N. J. Cb., 1909, p. 396.	Sodalite trachyte.	Also in Vh. Nf. Ges. Basel, XXI, p. 213, 1910.
43	I.6.1.4.⊙.	or 26.69 ol 2.57 ab 41.92 mt 3.02 an 2.50 ap 0.67 ne 22.44 C 0.31	Fotaba, Tamara Island, Los Islands, French Guinea.	Lassieur.	A. Lacroix, Nouv. Arch. Mus., III, 1911, p. 65.	Syenite.	
44	I″.6″.1.4.	or 35.03 ac 1.39 ab 26.98 di 4.99 ne 29.68 ol 0.72 mt 2.09	Topsail Point, Tamara Island, Los Islands, French Guinea.	Lassieur.	A. Lacroix, Nouv. Arch. Mus., III, p. 73, 1911.	Nephelite aplite.	
45	I.6.1.4.⊙.	or 26.13 di 0.43 ab 39.82 ol 1.64 an 3.89 mt 3.25 ne 21.87 il 0.46 hl 0.70	Rouma, Los Islands, French Guinea.	Pisani.	A. Lacroix, Nouv. Arch. Mus., III, p. 38, 1911.	Nephelite syenite.	
46	I(II).6.1.4.	or 35.58 ac 1.39 ab 25.15 di 7.74 ne 24.71 wo 0.35 hl 1.29 mt 1.16 th 1.56 ap 0.34	Tamara, Los Islands, French Guinea.	Lassieur.	A. Lacroix, Nouv. Arch. Mus., III, p. 65, 1911.	Hauyne, syenite.	
47	I.6.1.4.⊙.	or 26.13 ol 3.24 ab 37.99 mt 3.25 an 4.17 il 0.46 ne 22.58 C 1.84	Kassa Island, Los Islands, French Guinea.	Pisani.	A. Lacroix, Nouv. Arch. Mus., III, p. 105, 1911.	Nephelite aplite.	
48	I.″6.1(2).4.	or 27.80 ol 2.73 ab 39.82 mt 2.32 an 6.95 ne 14.48 hl 0.82 C 1.22	Topsail Point, Tamara Island, Los Islands, French Guinea.	Lassieur.	A. Lacroix, Nouv. Arch. Mus., III, p. 73, 1911.	Tinguaite.	
49	I(II).6.1.4.	or 31.69 ac 2.77 ab 32.49 ns 2.32 ne 22.15 di 5.12 hl 0.70 ol 1.16 il 0.46	Gebel Abu Khrug, Egypt.	J. Couyat.	J. Couyat, C. R., CLI, p. 1140, 1910.	Microsyenite.	
50	I.6.1.″4.	or 37.25 di 2.14 ab 24.89 mt 2.55 an 1.95 il 0.46 ne 26.84 hl 1.17	Near Kadero, Kordofan.	D. Schrimpff.	G. Linck, N. J. B. B., XVII, p. 442, 1903.	Tinguaite.	
51	I″.(5)6.1.″4.	or 32.25 ol 6.44 ab 41.66 mt 0.70 an 2.78 il 0.15 ne 13.77 C 1.53	Nosy Komba, Madagascar.	Pisani	A. Lacroix, Mat. Min. Mad., I, p. 53, 1902.	Phonolite.	
52	I.6.1.4.⊙.	or 30.58 ol 2.55 ab 41.39 mt 2.55 an 1.39 ne 21.02	Ampangarinana, Nosy Komba, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., I, p. 47, 1902.	Foyaite.	
53	I″.6.1″.″4.	or 35.03 di 3.56 ab 33.01 ol 4.46 an 3.89 mt 0.70 ne 18.74 il 0.15	Nosy Komba, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., I. p. 53, 1902.	Microfoyaite.	
54	I.(5)6.1.″4.	or 32.80 ol 2.28 ab 42.44 mt 3.48 an 3.34 il 0.15 ne 12.78 C 1.02	Mount Antana-omby, Nosy Komba, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., I, p. 19, 1902.	Ditroite.	
55	I″.6.1.″4.	or 36.70 ac 0.46 ab 25.15 di 1.73 ne 26.98 wo 2.20 mt 2.32 il 0.61 hm 0.48 ap 0.34	Andrakaka, Madagascar.	Boiteau.	A. Lacroix, pers. com., 1913.	Tinguaite.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. MIASKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
56	54.15	21.95	2.07	1.74	0.82	2.55	8.29	6.10	0.30	1.00	0.66	0.16			99.79	
A2. II	.903	.215	.013	.024	.021	.046	.134	.065			.008	.001				
57	53.40	23.50	1.57	2.35	0.66	2.64	9.10	5.58	1.25		0.33				99.31	
B3. IV	.890	.230	.010	.033	.017	.047	.147	.060			.004					
58	53.20	22.60	1.81	2.46	0.38	3.22	9.05	5.16	3.00		0.32				100.38	
A3. III	.887	.221	.011	.034	.010	.057	.146	.055			.004					
59	52.60	22.80	2.43	2.00	1.09	1.67	9.42	5.21	2.12		0.26				99.60	
A3. III	.877	.223	.015	.028	.027	.030	.152	.055			.003					
60	56.12	19.62	2.32	0.90	0.13	2.07	9.50	4.17	3.50		0.46			CO_2 0.80	99.50	
A3. III	.935	.192	.014	.013	.003	.038	.153	.045			.006					
61	49.88	21.70	1.30	0.53	0.07	3.92	11.80	4.66	2.35			trace		CO_2 2.30 Cl 0.44 F 1.25	100.20	
A2. II	.831	.213	.008	.007	.002	.070	.190	.050				—				
62	58.31	24.81	n. d.	0.73	0.16	0.64	11.52	3.25	0.87						100.29	
A4. IV	.972	.243	—	.010	.004	.012	.185	.035								
63	57.82	20.87	0.89	1.54	none	1.13	10.18	4.71	0.95		0.27		0.79	CO_2 0.08 F 0.49	99.72	
A2. II	.964	.205	.006	.021	—	.020	.165	.050			.003		.011			
64	57.32	21.90	0.71	2.12	none	1.14	10.05	5.06	1.00		0.02		0.48	CO_2 0.14 F 0.12	100.06	
A2. II	.955	.215	.004	.029	—	.020	.162	.054			—		.007			
65	59.49	19.56	2.20	2.34	0.09	0.85	8.68	5.29	1.36	0.18	0.09	0.04	trace	CO_2 0.04 ZrO_2 0.11 SO_3 none Cl 0.08 Cr_2O_3 none NiO trace BaO trace SrO trace V_2O_3 none CuO trace	100.40	2.593
A1. I	.992	.192	.014	.032	.002	.015	.140	.056			.001	—	—			
66	55.15	20.66	1.90	3.06	0.36	1.58	8.10	5.41	3.25	0.25	0.06	0.16	trace	CO_2 0.09 ZrO_2 none SO_3 trace Cl 0.08 Cr_2O_3 none V_2O_3 none NiO 0.03 BaO none SrO trace	100.14	2.573
A1. I	.919	.202	.012	.043	.009	.029	.131	.057			—	.001	—			
67	53.62	22.78	2.62	0.72	0.42	0.68	10.40	5.22	2.44	0.22	0.08	0.03	0.05	CO_2 0.07 ZrO_2 0.20 SO_3 0.05 Cl 0.19 F trace Cr_2O_3 none V_2O_3 none NiO none BaO none SrO trace	99.79	2.577
A1. I	.894	.224	.016	.010	.011	.012	.168	.055			.001	—	—			
68	53.30	22.19	3.58	1.55	0.24	1.36	9.73	5.74	1.38	0.38	none	0.08	0.47	CO_2 0.02 ZrO_2 0.11 SO_3 0.09 Cl 0.12 F 0.02 Cr_2O_3 none V_2O_3 none NiO 0.04 BaO none SrO trace Li_2O trace	100.41	2.618
A1. I	.888	.218	.023	.022	.006	.024	.156	.061			—	—	.007			

ORDER 6. LENDOFELIC. RUSSARE—Continued.

SUBRANG 4. DOSODIC. MIASKOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
56	I(II).6.1″.″4.	or 36.14 ab 21.22 an 4.45 ne 26.55 di 5.28 wo 0.35 mt 3.02 il 1.22 ap 0.34	Ankify, Madagascar.	Boiteau.	A. Lacroix, pers. com., 1913.	Phonolite.	
57	I″.6(7).1(2).4.	or 33.36 ab 17.84 an 6.39 ne 32.09 di 5.56 ol 1.06 mt 2.32 il 0.61	Bezavona Mountain, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., II, p. 205, 1903.	Tinguaite.	Border of dike.
58	I(II).6(7).1″.4.	or 30.58 ab 20.96 an 5.56 ne 30.10 di 6.87 wo 0.93 mt 2.55 il 0.61	Bezavona Mountain, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., II, p. 205, 1903.	Tinguaite.	Center of dike.
59	I″.6(7).1″.4.	or 30.58 ab 22.53 an 4.45 ne 30.96 di 3.06 ol 1.80 mt 3.48 il 0.46	Antsohanina, Bezavona, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., II, p. 205, 1903.	Variolitic tinguaite.	"Spherolitic" in reference.
60	I(II).6.1.4.	or 25.02 ab 40.08 ne 20.02 ac 2.77 di 0.65 wo 4.06 mt 1.62 il 0.91 hm 0.16	Leeuwfontein, Pretoria, Transvaal.	Pisani.	H. A. Brouwer, Transv. Nephs., p. 63, 1910.	Foyaite.	Fresh?
61	I.6″.1(2).4.	or 27.80 ab 25.68 an 8.62 ne 23.57 hl 0.70 nc 5.52 di 0.43 wo 0.46 mt 1.62 hm 0.16 ft 2.57	Olivenfontein, Pilandsberg, Transvaal.	Pisani.	H. A. Brouwer, Transv. Nephs., p. 163, 1910.	Nephelite syenite porphyry.	
62	I.6.1.4″.	or 19.46 ab 47.16 an 3.34 ne 26.98 C 1.12 ol 1.30	Zerafshan, Turkestan.	Not stated.	J. Preobrajensky, Ann. Inst. Pet. Gr., XV, p. 320, 1911.	Nephelite syenite.	
63	I(II).6.1.4.	or 27.80 ab 36.68 ne 24.14 ac 2.77 ns 0.49 di 4.96 ol 0.92 il 0.46	Nizhnaya Podgolenaya River, Jenissei District, Siberia.	A. Nikitinsky.	A. Meister, Expl. G. Reg. Aurif. Sib., IX, p. 292, 1910.	Nephelite syenite.	
64	I″.6.1.4.	or 30.02 ab 33.01 ne 27.83 ac 0.46 di 6.20 ol 0.82 mt 0.70	Nizhnaya Podgolenaya River, Jenissei District, Siberia.	A Nikitinsky.	A. Meister, Expl. G. Reg. Aurif. Sib., IX, p. 292, 1910.	Nephelite syenite.	
65	I″.″6.1.4.	or 31.14 ab 43.75 ne 14.91 ac 1.85 di 3.66 ol 0.82 mt 2.32 il 0.15	Dilabamble, Dubbo, New South Wales.	H. P. White.	G. W. Card, Rec. G. S. N. S. W., VIII, (3), p. 260, 1907.	Phonolite.	
66	I″.6.1″.4.	or 31.69 ab 32.49 an 3.89 ne 19.60 di 2.69 ol 2.08 mt 2.78 il 0.15 ap 0.34	Dairy Mount, New South Wales.	W. A. Greig.	Dep. Min. N. S. W. A. R. (1906), p. 177, 1907.	"Rock" (phonolite?).	
67	I.6(7).1.4.	or 30.58 ab 26.72 an 0.28 ne 33.23 di 2.38 mt 2.09 il 0.15 hm 1.12	Porcupine Mountain, Barigan, New South Wales.	J. C. H. Mingaye.	G. W. Card, pers. com.	Tinguaite.	
68	I(II).6(7).1.4.	or 33.92 ab 22.53 an 0.28 ne 32.09 di 2.78 wo 1.28 mt 5.34	Jimmy Jimmy, Barigan, New South Wales.	J. C. H. Mingaye.	G. W. Card, pers. com.	Tinguaite.	

CLASS I. PERSALANE—Continued.

RANG 1. PERALKALIC. MIASKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
69	56.40	21.41	1.04	1.50	0.51	0.96	9.61	5.36	2.50		0.25			Cl trace	99.54	
A3. III	.940	.210	.007	.021	.013	.017	.155	.057			.003					
70	53.87	20.64	4.51	1.42	0.34	2.13	6.86	6.24	2.93		1.10	0.18	trace		100.22	
A2. II	.898	.202	.028	.019	.009	.038	.111	.066			.014	.001	—			
71	58.64	22.55	0.97	0.99	0.16	1.43	9.87	4.98	0.35	0.08	0.28	trace	trace		100.30	
A3. III	.977	.222	.006	.014	.004	.025	.160	.053			.004	—	—			
72	57.95	20.43	3.43	1.35	0.26	1.90	8.32	5.96	0.39	0.23	0.40	0.07	0.07		100.76	
A2. II	.966	.200	.021	.019	.007	.034	.134	.064			.005	—	.001			

RANG 2. DOMALKALIC. VIEZZENASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	53.76	23.21	1.27	3.18	0.23	2.94	6.97	7.01	1.71		none	trace	none	Cl 0.02 SrO 0.04 Li_2O trace	100.34	
A2. II	.896	.227	.008	.044	.006	.052	.113	.074			—	—	—			
2	53.13	24.87	2.25	1.40	trace	2.68	5.56	7.26	1.05	0.36	0.60				99.16	
B3. IV	.886	.244	.014	.019	—	.048	.090	.078			.008					
3	55.95	19.80	0.97	1.98	1.20	2.66	5.58	8.32	1.00		1.60	0.30		SO_3 0.65 Cl 0.16	100.17	
A2. II	.933	.194	.006	.028	.030	.047	.090	.088			.020	.002			(100.16)	
4	52.60	26.60	0.91	2.21	0.51	1.89	7.06	6.94	0.61					CO_2 0.55	99.88	
A3. III	.877	.261	.006	.031	.013	.034	.114	.073								
5	56.31	21.69	1.20	0.97	0.54	1.88	5.56	9.17	1.13	none	0.41	0.13	0.16	ZrO_2 none Cl 0.28 F 0.03 S 0.17 BaO 0.05 SrO 0.04	99.72	
A1. I	.939	.213	.008	.014	.014	.034	.090	.098			.005	.001	.002			

RANG 2. DOMALKALIC. VIEZZENASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	54.68	21.63	2.22	2.00	1.25	2.86	7.03	4.58	1.88	0.27	0.79	0.28	trace	CO_2 none SO_3 0.07 Cl none F 0.22 BaO 0.05	99.81	
A1. I	.911	.212	.014	.028	.031	.051	.113	.049			.010	.002	—			
2	54.76	24.72	2.73	2.35	0.10	1.67	10.38	2.37	0.55						99.63	
A3. III	.913	.242	.017	.033	.003	.030	.168	.026								
3	58.40	20.25	1.78	2.41	0.49	3.11	7.01	5.39	0.57	0.27	0.25	0.20	trace	CO_2 none ZrO_2 none SO_3 0.06 Cl 0.02 BaO trace	100.21	
A1. I	.973	.198	.011	.033	.012	.055	.113	.057			.003	.001	—			
4	55.93	21.83	3.62	0.34	0.61	2.54	7.84	6.01	0.72		0.42	0.22		CO_2 0.03 SO_3 0.08 Cl 0.51	100.70	2.62
A2. II	.932	.214	.023	.005	.015	.045	.126	.064			.005	.002				
5	54.71	22.07	2.49	2.50	0.88	2.52	7.58	5.46	1.13	0.20				Cl trace	99.54	
A3. III	.912	.216	.016	.035	.022	.045	.122	.059								

ORDER 6. LENDOFELIC. RUSSARE—Continued.

SUBRANG 6. DOSODIC. MIASKOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
69	I''.6.1.4.	or 31.69 ac 0.92 ab 31.96 di 3.96 ne 26.13 ol 0.76 mt 1.16 il 0.46	Papenoo Valley, Tahiti.	Pisani.	A. Lacroix, B. Soc. G. Fr., X, p. 107, 1910.	Tinguaite.	
70	I(II).''6.1(2).(3)4	or 36.70 di 2.06 ab 27.77 mt 1.16 an 6.95 il 2.13 ne 16.47 hm 3.68 ap 0.34	Howe Island, Kerguelen Island.	Green and Steele.	E. G. Hogg, Pr. R. Soc. Vict., XI (II), p. 210, 1899.	Phonolite.	Not in W. T.
71	I.6.1.4.⊙	or 29.47 di 1.86 ab 38.77 wo 0.93 an 2.50 mt 1.39 ne 24.42 il 0.61	Brown Island, South Victoria Land, Antarctica.	G. T. Prior.	G. T. Prior, Nat. Ant. Exp., I, p. 115, 1907.	Phonolitic trachyte.	
72	I(II).6.1.''4.	or 35.58 di 1.51 ab 35.63 wo 2.90 an 0.56 mt 3.48 ne 18.74 il 0.76 hm 0.96	Cape Crozier, Ross Island, South Victoria Land, Antarctica.	G. T. Prior.	G. T. Prior, Nat. Ant. Exp., I, p. 115, 1907.	Trachy-dolerite.	

SUBRANG 3. SODIPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I''.6.''2.3(4).	or 41.14 di 2.91 ab 14.14 ol 2.93 an 11.12 mt 1.86 ne 24.42	The Ridge, Magnet Cove, Arkansas.	J. F. Williams.	J. F. Williams, Ark. G. S. A. R, II, p. 266, (1890) 1891.	Tinguaite porphyry.	In W. T., p. 213.
2	I.''6.2.3.	or 43.37 mt 2.55 ab 18.60 il 1.22 an 13.34 hm 0.48 ne 15.48 C 3.88	Cnoc-na-Sroine, Assynt, Scotland.	A. Gemmell.	A. Gemmell, Tr. Edin. G. Soc., IX (5), p. 418, 1910.	Nephelite syenite.	Al_2O_3 high? MgO low?
3	I''.(5)6.(1)2.3.	or 44.48 di 3.06 ab 24.63 ol 1.29 an 7.23 mt 1.39 ne 11.64 il 3.04 hl 0.23 ap 0.67 th 1.14	Kassa, Los Islands, French Guinea.	Pisani.	A. Lacroix, Nouv. Arch. Mus., III, p. 66, 1911.	Micromon-zonite.	
4	I.6.(1)2.3(4).	or 40.59 ol 3.46 ab 16.24 mt 1.39 an 9.45 ne 23.57 C 4.08	Karakut, Vizagapatam District, Madras, India.	T. L. Walker.	T. L. Walker, Rec. G. S. Ind., XXXVI, p. 21, 1908.	Nephelite syenite.	
5	I.''6.(1)2.3.	or 54.49 di 0.43 ab 14.15 ol 1.15 an 8.06 mt 1.86 ne 16.76 il 0.76 hl 0.47 ap 0.34	Gentungen River, n. Biliangin, Maros District, Celebes.	E. W. Morley.	J. P. Iddings, Ign. Rocks, II, p. 627, 1913.	Nephelite syenite.	Also in Iddings and Morley, J. G., XXIII, p. 240, 1915.

SUBRANG 4. DOSODIC. VIEZZENOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.(5)6.2.4.	or 27.24 ol 2.58 ab 37.20 mt 3.25 an 12.23 il 1.52 ne 11.93 ap 0.67 C 0.61	Brookville, New Jersey.	G. Steiger.	F. L. Ransome, A. J. S., VIII, p. 423, 1899.	Nephelite syenite.	In W. T., p. 213.
2	I.6.(1)2.4(5).	or 14.48 ol 1.84 ab 46.11 mt 3.94 an 8.34 ne 22.72 C 1.84	Wausau, Wisconsin.	W. W. Daniells.	S. Weidman. J. G., XII, p. 552, 1904.	Nephelite syenite.	
3	I(II).(5)6.(1)2.''4	or 31.69 di 5.66 ab 38.25 ol 0.62 an 7.78 mt 2.55 ne 11.36 il 0.46 ap 0.34	San José, Tamaulipas, Mexico.	H. S. Washing-ton.	G. I. Finlay, Ann. N. Y. Ac. Sc., XIV, p. 266, 1903.	Nephelite syenite.	In W. T., p. 211.
4	I''.6.(1)2.''4.	or 35.58 di 1.51 ab 30.13 ol 0.56 an 8.62 il 0.76 ne 17.46 hm 3.62 hl 0.82 ap 0.67	Forodada, Columbretes Islands, Spain.	R. Pfohl.	F. Becke, T. M. P. M., XVI, p. 165, 1896.	Phonolite.	In W. T., p. 211.
5	I''.6.(1)2.''4.	or 32.80 di 2.75 ab 27.24 ol 2.45 an 9.17 mt 3.71 ne 19.88	Barranco do Banho, Serra de Mon-chique, Portugal.	A. Kalecsinzky.	A. Kalecsinzky, F. K., XV, p. 562, 1885.	Nephelite syenite.	Cf. A. Merian, N. J. B. B., III, p. 271, 1885. In W. T., p. 213.

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. VIEZZENASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
6	56.04	22.15	1.06	3.28	1.12	2.42	8.39	5.03	0.67						100.16	
A3. III	.934	.217	.007	.046	.028	.043	.135	.054								
7	51.90	22.54	4.03	3.15	1.97	3.11	8.18	4.72	0.22						99.82	
A3. III	.865	.220	.025	.044	.049	.056	.114	.050								
8	52.04	23.92	1.46	4.18	1.50	2.38	8.36	2.37	2.21		0.26	0.26	0.11	CO_2 0.58	99.63	
A2. II	.864	.234	.009	.058	.038	.043	.135	.025			.003	.002	.002			
9	54.46	19.96	2.34	3.33	0.61	2.12	8.68	2.76	5.20		trace		trace		99.46	
A3. III	.908	.196	.015	.046	.015	.038	.140	.030			—		—			
10	55.19	23.02	1.23	n. d.	trace	2.70	9.95	4.48	0.52		0.63			CO_2 none SO_3 2.70	100.42	
A4. IV	.920	.225	.017	(.034)	—	.048	.160	.048			.008					
11	54.65	22.75	3.40	2.18	2.04	2.19	6.61	5.25	0.76		1.09				100.92	2.575
B3. IV	.911	.223	.021	.030	.051	.039	.106	.056			.014					
12	56.13	23.01	1.06	n. d.	1.88	1.98	8.67	3.57	2.22		0.81	0.03	0.18	CO_2 trace ZrO_2 0.02 SO_3 0.05 Cl 0.12 Ce_2O_3 0.03	99.56	
A2. II	.936	.225	.007	(.014)	.047	.036	.140	.038			.010	—	.003			
13	53.99	20.65	2.98	1.69	0.83	5.00	5.84	5.21	4.17			0.18			100.44	
A3. III	.900	.202	.019	.024	.021	.089	.094	.055				.001				
14	53.7	23.0	1.9	1.3	0.3	2.9	8.4	5.8	2.0	0.2	trace			Cl 0.4	99.90	2.577
B3. IV	.895	.225	.012	.018	.008	.052	.135	.062			—					
15	56.88	22.60	0.97	2.19	0.56	1.33	8.30	5.57	0.98		0.29	0.08		ZrO_2 trace Cl 0.34	100.09	
A2. II	.948	.221	.006	.031	.014	.023	.134	.060			.004	—				
16	56.54	22.33	1.43	1.18	0.75	1.94	8.39	5.20	0.62		0.30	trace		Cl 0.87	99.55	
B2. III	.942	.219	.009	.017	.019	.035	.135	.055			.004	—				
17	55.99	20.18	4.19	3.25	0.33	2.29	6.85	5.59	0.43	0.10	0.29	0.19		SO_3 0.02 Cl 0.04	99.84	
A2. II	.933	.198	.026	.045	.008	.041	.111	.060			.004	.001				
18	55.95	22.96	0.86	1.10	0.25	1.71	7.17	6.43	2.55	0.35	0.33	0.10			99.76	
A2. II	.933	.225	.005	.015	.006	.030	.116	.068			.004	.001				
19	54.25	22.61	0.61	3.60	0.26	1.62	8.95	3.97	3.12		0.32				99.31	
B3. IV	.904	.221	.004	.050	.007	.029	.145	.043			.004					
20	53.12	21.62	3.46	1.94	1.10	2.00	8.16	5.11	2.56		0.08	0.46	trace	ZrO_2 0.06 SO_3 0.28	99.95	2.540
A2. II	.885	.215	.022	.027	.028	.036	.132	.054			.001	.003	—			
21	55.95	22.53	0.99	4.54	trace	3.21	7.42	3.97	none	0.09	0.98			CO_2 0.02	99.70	
A3. III	.933	.220	.006	.063	—	.057	.119	.042			.012					

ORDER 6. LENDOFELIC. RUSSARE—Continued.

SUBRANG 4. DOSODIC. VIEZZENOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
6	I(II).6.(1)2.4.	or 30.02 di 3.53 ab 29.87 ol 4.60 an 7.78 mt 1.62 ne 22.15	Vasvik Tunnel, Laurvik, Norway.	G. Forsberg.	W. C. Brögger, Z. K., XVI, p. 38, 1890.	Nephelite rhomben porphyry.	In W. T., p. 213.
7	I(II).6.2.4.	or 27.80 ol 5.37 ab 25.15 mt 5.80 an 15.57 ne 18.74	Lunde, Lougendal, Norway.	G. Forsberg.	W. C. Brögger, Z. K., XVI, p. 33, 1890.	Larudalite.	In W. T., p. 299.
8	I(II).″6.″2.4″.	or 13.90 hy 7.56 ab 42.97 mt 2.09 an 10.01 il 0.46 ne 15.05 ap 0.67 C 3.88	Upptorp, Almunge, Sweden.	N. Sahlbom.	P. Quensel, B. G. Inst. Un. Ups., XII, p. 185, 1913.	Nephelite syenite.	
9	I(II).″6.(1)2.4″.	or 16.68 di 2.85 ab 46.64 ol 3.05 an 7.23 mt 3.48 ne 14.48	Njurjawrpachk, Umptek, Kola.	K. Kjellin.	V. Hackmann, Fennia, XI, No. 2, p. 158, 1894.	(Analcite) tinguaite.	In W. T., p. 215.
10	I.6.2.4.⊙	or 26.69 ol 2.65 ab 35.63 il 1.22 an 13.34 ne 15.34 th 4.83 C 0.31	Laacher See, Rheinland.	W. Bruhns.	W. Bruhns, Vh. Nh. Ver. Bonn., XLVIII, p. 317, 1891.	Nosean sanidinite.	In W. T., p. 215.
11	I(II).(5)6.2.(3)4.	or 31.14 ol 3.57 ab 34.06 mt 3.71 an 10.84 il 2.13 ne 11.64 hm 0.80 C 2.24	Schackau, Rhöngebirge.	H. Gachot.	H. Gachot, In. Diss. Stras., p. 15, 1912.	Trachypho-nolite.	
12	I.″6.″2.4.	or 21.13 ol 4.00 ab 42.97 il 1.52 an 10.01 ne 16.47 C 1.12	Spitzberg, Brüx, Bohemia.	H. Trenkler.	H. Trenkler, T. M. P. M., XX, p. 148, 1901.	Phonolite.	Traces of Cu, Pb, Sn, Sb, As.
13	I(II).(5)6.2.(3)4.	or 30.58 di 5.78 ab 28.30 wo 0.81 an 14.73 mt 4.41 ne 11.36 ap 0.34	Kahle Berg, Böhmischer Mittelgebirge.	C. F. Eich-leiter.	G. Irgang, T. M. P. M., XXVIII, p. 64, 1909.	Phonolite.	
14	I″.6.(1)2.″4.	or 34.47 di 3.22 ab 20.70 wo 1.04 an 8.06 mt 2.78 ne 27.12	Monte Mulatto, Predazzo, Tyrol.	C. Hlawatsch.	C. Hlawatsch, T. M. P. M., XX, p. 48, 1901.	Nephelite syenite porphyry.	
15	I.6.2.4.⊙	or 33.36 ol 3.12 ab 33.54 mt 1.39 an 6.39 il 0.61 ne 18.46 hl 0.59 C 0.92	Kassa, Los Islands, French Guinea.	Lassieur.	A. Lacroix, Nouv. Arch. Mus., III, p. 42, 1911.	Aegirite syenite.	
16	I.″6.(1)2.4.	or 30.58 ol 1.74 ab 37.20 mt 2.09 an 9.73 il 0.67 ne 14.77 hl 1.40 C 0.61	Tahiré, Rouma Island, Los Islands, French Guinea.	Lassieur.	A. Lacroix, Nouv. Arch. Mus., III, p. 86, 1911.	Theralite.	Border of dike. Cf. No. 23, III.6.2.4.
17	I(II).″6.(1)2.(3)4.	or 33.36 di 2.60 ab 35.11 ol 1.10 an 7.51 mt 6.03 ne 12.50 il 0.61 ap 0.34	Makarainga, Madagascar.	Boiteau.	A. Lacroix, C. R., CLV, p. 1126, 1912.	Nephelite syenite gneiss.	
18	I.″6.(1)2.(3)4.	or 37.81 ol 1.03 ab 30.39 mt 1.16 an 7.51 il 0.61 ne 16.47 ap 0.34 C 1.43	Nosy Komba, Madagascar.	Boiteau(?).	A. Lacroix, pers. com., 1913.	Nephelite syenite.	
19	I″.6.(1)2.4.	or 23.91 ol 4.77 ab 35.89 mt 0.93 an 8.06 il 0.61 ne 21.72 C 0.41	Bezavona Mountains, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., II, p. 205, 1903.	Leucitic microsyenite.	
20	I″.6.(1)2.4.	or 30.02 ol 2.47 ab 29.34 mt 5.10 an 8.06 il 0.15 ne 21.58 ap 1.01	Kibo, Kilimanjaro, German East Africa.	K. Eyme.	L. Finckh, Ros. Fests., p. 392, 1906.	Nephelite rhomben porphyry.	$ZrO_2=TiO_2$?
21	I″.(5)6.2.4.	or 23.35 ol 4.59 ab 40.35 mt 1.39 an 15.85 il 1.82 ne 11.93 C 0.20	Mount Erebus, S. Victoria Land, Antarctica.	Burrows and Walkom.	T. W. E. David, pers. com.	Kenyte pumice.	

CLASS I. PERSALANE—Continued.

RANG 2. DOMALKALIC. VIEZZENASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	55.45	21.65	0.81	0.49	0.13	3.65	9.31	1.62	1.64		0.30	0.01	0.01	CO_2 0.88 Corundum 4.45	100.40	
A2. II	.924	.212	.005	.007	.003	.065	.150	.017			.004	—	—			

CLASS I. PERSALANE.

RANG 1. PERALKALIC. LAUGENASE. (C. I. P. W., 1902.)

1	53.54	24.27	1.11	1.24	0.08	0.71	8.62	8.87	1.09	0.14				CO_2 0.20	99.87	
A3. III	.892	.238	.007	.017	.002	.012	.139	.094								
2	50.25	21.41	1.76	1.82	0.31	4.48	5.16	11.32	0.62	0.34	0.57	0.12		CO_2 0.32 ZrO_2 0.02 SO_3 1.05 Cl 0.18 BaO 0.13 SrO trace	99.86	
A1. I	.938	.210	.011	.025	.008	.080	.084	.120			.007	.001				

RANG 1. PERALKALIC. LAUGENASE.

1	48.38	30.54	0.40	0.06	0.19	1.87	13.94	3.70	0.50		trace	trace	trace	CO_2 0.62 CuO trace	100.20	
A3. III	.806	.299	.003	.001	.005	.034	.225	.039			—	—	—			
2	49.42	22.99	2.70	1.89	0.45	2.59	9.63	4.21	5.73						99.61	
A3. III	.824	.225	.017	.026	.011	.046	.155	.045							(99.99)	
3	55.50	22.45	1.03	1.32	0.47	1.60	10.74	5.48	0.96		0.50	trace			100.05	
A3. III	.925	.220	.006	.018	.012	.029	.173	.059			.006	—				
4	50.99	24.66	2.33	2.21	1.54	2.13	11.36	4.39	0.63						100.24	
A3. III	.850	.242	.015	.031	.039	.038	.185	.047								
5	56.75	21.10	2.55	none	0.08	0.76	11.66	3.88	1.69		0.03	0.01	0.12	ZrO_2 1.60 Cl 0.04 S 0.03	100.30	
A1. I	.946	.207	.016	—	.002	.014	.188	.041			—	—	.002			

RANG 1. PERALKALIC. LAUGENASE.

1	48.10	24.20	1.11	2.47	0.51	0.45	15.20	3.00	1.20		0.13		0.48	ZrO_2 trace Cl 2.80	99.65	
B2. II	.802	.237	.007	.035	.013	.008	.245	.032			.002		.007			

CLASS I. PERSALANE.

RANG 1. PERALKALIC. HOCHELAGASE. (H. S. WASHINGTON, 1917.)

1	41.84	28.42	3.29	0.40	0.25	0.66	19.48	2.06	0.62	0.14	none	0.04	0.15	Cl 4.47	101.82 1.10	
A2. II	.697	.278	.021	.006	.006	.012	.315	.022			—	—	.002		100.72	

RANG 2. DOMALKALIC. MONMOUTHASE. (ADAMS AND BARLOW, 1908.)

1	39.74	30.59	0.44	2.19	0.60	5.75	13.25	3.88	1.00		0.13		0.03	CO_2 2.17 SO_3 trace Cl 0.02 S 0.07	99.86	
A2. II	.662	.300	.003	.031	.015	.103	.214	.041			.002		—			

ORDER 6. LENDOFELIC. RUSSARE—Continued.

SUBRANG 5. PERSODIC. RAGLANOSE. (ADAMS AND BARLOW, 1908.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.(5)6.2.(4)5.	or 9.45 ol 0.21 ab 56.53 mt 0.70 an 12.51 il 0.61 ne 12.07 hm 0.32 C 4.45 cc 2.00	Raglan Township, Renfrew County, Ontario.	M. F. Connor.	Adams and Barlow, Tr. R. Soc. Can., II (4), p. 61, 1909.	Raglanite.	Also in Can. G. S., Mem. 6, p. 314, 1910.

ORDER 7. LENFELIC. TASMANARE. (C. I. P. W., 1902.)

SUBRANG 3. SODIPOTASSIC. APPIANOSE. (H. S. WASHINGTON, 1906.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.(6)7.1.3(4).	or 52.26 di 1.67 ab 3.14 ol 0.72 an 1.39 mt 1.62 ne 37.77	Magnet Cove, Arkansas.	H. S. Washington.	H. S. Washington, J. G., IX, p. 667, 1901.	Foyaite.	In W. T., p. 215.
2	I(II).7″.1(2).″3.	or 30.02 di 3.46 ab 6.12 wo 4.64 lc 28.78 mt 2.55 ne 19.31 il 1.06 hl 0.35 ap 0.34 th 1.85	Tavolato, Via Appia, n. Rome, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 51, 1906.	Tavolatite, (hauyne-leucite tephrite).	

SUBRANG 4. DOSODIC. LAUGENOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.7(8).1″.4(5).	or 21.68 ol 0.35 ab 10.48 mt 0.23 an 5.56 hm 0.32 ne 58.22 cc 1.40 C 1.53	Craigmont, Renfrew County, Ontario.	M. F. Connor.	Adams and Barlow, Tr. R. Soc. Can., II (4), p. 60, 1909.	Craigmontite (corundum nephelite syenite).	Also in Can. G. S., Mem. 6, p. 312, 1910.
2	I″.(6)7.1(2).4.	or 25.02 di 4.61 ab 19.91 wo 0.12 an 6.95 mt 3.94 ne 33.23	San José, Tamaulipas, Mexico.	G. I. Finlay.	G. I. Finlay. Ann. N. Y. Ac. Sc., XIV, p. 285, 1904.	Analcite tinguaite.	Also in Tr. Am. Inst. M. E., 1905, p. 894.
3	I(II).(6)7.1.4.	or 32.80 ac 2.77 ab 21.74 ns 0.73 ne 33.94 di 5.56 wo 0.58 il 0.91	Brathagen, Laugendal, Norway.	G. Forsberg.	W. C. Brögger, Z. K., XVI, p. 41, 1890.	Foyaite.	In W. T., p. 215.
4	I(II).7.1.4.	or 26.13 di 6.69 ab 14.15 ol 2.15 an 2.78 mt 3.48 ne 44.87	Laugendal, Norway.	G. Forsberg.	W. C. Brögger, Z. K., XVI, p. 41, 1890.	Nephelite porphyry.	In W. T., p. 215.
5	I(II).7″.1.4.	or 22.80 ac 7.39 ab 35.11 ns 0.73 ne 28.12 di 0.43 Z 2.38 wo 1.39	Kaxtorp, Lake Vetter, Sweden.	R. Mauzelius.	A. E. Törnebohm, Afh. Sv. G. Und., No. 199, p. 11, 1906.	Catapleite syenite.	

SUBRANG 5. PERSODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I″.7.1.(4)5.	or 17.79 di 1.92 ab 21.48 ol 3.52 ne 46.58 mt 1.62 hl 4.68 il 0.30	Rouma Island, Los Islands, French Guinea.	Pisani.	A. Lacroix, Nouv. Arch. Mus., III, p. 38, 1911.	Sodalite nephelite syenite.	

ORDER 8. FELDOLENIC. ONTARARE. (C. I. P. W., 1902.)

SUBRANG 4. DOSODIC. HOCHELAGOSE. (H. S. WASHINGTON, 1917.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.8.1.4(5).	or 12.23 di 1.30 ab 5.24 wo 0.23 an 1.11 mt 1.86 ne 68.73 hm 2.08 hl 7.37	Beloeil Mountain, Rouville County, Quebec.	M. F. Connor.	J. J. O'Neill, Can. G. S. Mem. 43, p. 48, 1914.	Tawite.	

SUBRANG 4. DOMALKALIC. MONMOUTHOSE. (ADAMS AND BARLOW, 1908.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.8″.(1)2.4″.	an 12.51 ol 3.70 lc 7.85 cs 0.86 ne 60.78 mt 0.70 kp 7.27 il 0.30 (c.c. 4.90)	Monmouth Township, Renfrew County, Ontario.	M. F. Connor.	Adams and Barlow, A. J. S., XVII, p. 275, 1904.	Monmouthite.	Also in Can. G. S. Mem. 6, p. 276, 1910.

CLASS I. PERSALANE.

RANG 1. PERALKALIC. CONGRESSASE. (F. D. ADAMS, 1913.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	41.58	30.36	2.46	1.64	0.37	0.88	14.30	5.15	0.95	0.06	0.22	0.07	0.03	CO_2 0.80 Cl 0.30 FeS_2 0.36 BaO 0.02 SrO trace	99.55	
A1. I	.693	.298	.015	.023	.009	.016	.231	.055			.003	—	—			

RANG 1. PERALKALIC. CONGRESSASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	36.64	32.41	none	trace	none	0.19	18.67	0.41	n. d.					NaCl 11.83	100.15	
B3. IV	.611	.318	—	—	—	.004	.302	.004							(100.29)	

CLASS I. PERSALANE. SECTION I. C EXTREME OVER Z.

RANG. NOT NEEDED.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	75.54	18.65	0.35	0.06	none	0.03	none	none	3.67	1.10	0.48	trace		ZrO_2 0.06 FeS_2 0.10	100.04	
A2. II	1.259	.183	.002	.001	—	—	—	—			.006	—				

SECTION 1. C EXTREME OVER Z.

RANG 1. PERALKALIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	69.42	15.65	1.25	3.30	1.02	0.63	0.27	4.06	0.54	0.06	trace	0.40	0.39	F 3.36 B_2O_3 0.59 Li_2O 0.81		
A1. I	1.157	.153	.008	.046	.026	.011	.004	.043			—	.003	.006			

RANG 1. PERALKALIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	57.18	34.10	0.54	0.28	0.10	0.63	0.39	2.57	2.02	0.69	0.66	0.53	none	CO_2 none ZrO_2 0.02 FeS_2 0.28 BaO 0.04 SrO trace Li_2O none	100.03	
A1. I	.953	.334	.003	.004	.003	.011	.006	.028			.008	.004				

SECTION 1. C EXTREME OVER Z.

RANG 1. PERALKALIC. URALASE. (H. S. WASHINGTON, 1903.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	40.53	13.62	0.19	0.04	none	0.67	3.40	5.92	1.01					Corundum 34.62	100.00	
A3. III	.676	.134	.001	.001	—	.012	.055	.063								
2	52.34	16.05	0.45	n. d.	0.16	0.20	4.77	6.58	0.40					Corundum 18.55	99.50	
A4. IV	.872	.157	.003	(.006)	.004	.004	.077	.070								
3	40.06	13.65	0.35	n. d.	0.15	0.30	3.71	5.20	0.46					Corundum 35.40	99.28	
A4. IV	.668	.134	.002	(.004)	.004	.005	.060	.055								

RANG 3. ALKALICALCIC. DUNGANNONASE. (ADAMS AND BARLOW, 1908.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	49.56	33.70	0.93	1.42	0.97	5.89	4.95	1.23	0.84					CO_2 0.17	99.66	
A3. III	.826	.330	.006	.019	.024	.105	.080	.013								

ORDER 9. PERLENIC. LAURENTARE. (F. D. ADAMS, 1913.)

SUBRANG 4. DOSODIC. CONGRESSOSE. (F. D. ADAMS, 1913.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.9.1.4⊙	or 3.89 ol 1.14 lc 20.93 mt 3.48 ne 64.18 il 0.46 hl 0.47 pr 0.36 C 1.73	Congress Hill, Craigmont, Ontario.	M. F. Connor.	Adams and Barlow, XII Cong. G. Int., Guide No. 2, p. 96, 1913.	Congressite.	

SUBRANG 5. PERSODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	I.9.1.5.⊙	an 1.11 kp 1.26 ne 85.77 hl 11.83 C 0.82	Zerafshan, Turkestan.	Not stated.	J. Preobrajensky, Ann. Inst. Pet. Gr., XV, p. 310, 1911.	Sodalite syenite.	Norm not exact, insufficient SiO_2.

SUBCLASS II. Q+F+L DOMINANT OVER C+Z. ORDER 1. PERQUARIC.

SUBRANG. NOT NEEDED.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	$\mathrm{I}._{\mathrm{II}}.1.1.$	Q 75.54 il 0.15 C 18.65 hm 0.30 ru 0.40	Dehesa, San Diego County, California.	W. T. Schaller.	W. T. Schaller, U. S. G. S. B. 262, p. 96, 1905.	Quartz-dumortierite rock.	Igneous?

ORDER 2. DOQUARIC.

SUBRANG 1. PERPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	$\mathrm{I}._{\mathrm{II}}.2''.1.1.$	Q 48.54 hy 7.62 or 23.91 mt 1.86 ab 2.10 ap 1.01 an 0.28 C 10.71	St. Michaels Mount, Lands End, Cornwall.	W. Pollard.	Reid and Flett, G. S. Eng., Mem., sh. 351, p. 59, 1907.	Greisen.	

SUBRANG 2. DOPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	$\mathrm{I}._{\mathrm{II}}.2.1.2.$	Q 44.94 il 0.61 or 15.57 hm 0.54 ab 3.14 ru 0.32 C 30.60 ap 1.34	Washongae River, Skamania County, Washington.	W. T. Schaller.	W. T. Schaller, U. S. G. S. B. 262, p. 105, 1905.	Dumortierite-quartz rock.	Igneous?

ORDER 5. PERFELIC. INDARE. (H. S. WASHINGTON, 1903.)

SUBRANG 3. SODIPOTASSIC. URALOSE. (H. S. WASHINGTON, 1903.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	$\mathrm{I}._{\mathrm{II(III)}}.5.1''.3.$	or 35.03 mt 0.23 ab 21.48 an 3.34 ne 3.98 C 35.03	Craigmont, Renfrew County, Ontario.	M. F. Connor.	Adams and Barlow, Tr. R. Soc. Can., II, (4), p. 71, 1909.	Corundum syenite pegmatite.	
2	$\mathrm{I}._{\mathrm{II}}.5.1.3.$⊙	or 38.92 ol 0.89 ab 37.20 an 1.11 ne 1.70 C 19.36	Nikolskaja Ssopka, Ural Mountains, Russia.	J. Morozewicz.	J. Morozewicz, T. M. P. M., XVIII, p. 219, 1898.	Corundum syenite.	In W. T., p. 219.
3	$\mathrm{I}._{\mathrm{II\ (III)}}.5.1.3.$	or 30.58 ol 0.69 ab 27.25 an 1.39 ne 2.27 C 36.83	Ilmen Mountains, Ural Mountains, Russia.	J. Morozewicz.	J. Morozewicz, T. M. P. M., XVIII, p. 219, 1898.	Corundum pegmatite.	In W. T., p. 219.

SUBRANG 4. DOSODIC. DUNGANNONOSE. (ADAMS AND BARLOW, 1908.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	$\mathrm{I}._{\mathrm{(I)II}}.5.3.4(5).$	Q 1.74 hy 4.12 or 7.23 mt 1.39 ab 41.92 cc 0.39 an 28.08 C 13.87	Dungannon, Renfrew County, Ontario.	N. N. Evans.	Adams and Barlow, Tr. R. Soc. Can., II, (4), p. 64, 1909.	Dungannonite (nephelite syenite).	Also in Can. G. S. Mem. 6, p. 319, 1910.

CLASS I. PERSALANE. SECTION I. C EXTREME OVER Z.

RANG 4. DOCALCIC. BORSOWASE. (H. S. WASHINGTON, 1903.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	22.52	16.31	2.20	n. d.	1.34	6.64	1.00	0.58	1.58					Corundum 47.51	99.40	3.240
A4. IV	.375	.160	.014	(.028)	.034	.118	.016	.006								22°

RANG 5. PERCALCIC. KYSCHTYMASE. (H. S. WASHINGTON, 1903.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	16.80	13.89	0.76	n. d.	0.61	7.26	0.38	0.13	0.76					Corundum 59.51	100.10	
A4. IV	.280	.136	.005	(.010)	.015	.129	.006	.001								

SUBCLASS III. Q+F+L EQUAL TO C+Z. ORDER 5. PERFELIC. SIBERARE. (H. S. WASHINGTON, 1903.)

SUBRANG 4-5. PRESODIC. BORSOWOSE. (H. S. WASHINGTON, 1903.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	$I._{III}.5.4''.4.$	or 3.34 ol 5.21 ab 5.24 an 32.80 ne 1.70 C 49.54	Borsowska, Ural Mountains, Russia.	J. Morozewicz.	J. Morozewicz, T. M. P. M., XVIII, p. 212, 1898.	Kyschtymite (corundum anortho-site).	In W. T., p. 217.

SUBRANG. NOT NEEDED.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	$I._{III(IV)}5.5.$	or 0.56 ol 2.07 ab 0.52 an 35.86 ne 1.42 C 59.51	Borsowska, Ural Mountains, Russia.	J. Morozewicz.	J. Morozewicz, T. M. P. M., XVII, p. 212, 1898.	Kyschtymite (corundum anortho-site).	In W. T., p. 217.

CLASS II.. DOSALANE. (C. I. P. W., 1902.)

RANG 1-2. PREALKALIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	89.25	2.20	3.00	n. d.	2.00	—	trace	4.00							100.45	
A4. IV	1.486	.022	.019	(.038)	.050	—	—	.043								
2	80.44	5.05	6.70	0.10	0.39	0.50	3.20	3.46				trace		SO_3 0.53	100.32	
A3. III	1.341	.050	.042	.001	.010	.009	.052	.037				—				

RANG 1-2. PREALKALIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	83.59	5.42	trace	trace	trace	3.44	5.33	1.37	0.76						99.91	2.54
A3. III	1.393	.053	—	—	—	.062	.086	.015								

RANG 4-5. PRECALCIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	71.70	6.90	0.96	3.74	2.82	11.37	0.66	0.10	0.22	0.08	1.11	0.09	0.05	CO_2 trace Cl 0.16	99.96	
A2. II	1.195	.068	.006	.052	.071	.204	.011	.001			.014	—	—			

CLASS II. . DOSALANE.

RANG 1. PERALKALIC. VARINGASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	75.40	7.72	1.41	n. d.	1.26	1.55	8.09	4.52	0.43				0.12	Cl 0.12	100.62	2.39
A4. IV	1.257	.076	.009	(.018)	.032	.028	.130	.048					.002			

RANG 1. PERALKALIC. VARINGASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	74.15	10.07	0.86	none	0.30	1.28	6.34	4.44	0.71		0.93	0.09	0.26	Cl 0.13 FeS_2 trace BaO 0.04 CuO 0.06	99.66	
A1. I	1.236	.099	.005	—	.008	.023	.102	.047			.012	—	.004			
2	74.35	8.73	5.84	1.00	0.07	0.45	4.51	3.96	0.25				0.22		99.38	
B3. IV	1.239	.086	.037	.014	.002	.008	.073	.042					.003			
3	69.22	7.78	9.80	3.02	0.10	0.12	6.32	2.72	n. d.						99.08	
A3. III	1.154	.076	.061	.042	.003	.002	.102	.029								
4	73.65	9.52	5.12	0.96	0.04	0.31	4.84	4.30	1.23		0.29				100.26	
A3. III	1.228	.094	.032	.013	.001	.005	.078	.046			.004					
5	70.14	8.61	6.01	2.73	0.20	0.45	5.44	4.20	0.35	0.17	0.86	0.12	0.38	CO_2 none ZrO_2 0.14 SO_3 0.06 BaO none		
A1. I	1.169	.084	.038	.038	.005	.008	.088	.045			.011	.001	.005			
6	69.91	8.58	1.81	5.86	0.28	0.33	6.41	4.71	0.22	0.13	0.75	0.16	0.24		99.39	
A2. II	1.165	.084	.011	.082	.007	.006	.103	.050			.009	.001	.003			
7	69.33	8.62	2.65	5.52	0.52	0.52	4.78	4.71	2.35	0.27	0.85	none	0.27		100.39	
A2. II	1.156	.084	.017	.076	.013	.009	.077	.050			.011	—	.004			

ORDER 2. DOQUARIC.

SUBRANG 1-2. PREPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(I)II.(1)2.1.1.	Q 74.79 ks 3.23 or 12.23 hy 10.02	McPhatlele's location, Secucuni Land, Transvaal.	C. C. Gardthausen.	A. L. Hall, Tr. G. Soc. S. Afr., XIII, p. 14, 1911.	Quartz-mica rock.	
2	II.2(3).1.2.	Q 51.96 ac 18.02 or 20.57 di 1.94 ab 6.81 hy 0.10 mt 0.23 hm 0.32	Kara River, Nertchinsk, Transbaikal, Siberia.	Djakanow.	A. Karpinsky, Vh. Russ. Min. Ges., XLI, (1), p. 76, 1904.	Karite (quartz grorudite).	

SUBRANG 4-5. PRESODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(I)II.2″.1.4.	Q 57.90 ns 5.46 or 8.34 wo 7.19 ab 19.91	Berkeley, California.	C. Palache.	C. Palache, B. Dep. G. Un. Cal., I, p. 67, 1894.	Soda rhyolite.	In W. T., p. **123**.

SUBRANG 4-5. PRESODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II″.2″.4″.″5.	Q 45.00 di 23.27 or 0.56 wo 5.22 ab 5.76 mt 1.39 an 15.57 il 2.13	Cape Royds, Ross Region, S. Victoria Land, Antarctica.	Burrows and Walkom.	J. W. E. David, pers. com.	Pyroxene granulite.	Erratic block. Igneous?

ORDER 3. QUARFELIC. HISPANARE. (C. I. P. W., 1902.)

SUBRANG 2. DOPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.3.1.2(3).	Q 36.60 ac 4.16 or 26.68 ns 11.35 ab 14.67 di 6.31 hy 0.60	S. of Borax Lake, California.	W. H. Melville.	G. F. Becker, U. S. G. S. Mon. 13, p. 159, 1888.	Rhyolite obsidian.	In W. T., p. **219**.

SUBRANG 3. SODIPOTASSIC. VARINGOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(I)II.3″.1.3.	Q 32.25 ac 2.31 or 26.13 ns 5.49 ab 27.25 di 1.73 wo 1.74 il 0.61 tn 1.57	Sapira Cataract, Mazaruni River, British Guiana.	J. B. Harrison.	J. B. Harrison, G. Goldf. Br. G., p. 76, 1908.	Aplite.	In W. T., p. **219**.
2	″II.3″.1.3.	Q 35.28 ac 13.40 or 23.35 di 1.92 ab 23.06 hy 0.40 mt 1.86	Varingskollen, Hakedalen, Norway.	G. Särnström.	W. C. Brögger, Z. K., XVI, p. 66, 1890.	Grorudite.	Also in Eg. **Kg.**, I, p. 48, **1894**. In W. T., p. **219**.
3	II″.3(4).1.3(4).	Q 26.22 ac 25.41 or 16.12 di 0.49 ab 24.63 hy 4.79 mt 1.39	Landinosa River, Corsica.	J. Deprat.	J. Deprat, B. Sv. Ct. G. Fr., XVII, No. 114, p. 42, 1906.	Riebeckite granite.	
4	″II.3(4).1.3.	Q 31.86 ac 13.86 or 25.58 di 1.21 ab 25.15 hy 0.40 mt 0.46 il 0.61	Le Fontane, San Pietro, Sardinia.	A. Johnsen.	A. Johnsen, Abh. Pr. Ak. W., Anh. 2, p. 22, 1912.	Comendite.	Also in N. J. Cb., **1912**, **p.** 738.
5	II.3(4).1.3.	Q 27.60 ac 17.56 or 25.02 ns 1.34 ab 20.44 di 1.21 hy 4.80 il 1.67 ap 0.34	Monte San Elmo, Pantelleria.	H. S. Washington.	H. S. Washingtgn, J. G., XXI, p. 703, 1913.	Aegirite panteller-ite.	
6	II.3(4).1.(2)3.	Q 28.38 ac 5.08 or 27.80 ns 7.08 ab 17.82 di 0.75 hy 10.34 il 1.37 ap 0.34	Gelkhamar, Pantelleria.	H. S. Washington.	H. S. Washington, J. G., XXI, p. 706, 1913.	Hyalopantellerite.	
7	II.3(4).I.(2)3.	Q 28.02 ac 7.85 or 27.80 ns 3.17 ab 17.82 di 2.16 hy 9.28 il 1.67	Cantina Ziton, Pantelleria.	H. S. Washington.	H. S. Washington, J. G., XXI, p. 706, 1913.	Hyalopantellerite.	

CLASS II. DOSALANE—Continued.

RANG 1. PERALKALIC. VARINGASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
8	76.0	9.4	3.7	1.1	trace	0.7	4.0	5.2	0.7						100.8	2.56
B3. IV	1.267	.092	.023	.015	—	.013	.065	.055								
9	73.0	10.0	5.9	0.8	trace	0.3	4.6	4.3	1.4						100.3	2.51
B3. IV	1.217	.098	.037	.011	—	.005	.074	.046								
10	73.0	9.9	6.0	1.3	0.2	0.4	4.0	4.4	1.1						100.3	2.62
B3. IV	1.217	.097	.038	.018	.005	.007	.065	.047								
11	70.40	7.85	6.98	2.98	0.52	0.26	4.05	4.25	0.25		0.13		0.13	ZrO_2 1.65	99.65	
A2. II	1.173	.077	.044	.042	.013	.005	.066	.046			.002		.002			
12	70.25	8.75	7.90	1.62	0.65	0.51	3.82	4.12	0.75		0.06		0.13	ZrO_2 0.78	100.84	
A2. II	1.171	.086	.049	.022	.016	.009	.061	.043			.001		.002			

RANG 1. PERALKALIC. VARINGASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	68.70	6.85	9.93	1.14	0.26	1.34	7.01	1.58	0.50		0.26		trace	ZrO_2 3.71	101.28	
B3. IV	1.145	.067	.062	.016	.007	.024	.113	.017			.003		—			

RANG 2. DOMALKALIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	66.44	17.43	2.10	1.60	3.70	0.65	0.99	4.76	2.13			trace		CO_2 0.10 SnO_2 trace	99.90	
A3. III	1.107	.171	.013	.022	.093	.012	.016	.051				—				
2	74.10	11.53	0.24	3.53	2.15	1.95	0.45	4.25	0.98		0.67	0.36	0.10	CO_2 none	100.31	
A2. II	1.235	.113	.002	.049	.054	.035	.007	.046			.008	.003	.001			
3	71.05	12.36	1.10	3.50	2.45	1.52	0.80	4.65	1.67		0.86	0.31	0.15	CO_2 none	100.42	
A2. II	1.186	.121	.007	.049	.061	.027	.013	.050			.011	.002	.002			

RANG 2. DOMALKALIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	69.27	12.56	2.89	4.51	0.91	1.44	3.12	3.05	0.76		0.78	0.06	trace		99.35	2.724
B2. III	1.155	.123	.018	.062	.023	.026	.050	.033			.009	—	—			
2	73.12	10.25	2.93	1.05	1.29	3.68	2.74	2.98	1.76		0.64				100.44	
A3. III	1.219	.100	.018	.015	.032	.064	.044	.032			.008					
3	66.35	14.54	0.39	5.61	1.60	2.03	2.36	3.27	2.60		0.96	0.17	0.03		99.91	
A2. II	1.106	.143	.002	.078	.040	.036	.038	.035			.012	.001	—			
4	69.38	12.56	2.40	2.25	1.47	3.72	2.77	3.75	1.05	0.09	0.52	0.12	0.04	CO_2 0.01 ZrO_2 none SO_3 none Cl none F none S none Cr_2O_3 none V_2O_3 trace NiO none BaO 0.10 SrO trace	100.23	
A1. I	1.156	.123	.015	.031	.037	.066	.045	.040			.007	.001	—			

ORDER 3. QUARFELIC. HISPANARE—Continued.

SUBRANG 3. SODIPOTASSIC. VARINGOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
8	(I)II.3″.1.(2)3.	Q 35.04 ac 10.63 or 30.58 ns 0.61 ab 19.39 di 3.23 hy 0.26	Morne Rouge, Obock, French Somali.	H. Arsandaux.	H. Arsandaux, Roches Est. Afr., p. 75, 1906.	Microgranite.	Also in C. R., CXL, p. 450, 1905.
9	(I)II.3(4).1.3.	Q 32.16 ac 10.16 or 25.58 wo 0.58 ab 27.25 mt 2.55 hm 0.64	Karoma, L'Ouache, French Somali.	H. Arsandaux.	H. Arsandaux, Roches Est. Afr., p. 75, 1906.	Microgranite.	Also in C. R., CXL, p. 450, 1905.
10	(I)II.3(4).1.3.	Q 33.42 ac 6.93 or 26.13 di 1.08 ab 26.20 wo 0.23 mt 4.18 hm 0.80	Ouardji, French Somali.	H. Arsandaux.	H. Arsandaux, Roches Est. Afr., p. 75, 1906.	Paisanite.	Also in C. R., CXL, p. 450, 1905.
11	II.3″.1.(2)3.	Q 30.36 ac 16.17 or 25.58 di 1.21 ab 16.24 hy 5.08 Z 2.56 mt 2.09 il 0.30	Ampasibitika, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., II, p. 235, 1903.	Arfvedsonite granite.	Center of dike. Cf. No. 12 below.
12	″II.3″.1.3.	Q 32.94 ac 8.32 or 23.91 di 1.97 ab 22.53 hy 0.73 Z 1.28 mt 5.10 hm 1.44	Ampasibitika, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., II, p. 235, 1903.	Aegirite granite.	Border of dike. Cf. No. 11 above.

SUBRANG 4. DOSODIC.

1	II″.3″.1.4.	Q 25.26 ac 28.64 or 9.45 di 4.54 ab 26.20 wo 0.46 Z 5.49 il 0.46	Ampasibitika, Sakalave, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., II, p. 235, 1903.	Aegirite granite.	

SUBRANG 2. DOPOTASSIC.

1	(I)II.3.(1)2.2.	Q 34.74 hy 10.49 or 28.36 mt 3.02 ab 8.38 an 3.35 C 9.38	Tamaya, Chile.	C. Schwartz.	v. Groddeck, Z. D. G. G., XXXIX, p. 252, 1887.	Dike rock.	In W. T., p. 219.
2	(I)II.3.2″.2(3).	Q 46.38 hy 10.68 or 25.58 mt 0.46 ab 3.67 il 1.22 an 6.95 ap 1.01 C 3.57	Uncles Bay, Lake Brunner, South Island, New Zealand.	J. S. Maclaurin.	P. G. Morgan, N. Z. G. S. B. 13, p. 78, 1911.	Granite.	
3	(I)II.3.2.2.	Q 40.44 hy 10.46 or 27.80 mt 1.62 ab 6.81 il 1.67 an 5.56 ap 0.67 C 3.87	Strauchon Creek, Mount Tekinga, New Zealand.	J. S. Maclaurin.	P. G. Morgan, N. Z. G. S. B. 13, p. 78, 1911.	Granite.	

SUBRANG 3. SODIPOTASSIC.

1	(I)II.3(4).2.3(4).	Q 32.82 hy 6.92 or 18.35 mt 4.18 ab 26.20 il 1.37 an 7.23 C 1.43	Whitson Lake, Sudbury, Ontario.	T. L. Walker.	T. L. Walker, Q. J. G. S., LIII, p. 56, 1897.	Granite.	In W. T., p. 219.
2	(I)II.3.2.″3.	Q 38.58 di 6.91 or 17.79 wo 0.93 ab 23.06 mt 1.62 an 6.67 il 1.22 hm 2.08	Fano, Marche, Italy.	A. Martelli.	A. Martelli, B. Soc. G. It., XXVIII, p. 251, 1909.	Quartz porphyry.	
3	″II.3(4).2.3.	Q 29.88 hy 12.45 or 19.46 mt 0.46 ab 19.91 il 1.82 an 9.17 ap 0.34 C 3.77	Fuse, Dogo, Oki Islands, Japan.	K. Yokoyama.	S. Kozu, Sci. Rep. Tohoku Un., (2), I, p. 35, 1913.	Schistose granite.	
4	(I)II.3(4).2.3.	Q 29.94 di 5.59 or 22.24 hy 2.20 ab 23.58 mt 3.48 an 10.56 il 1.06 ap 0.34	Braidwood, New South Wales.	H. P. White.	G. W. Card. pers. com.	Granite.	

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	64.04	15.83	2.16	2.40	2.72	3.60	3.52	1.43	1.60		0.30	1.56	0.15		99.31	2.74
B2. IV	1.067	.155	.014	.033	.068	.064	.056	.015			.004	0011	.002			
2	73.56	11.19	1.44	3.36	2.02	1.97	3.26	2.90	0.30	0.14	0.21	trace	0.19	CO_2 0.11	100.65	2.54
A2. II	1.226	.110	.009	.047	.051	.036	.053	.031			.003	—	.003			

RANG 3. ALKALICALCIC. ALMERASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	64.38	14.09	6.10	3.68	2.04	4.51	0.55	3.72	0.82				0.33		100.22	
A3. III	1.073	.138	.038	.051	.051	.080	.009	.039					.005			

RANG 3. ALKALICALCIC. ALMERASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	60.15	18.23	1.51	6.04	3.22	4.01	1.28	1.68	0.55		1.34	0.23	0.29	S 0.54 NiO 0.17 BaO 0.25 SrO 0.14 Cu 0.16	99.79	
A1. I	1.003	.179	.009	.084	.081	.071	.021	.018			.017	.002	.004			
2	63.75	17.62	3.00	3.26	3.41	2.50	1.75	2.40	2.77						100.45	
A3. III	1.063	.172	.019	.045	.085	.045	.030	.025								
3	68.90	13.39	3.45	1.39	4.10	3.31	2.07	2.88	0.90			0.20			100.59	
A3. III	1.148	.131	.022	.019	.103	.059	.034	.031				.001				
4	70.45	11.68	2.43	2.71	2.14	4.13	2.02	2.28	0.97		0.50	0.16	0.17	BaO trace	99.64	
A2. II	1.174	.114	.015	.038	.054	.073	.032	.026			.006	.001	.002			
5	69.95	12.30	2.09	2.72	2.03	4.26	1.99	3.13	0.91		0.42	0.12	0.13	BaO 0.06	100.11	
A2. II	1.166	.120	.013	.038	.051	.076	.032	.033			.005	.001	.002			
6	70.92	12.20	1.07	5.42	2.61	3.78	2.46	2.49	n. d.				0.14		101.09	
B3. IV	1.182	.120	.007	.075	.065	.068	.040	.027					.002			
7	72.39	13.12	0.42	4.48	1.87	3.17	1.54	1.92	0.11	0.02	0.76	none	0.05	CO_2 none SO_3 none Cl none NiO 0.06 BaO none SrO none	99.91	2.427
A1. I	1.207	.128	.003	.063	.047	.057	.025	.020			.010	—	—			
8	71.22	13.52	0.77	5.30	2.38	3.52	1.48	2.28	n. d.				0.28		100.75	2.443
B3. IV	1.187	.133	.005	.074	.060	.063	.024	.025					.004			
9	70.62	13.48	0.85	4.44	2.42	3.09	1.27	2.22	0.01	0.06	0.90	none	0.42	CO_2 none SO_3 trace Cl trace NiO trace	99.78	2.454
A2. II	1.177	.132	.005	.062	.061	.055	.021	.023			.011	—	.006			
10	69.80	15.02	0.40	4.65	2.47	3.20	1.29	2.56	n. d.	n d.	0.80		0.18	BaO none SrO none Li_2O trace	100.37	2.424
A2. II	1.163	.147	.003	.065	.062	.057	.021	.028			.010		.003			
11	72.40	12.56	none	4.03	1.87	2.09	2.14	1.95	1.25	0.15	0.77	0.09	0.50	CO_2 none SO_3 0.08	99.88	
A2. II	1.207	.123	—	.056	.047	.038	.034	.021			.010	—	.007			

ORDER 3. QUARFELIC. HISPANARE—Continued.

SUBRANG 4. DOSODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″II.3(4).2.4.	Q 29.76 hy 9.04 or 8.34 mt 3.25 ab 29.34 il 0.61 an 8.34 ap 3.70 C 5.51	Smith's Mill, Victoria District, Vancouver Island, British Columbia.	M. F. Connor.	C. H. Clapp. Can. G. S. Mem. 36, p. 64, 1913.	Quartz diorite gneiss.	Cf. No. 132, I.4.2.3.
2	(I)II.3(4).2.(3)4.	Q 34.26 di 2.29 or 17.24 hy 8.99 ab 27.77 mt 2.09 an 7.23 il 0.46	Musgrave Peninsula, Carnley Island, Auckland Islands.	A. M. Wright.	Speight and Finlayson, Subant. Islands, p. 720, 1909.	Granite.	

SUBRANG 2. DOPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″II.3.3(4).2.	Q 33.36 hy 7.48 or 21.68 mt 8.82 ab 4.72 an 22.24 C 1.02	Brockenrod, Hesse.	F. Kutscher.	C. Chelius, Erl. G. Kte. Hesse, Bl. Breusbach, p. 24, 1897.	Granite.	In W. T., p. 221.

SUBRANG 3. SODIPOTASSIC. ALMEROSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.3.3(4).3.	Q 29.88 hy 16.28 or 10.01 mt 2.09 ab 11.00 il 2.58 an 17.79 ap 0.67 C 7.75	Creighton Mine, Sudbury, Ontario.	M. T. Culbert.	A. P. Coleman, Rep. Bur. Min. Ont., XIV, (III), p. 112, 1905.	Norite.	Also in J. G., XV, p. 770, 1907.
2	″II.3″.3.3.	Q 31.92 hy 11.93 or 13.90 mt 4.41 ab 15.72 an 12.51 C 7.34	Hoyazo, Cabo de Gata, Spain.	J. Savelsberg.	A. Osann, Z. D. G. G., XL, p. 701, 1888.	Cordierite andesite.	In W. T., p. 219.
3	″II.3(4).3.3.	Q 32.58 hy 10.30 or 17.24 mt 4.41 ab 17.82 hm 0.48 an 15.57 ap 0.34 C 1.02	Calca Foggio, Corsica.	Not stated.	J. Deprat, B. Soc. G. Fr., (4), VI, p. 434, 1906.	Quartz diorite.	
4	(I)II.3.3.3.	Q 37.62 di 3.16 or 14.46 hy 6.38 ab 16.77 mt 3.48 an 15.57 il 0.91 ap 0.34	Tarmlangen, Skattmansö, Uppland, Sweden.	R. Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 266, 1906.	Granite.	
5	(I)II.3″.3.3.	Q 34.50 di 4.05 or 18.35 hy 6.04 ab 16.77 mt 3.02 an 15.29 il 0.76 ap 0.34	Upsala, Sweden.	R. Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 266, 1906.	Granite.	
6	″II.3(4).3.3(4).	Q 31.56 di 3.50 or 15.01 hy 13.72 ab 20.96 mt 1.62 an 14.73	Tebrung, Dendang, Java.	C. v. John.	F. E. Suess, Jb. G. R.-A., Wien, L, p. 237, 1901.	Moldavite.	
7	(I)II.3.3.3.	Q 43.56 hy 11.30 or 11.12 mt 0.70 ab 13.10 il 1.52 an 15.85 C 2.65	Mount Elephant, Victoria.	G. Ampt.	H. S. Summers, Pr. R. Soc. Vict., XXI, (2), p. 425, 1909.	Obsidianite.	"Button."
8	″II.3.3.3.	Q 38.04 hy 15.64 or 13.90 mt 1.16 ab 12.58 an 17.51 C 2.14	Between Everard and Frazer Ranges, Australia.	C. v. John.	F. E. Suess, Jb. G. R.-A., Wien, L, p. 238, 1901.	Moldavite.	
9	″II.3.3.3.	Q 41.40 hy 12.96 or 12.79 mt 1.16 ab 11.00 il 1.67 an 15.29 C 3.37	Coolgardie, West Australia.	Not stated.	Ann. Rep. Secy. Mines, Vict., (1907), p. 63, 1908.	Obsidian "buttons."	
10	(I)II.3.3.3.	Q 38.28 hy 13.46 or 15.57 mt 0.70 ab 11.00 il 1.52 an 15.85 C 4.18	Upper Weld Tindrift, Tasmania.	W. F. Hillebrand.	U. S. G. S. B. 228, p. 276, 1904.	Moldavite.	"Volcanic buttons." Cf. Pr. R. Soc. Vict. XXI, p. 425, 1909.
11	(I)II.3.″3.3(4)	Q 42.06 hy 11.70 or 11.68 il 1.52 ab 17.82 an 10.56 C 3.06	Inangahua Road, Waitahu, Reefton District, New Zealand.	Not stated.	P. G. Morgan, pers. com.	Granite.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ALMERASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	67.04	11.40	0.78	3.75	3.52	7.60	2.70	1.00	0.16	0.09	1.68	0.12		CO_2 none	99.84	
A2. II	1.117	.112	.005	.052	.088	.136	.044	.011			.021	.001				
2	68.45	10.00	5.71	2.59	3.26	6.20	1.98	1.18	0.62	0.18	0.20	0.25	0.05	CO_2 trace	100.67	
A2. II	1.141	.098	.036	.036	.082	.111	.032	.013			.003	.002	.001			
3	74.67	8.37	0.95	3.37	2.52	5.19	2.09	1.31	0.30	0.26	1.10	0.57	0.09	ZrO_2 trace	100.79	
A2. II	1.245	.082	.006	.047	.063	.093	.034	.014			.014	.004	.001			

RANG 4. DOCALCIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	64.68	16.80	6.57	1.01	2.50	3.88	trace	4.01	n. d.	n. d.			0.20		99.65	
A3. III	1.078	.164	.041	.014	.063	.070	—	.042					.003			

RANG 4. DOCALCIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	55.00	16.83	10.19	3.60	5.16	5.91	1.00	0.90	n. d.	n. d.		0.67		FeS_2 0.23	99.49	2.774
B3. IV	.917	.165	.064	.050	.129	.105	.016	.010				.005				

RANG 4. DOCALCIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	62.51	20.60	2.42	4.55	2.32	4.55	2.06	0.82	n. d.		0.38	0.16			100.27	
A2. II	1.042	.202	.015	.064	.058	.081	.033	.009			.005	.001				
2	62.63	12.19	2.98	2.89	1.49	4.84	2.12	0.82	4.11	3.94	1.53	0.35			99.89	
A2. II	1.044	.120	.019	.040	.037	.087	.034	.009			.019	.002				

RANG 5. PERCALCIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	69.67	13.26	0.63	4.48	1.37	8.96	0.24	0.18	0.31	0.04	1.18	trace	trace	CO_2 trace	100.32	
A3. III	1.161	.130	.004	.063	.034	.160	.004	.002			.015	—	—			

CLASS II. DOSALANE.

RANG 1. PERALKALIC. PANTELLERASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	68.68	10.11	6.72	3.02	—	—	4.51	6.42	n. d.						99.46	
A4. Iv	1.145	.099	.042	.042	—	—	.073	.068								

RANG 1. PERALKALIC. PANTELLERASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	73.68	11.05	3.93	1.45	none	0.48	5.20	4.05	0.08	0.17	0.57	none	trace	ZrO_2 0.24 Cl trace	100.90	2.694
A2. II	1.228	.108	.024	.020	—	.009	.084	.044			.007	—	—			
2	73.82	10.59	2.18	2.98	0.04	0.28	4.20	4.57	0.49	0.39	0.13	0.02	none	ZrO_2 none F 0.06 S none BaO none	99.75	
A1. I	1.230	.104	.014	.042	.001	.005	.068	.049			.002	—	—			

ORDER 3. QUARFELIC. HISPANARE—Continued.

SUBRANG 4. DOSODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.3(4).3.4.	Q 29.34 di 15.63 or 6.12 hy 4.72 ab 23.06 mt 1.16 an 15.85 il 3.19 ap 0.34	Fishermans Island, Boothbay quadrangle, Maine.	M. W. Adams.	I. H. Ogilvie, Ann. N. Y. Ac. Sci., XVII, p. 534, 1907.	Quartz-augite diorite.	
2	II.3.3.4.⊙.	Q 37.92 di 11.02 or 7.23 hy 3.10 ab 16.77 mt 7.66 il 0.46 hm 0.48 ap 0.67	Fredericksburg, Virginia.	W. M. Thornton.	T. L. Watson, Va. G. S., B. IA, p. 81, 1909.	Granite gneiss.	
3	II.3.″3.4.	Q 45.12 di 10.39 or 7.78 hy 4.95 ab 17.82 mt 1.39 an 9.45 il 2.13 ap 1.34	Cape Royds, Ross Region, S. Victoria Land, Antarctica.	Burrows and Walkom.	J. W. E. David, pers. com.	Pyroxene granulite.	Erratic block. Igneous?

SUBRANG 1-2. PREPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(I)II.3.(3)4.1.	Q 37.38 hy 6.30 or 23.35 mt 3.94 ab —— hm 3.84 an 19.46 C 5.30	Uralla, New South Wales.	J. C. H. Mingaye.	R. H. Walcott, Pr. R. Soc. Vict., XI, p. 30, 1898.	(Moldavite.)	"Volcanic button." Not in W. T.

SUBRANG 3. SODIPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.3″.4.3(4).	Q 27.36 hy 12.90 or 5.56 mt 11.60 ab 8.38 hm 2.24 an 24.46 ap 1.68 C 5.11	Zonderwater, Transvaal.	H. Eckstein and Co.	C. B. Horwood, Tr. G. S. So. Afr., XIII, p. 51, 1911.	Granophyre.	

SUBRANG 4-5. PRESODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(I)II.3″.″4.4.	Q 31.56 hy 11.61 or 5.00 mt 3.48 ab 17.29 il 0.76 an 22.52 C 8.06	Mont Pelée, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 550, 1904.	Cordieritized andesite.	Near Subclass II.
2	(I)II.3.(3)4.4.	Q 35.40 di 0.65 or 5.00 hy 3.66 ab 17.82 mt 4.41 an 21.41 il 2.89 ap 0.67	Morateno, Sakalave Region, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVII, p. 19, 1913.	Dacite pitchstone.	

SUBRANG. NOT NEEDED.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.3.5.0.	Q 45.78 di 8.42 or 1.12 hy 4.97 ab 2.10 mt 0.93 an 34.47 il 2.28	Cape Royds, Ross Region, S. Victoria Land, Antarctica.	Burrows and Walkom.	T. W. E. David, pers. com.	Not named.	Igneous? Erratic block.

ORDER 4. QUARDOFELIC. AUSTRARE. (C. I. P. W., 1902.)

SUBRANG 2. DOPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.4.1.2″.	Q 20.46 ac 19.40 or 37.81 hy 5.54 ab 16.24	Scala della, Spelunca, Corsica.	J. Deprat.	J. Deprat, B. Sv. Ct. G. Fr., XVII, No. 114, p. 38, 1906.	Riebeckite micropegmatite.	

SUBRANG 3. SODIPOTASSIC. GRORUDOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(I)II.4.1.3″.	Q 28.80 ac 9.24 or 24.46 di 2.23 ab 33.54 mt 0.93 Z 0.37 il 1.06	Ilimausak, South Greenland.	C. Winther.	N. V. Ussing, G. Julhb., p. 224, 1911.	Comendite.	
2	(I)II.(3)4.1.3.	Q 30.54 ac 6.01 or 27.24 di 1.24 ab 28.82 hy 4.59 mt 0.23 il 0.30	Rosemont, Colorado Springs quadrangle, Colorado.	G. Steiger.	W. Cross, U. S. G. S. B. 419, p. 100, 1910.	Riebeckite granite.	

CLASS II. DOSALANE—Continued.

RANG 1. PERALKALIC. PANTELLERASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
3	69.47	11.73	5.08	0.48	0.99	2.63	3.46	5.34	1.28	0.31		trace	trace		100.77	
A3. III	1.158	.115	.032	.007	.025	.046	.056	.056				—	—			
4	67.91	12.21	4.17	2.97	1.18	2.03	3.83	4.47	0.67		0.93	0.18	trace		100.55	
A2. II	1.132	.120	.026	.042	.029	.036	.061	.048			.012	.001	—			
5	70.15	10.60	5.77	1.74	0.35	0.72	5.30	4.09	trace		0.65		0.52		99.89	
A2. II	1.169	.104	.036	.024	.009	.013	.085	.043			.008		.007			
6	66.50	10.90	9.85	2.34	0.60	0.64	5.56	4.54	0.20		trace	trace	trace		101.23	
B3. IV	1.108	.107	.062	.033	.015	.011	.090	.048			—	—	—			
7	69.01	12.16	2.07	2.40	0.93	2.28	3.65	4.81	0.42	0.44	0.97	0.11	0.06		99.73	
A2. II	1.150	.119	.013	.033	.023	.041	.059	.051			.012	.001	.001			
8	60.13	10.23	4.21	3.12	4.89	5.54	3.10	4.63	1.81		0.72	1.26	0.03	S 0.05	99.72	2.796
A2. II	1.002	.100	.026	.043	.122	.099	.050	.049			.009	.009	—			
9	68.09	11.15	2.85	0.95	1.10	1.98	7.42	5.16	0.56		0.41	1.11			100.78	
A2. II	1.135	.109	.018	.014	.028	.036	.119	.055			.005	.008				
10	61.18	17.04	6.57	1.75	1.27	0.24	5.00	4.84	1.15	0.48	0.41	0.10		CO_2 0.05 SO_3 0.15	100.23	2.66
A2. II	1.020	.167	.041	.025	.032	.004	.081	.051			.005	.001				
11	67.88	12.27	3.39	6.18	1.03	0.70	3.76	3.63	1.17			0.08			100.09	
A3. III	1.131	.120	.021	.086	.026	.013	.061	.038				—				
12	65.66	13.77	2.19	4.88	0.86	1.40	3.23	5.72	1.46		0.57	0.42			100.16	
A2. II	1.094	.135	.014	.068	.022	.025	.052	.061			.007	.003				
13	65.64	13.14	5.25	1.31	2.02	2.86	4.32	4.87	0.77		0.29	0.15			100.63	
A2. II	1.094	.129	.033	.018	.051	.051	.069	.052			.004	.001				
14	66.10	13.45	6.30	0.45	0.92	0.60	5.42	5.04	2.10						100.38	
A3. III	1.120	.132	.039	.006	.023	.011	.087	.054								
15	66.19	14.22	3.08	1.70	0.54	1.24	4.98	6.25	1.14	0.15	0.19				99.68	2.68
A3. III	1.103	.139	.019	.024	.014	.022	.081	.067			.002					
16	66.08	11.63	1.44	2.94	2.56	3.33	3.36	5.29	0.86	0.06	1.29	0.83			99.67	2.70
A2. II	1.101	.114	.009	.041	.064	.059	.054	.056			.016	.006				
17	72.21	9.72	3.26	1.07	0.29	0.82	4.42	4.98	1.96	0.24	0.62	0.10	0.05		99.74	
A2. II	1.204	.095	.020	.015	.007	.014	.071	.053			.008	.001	.001			

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 3. SODIPOTASSIC. GRORUDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
3	(I)II.4.1.3.	Q 24.72 di 5.40 or 31.14 wo 2.09 ab 29.34 mt 1.62 an 0.83 hm 4.00	Near Watuska, Walker region, Nevada.	D. T. Smith.	D. T. Smith, Un. Cal., Dep. G., B. IV, p. 26, 1904.	Rhyolite.	
4	(I)II.4.1″.3.	Q 23.94 di 4.85 or 26.69 hy 1.13 ab 31.96 mt 6.03 an 3.06 il 1.82 ap 0.34	Lövstakken, Bergen, Norway.	O. Heidenreich.	C. F. Kolderup Berg. Mus. Aarb., 1902, p. 26.	Granite.	
5	II.4.1.3″.	Q 24.96 ac 11.09 or 23.91 di 3.03 ab 31.96 hy 0.83 mt 2.58 il 1.22	Grussletten, n. Grorud, Christiania, Norway.	V. Schmelck.	W. C. Brögger, Eg. Kg., I, p. 48, 1894.	Grorudite.	Center of dike. In W. T., p. 221.
6	II.4.1.3.⊙	Q 18.84 ac 14.32 or 26.69 di 2.44 ab 30.92 hy 0.60 mt 7.19	Grussletten, Grorud, Christiania, Norway.	L. Schmelck.	W. C. Brögger, Eg. Kg., I, p. 48, 1894.	Grorudite.	Border of dike. In W. T., p. 221.
7	(I)II.4.1″.3.	Q 24.72 di 6.52 or 28.36 hy 0.20 ab 30.92 mt 3.02 an 2.50 il 1.82 ap 0.34	Klondyke, Bornholm Island, Denmark.	M. Dittrich.	G. Kalb, Mt. Nw. Ver. Neup., XLV, p. 21, 1913.	Pegmatite.	L. Milch, pers. com.
8	II″.4.1.3.	Q 12.36 di 14.85 or 27.24 hy 6.56 ab 26.20 mt 6.03 an 0.28 il 1.37 ap 3.02	Olbersdorf, n. Aachen, Rhein Preussen.	A. Lindner.	E. Dathe, Jb. Pr. G. L.-A., XIX, p. 130, 1899.	Minette.	Not in W. T.
9	II.4.1.3.⊙	Q 19.08 ac 8.32 or 30.58 ns 5.49 ab 28.30 di 2.00 hy 3.02 il 0.76 ap 2.69	Forst, Westerwald, Hesse.	H. Schmeidehöhn.	H. Schmeidehöhn, Jb. Pr. G. L.-A., XXX, (2), p. 306, (1909), 1910.	Arfvedsonite trachyte.	
10	(I)II.4(5).1.3(4).	Q 11.76 hy 3.20 or 28.36 mt 4.64 ab 42.44 il 0.76 C 3.16 hm 3.36 ap 0.34	Rupbach Thal, Hesse Nassau.	G. Butzbach.	R. Brauns, N. J. B. B., XXVII, p. 307, 1909.	Porphyry.	
11	″II.4.1(2).3(4).	Q 25.20 hy 11.18 or 21.13 mt 4.87 ab 31.96 an 3.61 C 0.82	Abruzzen, n. Cunnersdorf, Riesengebirge.	F. Riegner.	F. Riegner, In. Diss. Bres., p. 45, 1909.	Schliere in granite.	Cf. No. 183, I.4.1.3.
12	(I)II.4.1(2).3.	Q 19.02 hy 8.40 or 33.92 mt 3.25 ab 27.25 il 1.06 an 4.17 ap 1.01 C 0.71	Striegau, Silesia.	F. Riegner.	F. Riegner. In. Diss. Bres., p. 26, 1909.	Schliere in granite.	Cf. No. 270, I.4.2.3.
13	″II.4.1.3.	Q 15.66 di 8.64 or 28.91 hy 1.10 ab 36.15 mt 3.25 an 2.22 il 0.61 hm 2.89 ap 0.34	Wahnitz, n. Meissen, Saxony.	E. Worm.	E. Worm, In. Diss. Leip., p. 44, 1913.	Syenite aplite.	
14	(I)II.4″.1.3″.	Q 15.48 ac 4.16 or 30.02 di 2.38 ab 40.87 hy 1.20 mt 1.39 hm 3.84	Holbak, Siebenbürgen, Hungary.	C. v. John.	C. v. John, Jb. G. R.-A., Wien, XLIX, p. 566, 1899.	Sanidinite.	In W. T., p. 221.
15	(I)II.4(5).1.3.	Q 11.10 ac 4.16 or 37.25 di 5.07 ab 37.73 hy 0.46 mt 2.32 il 0.30	Voralp, Aarmassif, Switzerland.	O. Fischer.	O. Fischer, T. M. P. M., XXIV, p. 57, 1905.	Quartz syenite.	
16	II.4.1.3.⊙	Q 19.08 di 7.78 or 31.14 hy 4.79 ab 28.30 mt 2.09 an 1.11 il 2.43 ap 2.02	Val Punteglia, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Granite.	
17	(I)II.(3)4.1.3.	Q 31.14 ac 9.24 or 29.47 ns 1.10 ab 22.01 di 2.57 hy 0.46 il 1.22 ap 0.34	Cuddia Nera, Pantelleria.	H. S. Washington.	H. S. Washington, J. G., XXI, p. 697, 1913.	Comendite.	

CLASS II. DOSALANE—Continued.

RANG 1. PERALKALIC. PANTELLERASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
18	69.79	11.91	5.35	1.43	0.25	0.25	5.66	4.59	0.17	0.04	0.89	0.13	0.20		100.66	
A2. II	1.163	.117	.034	.020	.006	.004	.091	.049			.011	.001	.003			
19	67.85	12.87	1.84	4.54	0.30	0.17	6.03	4.83	0.13	0.02	0.83	0.08			99.49	
A2. II	1.131	.126	.012	.063	.008	.003	.097	.051								
20	67.32	9.55	6.73	0.81	0.20	0.20	5.71	4.48	3.15	0.49	0.59	0.08	0.24		99.55	
A2. II	1.122	.094	.042	.011	.005	.004	.092	.048			.007	.001	.003			
21	66.07	11.74	2.05	5.88	0.13	0.46	6.89	4.80	0.43	0.03	0.92	0.18	0.16	ZrO_2 0.12 SO_3 0.23 BaO none	100.09	
A1. I	1.101	.115	.013	.082	.003	.008	.111	.051			.012	.001	.002			
22	64.54	11.49	5.14	2.99	0.89	0.64	5.46	4.66	1.11	2.12	0.90	0.16	0.13	ZrO_2 0.08 SO_3 0.17 BaO none	100.48	
A1. I	1.076	.113	.032	.042	.022	.011	.088	.050			.011	.001	.002			
23	63.77	11.18	5.02	2.58	0.51	1.37	5.55	4.35	2.72	1.28	0.94	0.14	0.26		99.67	
A2. II	1.063	.110	.031	.036	.013	.025	.090	.047			.012	.001	.003			
24	62.95	12.57	4.73	4.14	0.27	3.07	4.52	4.24	1.34	0.39	1.33		trace		99.55	
A3. III	1.049	.123	.029	.057	.007	.055	.073	.044			.017		—			
25	68.04	12.10	3.18	1.90	0.19	0.82	5.53	4.50	3.40			trace	0.20		99.86	
A3. III	1.134	.119	.020	.026	.005	.014	.089	.048				—	.003			
26	67.44	11.59	4.48	1.35	0.37	2.08	6.68	4.24	0.62			0.12	0.34		99.31	
B2. III	1.124	.114	.028	.019	.009	.038	.108	.045				.001	.005			
27	71.0	10.1	6.0	2.3	trace	0.6	5.2	5.1	0.9						101.2	2.51
C3. V	1.183	.099	.038	.032	—	.011	.084	.054								
28	69.1	10.5	3.6	6.4	0.1	0.4	6.2	4.3	none						100.6	2.51
B3. IV	1.152	.103	.023	.089	.002	.007	.100	.046								
29	68.5	12.1	6.2	2.2	0.1	0.6	6.1	4.5	0.2						100.5	2.47
B3. IV	1.142	.119	.039	.031	.002	.011	.098	.048								
30	70.61	8.59	2.52	5.96	0.07	0.61	6.77	4.46	0.10		0.15		0.34		100.18	
A2. II	1.177	.084	.016	.083	.002	.011	.110	.048			.002		.005			
31	64.00	10.43	6.30	3.86	0.34	1.45	7.59	4.59	0.17		0.78		0.37		99.88	
A2. II	1.067	.102	.039	.054	.009	.026	.123	.049			.010		.005			
32	70.85	9.97	5.00	1.17	0.25	none	3.98	4.68	0.50		0.06		0.12	ZrO_2 3.48	99.56	
A2. II	1.181	.098	.031	.017	.006	—	.065	.050			.001		.002			

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 3. SODIPOTASSIC. GRORUDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
18	"II.4.1.3".	Q 21.78 or 27.24 ab 35.63 ac 10.63 hy 0.60 mt 2.09 il 1.67 hm 0.32 ap 0.34	Costa Zeneti, Pantelleria.	H. S. Washington.	H. S. Washington, J. G., XXI, p. 703, 1913.	Aegirite pantellerite.	
19	II.4.1.3.⊙	Q 15.36 or 28.36 ab 39.30 ac 5.54 ns 1.22 hy 7.80 il 1.52 ap 0.34	Costa Zeneti, Pantelleria.	H. S. Washington.	H. S. Washington, J. G., XXI, p. 706, 1913.	Pantellerite obsidian.	
20	II.4.1.3.⊙	Q 22.44 or 26.69 ab 24.10 ac 19.40 ns 0.49 hy 1.03 il 1.42 ap 0.34	Rione Buccarame, Pantelleria.	H. S. Washington.	H. S. Washington, J. G., XXI, p. 703, 1913.	Pantellerite pumice.	
21	II.4.1.3.⊙	Q 14.70 or 28.36 ab 33.54 ac 6.01 ns 4.15 di 1.24 hy 9.01 il 1.82 ap 0.34	Khagiar, Pantelleria.	H. S. Washington.	H. S. Washington, J. G., XXI, p. 706, 1913.	Hyalopantellerite.	
22	II.4.1.3.⊙	Q 15.12 or 27.80 ab 33.01 ac 11.55 di 1.76 hy 3.38 mt 1.62 il 1.67 ap 0.34	Costa Zeneti, Pantelleria.	H. S. Washington.	H. S. Washington, J. G., XXI, p. 693, 1913	Pantelleritic trachyte.	
23	II.4.1.3".	Q 14.34 or 26.13 ab 33.01 ac 12.47 di 5.20 hy 1.42 mt 0.93 il 1.82 ap 0.34	Punta Pozzolana, Pantelleria.	H. S. Washington.	H. S. Washington, J. G., XXI, p. 693, 1913.	Pantelleritic trachyte.	
24	"II.4.1.3(4).	Q 16.08 or 24.46 ab 38.25 an 1.67 di 4.24 wo 3.60 mt 6.73 il 2.58	Southern Ural Mountains, Russia.	Not stated.	A. Ginsberg, Ann. Inst. Polyt St. Pet., XV, p. 210, 1911.	Rapakiwi granite.	
25	(I)II.4.1.3".	Q 18.12 or 26.69 ab 37.20 ac 8.32 di 3.41 hy 2.28 mt 0.46	Aden, Arabia.	E. Manasse.	E. Manasse, Mem. Soc. Tosc., XXIV, p. 197, 1908.	Pantellerite.	
26	II.4.1.3(4).	Q 14.94 or 25.02 ab 36.15 ac 12.94 ns 1.34 di 7.90 wo 0.23 ap 0.34	Aden, Arabia.	E. Manasse.	E. Manasse, Mem. Soc. Tosc., XXIV, p. 193, 1908.	Aegirite trachyte.	
27	II.4.1.3.⊙	Q 23.58 or 30.02 ab 23.58 ac 17.56 ns 0.12 di 2.73 hy 2.77	Yaba L'Aouache, French Somali.	H. Arsandaux.	H. Arsandaux, Roches Est. Afr., p. 75, 1906.	Pantellerite.	Also in C. R., CXL, p. 450, 1906.
28	II.4.1.3.⊙	Q 19.38 or 25.58 ab 29.87 ac 10.63 ns 2.44 di 1.70 hy 11.16	Fantalé, French Somali.	H. Arsandaux.	H. Arsandaux, Roches Est. Afr., p. 75, 1906.	Pantellerite obsidian.	Also in C. R., CXXXVII, p. 878, 1903.
29	II.4.1.3".	Q 17.40 or 26.69 ab 37.20 ac 12.47 di 2.73 hy 1.06 mt 2.78	Tadetchamalka, French Somali.	H. Arsandaux.	H. Arsandaux, Roches Est. Afr.; p. 75, 1906.	Pantellerite.	Also in C. R., CXXXVII, p. 878, 1903.
30	II.(3)4.1."3.	Q 27.12 or 26.69 ab 18.86 ac 7.39 ns 7.08 di 2.70 hy 9.97 il 0.30	Lake Naivasha, British East Africa.	G. T. Prior.	G. T. Prior, Min. Mag., XIII, p. 246, 1903.	Soda rhyolite (pantellerite).	
31	II(III).4".1.3.	Q 10.44 or 27.24 ab 27.77 ac 18.02 ns 3.78 di 6.23 hy 5.32 il 1.52	Lake Nakuru, British East Africa.	G. T. Prior.	G. T. Prior, Min. Mag., XIII, p. 245, 1903.	Phonolitic obsidian (pantelleritic obsidian).	
32	(I)II."4.1.3.	Q 29.22 or 27.80 ab 25.15 Z 5.12 ac 7.85 hy 1.13 mt 3.25 il 0.15	Ampasibitika, Sakalave, Madagascar.	A. Pisani.	A. Lacroix, Mat. Min. Mad., II, p. 235, 1903.	Aplite.	Veinlet in No. 9, II.4.1.4.

CLASS II. DOSALANE—Continued.

RANG 1. PERALKALIC. PANTELLERASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
33	64.01	13.96	7.31	0.20	0.21	1.02	5.30	5.10	1.38		1.66	0.08			100.23	
A2. II	1.067	.137	.046	.003	.005	.018	.085	.054			.021	.001				
34	71.56	11.94	4.68	0.46	0.32	0.28	4.88	5.03	0.40	0.33	0.17	trace	trace	NiO 0.01 BaO none SrO nono Li_2O none	100.06	2.71
A2. II	1.193	.117	.029	.007	.008	.005	.088	.053			.002	—	—			
35	65.31	12.08	5.12	3.07	0.96	2.50	4.91	4.72	0.57	0.47	0.49	0.14	0.11		100.45	2.40
A2. II	1.089	.118	.032	.043	.024	.045	.079	.050			.006	.001	.001			
36	64.13	14.32	5.58	0.70	0.72	2.36	5.29	4.86	0.79		0.65	0.39	0.12		99.91	
A2. II	1.069	.140	.035	.010	.018	.042	.085	.052			.008	.003	.002			

RANG 1. PERALKALIC. PANTELLERASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	70.59	12.38	1.61	3.33	none	0.93	6.95	3.74	0.21	0.20	0.44	trace	0.08	Cl none	100.46	2.657
A2. II	1.177	.122	.010	.046	—	.017	.112	.039			.005	—	.001			
2	73.01	11.23	2.53	3.66	0.02	0.75	5.56	3.66	0.55	none			0.19	S 0.05 BaO 0.06 SrO 0.01	101.28	
B2. III	1.217	.110	.016	.051	—	.013	.090	.039					.003			
3	71.35	12.21	4.53	1.14	trace	0.22	6.51	3.22	0.33		0.50		0.78		100.79	
A?3. III	1.189	.120	.028	.014	—	.004	.105	.034			.006		.011			
4	63.68	13.31	2.94	3.40	2.45	2.66	4.89	4.27	0.93		0.45	0.60	0.25		99.83	
A2. II	1.061	.130	.018	.047	.061	.047	.079	.045			.006	.004	.004			
5	66.73	12.23	1.49	3.25	1.49	3.25	6.14	2.53	0.62	0.05	0.32	0.22		FeS_2 0.39	99.46	
A2. II	1.112	.120	.009	.045	.037	.058	.099	.027			.004	.002				
6	60.76	10.72	5.22	5.40	4.19	4.37	4.93	2.44	n. d.		2.14				100.17	
A3. III	1.013	.105	.033	.075	.105	.079	.079	.026			.027					
7	64.76	13.40	4.48	2.26	0.39	2.57	5.65	4.10	1.21		0.31	trace	0.31	SO_3 trace	99.44	
A2. II	1.079	.131	.028	.032	.010	.046	.091	.044			.004	—	.004			
8	65.60	10.15	6.40	3.70	0.64	none	7.45	1.17	0.62		0.19		0.51	ZrO_2 3.10	99.53	
A2. II	1.093	.100	.040	.051	.016	—	.120	.013			.002		.007			
9	63.70	9.78	9.01	7.85	0.45	1.36	3.98	2.36	0.75		0.30		0.12	ZrO_2 0.50	100.84	
A2. II	1.062	.096	.056	.109	.011	.024	.065	.026			.004		.002			
10	70.76	10.16	7.00	0.63	0.49	0.65	5.53	2.57	0.88	0.57	0.49	none	0.16	ZrO_2 none Cl 0.04 F 0.02 S 0.06 Cr_2O_3 none BaO 0.12 SrO 0.03	100.16	
A1. I	1.179	.100	.044	.009	.012	.012	.089	.028			.006	—	.002			

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 3. SODIPOTASSIC. GRORUDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
33	(I)II.4(5).1.3(4).	Q 13.02, or 30.02, ab 43.49, ac 0.92, di 1.08, wo 1.16, il 0.46, hm 7.36, ru 1.44, ap 0.34	Chapelle, Cilaos, Reunion Island.	Boiteau.	A. Lacroix, C. R., CLV, p. 541, 1912.	Quartz syenite.	Iron oxides?
34	(I)II.4.1.3.	Q 22.92, or 29.47, ab 33.54, ac 11.09, di 1.08, hy 0.30, mt 1.16, il 0.30	Trachyte Range, Glass House Mountains, Queensland.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXI, p. 68, 1906.	Pantellerite.	
35	II.4.1.3″.	Q 15.18, or 27.80, ab 35.63, ac 5.08, di 9.65, mt 4.87, il 0.91, ap 0.34	Cainbable Creek, Queensland.	G. R. Patten.	A. R. Agric. Chem. Qld., 1914.	Trachyte.	H. C. Richards, pers. com.
36	(I)II.4(5).1.3(4).	Q 11.64, or 28.91, ab 44.54, an 0.83, di 3.89, wo 1.28, mt 0.93, il 1.22, hm 4.96, ap 1.01	Cape Adare, Victoria Land, Antarctic.	G. T. Prior.	G. T. Prior, Rep. S. Cross Exp. p. 329, 1902.	Phonolitic trachyte.	

SUBRANG 4. DOSODIC. PANTELLEROSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(I)II.4.1.″4.	Q 19.68, or 21.68, ab 43.49, ac 4.62, ns 2.32, di 4.21, hy 3.17, il 0.76	Ilimausak, South Greenland.	C. Winther.	N. V. Ussing, G. Julhb., p. 114, 1911.	Arfvedsonite granite.	
2	″II.4.1.(3)4.	Q 25.38, or 21.68, ab 37.20, ac 7.39, ns 0.37, di 3.23, hy 5.41	Sneech Pond, Cumberland River, Rhode Island.	J. H. Perry.	Emerson and Perry, U. S. G. S. B. 311, p. 66, 1907.	Riebeckite porphyry (paisanite).	
3	(I)II.4.1.″4.	Q 20.94, or 21.68, ab 45.06, ac 8.78, di 0.99, hy 0.79, mt 2.09, il 0.93	Kallerud, Laugendal, Norway.	L. and V. Schmelck.	W. C. Brögger, Eg. Kg., I, p. 48, 1894.	Grorudite.	MnO high? Probably in I.4.1.4. In W. T., p. 155.
4	II.4(5).1.(3)4.	Q 11.34, or 25.02, ab 41.39, an 1.67, di 6.34, hy 6.58, mt 4.18, il 0.91, ap 1.34	Björkstugan, Lapland.	T. Sundberg.	P. J. Holmquist, B. Un. Ups., VII, p. 266, 1906.	Granite.	
5	II.4″.1.4.	Q 12.36, or 15.01, ab 51.87, ac 2.77, di 11.85, hy 2.78, mt 0.70, il 0.61, ap 0.67	Backofenberg, Hesse.	W. Sonne.	C. Chelius, Erl. G. Kte. Hesse, Bl. Breusbach, p. 24, 1897.	Granite.	In W. T., p. 221.
6	II″.4″.1.4.	Q 11.04, or 14.46, ab 41.39, di 17.38, hy 4.26, mt 7.66, il 4.10	Lausitz, Saxony.	H. Ivens.	H. Ivens, In. Diss. Erl., p. 9, 1910.	Granite.	
7	(I)II.4″.1.″4.	Q 12.78, or 24.46, ab 45.59, ac 1.85, di 4.15, wo 3.25, mt 5.57, il 0.61	Aden, Arabia.	E. Manasse.	E. Manasse, Mem. Soc. Tosc., XXIV, p. 188, 1908.	Trachydacite.	
8	II.4.1.4(5).	Q 16.26, or 7.23, ab 45.59, Z 4.58, ac 15.25, hy 8.07, mt 1.62, il 0.30	Ampasibitika, Madagascar.	A. Pisani.	A. Lacroix, Mat. Min. Mad., II, p. 235, 1903.	Arfvedsonite granite.	
9	II.″4.1.4.	Q 25.86, or 14.46, ab 34.06, an 1.39, Z 0.73, di 4.61, hy 5.42, mt 12.99, il 0.61	Ampasibitika, Madagascar.	A. Pisani.	A. Lacroix, Mat. Min. Mad., II, p. 235, 1903.	Aegirite-riebeckite granite.	
10	(I)II.(3)4.1.4.	Q 29.22, or 15.57, ab 37.73, ac 7.85, di 2.59, mt 1.16, il 0.91, hm 3.52	Manumea River, Timor Island.	E. W. Morley.	J. P. Iddings, pers. com.	Trachyte.	

CLASS II. DOSALANE—Continued.

RANG 1. PERALKALIC. PANTELLERASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
11	66.40	12.03	8.23	0.64	0.40	0.62	5.26	3.26	1.85	0.50	0.82	0.23	0.05	CO_2 none	100.29	2.49
A2. II	1.107	.118	.051	.009	.010	.011	.085	.035			.010	.002	—			
12	60.00	10.58	6.18	4.72	1.97	2.88	6.58	2.20	1.65	0.65	1.56	0.44	0.18		99.59	2.69
A2. II	1.000	.104	.039	.065	.049	.052	.106	.023			.020	.003	.003			
13	67.60	12.29	3.15	4.88	1.08	2.90	5.67	2.16	0.15						99.88	
A3. III	1.127	.120	.020	.068	.027	.052	.092	.023								
14	66.02	11.83	2.08	2.88	0.95	1.03	8.88	3.73	1.07	1.21	0.61	trace	0.17	CO_2 trace	100.46	2.48
A2. II	1.100	.116	.013	.040	.024	.018	.144	.039			.008	—	.002			
15	62.81	10.36	5.92	2.59	0.47	1.79	7.73	3.64	2.44	0.81	0.71	trace	0.11	CO_2 0.17	99.55	2.44
A2. II	1.047	.102	.037	.036	.012	.032	.124	.038			.009	—	.002			

RANG 1. PERALKALIC. PANTELLERASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	68.07	15.07	1.13	3.42	2.27	0.73	6.06	0.29	1.25	0.01	0.37	trace	0.31	S 1.14	100.12	
A2. II	1.135	.148	.007	.047	.057	.013	.098	.003			.005	—	.004			
2	70.75	12.01	0.62	0.94	0.56	6.13	7.20	0.79	0.49	0.20	0.17	0.10	0.08	S trace BaO trace	100.44	
A2. II	1.179	.118	.004	.013	.014	.109	.116	.008			.002	.001	.001			

RANG 2. DOMALKALIC. DACASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	63.25	10.37	2.77	2.71	9.92	1.24	1.55	4.90	4.03		0.34				101.08	2.696
B3. IV	1.054	.102	.017	.038	.248	.022	.025	.052			.004					
2	67.50	14.47	1.23	5.29	2.25	1.75	1.75	5.35	0.53		0.09		trace		100.21	
A3. III	1.125	.142	.008	.074	.056	.031	.028	.057			.001		—			
3	65.63	13.85	2.02	2.80	2.79	3.43	1.84	6.25	1.17		trace	trace	trace		99.77	2.864
A3. III	1.094	.136	.013	.039	.070	.060	.030	.067			—	—	—			

RANG 2. DOMALKALIC. DACASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	64.52	15.58	2.13	2.18	2.32	3.88	3.70	4.02	0.67	0.22	0.80	0.34	0.05	Cl 0.10 S 0.03 Cr_2O_3 none BaO 0.06 SrO trace	100.68	
A1. I	1.075	.153	.013	.031	.058	.070	.060	.042			.010	.002	—			
2	66.35	14.09	1.81	4.49	1.05	3.16	3.32	4.08	0.35		1.00	0.40	0.17	ZrO_2 trace Cl 0.02 F 0.03 S 0.04 BaO 0.03	100.39	
A1. I	1.106	.138	.011	.063	.026	.056	.053	.044			.013	.003	.002			
3	64.47	10.51	1.11	7.37	5.21	3.10	2.21	3.63	0.75	0.18	0.65	0.25	0.15	CO_2 0.58 ZrO_2 none S 0.12 NiO 0.04 BaO 0.04		
A1. I	1.075	.103	.007	.103	.130	.055	.035	.038			.008	.002	.002			

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 4. DOSODIC. PANTELLEROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
11	(I)II.4.1.4.	Q 22.56 ac 0.92 or 19.46 di 0.86 ab 43.49 hy 0.70 il 1.52 hm 7.84 ap 0.67	Esk, Queensland.	G. R. Patten.	A. R. Agric. Chem. Qld., 1914.	Trachyte.	H. C. Richards, pers. com.
12	II″.4(5).1.4.	Q 9.06 ac 11.55 or 12.79 di 9.61 ab 42.44 hy 4.64 mt 3.25 il 3.04 ap 1.01	Esk, Queensland.	G. R. Patten.	A. R. Agric. Chem. Qld., 1914.	Trachyte.	H. C. Richards, pers. com.
13	II.4.1.4.⊙	Q 18.12 di 11.11 or 12.79 hy 3.38 ab 48.21 mt 4.64 an 1.39	Tewaewae Point, Otago, New Zealand.	L. J. Wild.	L. J. Wild, Tr. N. Z. Inst., XLIV, p. 327 (1911), 1912.	Porphyry.	
14	II.4.1.4.⊙	Q 13.32 ac 6.01 or 21.68 ns 6.59 ab 40.35 di 5.24 hy 4.74 il 1.22	Circular Head, Carnley Island, Auckland Islands.	A. M. Wright.	Speight and Finlayson, Subant. Islds, p. 724, 1909.	Trachyte.	
15	II.4″.1.(3)4.	Q 11.46 ac 17.09 or 21.13 ns 2.81 ab 33.54 di 7.65 hy 1.09 il 1.37	Musgrave Peninsula, Carnley Island, Auckland Islands.	A. M. Wright.	Speight and Finlayson, Subant. Islds., p. 724, 1909.	Trachyte.	

SUBRANG 5. PERSODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(I)II.″4.1(2).5.	Q 25.50 hy 8.47 or 1.67 mt 1.62 ab 51.35 il 0.76 an 3.61 pr 2.15 C 3.47	Seminole Mine, Lincoln County, Georgia.	E. Everhardt.	S. P. Jones, Ga. G. S. B. 19, p. 56, 1909.	Quartz albite porphyry.	Altered?
2	″II.4.1.″5.	Q 19.26 ac 1.85 or 4.45 ns 0.24 ab 57.64 di 6.00 wo 9.28 il 0.30 ap 0.34	Svartsberg, North Ulfön, Nordingra, Sweden.	N. Sahlbom.	J. E. Sobral, G. Nord. Reg., p. 163, 1913.	Micropegmatite.	

SUBRANG 2. DOPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II″.4.2.2″.	Q 16.98 hy 27.04 or 28.91 mt 3.94 ab 13.10 il 0.62 an 6.12 C 0.31	Gierniger Loch, Baden.	M. Dittrich.	F. Schalch, Sp. Kte. Bad., Bl. Petersthal, p. 33, 1895.	Quartz-mica syenite.	Border of No. 159, I.4.1.3. In W. T., p. 223.
2	″II.″4.2.2″.	Q 25.92 hy 14.08 or 31.69 mt 1.86 ab 14.67 il 0.15 an 8.62 C 2.65	Wolfsklippen, Brocken, Hartz.	O. Dreibrodt.	O. Dreibrodt, In. Diss. Leip., 1912.	Diopside granite.	
3	″II.4.2.2.	Q 18.84 di 4.51 or 37.25 hy 8.50 ab 15.72 mt 3.02 an 10.84	Follmersdorf, Silesia.	H. Traube.	H. Traube, N. J., 1890, I, p. 212.	Hornblende syenite.	In W. T., p. 223.

SUBRANG 3. SODIPOTASSIC. ADAMELLOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(I)II.4.2″.3″.	Q 16.98 di 2.65 or 23.35 hy 5.59 ab 31.44 mt 3.02 an 14.18 il 1.52 ap 0.67	Rocky Islet Bay, Rainy Lake, Ontario.	M. F. Connor.	A. C. Lawson, Can. G. S. Mem. 40, p. 91, 1913.	Syenite.	
2	(I)II.4.2.3.	Q 22.20 di 1.18 or 24.46 hy 7.42 ab 27.77 mt 2.55 an 11.40 il 1.98 ap 1.01	Northville, Fulton County, New York.	E. W. Morley.	W. J. Miller, N. Y. St. Mus. B. 153, p. 15, 1911.	Quartz syenite.	
3	II.4.2.3.⊙	Q 20.34 di 4.11 or 21.13 hy 22.86 ab 18.34 mt 1.62 an 8.34 il 1.22 ap 0.67	Fort Ann, Washington County, New York.	W. F. Hillebrand.	J. F. Kemp, U. S. G. S. B. 228, p. 46, 1904.	Syenite.	In W. T., p. 223.

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. DACASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
4	61.01	15.36	2.98	7.77	0.78	4.05	3.68	3.90	0.49				.008		100.10	
A3. III	1.017	.150	.019	.108	.020	.072	.060	.041					.001			
5	63.40	15.94	2.01	3.91	1.33	3.75	3.53	3.30	0.76	0.06	1.33	0.55	0.05	CO_2 trace	99.94	2.82
A2. II	1.057	.156	.013	.054	.033	.067	.056	.035			.017	.004	—			
6	62.35	13.24	3.52	6.33	0.85	3.34	2.79	3.95	1.21	0.11	1.18	0.57	0.08	Cr_2O_3 none NiO none BaO 0.16 SrO trace Li_2O trace	99.68	
A1. I	1 039	.130	.022	.088	.021	.059	.054	.042			.014	.004	.001			
7	57.98	13.58	3.11	8.68	2.87	2.01	3.56	3.44	2.47		1.75	0.29	0.13	BaO 0.04 SrO trace Li_2O trace	99.91	
A1. I	.966	.134	.020	.121	.072	.036	.057	.036			.022	.002	.002			
8	64.49	15.49	1.28	2.71	1.89	4.32	3.53	4.04	0.48	0.16	0.56	0.19	0.07	CO_2 0.49 S 0.07 BaO 0.06	99.83	2.714
A1. I	1.075	.152	.008	.038	.047	.077	.056	.042			.007	.001	.001			
9	62.18	15.77	1.83	2.44	3.55	4.13	3.92	3.91	0.70	0.30	0.55	0.32	trace	SO_3 trace Cl 0.04 BaO 0.43 SrO 0.16	100.23	
A1. I	1.036	.154	.011	.033	.089	.073	.063	.041			.007	.002	—			
10	59.24	13.84	5.46	1.36	4.79	5.60	3.13	4.22	2.02		0.22	0.34	trace	CO_2 none SO_3 0.08 Cl 0.04 BaO trace SrO none	100.34	
A1. I	.987	.136	.034	.019	.120	.100	.050	.045			.003	.002	—			
11	63.97	15.78	2.35	1.87	2.84	3.71	4.36	4.01	0.49	0.09	0.48	0.40	0.05	NiO trace	100.40	
A2. II	1.066	.155	.015	.026	.071	.066	.070	.042			.006	.003	—			
12	63.05	15.58	2.92	2.11	1.70	4.15	3.77	3.66	1.38	0.55	0.60	0.27	0.12	BaO 0.13 SrO 0.07 Li_2O trace	100.06	
A1. I	1.051	.153	.018	.030	.043	.074	.061	.039			.007	.002	.002			
13	62.36	14.95	5.15	0.89	1.82	3.88	3.59	3.74	0.85	1.52	0.69	0.31	0.09	CO_2 0.10 ZrO_2 none S 0.01 Cr_2O_3 none V_2O_3 0.02 BaO 0.08 SrO 0.07	100.12	
A1. I	1.039	.147	.032	.013	.046	.070	.058	.039			.009	.002	.001			
14	60.25	15.55	5.95	0.53	2.91	4.93	3.41	4.39	0.46	0.20	0.51	0.61	0.09	CO_2 none ZrO_2 0.04 F 0.04 S 0.02 Cr_2O_3 trace V_2O_3 0.02 NiO none BaO 0.13 SrO 0.05	100.09	
A1. I	1.004	.152	.038	.007	.073	.088	.055	.047			.006	.004	.001			
15	65.29	11.57	2.10	2.67	2.87	4.85	2.10	5.18	1.82	0.50		0.22		BaO 0.17	99.34	
B3. IV	1.088	.113	.013	.038	.072	.087	.034	.055				.002				
16	62.84	14.21	0.91	3.75	3.04	4.72	2.85	4.60	1.23	0.26	0.42	0.41	0.06	CO_2 0.38 ZrO_2 trace S 0.01 BaO 0.03	99.72	
A1. I	1.047	.139	.006	.052	.076	.084	.046	.049			.005	.003	.001			
17	69.41	12.83	1.06	2.48	0.71	4.73	3.13	5.25	0.18	0.11	0.20		0.12		100.21	
A2. II	1.157	.126	.007	.035	.018	.084	.050	.056			.003		.002			
18	64.34	13.80	1.31	3.30	3.61	2.98	3.50	5.57	1.64		0.43				100.48	
A3. III	1.072	.135	.008	.046	.090	.054	.056	.060			.005					

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 3. SODIPOTASSIC. ADAMELLOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
4	II.4(5).2″.3″.	Q 10.86 di 5.58 or 22.80 hy 10.84 ab 31.44 mt 4.41 an 13.62	Altamont, Franklin County, New York.	E. W. Morley.	H. P. Cushing, N. Y. St. Mus. A. R. LIV, p. R 69, (1900), 1902.	Augite syenite.	Iron oxides as in op. cit. LX, p. 514, 1907.
5	(I)II.4.2(3).3(4).	Q 20.76 hy 6.47 or 19.46 mt 3.02 ab 29.34 il 2.58 an 15.01 ap 1.34 C 1.12	Colleen, Nelson County, Virginia.	W. M. Thornton.	Watson and Taber, Va. G. S. B. III A, p. 63, 1913.	Quartz monzonite gneiss.	
6	″II.4.2″.3.	Q 21.24 di 0.71 or 23.35 hy 8.73 ab 23.58 mt 5.10 an 11.95 il 2.13 ap 1.34	Near Barmer's Elk, Watauga County, North Carolina.	H. N. Stokes.	A. Keith, U. S. G. S. B. 168, p. 52, 1900.	Rhyolite.	In W. T., p. 223.
7	II.4″.2.3(4).	Q 11.82 hy 17.76 or 20.02 mt 4.64 ab 29.87 il 3.34 an 8.06 ap 0.67 C 1.22	Pigeon Point, Minnesota.	W. F. Hillebrand.	W. S. Bayley, A. J. S., XXXVII, p. 61, 1889.	Quartz diorite.	Also in U.S.G.S. B. 109, p. 63, 1893. In W. T., p. 223.
8	(I)II.4.2″.3.	Q 17.28 di 4.54 or 23.35 hy 5.64 ab 29.34 mt 1.86 an 15.01 il 1.06 ap 0.34	Clancy, Montana.	J. G. Fairchild.	A. Knopf, U. S. G. S. rec. lab.	Quartz monzonite.	"Fresh."
9	″II.4(5).2″.3(4).	Q 11.58 di 3.52 or 22.40 hy 9.08 ab 33.01 mt 2.55 an 13.90 il 1.06 ap 0.67	Steamboat Mountain, Little Belt Mountains, Montana.	W. F. Hillebrand.	L. V. Pirsson, U. S. G. S. A. R. 20, III, p. 517, 1900.	Diorite porphyry.	In W. T., p. 223.
10	II.4(5).2.3.	Q 9.54 di 11.45 or 25.02 hy 7.00 ab 26.20 mt 3.71 an 11.40 il 0.46 hm 2.88 ap 0.67	N. fork of Willow Creek, Highwood Mountains, Montana.	Hurlbut and Barnes.	Weed and Pirsson, U. S. G. S. B. 237, p. 164, 1905.	Trachyandesite.	In W. T., p. 223.
11	(I)II.4″.2.3(4).	Q 13.14 di 2.94 or 23.35 hy 6.43 ab 36.68 mt 3.48 an 11.95 il 0.91	Hurricane Ridge, Crandall Basin, Yellowstone National Park.	W. Melville.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 261, 1899.	Quartz diorite.	In W. T., p. 223.
12	(I)II.4.2″.3(4).	Q 16.98 di 3.09 or 21.68 hy 3.76 ab 31.96 mt 4.18 an 14.73 il 1.06 ap 0.67	Cliff Creek, West Elk Mountains, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. A. R. 14, (II), p. 227, 1894.	Porphyrite.	In W. T., p. 223.
13	(I)II.4.2″.3(4).	Q 17.88 di 2.81 or 21.68 hy 3.30 ab 30.39 mt 1.16 an 13.90 il 1.37 hm 4.32 ap 0.67	Mineral Creek, San Cristobal quadrangle, Colorado.	G. Steiger.	W. Cross, U. S. G. S. rec. lab.	Quartz latite.	
14	II.4(5).2″.3.	Q 11.64 di 5.40 or 26.13 hy 4.80 ab 28.82 mt 0.46 an 13.90 il 0.91 hm 5.76 ap 1.34	Cascade Gulch, San Cristobal quadrangle, Colorado.	C. Palmer.	W. Cross, U. S. G. S. rec. lab.	Quartz latite.	
15	II.4.2.(2)3.	Q 21.18 di 12.58 or 30.58 hy 4.42 ab 17.82 mt 3.02 an 6.67 ap 0.67	Granite Mountains, Iron Springs District, Utah.	R. D. Hall.	Leith and Harder, U. S. G. S. B. 338, p. 49, 1908.	Andesite.	
16	II.4″.2″.3.	Q 14.46 di 6.83 or 27.24 hy 9.79 ab 24.10 mt 1.39 an 12.23 il 0.76 ap 1.01	Clifton District, Utah.	R. C. Wells.	E. S. Butler, U. S. G. S. rec. lab.	Monzonite.	
17	(I)II.4.″2.3.	Q 22.32 di 10.58 or 31.14 wo 2.20 ab 26.20 mt 1.62 an 5.56 il 0.46	Sao Antonio, Rio Madeira, Amazonas, Brazil.	G. S. Blake.	J. W. Evans, Q. J. G. S. LXII, p. 119, 1906.	Granite.	
18	II.4(5).(1)2.3.	Q 10.80 di 7.85 or 33.36 hy 9.57 ab 29.34 mt 1.86 an 5.28 il 0.76	Talhorn, Vogesen.	K. Weyberg.	K. Weyberg, Warsch. Un. Nachr., 1909.	Syenite porphyry.	Osann, III, (I), p. 106.

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. DACASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
19	63.51	14.31	2.08	3.70	4.90	2.60	2.90	3.80	1.64		0.55		0.04		100.03	
A2. II	1.059	.140	.013	.051	.123	.046	.047	.040			.007		—			
20	63.20	17.15	0.20	3.72	3.32	3.06	3.17	4.21	0.60		0.95	0.19			99.77	
A2. II	1.053	.168	.001	.051	.083	.055	.052	.044			.016	.001			(100.58)	
21	63.0	14.9	0.4	4.3	4.5	0.9	3.1	4.5	2.6		1.5	trace			99.7	
B3. IV	1.050	.146	.003	.060	.113	.016	.050	.048			.019	—				
22	59.87	17.57	4.01	0.87	5.42	2.20	2.40	5.50	3.07						100.91	
B3. IV	.998	.172	.025	.013	.133	.039	.039	.059								
23	74.10	11.64	2.62	n. d.	2.81	2.28	2.90	3.81	0.75						100.91	
A4. IV	1.235	.114	.016	(.032)	.070	.041	.047	.040								
24	69.19	11.86	1.22	4.72	2.02	2.45	3.80	3.57	0.60	0.36	0.54	0.10	0.08	S 0.02 BaO trace	100.53	
A2. II	1.153	.116	.008	.065	.050	.044	.061	.038			.007	.001	.001			
25	68.97	14.30	3.80	0.68	0.88	2.41	3.72	3.85	0.57		0.34		0.45		99.97	
A2. II	1.150	.140	.024	.010	.022	.043	.060	.041			.004		.006			
26	67.31	13.26	5.46	1.32	1.08	3.57	3.09	3.17	0.43		0.81		0.21		99.71	
A2. II	1.122	.130	.034	.018	.027	.064	.050	.034			.010		.003			
27	63.47	15.01	2.70	3.01	2.18	3.91	3.70	3.39	0.87		0.88		0.47		99.59	
A2. II	1.058	.147	.017	.042	.055	.070	.060	.036			.011		.007			
28	62.02	11.76	5.71	2.87	2.79	4.09	3.65	3.71	1.32		1.80	0.61	trace		100.33	
A2. II	1.034	.115	.036	.040	.070	.073	.059	.039			.023	.004	—			
29	61.67	13.70	3.91	4.61	1.72	4.33	3.02	4.37	0.40		1.38	0.44	0.20		99.75	
A2. II	1.028	.134	.024	.064	.043	.077	.048	.047			.017	.003	.003			
30	60.16	13.18	8.88	3.15	1.03	3.89	3.42	3.53	1.90		0.20	trace	0.22		99.56	
A2. II	1.003	.129	.055	.044	.026	.070	.055	.037			.003	—	.003			
31	64.49	13.67	1.63	4.42	1.38	3.12	3.57	4.40	1.11	0.46	1.22	0.58	0.14		100.19	
A2. II	1.075	.134	.010	.061	.035	.055	.058	.047			.015	.004	.002			
32	63.57	14.69	1.79	3.11	2.82	3.84	4.26	4.07	0.95		0.55	0.24			99.89	
A2. II	1.060	.144	.011	.043	.071	.069	.069	.043			.007	.002				
33	63.70	15.53	1.77	1.52	2.02	4.11	4.35	4.00	0.71	0.07	1.09	0.24		CO_2 0.83 SO_3 0.26	100.25	
A2. II	1.062	.152	.011	.021	.051	.073	.070	.042			.014	.002				

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 3. SODIPOTASSIC. ADAMELLOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
19	II.4.2″.3.	Q 17.46 hy 16.39 or 22.24 mt 3.02 ab 24.63 il 1.06 an 12.79 C 0.71	Haut du Faite, Vogesen.	K. Weyberg.	K. Weyberg, Warsch. Un. Nachr., 1909.	Granite.	Osann, III, (I), p. 1.
20	″II.4″.2(3).3.	Q 15.12 hy 13.32 or 24.46 mt 0.23 ab 27.25 il 1.82 an 14.46 ap 0.34 C 2.04	Moulin de Tabourette, Lyonnais, France.	Pisani.	A. Michel-Levy, C. R., CLVI, p. 718, 1913.	Granite.	
21	II.4.(1)2.3.	Q 16.74 hy 16.32 or 26.69 mt 0.70 ab 26.20 il 2.89 an 4.45 C 3.26	Tabor, Mount Pelvoux, Dauphiny, France.	Lassieur.	P. Termier, B. Soc. Min. Fr., XXXIV, p. 46, 1911.	Mica trachyte.	
22	″II.4(5).2.(2)3.	Q 11.94 hy 13.30 or 32.80 mt 3.02 ab 20.44 hm 1.92 an 10.84 C 3.57	Locality?, Northwest Corsica.	J. Deprat.	J. Deprat, B. Serv. Ct. G. Fr., XVII, No. 117, p. 55, 1907.	Trachyandesite.	
23	(I)II.(3)4.2.3.	Q 32.58 di 3.16 or 22.24 hy 9.70 ab 24.63 an 7.51	Scheerenberg, New Amsterdam Island, Spitzbergen.	Peiser.	D. L. Bryant, In. Diss. Erl., p. 12, 1905.	Granite.	
24	″II.4.(1)2.3(4).	Q 24.00 di 5.56 or 21.13 hy 8.95 ab 31.96 mt 1.86 an 4.73 il 1.06 ap 0.34	Svartsbergvik, N. Ulfön, Nordingra, Sweden.	N. Sahlbom.	J. E. Sobral, G. Nord. Reg., p. 126, 1913.	Adamellite.	
25	II″.4.2.3″.	Q 26.40 di 0.86 or 22.80 hy 1.80 ab 31.44 mt 2.78 an 10.84 il 0.61 hm 1.92	Stangsmala, Eringsboda, Blekinge, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 258, 1906.	Granite.	
26	(I)II.″4.2″.3(4).	Q 28.86 di 3.89 or 18.90 hy 0.90 ab 26.20 mt 2.55 an 12.79 il 1.52 hm 3.68	Bräunemosse, Kalmar, Smaland, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 262, 1906.	Granite.	
27	″II.4.2(3).3(4).	Q 17.10 di 4.26 or 20.02 hy 6.21 ab 31.44 mt 3.94 an 14.18 il 1.67	Smedsemm, Oskarshamn, Smaland, Sweden.	H. Santesson.	P. J. Holmquist. B. Un. Ups., VII, p. 262, 1906.	Granite.	
28	II.4.″2.3(4).	Q 17.94 di 9.29 or 21.68 hy 2.70 ab 30.92 mt 3.94 an 4.73 il 3.50 hm 2.89 ap 1.34	Amal, Dalsland, Sweden.	O. Berg.	P. J. Holmquist, B. Un. Ups., VII, p. 264, 1906.	Granite.	
29	II.4.2.3.⊙	Q 16.98 di 6.40 or 26.13 hy 4.58 ab 25.15 mt 5.57 an 10.84 il 2.58 ap 1.01	Beden, Villie, Skane, Sweden.	R. Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 266, 1906.	Granite.	
30	II.4.2.3(4).	Q 19.08 di 5.62 or 20.57 hy 0.81 ab 28.82 mt 10.21 an 10.29 il 0.46 hm 1.76	Svärdfall, Brefven, Sweden.	K. Winge.	K. Winge, G. F. F., XVIII, p. 195, 1896.	(Monzonite.)	"Intermediate rock." In W. T., p. 223.
31	(I)II.4.2.3.	Q 18.06 di 3.03 or 26.13 hy 6.99 ab 30.39 mt 2.32 an 8.06 il 2.28 ap 1.34	Knudsbakke, Bornholm Island, Denmark.	M. Dittrich.	C. Kalb, In. Diss. Greif., p. 35, 1914.	Granite.	L. Milch, pers. com.
32	″II.4(5).2.3(4).	Q 11.88 di 6.74 or 23.91 hy 7.14 ab 36.15 mt 2.55 an 8.90 il 1.06 ap 0.67	Heiligkreutz, Neckarthal, Baden.	M. Dittrich.	M. Dittrich, Mt. Bad. G. L.-A., IV (2), p. 202, 1901.	Granite.	
33	(I)II.4(5).2.3(4).	Q 13.98 di 5.62 or 23.35 hy 2.50 ab 36.68 mt 1.62 an 11.12 il 2.13 hm 0.64 ap 0.67	Hühnerbusch, n. Rossdorf, Hesse.	Stadler.	G. Klemm, Erl. G. Kte. Hes., Bl. Rossdorf, p. 58, 1912.	Granite porphyry.	Fresh?

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. DACASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
34	65.61	14.91	0.94	4.47	1.41	2.07	3.02	5.44	1.57		0.21	0.25		SO_3 0.18	100.08	
A2. II	1.094	.146	.006	.063	.035	.038	.048	.057			.003	.002				
35	65.17	14.60	1.39	4.79	1.45	1.86	3.29	3.99	2.21		0.32	0.41		SO_3 0.37	99.85	2.664
A2. II	1.086	.143	.009	.067	.036	.033	.053	.043			.004	.003				
36	64.71	12.82	2.85	7.71	1.46	2.04	2.59	3.52	1.63		1.02	0.32	0.18	SO_3 0.13	100.98	
B2. III	1.079	.126	.018	.107	.037	.037	.042	.037			.013	.002	.003			
37	63.45	13.29	3.11	5.78	1.37	3.04	2.95	3.43	1.36		1.03	0.19	0.15	CO_2 0.14 S 0.06	99.35	
B2. III	1.058	.130	.019	.081	.034	.054	.048	.036			.013	.001	.002			
38	60.11	15.93	2.04	6.66	1.22	3.25	3.65	4.18	1.78		0.82	0.37		SO_3 0.27	100.28	2.809
A2. II	1.002	.156	.013	.093	.031	.058	.059	.044				.003				
39	64.73	14.92	3.91	2.41	0.47	3.25	4.20	4.47	0.64		0.64	0.23	trace	CO_2 0.08	99.95	2.656
A2. II	1.079	.146	.024	.033	.012	.058	.068	.048			.008	.002	—			
40	66.75	13.44	2.96	4.98	1.10	1.77	3.45	4.30	1.39		0.23	0.35			100.72	
A2. II	1.113	.132	.019	.069	.028	.032	.056	.045			.003	.002				
41	62.51	12.78	2.56	4.76	3.33	4.76	2.71	4.81	1.53		0.81	trace	trace		100.59	2.901
A2. II	1.042	.125	.016	.066	.083	.085	.043	.051			.010	—	—			
42	67.94	14.86	1.60	3.62	1.91	2.02	2.52	4.01	1.57						100.05	
A3. III	1.132	.146	.010	.050	.048	.036	.040	.042								
43	67.04	13.92	1.26	1.97	2.19	3.10	3.01	6.23	0.56	0.11	0.77	0.25			100.41	2.71
A2. II	1.117	.136	.008	.027	.055	.055	.048	.066			.010	.002				
44	66.56	13.29	0.88	4.16	1.78	3.37	3.08	4.36	1.34	0.09	0.80				99.71	2.77
A3. III	1.109	.130	.006	.058	.045	.061	.050	.047			.010					
45	65.89	16.70	0.94	2.43	1.00	3.65	3.07	3.87	1.48	0.03	0.47	1.05	0.04		100.62	2.71
A2. II	1.098	.164	.006	.033	.025	.065	.050	.041			.006	.007	—			
46	66.86	12.83	4.21	1.86	2.06	3.80	2.70	5.19	0.25			0.19			99.95	
A3. III	1.114	.126	.026	.026	.052	.068	.044	.055				.001				
47	65.02	15.23	1.01	3.12	1.84	2.88	2.92	6.09	2.15		trace	0.05			100.31	
A3. III	1.084	.149	.006	.043	.046	.051	.047	.065			—	—				
48	68.52	15.03	0.19	3.21	1.14	3.16	4.23	4.85	n. d.		0.15		0.31		100.79	
A3. III	1.142	.147	.001	.044	.029	.056	.068	.052			.002		.004			
49	64.03	12.77	1.92	5.44	0.65	3.42	2.91	4.30	2.25	0.39	1.30	0.40			99.78	
A2. II	1.067	.125	.012	.075	.016	.061	.047	.046			.016	.003				

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 3. SODIPOTASSIC. ADAMELLOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
34	(I)II.4.2.3.	Q 18.98 hy 10.63 or 31.69 mt 1.39 ab 25.15 il 0.46 an 8.62 ap 0.67 C 1.02	Wolfsklippen, Brocken, Harz.	G. Klüss.	O. H. Erdmannsdorfer, Jb. Pr. G. L.-A., XXXII (2), p. 353, 1912.	Schliere in granite.	Cf. No. 265, I.4.2.3.
35	(I)II.4.2.3.	Q 22.44 hy 10.73 or 23.91 mt 2.09 ab 27.77 il 0.61 an 6.39 ap 1.01 C 2.45	Meineckenberg, Ilsethal, Brocken, Harz.	K. Hampe.	O. H. Erdmannsdorfer, Jb. Pr. G. L.-A., XXVII, p. 347, 1906.	Granite.	
36	II.″4.2.3.	Q 25.74 hy 14.13 or 20.57 mt 4.18 ab 22.01 il 1.98 an 8.34 ap 0.67 C 1.73	Kleine Birkenkopf, Brocken, Harz.	Schade.	O. H. Erdmannsdorfer, Jb. Pr. G. L.-A., XXVII, p. 348, 1906.	Granite.	
37	″II.4.2(3).3″.	Q 22.32 di 1.18 or 20.02 hy 9.54 ab 25.15 mt 4.41 an 12.79 il 1.98 ap 0.34	Ilsethal, Brocken, Harz.	Jacobs.	O. H. Erdmannsdorfer, Jb. Pr. G. L.-A., XXVII, p. 347, 1906.	Granite.	
38	″II.4(5).2″.3″.	Q 11.22 hy 12.34 or 24.46 mt 3.02 ab 30.92 il 1.52 an 13.34 ap 1.01 C 0.51	Meineckenberg, Ilsethal, Brocken, Harz.	Klüss.	O. H. Erdmannsdorfer, Jb. Pr. G. L.-A., XXVII, p. 349, 1906.	Granite.	
39	(I)II.4.2.3″.	Q 17.34 di 2.84 or 26.69 wo 0.93 ab 35.63 mt 5.57 an 8.34 il 1.22 ap 0.67	Breiterberg, Lüptitz, Saxony.	C. Ambronn.	C. Ambronn, In. Diss. Leip., p. 27, 1907.	Pyroxene-quartz porphyry.	
40	(I)II.4.2.3.	Q 22.92 hy 9.00 or 25.02 mt 4.41 ab 29.34 il 0.46 an 6.95 ap 0.67 C 0.71	Striegau, Silesia.	F. Riegner.	F. Riegner, In. Diss. Bres., p. 26, 1909.	Granite.	
41	II.4.2.3.⊙	Q 14.34 di 12.24 or 28.36 hy 7.60 ab 22.53 mt 3.71 an 8.62 il 1.52	Reichenstein, Silesia.	H. Traube.	H. Traube, N. J., 1890, I, p. 206.	Syenite.	In W. T., p. 225.
42	(I)II.(3)4.2.3.	Q 28.80 hy 10.08 or 23.35 mt 2.32 ab 20.96 an 10.01 C 2.86	Raffernertobel, n. Meran, Tyrol.	M. Dittrich.	E. Künzli, T. M. P. M., XVIII, p. 418, 1899.	Granitite gneiss.	In W. T., p. 225.
43	(I)II.4.″2.″3.	Q 17.94 di 5.75 or 36.70 hy 3.96 ab 25.15 mt 1.86 an 6.12 il 1.52 ap 0.67	Hälsistock, Graubünden, Switzerland.	L. Hezner.	F. Weber, U. Grubenmann, pers. com.	Syenite.	
44	″II.4.2.3.	Q 20.82 di 6.47 or 26.13 hy 6.83 ab 26.20 mt 1.39 an 9.17 il 1.52	Pontresina, Bernina region, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Banatite.	
45	(I)II.4.2″.3.	Q 25.32 hy 5.27 or 22.80 mt 1.39 ab 26.20 il 0.91 an 11.68 ap 2.35 C 3.16	Pontresina, Bernina region, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Banatite.	
46	″II.4.2.3.	Q 22.56 di 8.21 or 30.58 hy 1.40 ab 23.06 mt 6.03 an 7.51 ap 0.34	Ponte Volpara, Bagnaia, Monte Cimino, Italy.	G. Aichino.	V. Sabatini, Vulc. Cim., p. 507, 1912.	"Peperino" (biotite latite).	
47	(I)II.4.2.″3.	Q 14.46 di 3.22 or 36.14 hy 7.89 ab 24.63 mt 1.39 an 10.29	Monte Amiata, Tuscany, Italy.	L. Ricciardi.	L. Ricciardi, Gazz. Chim. Ital., XVIII, 1888.	Trachyte (toscanite).	In W. T., p. 225.
48	(I)II.4″.2.3″.	Q 15.90 di 6.84 or 28.91 hy 5.36 ab 35.63 mt 0.23 an 7.51 il 0.30	Cumpana Mare, Arges Valley, Rumania.	W. T. Saidel.	M. Reinhard, In. Diss. Zür., p. 90, 1906.	Aplite.	Border of dike. Cf. No. 235, I.4.1.3.
49	″II.4.2.3.	Q 21.78 di 4.55 or 25.58 hy 5.46 ab 24.63 mt 2.78 an 8.90 il 2.43 ap 1.01	Ranomainty, Sakelave region, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVII, p. 18, 1913.	Olivine rhyolite.	

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. DACASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
50	67.20	14.64	0.97	3.34	1.97	2.04	3.69	5.70	0.34					Cr_2O_3 0.10	99.99	
A3. III	1.120	.144	.006	.046	.049	.037	.060	.061								
51	61.45	14.36	2.75	4.61	2.73	4.34	3.98	3.75	0.87		1.37				100.21	
A3. III	1.024	.141	.017	.064	.068	.077	.064	.040			.017					
52	62.84	15.29	4.93	2.87	2.24	3.68	3.50	3.22	1.05				0.17		99.79	2.737
A3. III	1.047	.150	.031	.040	.056	.066	.056	.034				.002				
53	69.38	12.56	2.40	2.25	1.47	3.72	2.77	3.75	1.05	0.09	0.52	0.12	0.04	CO_2 0.01 ZrO_2 none Cl, F none SO_3, S none Cr_2O_3 none NiO none BaO 0.10 SrO trace Li_2O trace	100.23	2.710
A1. I	1.156	.123	.015	.032	.037	.066	.045	.040			.007	.001	—			
54	69.24	12.88	0.20	4.05	2.21	3.10	2.94	3.66	0.80	0.06	0.55	0.23	0.06	CO_2 0.04 ZrO_2 none Cl, F none SO_3, S none Cr_2O_3 none NiO none BaO 0.04 SrO trace	100.06	2.705
A1. I	1.154	.126	.001	.057	.055	.055	.047	.039			.007	.002	.001			
55	67.24	14.20	1.50	2.88	1.39	3.24	3.98	4.07	0.50	0.12	0.65	0.11	0.06	CO_2 0.06 ZrO_2 none Cl trace F none SO_3, S none Cr_2O_3 none NiO none BaO 0.07 SrO trace V_2O_3 none	100.07	2.711
A1. I	1.121	.139	.009	.040	.035	.058	.065	.044			.008	.001	.001			
56	57.62	13.63	5.41	5.15	2.86	5.57	3.38	3.07	1.54	none	1.75	0.40	0.26		100.64	2.64
A2. II	.960	.134	.034	.072	.072	.100	.055	.033			.022	.003	.004			
57	62.09	14.45	3.46	4.00	0.94	3.15	4.45	4.56	0.34	0.24	1.30	0.56	0.38	CO_2 0.11 ZrO_2 trace Cl 0.05 S 0.05 Cr_2O_3 none NiO 0.09 BaO trace SrO none Li_2O none	100.22	2.70
A1. I	1.035	.142	.022	.056	.024	.056	.072	.049			.016	.004	.005			
58	60.00	16.26	5.72	3.52	1.05	3.30	4.08	4.17	2.64						100.74	
A3. III	1.000	.160	.036	.049	.026	.059	.066	.045								

RANG 2. DOMALKALIC. DACASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	68.95	12.74	0.46	5.15	1.57	1.72	3.80	3.28	1.50		0.43	0.20	0.13	BaO trace	99.93	2.694
A2. II	1.149	.125	.003	.072	.039	.030	.061	.030			.005	.001	.002			
2	60.05	11.88	3.22	10.21	0.85	4.76	4.04	2.10	0.66	0.21	1.74	0.52	0.28		100.52	2.872
A2. II	1.001	.117	.020	.142	.021	.085	.065	.022			.022	.004	.004			
3	61.66	17.31	1.56	5.94	2.44	2.38	4.41	1.89	0.53	0.06	1.47	none	0.18	S trace	99.83	
A2. II	1.028	.170	.010	.082	.061	.043	.071	.020			.018	—	.003			
4	63.04	14.30	1.25	6.12	1.75	4.38	3.57	3.17	0.72	0.05	1.43	0.28	0.09	S 0.04	100.19	
A2. II	1.051	.140	.008	.085	.044	.079	.058	.034			.018	.002	.001			

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 3. SODIPOTASSIC. ADAMELLOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
50	(I)II.4″.″2.3.	Q 14.70 di 3.22 or 33.92 hy 8.59 ab 31.44 mt 1.39 an 6.39	Tatarka River, Jenissei District, Siberia.	(?)	A. Meister, Reg. Aurif. Sib., IX, p. 138, 1910.	Granite.	
51	II.4″.2.3(4).	Q 11.28 di 9.02 or 22.24 hy 6.38 ab 33.54 mt 3.94 an 10.29 il 2.58	Arka Tag, Lat. 36° 30′ N., Lon. 80° E., Tibet.	H. Bäckström.	H. Bäckström, Peterm. Mt. Erg. Hft., No. 131, p. 376, 1900.	Bronzite andesite.	In W. T., p. 225.
52	(I)II.4.2(3).3(4).	Q 18.84 di 1.33 or 18.90 hy 6.42 ab 29.34 mt 7.19 an 16.68	Gunung Bessie, Sumatra.	L. Serrurier.	R. D. M. Verbeek, Sum. Westk., p. 232, 1883.	Granite.	Not in W. T.
53	(I)II.″4.2.3.	Q 29.70 di 5.56 or 22.24 hy 2.36 ab 23.58 mt 3.48 an 10.56 il 1.06 ap 0.34	Braidwood, New South Wales.	Not stated.	A. R. Dep. Mines N. S. W. (1909), p. 198, 1910.	Granite.	
54	(I)II.″4.2″.3.	Q 26.70 di 1.86 or 21.68 hy 11.17 ab 24.63 mt 0.23 an 11.12 il 1.06 ap 0.67	Barren Jack, Yass, New South Wales.	Not stated.	A. R. Dep. Mines N. S. W. (1907), p. 185, 1908.	Hypersthene-quartz porphyry.	
55	(I)II.4.2.3(4).	Q 19.38 di 5.72 or 24.46 hy 3.85 ab 34.06 mt 2.09 an 8.34 il 1.22 ap 0.34	Amosfield, New South Wales.	H. P. White.	J. E. Carne, G. S. N. S. W. Min. Res. No. 14, p. 84, 1911.	Granite.	
56	II.4(5).2″.3(4).	Q 12.48 di 9.76 or 18.35 hy 4.66 ab 28.82 mt 7.89 an 24.10 il 3.34 ap 1.01	Tamborrie Plateau, Queensland.	G. R. Patten.	A. R. Agric, Chem. Qld., 1914.	Andesite.	H. C. Richards, pers. com.
57	″II.4(5).(1)2.″3.	Q 11.88 di 5.10 or 27.24 hy 2.88 ab 37.73 mt 5.10 an 5.84 il 2.43 ap 1.34	Mount Cooroy, East Moreton District, Queensland.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXI, p. 168, 1906.	Monzonite.	
58	(I)II.4(5).2.3″.	Q 11.22 di 2.26 or 25.02 hy 3.22 ab 34.58 mt 8.35 an 13.62	Au Koraki, Dunedin, New Zealand.	P. Marshall.	P. Marshall, Q. J. G. S., LXII, p. 402, 1906.	Trachytoid phonolite.	

SUBRANG 4. DOSODIC. DACOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(I)II.4.2.(3)4.	Q 24.84 hy 12.61 or 19.46 mt 0.70 ab 31.96 il 0.76 an 7.51 ap 0.34 C 0.20	Fairbank Lake, Sudbury, Ontario.	E. G. R. Ardagh.	A. P. Coleman, J. G., XV, p. 770, 1907.	Micropegmatite (granite).	
2	II.4.2.4.⊙	Q 15.12 di 10.08 or 12.23 hy 10.51 ab 34.06 mt 4.64 an 8.34 il 3.34 ap 1.34	Homestead, New Jersey.	R. B. Gage.	J. V. Lewis, N. J. G. S. A. R. (1907), p. 121, 1908.	Quartz diabase.	Also in A. J. S., XXVI, p. 158, 1908.
3	II.4.2″.4.	Q 16.68 hy 13.62 or 11.12 mt 2.32 ab 37.20 il 2.74 an 11.95 C 3.77	Consolidated Mine, Dahlonega, Georgia.	E. Everhardt.	S. P. Jones, Ga. G. S. B. 19, p. 75, 1909.	Granite.	Sheared.
4	II.4.2″.(3)4.	Q 16.50 di 5.63 or 18.90 hy 9.47 ab 30.39 mt 1.86 an 13.34 il 2.74 ap 0.67	Cold Spring, Oklahoma.	J. G. Fairchild.	C. H. Taylor, U. S. G. S. rec. lab.	Granite.	

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. DACASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
5	65.06	14.71	2.82	1.31	2.48	3.43	3.86	3.48	1.10	0.31	0.61	0.18	0.18	BaO 0.10 SrO 0.05	99.68	
A1. I	1.084	.144	.018	.018	.062	.061	.062	.037			.008	.001	.003			
6	64.95	15.44	2.02	1.60	2.65	3.07	4.25	3.87	0.85	0.26	0.39	0.25	trace	SO_3 0.02 Cl 0.04 BaO 0.35 SrO 0.10	100.11	
A1. I	1.083	.151	.013	.022	.066	.055	.069	.041			.005	.002	—			
7	64.47	15.45	2.25	2.25	2.68	3.63	4.54	3.19	0.63	0.05	0.75	0.22	0.06	BaO 0.23 SrO 0.04	100.44	
A1. I	1.075	.151	.014	.031	.067	.065	.073	.034			.009	.002	—			
8	65.50	14.94	1.72	2.27	2.97	2.33	5.46	2.76	1.13	0.24	0.45	0.09	0.20	SO_3 0.06 BaO 0.13 SrO trace	100.25	
A1. I	1.092	.146	.011	.032	.074	.042	.088	.029			.005	—	.003			
9	61.56	14.73	4.47	1.23	3.57	4.87	5.10	2.24	1.42		0.87	0.04	0.34		100.44	
A2. II	1.026	.144	.028	.017	.089	.087	.082	.024			.011	—	.005			
10	62.65	16.68	2.35	2.63	1.43	4.96	4.45	2.75	0.66	0.27	0.42		0.16	BaO 0.13 SrO 0.11 Li_2O trace	99.93	
A1. I	1.044	.163	.015	.036	.036	.088	.072	.030			.005		.002			
11	62.95	15.91	3.30	1.37	2.18	4.46	4.05	2.95	1.19	0.72	0.67	0.18	0.08	CO_2 none ZrO_2 none BaO 0.03 SrO 0.03	100.07	
A1. I	1.049	.156	.021	.019	.055	.080	.066	.032			.008	.001	.001			
12	62.34	16.40	2.87	3.32	2.10	3.83	4.26	3.25	0.62	0.08	0.96	0.20		CO_2 none SO_3 none Cl trace	100.23	2.59
A2. II	1.039	.161	.018	.046	.053	.068	.069	.035			.012	.001				
13	66.55	15.79	0.15	3.08	2.14	3.47	4.39	2.80	0.40	0.05	0.60	0.04	0.06	BaO 0.03 SrO 0.01	99.56	2.678
A2. II	1.109	.155	.001	.043	.054	.063	.071	.030			.008	—	—			
14	60.03	16.15	5.25	2.67	0.60	3.91	4.26	3.45	0.96	0.84	1.36	0.41	0.15	CO_2 none	100.04	
A2. II	1.001	.158	.033	.038	.015	.070	.069	.037			.017	.003	.002			
15	62.53	15.53	1.99	3.93	1.97	5.10	5.20	1.38	1.94		0.18	0.06	0.26	Cl 0.01 FeS_2 0.03 NiO trace BaO 0.13 Cu 0.04	100.29	
A1. I	1.042	.152	.012	.054	.049	.091	.084	.015			.002	—	.004			
16	62.16	16.12	3.39	1.85	2.93	4.59	5.20	2.29	1.12		0.23	0.16	0.20	CO_2 trace ZrO_2 trace Cl 0.02 FeS_2 trace CoO 0.01 BaO 0.07 Cu 0.02 Pb none	100.36	
A1. I	1.036	.158	.021	.026	.073	.082	.084	.024			.003	.001	.003			
17	63.50	15.34	3.22	1.71	2.50	4.31	2.75	1.99							100.16	
A3. III	1.058	.150	.020	.024	.063	.077	.030									
18	63.49	12.42	6.41	1.34	1.32	4.17	4.90	1.78	2.88			trace	0.85	SO_3 trace Cl trace CuO trace	99.56	2.52
A3. III	1.058	.122	.040	.018	.033	.075	.079	.019				—	.012			
19	66.91	15.09	1.70	1.95	2.02	3.27	4.16	3.16	0.56	0.14	0.67	0.17	0.18	CO_2 none NiO none BaO 0.05	100.03	
A1. I	1.115	.148	.011	.027	.051	.059	.067	.034			.008	.001	.003			

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 4. DOSODIC. DACOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
5	(I)II.4.2″.(3)4.	Q 19.32 di 2.81 or 20.57 hy 5.20 ab 32.49 mt 2.32 an 12.51 il 1.22 hm 1.28 ap 0.34	Haystack Stock, Park County, Montana.	G. Steiger.	W. H. Emmons, J. G., XVI, p. 207, 1908.	Granodiorite.	
6	(I)II.4″.2.(3)4.	Q 15.84 di 1.51 or 22.80 hy 6.43 ab 36.16 mt 3.02 an 11.40 il 0.76 ap 0.67	Bear Park, Little Belt Mountains, Montana.	H. N. Stokes.	L. V. Pirsson, U. S. G. S. A. R. 20, III, p. 519, 1900.	Diorite-syenite (monzonite) porphyry.	In W. T., p. 225.
7	(I)II.4″.2.″4.	Q 15.36 di 3.09 or 18.90 hy 6.29 ab 38.25 mt 3.25 an 12.23 il 1.37 ap 0.67	Big Timber Creek, Crazy Mountains, Montana.	W. F. Hillebrand.	J. E. Wolff, U. S. G. S. B. 148, p. 142, 1897.	Granitite.	In W. T., p. 225.
8	(I)II.4(5).2.4.	Q 13.50 di 2.91 or 16.12 hy 8.61 ab 46.11 mt 2.55 an 8.06 il 0.76	Sepulcher Mountain, Yellowstone National Park.	T. M. Chatard.	J. P. Iddings, U. S. G. S. A. R. 12, p. 648, 1891.	Andesite.	Also in U. S. G. S. Mon. 32, p. 135, 1899. In W. T., p. 225.
9	II.4(5).2.4.	Q 10.56 di 10.58 or 13.34 hy 4.00 ab 42.97 mt 2.55 an 10.56 il 1.67 hm 2.72	Tower Creek, Yellowstone National Park.	F. A. Gooch.	J. P. Iddings, U. S. G. S. Mon. 32 (II), p. 272, 1899.	Andesite.	In W. T., p. 225.
10	(I)II.4″.2(3).4.	Q 14.16 di 4.54 or 16.68 hy 3.75 ab 37.73 mt 3.48 an 16.96 il 0.76 ap 0.67	Hermano Peak, Sierra El Late, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. A. R. 14, p. 227, 1894.	Porphyrite.	In W. T., p. 177.
11	(I)II4.2(3).″4.	Q 16.32 di 4.32 or 17.79 hy 3.50 ab 34.58 mt 2.55 an 15.85 il 1.22 hm 1.60 ap 0.34	Cooks Peak, New Mexico.	G. Steiger.	Lindren, Graton, and Gordon, U. S. G. S. P. P. 68, p. 39, 1910.	Syenite porphyry.	
12	(I)II.4″.2(3).″4.	Q 13.44 di 1.79 or 19.46 hy 6.55 ab 36.15 mt 4.18 an 15.85 il 1.82 ap 0.34	O'Leary Peak, San Francisco Mountains, Arizona.	H. H. Robinson.	H. H. Robinson, U. S. G. S. P. P. 76, p. 135, 1913.	Dacite.	
13	(I)II.4.2(3).4.	Q 17.40 di 2.07 or 16.68 hy 9.92 ab 37.20 mt 0.23 an 15.01 il 1.22	Mount Frosty, Hozumeen range, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38 (1), p. 493, 1912.	Granodiorite.	
14	(I)II.4″.2″.″4.	Q 14.28 di 1.73 or 20.57 hy 0.70 ab 36.15 mt 5.34 an 14.46 il 2.58 ap 1.01	Las Cascadas, Panama Canal Zone.	G. Steiger.	D. F. McDonald, U. S. G. S. rec. lab.	Lava.	
15	II.4″.2(3).4(5).	Q 12.66 di 8.79 or 8.34 hy 6.33 ab 44.01 mt 2.78 an 14.73 il 0.30	Cuyuni River, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Brit. Guiana, p. 61, 1908.	Augite porphyrite.	Dried at 100°.
16	″II.4(5).2″.4.	Q 10.86 di 6.32 or 13.34 hy 5.00 ab 44.02 mt 4.87 an 13.90 il 0.46 ap 0.34	Mazaruni-Purini River, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Brit. Guiana, p. 76, 1908.	Granitite.	Dried at 100°. In W. T., p. 225.
17	(I)II.4(5).2.4.	Q 13.74 di 7.40 or 16.68 hy 3.36 ab 40.68 mt 4.64 an 11.95	Chiles Volcano, Colombia.	R. Küch.	R. Küch, Geol. Stud. Col., I, p. 172, 1892.	Dacite.	In W. T., p. 225.
18	″II 4.2.4.	Q 20.28 di 7.13 or 10.56 wo 2.09 ab 41.39 mt 6.96 an 6.67 hm 1.60	Yate Volcano, Patagonia, Chile.	H. Ziegenspeck.	H. Ziegenspeck, In. Diss. Jena, p. 46, 1883.	Andesite.	In W. T., p. 227.
19	(I)II.4.2.″4.	Q 21.24 di 4.20 or 18.90 hy 4.56 ab 35.11 mt 2.55 an 10.29 il 1.22 ap 0.34	Moor of Rausch, n. Ben Nevis, Scotland.	E. G. Radley.	H. B. Maufe, G. S. Grt. Brit., Sum. Prog. (1909), p. 87, 1910.	Granite.	

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. DACASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
20	64.54	13.63	0.22	4.83	1.25	2.31	5.21	2.28	1.86	0.84	1.22	0.32	0.20	SO_3 trace F 0.06 FeS_2 1.74	100.50	
A2. II	1.076	.134	.001	.067	.031	.041	.084	.024			.015	.002	.003			
21	59.33	12.86	1.88	6.46	2.09	3.74	5.13	2.15	2.12	0.48	3.42	0.39	0.14	F 0.04 FeS. 0.22	100.44	
A2. II	.989	.126	.012	.090	.052	.067	.082	.023			.043	.003	.002			
22	63.41	16.92	2.67	2.96	2.08	4.32	5.18	2.36	0.64						100.54	
A3. III	1.057	.166	.017	.041	.052	.077	.084	.024								
23	62.37	12.04	1.87	5.81	0.97	3.51	3.47	2.34	5.54	0.44	1.06	0.30	0.24	S none NiO none BaO 0.07	100.26	
A2. II	1.040	.118	.012	.081	.024	.063	.056	.025			.013	.002	.003			
24	61.54	18.14	3.29	3.50	1.81	2.95	4.62	2.54	0.52		1.97				100.88	2.610
A3. III	1.026	.177	.021	.049	.045	.053	.074	.027			.025					
25	66.10	13.57	4.80	2.23	0.75	4.13	3.56	2.58	0.54		0.81		0.41		99.48	
A2. II	1.102	.133	.030	.031	.018	.073	.057	.028			.010		.006			
26	56.64	12.84	4.06	8.43	2.01	4.08	3.74	3.17	0.90	0.52	1.88	0.89	0.15	CO_2 0.11 S 0.24 BaO 0.10	99.76	
A1. I	.944	.126	.025	.117	.050	.073	.060	.034			.024	.006	.002			
27	64.17	14.73	0.57	5.83	2.09	3.76	3.81	3.35	2.24						100.55	
A3. III	1.070	.144	.004	.080	.052	.067	.061	.036								
28	64.13	13.57	2.40	4.11	1.45	2.91	4.31	3.46	1.45	0.37	0.99	0.56	0.06	CO_2 0.59	100.36	
A2. II	1.069	.133	.015	.057	.036	.052	.069	.037			.012	.004	—			
29	64.94	17.50	0.69	3.94	2.83	2.59	3.44	3.11	1.36						100.40	
A3. III	1.082	.172	.004	.055	.071	.047	.055	.022								
30	59.94	16.11	4.29	2.68	3.02	1.74	4.78	2.55	3.07		1.44	0.24		CO_2 0.40 SO_3 0.17	100.43	2.651
A2. II	.999	.158	.027	.038	.076	.030	.077	.027			.018	.002				
31	63.99	15.12	2.07	4.63	1.68	3.38	4.09	2.76	1.34		0.56		0.29		99.91	
A2. II	1.067	.148	.013	.064	.042	.061	.066	.030			.007		.004			
32	64.31	12.92	4.73	5.26	0.67	2.50	4.44	2.43	1.80		0.25	0.41			99.72	
A2. II	1.072	.127	.029	.073	.017	.045	.072	.026			.003	.003				
33	60.70	14.60	4.32	6.41	1.09	2.04	4.51	3.48	1.70		0.63	0.53			100.01	
A2. II	1.062	.143	.027	.089	.027	.037	.073	.037			.008	.004				
34	65.84	13.63	2.25	3.45	1.85	3.95	4.47	1.76	2.15		0.18	0.18			99.71	
A2. II	1.097	.134	.014	.048	.046	.071	.073	.019			.002	.001				
35	59.98	14.79	5.02	3.25	2.14	5.79	3.77	3.04	1.96		0.07				99.80	
A3. III	1.000	.145	.031	.045	.054	.104	.061	.032			.001					

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 4. DOSODIC. DACOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
20	(I)II.4.2.4.	Q 16.98 di 1.89 or 13.34 hy 9.27 ab 44.01 mt 0.23 an 7.23 il 2.28 ap 0.67 pr 1.74	Caribber Quarry, Linlithgow, Scotland.	G. S. Blake.	J. D. Falconer, Tr. R. Soc. Edin., XLV, p. 147, 1908.	Quartz diabase.	"Blue band."
21	II.4(5).″2.4.	Q 11.52 di 8.26 or 12.79 hy 6.00 ab 42.97 mt 2.78 an 5.84 il 6.54 ap 1.01	Kettlestoun, Linlithgow, Scotland.	G. S. Blake.	J. D. Falconer, Tr. R. Soc. Edin., XLV, p. 147, 1908.	Feldspathic diabase.	
22	(I)II.4(5).2″.4.	Q 11.88 di 4.29 or 13.34 hy 6.28 ab 44.02 mt 3.94 an 16.12	Beinn an Fhurian, Inchnadampf, Assynt, Scotland.	J. J. H. Teall.	J. J. H. Teall, Geol. Mag., XXIII, p. 350, 1886.	Hornblende porphyrite.	In W. T., p. 227.
23	II.4.2″.4.	Q 22.68 di 4.52 or 13.90 hy 7.87 ab 29.34 mt 2.78 an 10.29 il 1.98 ap 0.67	Pennygael, Island of Mull, Scotland.	E. G. Radley.	G. S. Grt. Brit., Sum. Prog. (1912), p. 69, 1913.	Glassy rock.	
24	(I)II.4.2″.4.	Q 15.96 hy 4.90 or 15.01 mt 4.87 ab 38.77 il 3.80 an 14.73 C 2.35	Chastel, Cantal, Auvergne.	F. Fouqué.	F. Fouqué, B. Soc. Min. Fr., XXV, p. 331, 1902.	Andesite.	
25	(I)II.″4.2(3).″4.	Q 27.18 di 3.89 or 15.57 wo 0.81 ab 29.87 mt 6.26 an 13.34 il 1.52 hm 0.48	Möllenäs, Ronneby, Blekinge, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 258, 1906.	Granite.	
26	II.4(5).2.(3)4.	Q 10.50 di 5.02 or 18.90 hy 11.66 ab 31.44 mt 5.80 an 8.90 il 3.65 ap 2.02	Korsudden, N. Ulfön., Nordingra, Sweden.	N. Sahlbom.	J. E. Sobral, G. Nord. Reg., p. 113, 1913.	Fayalite monzonite.	
27	″II.4.2″.(3)4.	Q 15.36 di 4.74 or 20.02 hy 11.82 ab 31.96 mt 0.93 an 13.07	Föglö, Aland, Finland.	H. Berghell.	B. Frosterus, G. F. F., XV, p. 285, 1893.	Granite.	In W. T., p. 227.
28	″II.4.2.(3)4.	Q 18.06 di 2.75 or 20.57 hy 6.20 ab 36.15 mt 3.48 an 7.51 il 1.82 ap 1.34	Kundsbakke, Bornholm Island, Denmark.	M. Dittrich.	G. Kalb, In. Diss. Grief., p. 35, 1914.	Granite.	L. Milch, pers. com.
29	(I)II.4.2(3).(3)4.	Q 20.64 hy 13.83 or 17.79 mt 0.93 ab 28.82 an 13.07 C 3.67	Lippenhof, n. Tryberg, Schwarzwald, Baden.	G. H. Williams.	G. H. Williams, N. J. B. B., II, p. 624, 1883.	Mica diorite.	In W. T., p. 227.
30	″II.4.″2.4.	Q 15.18 hy 7.60 or 15.01 mt 4.64 ab 40.35 il 2.74 an 6.39 hm 1.12 C 3.16 ap 0.67	Gerach, Fischbachthal, Saar Nahe Gebiet, Rhenish Prussia.	K. Gremse.	K. A. Lossen, Jb. Pr. G. L.-A., X, p. 290 (1889), 1892.	Porphyrite.	In W. T., p. 227.
31	″II.4.2(3).″4.	Q 17.28 di 2.10 or 16.68 hy 9.48 ab 34.58 mt 3.02 an 14.46 il 1.06	Nadelwitz, Bautzen, Saxony.	Z. Weyberg.	Z. Weyberg, Ref. N. J., 1912, I, p. 398.	Granite.	
32	″II.4.2.4.	Q 21.72 di 1.43 or 14.46 hy 6.38 ab 37.73 mt 6.73 an 8.06 il 0.46 ap 1.01	Striegau, Silesia.	F. Riegner.	F. Riegner, In. Diss. Bres., p. 27, 1909.	Schliere in granite.	Cf. No. 270, I.4.2.3.
33	II.4″.2.″4.	Q 13.38 hy 9.83 or 20.57 mt 6.26 ab 38.25 il 1.22 an 6.67 ap 1.34 C 0.92	Striegau, Silesia.	F. Riegner.	F. Riegner, In. Diss. Bres., p. 27, 1909.	Schliere in granite.	Cf. No. 270. I.4.2.3.
34	″II.4.2″.4.	Q 21.42 di 5.97 or 10.56 hy 5.87 ab 38.25 mt 3.25 an 11.68 il 0.30 ap 0.34	Ujmoldava, Krasso-Szoreny, Hungary.	K. Emszt.	Rozlozsnik and Emszt, Mt. Ung. G. A., XVI, p. 190, 1908.	Quartz diorite porphyry.	
35	II.4″.2(3).″4.	Q 13.14 di 11.55 or 17.79 hy 1.60 ab 31.96 mt 7.19 an 14.46 il 0.15	Felvacza, Comität Hunyad, Hungary.	K. Emszt.	K. Emszt, Jb. Ung. G. A., XIV, p. 337 (1904), 1906.	Quartz diorite.	Also in P. Rozlozsnik, F. K., XXXV, p. 512, 1905.

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. DACASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
36	59.24	15.79	7.43	2.53	1.38	5.41	4.94	1.89	1.50						100.11	
A3. III	.987	.155	.046	.035	.035	.096	.080	.020								
37	58.75	12.15	1.57	4.46	8.20	4.70	3.04	2.56	2.05	0.15	1.13	0.76			99.52	2.79
A2. II	.979	.119	.010	.062	.205	.084	.049	.028			.017	.005				
38	58.07	17.11	3.02	4.30	2.98	3.29	3.87	2.92	1.48		1.18	0.67	0.64		99.53	
A2. II	.968	.168	.019	.060	.075	.059	.063	.031			.015	.005	.009			
39	63.94	13.05	2.45	7.52	0.43	3.35	4.45	3.68	0.34			0.93	0.12		100.26	
A?2. II	1.066	.128	.015	.104	.011	.060	.072	.039				.006	.002			
40	61.08	13.66	0.70	5.61	4.69	4.84	3.84	2.23	0.74	0.49	1.76	0.17			99.81	
A2. II	1.018	.134	.004	.078	.117	.087	.062	.023			.022	.001				
41	55.54	11.98	5.48	9.33	1.39	4.99	3.78	2.73	0.83	1.17	1.79	0.73	0.29	FeS_2 0.12 V_2O_3 trace NiO 0.04 BaO 0.08	100.27	
A1. I	.926	.118	.034	.129	.035	.089	.061	.029			.022	.005	.004			
42	64.06	15.25	2.72	4.30	1.30	3.93	4.37	2.78	1.70		0.18				100.59	2.352
A3. III	1.068	.149	.017	.059	.032	.070	.070	.031			.002					
43	64.87	16.65	1.46	4.21	1.42	2.88	5.09	1.87	0.10	0.04	1.08	0.23			99.90	
A2. II	1.081	.163	.009	.058	.036	.051	.082	.020			.014	.002				
44	63.44	15.56	1.59	3.75	2.09	4.60	5.30	2.60	0.33		0.97	0.22			100.45	
A2. II	1.057	.153	.010	.052	.052	.082	.085	.028			.012	.002				
45	66.10	14.30	1.17	5.23	1.04	2.41	3.06	2.42	3.25		0.98	0.15			100.11	
A2. II	1.102	.140	.007	.072	.026	.043	.049	.026			.012	.001				
46	67.66	15.39	2.00	2.87	2.48	2.70	3.59	2.66	0.80				0.04		100.19	2.731
A3. III	1.128	.151	.013	.040	.062	.048	.058	.029					—			
47	66.85	14.17	3.83	0.80	1.82	4.28	4.64	2.68	0.12				0.21		99.40	2.499
A3. III	1.114	.139	.024	.011	.046	.077	.075	.029					.003			
48	64.27	14.72	1.48	5.28	2.88	3.08	3.47	2.81	1.08		0.33	0.35			99.75	
A2. II	1.071	.144	.009	.074	.072	.055	.056	.030			.004	.002				
49	61.91	16.26	2.45	3.96	1.81	4.35	4.40	3.04	0.18	0.10	0.79	0.40	0.20	ZrO_2 none Cl 0.13 F 0.04 S 0.05 Cr_2O_3 none BaO 0.02 SrO 0.06	100.15	
A1. I	1.032	.160	.015	.055	.045	.078	.071	.032			.010	.003	.003			
50	60.13	17.41	4.30	1.68	2.27	3.36	4.88	2.46	n. d.		1.10		0.40	$CaSO_4$ 1.57	99.56	2.607
A2. II	1.002	.171	.027	.024	.057	.060	.079	.027			.014		.006			
51	63.58	14.57	1.52	5.92	1.60	4.58	4.86	2.02	0.31		0.71	0.34	trace		100.01	
A2. II	1.060	.143	.010	.082	.040	.082	.078	.021			.009	.002	—			

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 4. DOSODIC. DACOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
36	″II.4(5).2(3).4.	Q 12.06 di 7.56 or 11.12 wo 0.70 ab 41.92 mt 8.12 an 15.29 hm 1.76	Allochet, Monzoni, Tyrol.	J. A. Ippen.	J. A. Ippen, N. J. Cb., 1903, p. 386.	Diorite porphyrite.	
37	II(III).4″.2(3).(3)4	Q 10.68 di 5.62 or 15.57 hy 22.40 ab 25.68 mt 2.32 an 11.68 il 2.58 ap 1.68	Val Ufirn, Ponteglia region, Graubünden, Switzerland.	L. Hezner.	F. Weber, U. Grubenmann, pers. com.	Syenitic lamprophyre.	
38	II.4″.2.″4.	Q 12.60 hy 12.12 or 17.24 mt 4.41 ab 33.01 il 2.28 an 11.68 ap 1.68 C 3.26	Sondalo, Valtellina, Lombardy.	A. Zapf.	A. Zapf, In. Diss. Jena, p. 22, 1910.	Granodiorite.	
39	II.4″.(1)2.(3)4.	Q 14.46 di 5.51 or 21.68 hy 10.17 ab 37.73 mt 3.48 an 4.73 ap 2.02	Eruption of 1888–89, Vulcano, Aeolian Islands.	L. Ricciardi.	G. Mercalli, Gior. Min., III, p. 107, 1892.	Andesite.	Bomb. In W. T., p. 227.
40	II.4″.2(3).4.	Q 12.36 di 7.91 or 12.79 hy 14.71 ab 32.49 mt 0.93 an 13.62 il 3.34 ap 0.34	Near Rione Pranu Pira, Monte Arci, Sardinia.	H. S. Washington.	H. S. Washington, A. J. S., XXXVI, p. 587, 1913.	Hypersthene andesite.	
41	II″.4″.2.″4.	Q 10.44 di 10.49 or 16.12 hy 8.27 ab 31.96 mt 7.89 an 7.78 il 3.34 ap 1.68	Shcheliki, Olonez, Russia.	W. Wahl.	W. Wahl, Fennia, XXIV, No. 3, p. 40, 1908.	Quartz diabase.	
42	(I)II.4.2″.4.	Q 16.32 di 5.13 or 17.24 hy 5.90 ab 36.68 mt 3.94 an 13.34 il 0.30	Kakoperato, Aegina, Greece.	A. Röhrig.	H. S. Washington, J. G., III, p. 150, 1895.	Dacite.	In W. T., p. 227.
43	(I)II.4.2.4.	Q 18.60 hy 8.22 or 11.12 mt 2.09 ab 42.97 il 2.14 an 12.23 ap 0.67 C 1.73	Giorgiokameni, Santorini, Greece.	H. S. Washington.	H. S. Washington, XII, Cong. G. Int., C. R. 1913.	Andesite.	
44	″II.4(5).2.4.	Q 10.92 di 7.98 or 15.57 hy 5.24 ab 44.54 mt 2.32 an 11.12 il 1.82 ap 0.67	Kilometer 437, Konakry-Niger Railway, French Guinea.	Not stated.	Col. Azema, C. R. Cong. Soc. Sav., p. 161, 1912.	Granite.	
45	(I)II.(3)4.2(3).(3)4.	Q 29.58 hy 9.60 or 14.56 mt 1.62 ab 25.68 il 1.82 an 11.12 ap 0.34 C 2.55	Manombra River, Sakalave region, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVII, p. 19, 1913.	Cordierite dacite.	
46	(I)II.4.2(3).″4.	Q 25.26 hy 9.76 or 16.12 mt 3.02 ab 30.39 an 13.34 C 1.63	Boeloer Kasap, Sumatra.	L. Serrurier.	R. D. M. Verbeek, Sum. Westk., p. 232, 1883.	Syenite-granite.	Not in W. T.
47	(I)II.4.2.4.	Q 19.92 di 9.07 or 16.12 hy 0.40 ab 39.30 mt 3.25 an 9.73 hm 1.60	Sello River, Sumatra.	J. J. Penniok.	R. D. M. Verbeek, Sum. Westk., p. 516, 1883.	Andesite, pitchstone.	Not in W. T.
48	II.4.2″.(3)4.	Q 19.56 hy 15.25 or 16.68 mt 2.09 ab 29.34 il 0.61 an 13.34 ap 0.67	Lau Alas, Sumatra.	F. Riegner.	F. Riegner, In. Diss. Bres., p. 49, 1909.	Schliere in granite.	Cf. No. 356, I.4.2.3.
49	″II.4(5).2″.4.	Q 12.66 di 2.54 or 17.79 hy 7.60 ab 37.20 mt 3.48 an 15.85 il 1.52 ap 1.01	Simaboer, Merapi, Sumatra.	E. W. Morley.	J. P. Iddings, Igneous Rocks, II, p. 625, 1913.	Andesite, pitchstone.	Also in Iddings and Morley, J. G., XXIII, p. 240, 1915.
50	(I)II.4(5).2(3).4.	Q 10.74 hy 5.70 or 15.01 mt 3.71 ab 41.39 il 2.13 an 18.07 hm 1.76 C 0.52	Eruption of 1883, Krakatoa.	C. Winkler.	R. D. M. Verbeek, Krakatau, p. 292, 1884.	Andesite ash.	In W. T., p. 429.
51	II.4″.2.4.	Q 14.64 di 7.31 or 11.68 hy 8.61 ab 40.87 mt 2.32 an 12.23 il 1.37 ap 0.67	Saipan Island, Mariana Islands.	Klüss.	E. Kaiser, Jb. Pr. G. L.-A., XXIV, p. 120, 1907.	Andesite obsidian.	

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. DACOSE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
52	62.44	15.84	3.54	4.82	1.39	4.06	4.78	2.37	0.74		0.28	0.33	trace		100.59	
A2. II	1.041	.155	.022	.067	.035	.066	.077	.026			.004	.002	—			
53	58.77	14.62	5.61	3.16	2.66	6.25	3.82	3.11	1.38		0.05	0.32	0.11	CO_2 0.11	99.97	2.597
A2. II	.980	.143	.035	.044	.067	.112	.061	.033			.001	.002	.002			
54	67.33	14.03	1.86	2.88	2.47	2.72	4.36	1.71	1.76	0.10	0.65	0.22	0.03	CO_2 0.03 ZrO_2 none SO_3 none Cl none S none Cr_2O_3 none NiO trace BaO 0.04 SrO trace	100.19	2.731
A1. I	1.122	.137	.012	.040	.062	.048	.070	.018			.008	.002	—			
55	61.24	14.33	1.81	6.09	3.45	5.07	3.75	3.13	0.28	0.17	0.52	0.51	trace		100.35	2.57
A2. II	1.021	.140	.011	.085	.086	.091	.061	.033			.007	.004	—			
56	63.08	15.10	1.72	4.45	2.67	2.83	4.37	3.86	0.58	0.10	0.68		0.23	CO_2 0.11 FeS_2 0.17	99.95	2.71
A2. II	1.051	.148	.011	.062	.067	.051	.071	.041			.009		.003			
57	59.35	17.85	5.92	1.23	2.02	7.72	2.55	1.41	0.70	0.44	0.75	0.16	0.05		100.15	
A2. II	.989	.175	.037	.017	.051	.138	.041	.015			.009	.001	—			
58	63.34	15.24	5.15	2.06	0.82	3.30	6.28	2.38	1.78		0.53				100.88	
A3. III	1.056	.149	.032	.029	.021	.059	.102	.026			.007					
59	54.44	12.83	8.32	5.41	2.66	6.90	4.34	1.58	1.58		2.68				100.74 (100.69)	
A3. III	.908	.126	.052	.075	.067	.123	.070	.017			.034					
60	60.19	16.12	3.97	3.07	2.14	4.35	5.22	1.97	1.38		1.15	0.30			99.85	
A2. II	1.003	.158	.025	.043	.054	.078	.084	.021			.014	.002				

RANG 2. DOMALKALIC. DACASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	57.39	15.84	5.68	2.98	2.41	5.24	5.23	0.84	1.74	1.09	1.35	0.68	0.18	CO_2 trace ZrO_2 trace Cl 0.05 F trace S 0.01 V_2O_3 trace BaO 0.02	100.73	2.57
A1. I	.957	.155	.036	.042	.060	.094	.084	.009			.017	.005	.003			
2	67.61	14.54	1.13	3.44	1.39	3.18	5.63	0.82	1.48		0.72	0.09	0.16	CO_2 0.06 ZrO_2 none Cl 0.02 S none CoO none BaO 0.11 Cu, Pb none	100.38	
A1. I	1.127	.142	.007	.047	.035	.057	.091	.009			.009	—	.002			
3	62.22	15.39	4.23	2.11	1.24	4.52	6.06	0.93	3.32						100.02	
A3. III	1.037	.151	.026	.029	.031	.080	.098	.010								
4	70.95	14.29	1.19	n. d.	4.20	2.19	5.20	0.77	2.27						101.06	
A4. IV	1.183	.140	.008	(.016)	.105	.039	.084	.008								

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 4. DOSODIC. DACOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
52	"II.4".2".4.	Q 14.28 di 1.64 or 14.46 hy 8.08 ab 40.35 mt 5.10 an 14.46 il 0.61 ap 0.67	Simpson Harbor, New Britain, Bismarck Archipelago.	A. Lindner.	E. Lehmann, T. M. P. M., XXVII, p. 222, 1908.	Andesite.	
53	II.4(5).2".(3)4.	Q 11.10 di 12.32 or 18.35 hy 2.20 ab 31.96 mt 8.12 an 13.62 il 0.15 ap 0.67	Watom Island, New Britain, Bismarck Archipelago.	A. Lindner.	E. Lehmann, T. M. P. M., XXVII, p. 225, 1908.	Andesite.	
54	(I)II.4.2".4.	Q 25.80 hy 8.84 or 10.01 mt 2.78 ab 36.68 il 1.22 an 11.40 ap 0.67 C 0.82	Cooma, New South Wales.	Not stated.	Dep. Mines N. S. W. A. R. (1908), p. 184, 1909.	Quartz porphyry.	
55	II.4(5).2".(3)4.	Q 10.56 di 7.36 or 18.35 hy 14.32 ab 31.96 mt 2.55 an 12.79 il 1.06 ap 1.34	Observation Hill, Tweed Heads, New South Wales.	N. H. Christensen.	A. R. Agric. Chem. Qld., 1914.	Andesite.	H. C. Richards, pers. com.
56	"II.4(5).2.(3)4.	Q 10.80 di 3.37 or 22.80 hy 11.01 ab 37.20 mt 2.55 an 10.01 il 1.37	Musquito Creek, Pilbara, West Australia.	J. H. Brooking.	A. G. Maitland, W. Aust. G. S., B. 15, p. 12, 1904.	Granite.	
57	(1)II.4."2.4.	Q 20.88 di 3.40 or 8.34 hy 3.50 ab 21.48 mt 1.86 an 33.08 il 1.37 hm 4.64 ap 0.34	Waimata River, Aroha, Hauraki, New Zealand.	Surv. lab.	Henderson and Bartrum, N. Z. G. S. B. 16, p. 75, 1913.	Andesite.	
58	(I)II.4(5).(1)2.4.	Q 11.22 di 4.54 or 14.46 wo 1.97 ab 53.45 mt 5.10 an 5.84 il 1.06 hm 1.60	Mount Honey, Campbell Island.	P. Marshall.	P. Marshall, Subant. Islds., p. 692, 1909.	Trachyte.	
59	II".4(5).2.4.	Q 9.42 di 14.47 or 9.45 wo 1.97 ab 36.68 mt 9.51 an 10.84 il 5.17 hm 1.76	Mount Lyall, Campbell Island.	P. Marshall.	P. Marshall, Subant. Islds., p. 697, 1909.	"Melilite basalt."	Melilite? Interchange of specimens? Incorrect identification?
60	"II.4(5).2".4.	Q 11.46 di 3.92 or 11.68 hy 4.10 ab 44.01 mt 5.80 an 14.73 il 2.13 ap 0.67	Jenny Island, Weddell Land, Antarctica.	Boiteau.	E. Gourdon, pers. com.	Andesite.	

SUBRANG 5. PERSODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.4".2(3).(4)5.	Q 12.00 di 3.24 or 5.00 hy 4.50 ab 44.01 mt 6.50 an 17.24 il 2.58 hm 1.28 ap 1.68	Point Far Fan, Panama.	R. C. Wells.	D. F. McDonald, U. S. G. S. rec. lab.	Andesite.	
2	(I)II.4.2."5.	Q 21.36 di 3.46 or 5.00 hy 6.13 ab 47.68 mt 1.62 an 11.68 il 1.37	Cuyuni River, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Brit. Guiana, p. 39, 1908.	Granite gneiss.	
3	(I)II.4".2."5.	Q 13.92 di 7.44 or 5.56 wo 0.35 ab 51.35 mt 6.03 an 11.95	Ottischniggberg, Bachergebirge, Styria.	B. Trobei.	B. Trobei, Mt. Nw. Ver. Steierm., XLIV, p. 192 (1907), 1908.	Granite porphyry.	
4	(I)II.4.2."5.	Q 25.92 hy 12.61 or 4.45 ab 44.01 an 10.84 C 0.92	Koswinsky Kamen, North Ural Mountains.	L. Duparc.	Duparc and Pearce, Oural Nord, I, p. 167, 1902.	Plagiaplite.	

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. DACOSE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
5	69.19	13.50	1.34	2.06	1.28	5.21	5.59	0.89	1.25						100.31	
A3. III	1.153	.132	.008	.029	.032	.093	.090	.010								
6	61.41	15.61	2.45	5.48	2.55	5.02	5.90	0.42	1.24						100.08	
A3. III	1.024	.153	.016	.076	.064	.089	.095									

RANG 3. ALKALICALCIC. TONALASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	61.05	16.03	5.42	0.98	3.03	5.40	1.43	5.58	0.81			0.30		BaO 0.08	100.11	
A2. II	1.018	.157	.034	.014	.076	.096	.023	.060				.002				

RANG 3. ALKALICALCIC. TONALASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	57.92	16.71	4.08	4.26	1.70	3.86	3.68	3.50	1.19		2.13	0.16	0.13	FeS_2 0.64	99.96	
A2. II	.965	.164	.026	.059	.043	.069	.060	.037			.027	.001	.002			
2	60.52	16.99	0.60	6.53	1.59	4.58	2.83	3.91	0.88			0.74	0.25	ZrO_2 trace Cr_2O_3 trace	99.42	
A2. II	1.009	.167	.004	.090	.040	.082	.045	.041				.005	.003			
3	56.20	15.46	1.54	9.76	1.83	5.39	2.78	2.56	0.59	0.16	2.25	1.13	0.13	CO_2 none SO_3 trace Cl trace F trace S 0.07 BaO 0.17 SrO trace Li_2O none	100.02	
A1. I	.937	.151	.010	.137	.046	.096	.045	.027			.027	.008	.002			
4	58.77	13.12	5.45	6.87	4.93	5.99	1.94	2.83	0.45				trace		100.35	
A3. III	.980	.129	.034	.096	.123	.107	.031	.030					——			
5	64.34	15.72	1.62	2.94	2.17	4.24	2.76	4.04	0.76	0.25	0.53	0.14	0.12	CO_2 0.03 ZrO_2 0.02 S 0.03 BaO 0.06 SrO 0.03 Cu trace	99.80	
A1. I	1.072	.154	.010	.041	.054	.076	.044	.042			.007	.001	.002			
6	63.88	15.84	2.11	2.59	2.13	3.97	2.81	4.23	0.66	0.22	0.65	0.21	0.07	SO_3 0.34 Cl trace BaO 0.09 SrO 0.02	99.82	
A1. I	1.065	.155	.013	.036	.053	.071	.045	.045			.008	.001	.001			
7	63.87	15.39	1.93	3.08	2.23	4.30	2.76	4.18	0.69	0.19	0.65	0.17	0.11	CO_2 0.15 ZrO_2 0.03 S 0.07 BaO 0.07 SrO 0.04 Cu trace	99.91	
A1. I	1.065	.151	.012	.043	.056	.077	.044	.045			.008	.001	.002			
8	61.64	15.63	3.39	2.69	2.82	4.90	2.64	3.72	0.91	0.28	0.71	0.21	0.04	CO_2 none SO_3 none BaO 0.08 SrO 0.04	99.70	
A1. I	1.027	.153	.021	.038	.071	.087	.042	.039			.009	.001	——			
9	64.17	15.25	2.16	2.98	2.60	4.24	2.62	4.34	0.65	0.16	0.67	0.16	0.04	CO_2 none SO_3 0.07 Cl trace BaO 0.07 SrO trace	100.18	
A1. I	1.070	.149	.014	.042	.065	.076	.042	.046			.008	.001	——			
10	60.84	16.36	2.40	3.23	3.85	4.96	2.90	4.10	1.03	0.48					100.05	
A3. III	1.014	.160	.015	.044	.096	.089	.047	.044								

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 5. PERSODIC—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
5	(I)II.4.2.(4)5.	Q 22.50 di 12.12 or 5.56 wo 0.93 ab 47.16 mt 1.86 an 8.90	Dshaksy Tau Mountains, Mugodjaren, S. Ural Mountains.	Loewinson-Lessing.	E. Jeremina, Exp. Mugo., p. 127, 1905.	Quartz diorite.	
6	II.4(5).2″.5.	Q 9.48 di 8.36 or 2.78 hy 10.14 ab 49.78 mt 3.71 an 14.73	Dau, Mugodjaren, S. Ural Mountains.	Leberta.	Jeremina and L.-Lessing, Trav. Soc. Nat. St. P., XXXIII, p. 159, 1905.	Spherulite rock.	

SUBRANG 2. DOPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″II.4.3.2.	Q 16.86 di 3.24 or 33.36 hy 6.10 ab 12.05 mt 3.25 an 20.57 il 3.20 ap 0.67	Swett Hill, Iron Springs District, Utah.	R. D. Hall.	Leith and Harder, U. S. G. S. B. 338, p. 58, 1908.	Dacite.	

SUBRANG 3. SODIPOTASSIC. HARZOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″II.4(5).″3.3(4).	Q 12.00 hy 5.36 or 20.57 mt 6.03 ab 31.44 il 4.10 an 18.35 ap 0.34 C 0.10 pr 0.64	Pim Island, Rice Strait, Ellesmere Land.	P. Schei.	C. Bugge, 2nd Fram. Exp., No. 22, p. 18, 1910.	Kersantite.	
2	″II.4″.″3.3.	Q 14.04 hy 15.75 or 22.80 mt 0.93 ab 23.58 ap 1.68 an 18.07 C 1.63	Milams Gap, Virginia.	W. C. Phalen.	W. C. Phalen, Smiths. Misc. Coll., XLV, p. 311, 1904.	Hypersthene akerite.	
3	II.4.3.3(4).	Q 13.14 hy 18.06 or 14.01 mt 2.32 ab 23.58 il 4.10 an 19.18 ap 2.69 C 1.02	Near Walleska, Cherokee County, Georgia.	H. N. Stokes.	A. H. Brooks, U. S. G. S. B. 168. p. 55, 1900.	Quartz gabbro.	In W. T., p. 229.
4	II″.4.3.3.	Q 15.24 di 8.84 or 16.68 hy 16.17 ab 16.24 mt 7.89 an 18.90	St. Cloud, Minnesota.	Dodge and Sidener.	M. Wadsworth, Minn. G. N. H. S. B. 2, p. 86, 1897.	Gabbro.	Dark portion, Cf. No. 12, II.4.3.4. In W. T., p. 229.
5	(I)II.4.3.3.	Q 20.10 di 1.14 or 23.35 hy 8.27 ab 23.06 mt 2.32 an 18.90 il 1.06 ap 0.34	Atlantic Mine, Butte, Montana.	H. N. Stokes.	W. H. Weed, U. S. G. S. P. P. 74, p. 33, 1912.	Quartz monzonite.	Also in J. G., VII, p. 739, 1899. In W. T., p. 229.
6	(I)II.4.″3.3	Q 19.38 di 0.68 or 25.02 hy 7.08 ab 23.58 mt 3.02 an 18.07 il 1.22 ap 0.34	Walkerville Station, Butte, Montana.	H. N. Stokes.	W. H. Weed, U. S. G. S. P. P. 74, p. 33, 1912.	Quartz monzonite.	Also in J. G., VII, p. 739, 1899. In W. T., p. 229.
7	(I)II.4.″3.3.	Q 18.84 di 2.72 or 25.02 hy 7.57 ab 23.06 mt 2.78 an 17.23 il 1.22 ap 0.34	Alice Mine, Butte, Montana.	H. N. Stokes.	W. H. Weed, U. S. G. S. P. P. 74, p. 33, 1912.	Quartz monzonite.	Also in J. G., VII, p. 739, 1899. In W. T., p. 229.
8	(I)II.4.3.3.	Q 17.76 di 0.43 or 21.68 hy 7.96 ab 22.01 mt 4.87 an 22.80 il 1.37 ap 0.34	Red Rock Creek, Boulder Mountains, Montana.	H. N. Stokes.	W. H. Weed, U. S. G. S. P. P. 74, p. 33, 1912.	Quartz monzonite.	Also in J. G., VII, p. 739, 1899. In W. T., p. 229.
9	(I)II.4.″3.3.	Q 19.38 di 2.69 or 25.58 hy 7.84 ab 22.01 mt 3.25 an 16.96 il 1.22 ap 0.34	Frohner Mine, S. of Helena, Boulder Mountains, Montana.	H. N. Stokes.	W. H. Weed, U. S. G. S. P. P. 74, p. 33, 1912.	Quartz monzonite.	Also in J. G., VII, p. 739, 1899. In W. T., p. 229.
10	II.4(5).″3.3.	Q 11.10 di 4.48 or 24.46 hy 11.27 ab 24.63 mt 3.48 an 19.18	Elkhorn District, Montana.	E. C. Sullivan.	W. H. Weed, U. S. G. S. B. 419, p. 93, 1910.	Mica diorite.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. TONALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
11	59.64	16.64	2.33	4.35	2.10	4.59	3.31	4.16	0.69	0.14	1.08	0.49	trace	CO_2 none S 0.01 Cr_2O_3 none BaO 0.10 SrO 0.05 Li_2O trace	99.68	
A1. I	.994	.163	.014	.061	.053	.082	.053	.045			.014	.004	—			
12	59.83	15.86	4.07	2.12	2.73	4.34	3.00	3.55	2.04	1.09	0.70	0.31	0.06	CO_2 0.59 ZrO_2 none NiO none BaO 0.08 SrO 0.02	100.39	
A1. I	.997	.155	.026	.029	.068	.078	.048	.038			.009	.002	—			
13	56.03	15.97	4.78	3.00	3.36	6.44	2.85	3.29	1.08	1.31	1.01	0.48	0.16	S none BaO 0.08 SrO 0.04	99.88	
A1. I	.934	.157	.030	.042	.084	.115	.048	.035			.013	.003	.002			
14	63.46	15.93	2.61	2.31	2.27	4.33	3.66	3.49	0.74	0.27	0.62	0.16	0.09	CO_2 trace ZrO_2 0.03 SO_3 none Cl 0.05 Cr_2O_3 none BaO 0.15	100.17	
A1. I	1.058	.156	.016	.032	.057	.077	.059	.037			.008	.001	.001			
15	60.17	15.78	3.42	2.95	2.52	4.69	2.96	4.16	1.23	0.25	0.87	0.40	0.11	Cl 0.04 V_2O_3 0.01 BaO 0.14 SrO 0.09 Li_2O trace	99.79	
A1. I	1.003	.154	.021	.042	.063	.084	.048	.045			.011	.003	.001			
16	62.08	16.61	1.53	3.72	2.44	5.20	3.18	3.29	1.00	0.16	0.73	0.30	0.11	BaO 0.09 SrO 0.03	100.47	2.754
A2. II	1.035	.163	.010	.051	.061	.093	.052	.035			.009	.002	.002			
17	60.27	17.17	2.36	3.67	2.45	6.49	2.92	3.25	0.23	0.15	0.63	0.20	0.14	BaO 0.04 SrO 0.04	100.01	2.785
A2. II	1.005	.168	.015	.051	.061	.116	.047	.035			.008	.001	.002			
18	63.85	15.84	1.91	2.75	2.07	4.76	3.29	3.08	1.65	0.28	0.58	0.13	0.07	FeS_2 0.04 BaO 0.06 SrO trace Li_2O trace	100.36	
A1. I	1.064	.155	.012	.039	.052	.085	.053	.033			.007	.001	.001			
19	57.80	16.43	1.62	6.51	4.14	7.21	2.35	2.29	0.31	0.11	0.70	0.19	0.18	CO_2 none S none NiO 0.03 BaO 0.09 SrO trace	100.03	
A1. I	.963	.161	.010	.090	.104	.128	.038	.024			.009	.001	.003			
20	57.26	16.51	3.27	5.19	3.41	6.69	2.65	2.93	0.95	0.20	0.53	0.30	0.18	BaO 0.10 SrO 0.06 Li_2O trace	100.23	
A1. I	.954	.162	.020	.072	.085	.120	.043	.031			.007	.002	.003			
21	62.97	15.52	4.03	1.45	2.07	5.31	3.31	3.46	0.48	0.66	0.67	0.18	0.10	CO_2 0.18 ZrO_2 trace S trace BaO 0.09 SrO 0.02	100.50	
A1. I	1.050	.152	.025	.020	.052	.095	.053	.037			.008	.001	.001			
22	61.25	15.92	3.75	1.17	2.28	5.39	3.19	3.23	1.88	1.08	0.71	0.22	0.08	CO_2 none	100.15	
A2. II	1.021	.156	.024	.017	.057	.096	.052	.034			.009	.002	.001			
23	59.79	17.70	2.42	2.76	1.92	5.22	2.64	4.19	2.00			0.37	0.09	BaO 0.21	99.31	
B2. III	.997	.174	.015	.039	.048	.093	.043	.045				.003	.001			
24	58.55	15.48	3.93	2.07	3.60	6.44	1.69	3.99	3.62		0.83	0.30	0.11		100.61	2.71
A2. II	.976	.152	.024	.030	.090	.115	.027	.042			.010	.002	.002			
25	62.07	16.03	0.80	4.76	3.34	5.45	3.07	2.80	0.55	0.26	0.80	0.10		S 0.01	100.04	
A2. II	1.035	.157	.005	.066	.084	.097	.050	.030			.010	.001				

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 3. SODIPOTASSIC. HARZOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
11	"II.4(5).(2)3.3.	Q 11.16 di 0.92 or 25.02 hy 9.19 ab 27.77 mt 3.25 an 18.07 il 2.13 ap 1.34	Elkhorn Mountain, Elkhorn District, Montana.	H. N. Stokes.	J. S. Barrell, U. S. G. S. A. R. 22, II, p. 525, 1901.	Andesite.	
12	(I)II.4.(2)3.3.	Q 18.06 hy 6.80 or 21.13 mt 4.64 ab 25.15 il 1.37 an 15.57 hm 0.96 C 1.33 ap 0.67 cc 1.40	Wetterhorn Peak, Ouray quadrangle, Colorado.	G. Steiger.	Cross and Howe, U. S. G. S. Fol. 153, p. 12, 1907.	Quartz-biotite latite.	
13	II.4(5).3.3".	Q 10.26 di 6.70 or 19.46 hy 5.56 ab 25.15 mt 6.96 an 20.57 il 1.98 ap 1.01	Dolly Vardon Mine, Henson Creek, Silverton, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. Fol. 120, p. 9, 1905.	Quartz latite.	
14	(I)II.4.(2)3.3(4).	Q 16.92 di 3.09 or 20.57 hy 5.42 ab 30.92 mt 3.71 an 16.68 il 1.22 ap 0.34	Brighton Gap, Park City District, Utah.	W. F. Hillebrand.	J. M. Boutwell, U. S. G. S. P. P. 77, p. 79, 1912.	Quartz diorite.	
15	"II.4".(2)3.3.	Q 14.16 di 2.87 or 25.02 hy 6.39 ab 25.15 mt 4.87 an 16.96 il 1.67 ap 1.01	Tintic Mountain, Tintic District, Utah.	H. N. Stokes.	Tower and G. O. Smith, U. S. G. S. A. R. 19, III, p. 641, 1899.	Andesite.	Also in U. S. G. S. Fol. 65, p. 3, 1900. In W. T., p. 229.
16	"II.4".3.3".	Q 15.36 di 2.29 or 19.46 hy 9.46 ab 27.25 mt 2.32 an 21.13 il 1.37 ap 0.67	Trail, W. Kootenai District, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38 (1), p. 347, 1912.	Granodiorite.	
17	"II.4".3.3".	Q 13.50 di 6.55 or 19.46 hy 6.87 ab 24.63 mt 3.48 an 23.35 il 1.22 ap 0.34	Bayonne Batholith, Nelson Range, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38 (I), p. 291, 1912.	Granodiorite.	
18	(I)II.4.3.3(4).	Q 19.44 di 2.94 or 18.35 hy 6.54 ab 27.77 mt 2.78 an 19.18 il 1.06 ap 0.34	Grass Valley, Nevada County, California.	W. F. Hillebrand.	W. Lindgren, U. S. G. S. A. R. 17, II, p. 44, 1896.	Granodiorite.	In W. T., p. 229.
19	II.4(5).3(4).3(4).	Q 10.74 di 6.00 or 13.34 hy 18.50 ab 19.91 mt 2.32 an 27.52 il 1.37 ap 0.34	Sonora, Tuolumne County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 17, I, p. 724, 1896.	Quartz diorite.	In W. T., p. 229.
20	II.4(5).3.3".	Q 10.56 di 5.69 or 17.23 hy 12.05 ab 22.53 mt 4.64 an 24.46 il 1.06 ap 0.67	Milton, Sierra County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 17, I, p. 724, 1896.	Quartz diorite.	In W. T., p. 229.
21	(I)II.4."3."3.	Q 18.18 di 6.48 or 20.57 hy 2.30 ab 27.77 mt 2.78 an 17.24 il 1.22 hm 2.08 ap 0.34	Coyote Springs, Pah-Ute Range, Nevada.	W. F. Hillebrand.	J. E. Spurr, U. S. G. S. B. 228, p. 206, 1904.	Quartz latite.	
22	(I)II.4.3.3(4).	Q 17.28 di 4.10 or 18.90 hy 3.90 ab 27.25 mt 1.62 an 19.46 il 1.37 hm 2.72 ap 0.67	Diamond Peak, Goldfield District, Nevada.	G. Steiger.	F. L. Ransome, U. S. G. S. P. P. 66, p. 56, 1909.	Dacite.	
23	(I)II.4".3.3.	Q 13.50 hy 7.97 or 25.02 mt 3.48 ab 22.53 ap 0.84 an 23.91	Lane City, Egan Range, Nevada.	H. Ross.	A. C. Lawson, Un. Cal., Dep. G. B., IV, p. 310, 1906.	Monzonite porphyry.	
24	II.4.3.(2)3.	Q 16.86 di 5.40 or 23.35 hy 6.50 ab 14.15 mt 5.10 an 23.07 il 1.52 hm 0.32 ap 0.67	Cedar Hill Ridge, Washoe, Nevada.	G. E. Moore.	G. F. Becker, U. S. G. S. Mon. 2, Table I, 1882.	Andesite.	In W. T., p. 229.
25	II.4.3.3(4).	Q 14.94 di 3.86 or 16.68 hy 13.24 ab 26.20 mt 1.16 an 21.41 il 1.52 ap 0.34	Cerro de Perico, n. Jorullo Volcano, Mexico.	F. Roel.	E. Ordonez, Cong. G. Int. X, Guide XI, p. 55, 1906.	Diorite.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. TONALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
26	61. 52	16. 00	2. 93	2. 05	2. 03	6. 72	3. 09	3. 83	0. 16		0. 78	0. 45		CO_2 0. 45 S trace SrO 0. 11	100. 12	
A2. II	1. 025	. 157	. 018	. 029	. 051	. 120	. 050	. 040			. 010	. 003				
27	61. 55	14. 01	0. 37	7. 27	5. 26	4. 80	2. 29	2. 52	0. 45		0. 28	0. 02	0. 46	CO_2 0. 19 ZrO_2 0. 01 Cl 0. 05 BaO 0. 61	100. 14	
A1. I	1. 026	. 137	. 002	. 101	. 132	. 086	. 037	. 027			. 003	—	. 007			
28	57. 92	16. 04	5. 81	3. 13	2. 19	4. 42	3. 28	4. 15	2. 08		0. 67	0. 39		BaO trace	100. 08	2. 740
A2. II	. 965	. 157	. 036	. 043	. 055	. 079	. 053	. 044			. 008	. 003				
29	61. 27	16. 37	4. 59	1. 18	2. 29	4. 44	3. 34	3. 41	2. 00		0. 64	0. 12	trace	X 0. 85 Li_2O trace	100. 50	2. 631
A2. II	1. 021	. 160	. 029	. 016	. 057	. 079	. 053	. 036			. 008	. 001	—			
30	61. 03	16. 55	2. 34	2. 66	1. 98	3. 98	3. 62	3. 74	3. 52		0. 79		trace	SrO trace	100. 21	2. 665
A3. III	1. 017	. 162	. 015	. 037	. 050	. 071	. 058	. 039			. 010		—			
31	62. 6	17. 7	1. 2	3. 3	3. 4	4. 6	2. 5	3. 7	0. 7						99. 7	2. 76
B3. IV	1. 043	. 174	. 007	. 046	. 085	. 082	. 040	. 039								
32	59. 21	14. 06	2. 66	4. 87	3. 71	5. 95	2. 06	2. 83	1. 49	2. 06	1. 06	0. 20	0. 24	S none NiO none BaO 0. 03	100. 43	
A1. I	. 987	. 138	. 017	. 068	. 093	. 106	. 033	. 030			. 013	. 001	. 003			
33	58. 85	16. 41	1. 00	8. 85	2. 63	3. 99	3. 02	2. 76	1. 01		2. 03	0. 06			100. 61	
A2. II	. 981	. 161	. 006	. 123	. 066	. 071	. 048	. 030			. 025	—				
34	60. 80	18. 10	0. 70	3. 87	4. 92	4. 71	2. 32	2. 58	2. 89						100. 88	
A3. III	1. 013	. 177	. 004	. 054	. 123	. 084	. 037	. 028								
35	63. 55	15. 60	trace	5. 10	3. 65	4. 49	2. 55	2. 92	1. 50		0. 91	0. 19			100. 46	
A2. II	1. 059	. 153	—	. 071	. 091	. 080	. 041	. 031			. 011	. 001				
36	62. 75	15. 43	0. 29	3. 47	3. 09	5. 00	2. 37	5. 12	1. 01		0. 81	0. 43			99. 79	
A2. II	1. 046	. 151	. 002	. 049	. 077	. 089	. 039	. 054			. 010	. 003				
37	55. 95	19. 35	4. 60	3. 00	2. 52	5. 40	2. 86	2. 64	1. 05		2. 80		0. 21		100. 38	
A2. II	. 933	. 190	. 029	. 042	. 063	. 096	. 046	. 028			. 034		. 003			
38	63. 74	14. 87	3. 72	2. 21	1. 93	4. 90	3. 06	3. 29	0. 94		0. 69	0. 36	0. 15		99. 86	
A2. II	1. 062	. 146	. 023	. 031	. 048	. 088	. 049	. 035			. 009	. 002	. 002			
39	61. 44	17. 00	1. 90	3. 39	1. 73	4. 26	3. 01	4. 90	0. 65		1. 14		0. 75		100. 17	
A2. II	1. 024	. 167	. 012	. 047	. 043	. 076	. 048	. 052			. 014		. 011			
40	60. 83	15. 12	3. 88	4. 82	1. 97	4. 11	3. 50	3. 15	1. 19		1. 35		0. 39		100. 31	
A2. II	1. 014	. 148	. 014	. 067	. 049	. 073	. 056	. 034			. 017		. 006			
41	63. 50	16. 08	0. 12	3. 37	2. 47	4. 93	2. 94	3. 05	2. 11		0. 57	0. 15	0. 07		99. 36	
B2. III	1. 058	. 158	. 001	. 047	. 062	. 088	. 047		. 032		. 007	. 001	. 001			

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 3. SODIPOTASSIC. HARZOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
26	"II.4".''3.3.	Q 15.36 di 9.32 or 22.24 hy 0.90 ab 26.20 mt 4.18 an 18.63 il 1.52 ap 1.01	Aranzazu, Concepcion de Oro, Zacatecas, Mexico.	M. Dittrich.	A. Bergeat, N. J. B. B., XXVIII, p. 438, 1909.	Granodiorite.	Also in Bol. Inst. G. Mex., No. 27, p. 12, 1910.
27	II.4.3.3".	Q 14.88 di 3.00 or 15.01 hy 25.30 ab 19.39 mt 0.46 an 20.29 il 0.46	Groete Creek, Essequibo River, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Brit. Guiana, p. 77, 1908.	Augite granite.	
28	"II.4(5).(2)3.3.	Q 11.94 di 1.94 or 24.46 hy 4.60 ab 27.77 mt 8.35 an 16.68 il 1.22 ap 1.01	Cerro Gordo, Upper Magdalena River, Colombia.	A. Lindner.	E. Lehmann, T. M. P. M., XXX, p. 269, 1911.	Latite.	
29	(I)II.4.3.3(4).	Q 16.98 di 1.08 or 20.02 hy 5.20 ab 27.77 mt 1.86 an 19.74 il 1.22 hm 3.36 ap 0.34	Cuesta de Acay, Salta, Argentina.	P. Jannasch.	F. Tannhäuser, N. J. B. B., XXII, p. 589, 1906.	Mica andesite.	
30	(I)II.4".(2)3.3(4)	Q 14.22 di 1.36 or 21.68 hy 5.92 ab 30.39 mt 3.48 an 18.07 il 1.52	Cochinoca, Jujuy, Argentina.	P. Jannasch.	F. Tannhäuser N. J. B. B., XXII, p. 612, 1906.	Diorite porphyrite.	
31	(I)II.4.3.3.	Q 16.86 hy 13.65 or 21.68 mt 1.62 ab 20.96 an 22.80 C 1.33	Ben Damhaim, Loch Garabal, Scotland.	J. H. Player.	Dakyns and Teall, Q. J. G. S., XLVIII, p. 115, 1892.	Granitite.	In W. T., p. 229.
32	II.4.3.3.⊙	Q 17.82 di 6.32 or 16.68 hy 11.62 ab 17.29 mt 3.94 an 20.85 il 1.98 ap 0.34	Mullach Glach, Pennygael, Mull, Scotland.	E. G. Radley.	G. S. Gt. Brit., Sum. Prog., (1912), p. 69, 1913.	Tholeite pitchstone.	"Stony portion." Cf. No. 140, II.4.3.4.
33	II.4".3.3(4).	Q 12.78 hy 18.74 or 16.68 mt 1.39 ab 25.15 il 3.80 an 19.74 C 1.22	Brée, Brittany, France.	Pisani.	L. Vandernotte, Mass. Armor., p. 158, 1913.	Microgabbro.	
34	II.4.3".3".	Q 16.92 hy 18.90 or 15.57 mt 0.93 ab 19.39 an 23.35 C 2.86	Saint Maigner, La Creuse, France.	Pisani.	L. de Launay, B. Sv. Ct. G. Fr., XI, No. 83, p. 77, 1902.	Kersantite.	
35	II.4.3.3".	Q 19.32 hy 17.02 or 17.24 il 1.67 ab 21.48 ap 0.34 an 21.41 C 1.02	Serrat de Soupère, Bagnères de Luchon, Pyrenees.	Pisani.	A. de Romeu, B. Soc. Min. Fr., XXX, p. 147, 1907.	Microdiorite.	
36	"II.4".(2)3.''3.	Q 14.22 di 4.76 or 30.02 hy 10.26 ab 20.44 mt 0.46 an 16.12 il 1.52 ap 1.01	Near Corte, Corsica.	J. Deprat.	J. Deprat, B. Sv. Ct. G. Fr., XVII, No. 117, p. 56, 1907.	Trachyandesite.	
37	"II.4".3.3(4).	Q 14.04 hy 6.30 or 15.57 mt 2.55 ab 24.10 il 5.17 an 26.67 hm 2.88 C 2.04	Fjulsrud, Humledal, n. Christiania, Norway.	G. Särnström.	W. C. Brögger, Z. K., XVI, p. 53, 1890.	Porphyry.	In W. T., p. 229.
38	(I)II.4.''3.3".	Q 21.96 di 4.10 or 19.46 hy 3.03 ab 25.68 mt 5.34 an 17.24 il 1.37 ap 0.67	Nya Varfvet, Göteborg, Sweden.	O. Berg.	P. J. Holmquist, B. Un. Ups., VII, p. 268, 1906.	Granite gneiss.	
39	(I)II.4(5).(2)3.3.	Q 12.36 di 2.07 or 28.91 hy 7.50 ab 25.15 mt 2.78 an 18.63 il 2.13	Djupadal, Oskarshamn, Smaland, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 264, 1906.	Granite.	
40	II.4.(2)3.3(4).	Q 15.72 di 3.43 or 18.90 hy 7.43 ab 29.34 mt 5.57 an 16.12 il 2.58	Flohult, Oskarshamn, Smaland, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 262, 1906.	Granite.	
41	(I)II.4.3.3(4).	Q 18.96 di 2.07 or 17.79 hy 10.32 ab 24.63 mt 0.23 an 21.96 il 1.06	Sassi, Finland.	I. G. Sundell.	V. Hackmann, B. C. G. Fin., 15, p. 50, 1905.	Quartz diorite.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. TONALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
42	57.69	14.48	4.40	1.71	5.63	5.42	2.73	2.94	3.44		0.82	0.29		CO_2 0.11 SO_3 0.17 Org. 0.05	99.88	2.66
A2. II	.962	.142	.027	.024	.141	.096	.043	.031			.010	.002				
43	62.39	15.98	2.39	3.16	2.53	4.43	3.46	3.75	1.13		0.37		0.78		100.37	
A2. II	1.040	.157	.015	.044	.063	.079	.056	.040			.005		.011			
44	64.99	14.53	1.35	6.10	1.07	3.38	2.93	2.97	1.94		1.11	0.23			100.60	2.755
A2. II	1.083	.142	.009	.085	.027	.061	.047	.032			.014	.002				
45	57.64	14.49	3.17	5.81	4.62	8.02	2.13	2.32	1.77		0.31	0.23		CO_2 0.13	100.64	2.837
A2. II	.961	.142	.020	.080	.116	.143	.034	.024			.004	.002				
46	56.91	15.54	2.32	4.98	5.71	5.80	2.45	2.74	2.29		1.09	0.21		SO_3 0.15	100.19	2.791
A2. II	.959	.152	.014	.070	.143	.103	.040	.029			.013	.002				
47	63.06	18.01	2.48	1.31	4.55	2.72	2.01	3.88	2.20						100.22	
A3. III	1.051	.176	.016	.018	.114	.048	.032	.041								
48	65.87	14.88	1.77	3.11	2.93	4.61	2.12	4.22	0.83		0.43	trace			100.77	2.899
A3. III	1.098	.146	.011	.043	.072	.082	.034	.045			.005					
49	62.69	12.77	3.22	4.79	3.09	5.02	2.39	3.63	1.06		1.22	trace	0.60		100.48	2.952
A2. II	1.045	.125	.020	.067	.077	.089	.039	.038			.014	——	.009			
50	60.58	11.92	3.05	8.14	3.88	6.97	1.21	2.55	0.95		1.14	trace	0.63		101.02	2.926
B2. III	1.010	.117	.020	.112	.097	.125	.019	.027					.007			
51	52.67	13.66	7.33	1.44	4.01	7.94	3.79	2.51	1.51	1.07	2.58	0.52	0.78	F 0.17	99.98	
A2. II	.878	.134	.046	.020	.100	.142	.061	.027			.032	.004	.011			
52	63.10	16.40	2.77	4.80	1.68	4.94	2.44	2.40	1.24			0.26		S 0.25	100.28	
A3. III	1.052	.161	.017	.067	.042	.088	.039	.026				.002				
53	61.36	16.70	2.00	5.58	2.70	5.52	2.21	3.01	1.16			0.24		S 0.01	100.49	
A3. III	1.023	.164	.013	.078	.068	.098	.035	.032				.002				
54	57.02	16.52	3.25	6.27	2.42	8.64	2.38	2.54	1.28						100.32	
A3. III	.950	.162	.021	.088	.061	.154	.039	.027								
55	65.34	16.53	1.16	3.40	1.62	4.70	2.41	3.23	0.67		trace	1.54			100.60	2.688
A3. III	1.089	.162	.007	.047	.041	.084	.039	.034			——	.011				
56	52.15	14.93	7.07	6.10	5.93	5.62	1.74	3.34	0.88		1.12	1.58			100.46	2.917
A2. II	.869	.146	.044	.085	.148	.100	.028	.035			.014	.011				
57	58.68	17.84	2.05	5.30	2.87	6.03	2.15	3.22	1.53		0.16		trace		99.83	2.76
A3. III	.978	.175	.013	.074	.072	.107	.035	.034			.002		——			

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 3. SODIPOTASSIC. HARZOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
42	II.4″.3.3.	Q 13.20 di 4.54 or 17.24 hy 12.00 ab 22.53 mt 3.25 an 18.90 il 1.52 hm 2.08 ap 0.67	Peterberg, Blatt Wadern, Rheinland.	K. Böttcher.	H. Greb, Erl. G. Kt. Pr., Bl. Wadern, p. 34, 1889.	Bronzite porphyrite.	Also in K. A. Lossen, Jb. Pr. G. L.-A. (1889), p. 290, 1892. In W. T., p. 229.
43	″II.4″.(2)3.3″.	Q 13.56 di 4.08 or 22.24 hy 8.93 ab 29.34 mt 3.48 an 16.96 il 0.76	Wehrathal, Schwarzwald, Baden.	Not stated.	O. H. Erdmannsdörfer, Mt. Bad. G. L.-A., IV (2), p. 168, 1901.	Granite.	
44	″II.4.(2)3.3″.	Q 24.72 hy 10.88 or 17.79 mt 2.09 ab 24.63 il 2.13 an 15.01 ap 0.67 C 0.92	Schmalenberg, n. Ettersgrund, Brocken, Harz.	K. Hampe.	O. H. Erdmannsdörfer, Jb. Pr. G. L.-A., XXVII, p. 347, 1906.	Granite.	
45	II.4.3″.3″.	Q 13.26 di 11.81 or 13.34 hy 13.22 ab 18.42 mt 4.64 an 23.35 il 0.61 ap 0.67	Ole Padde, Harz.	F. Steffen.	K. A. Lossen, Jb. Pr. G. L.-A., (1889), p. 290, 1892.	Tonalite.	In W. T., p. 229.
46	II.4(5).3.3.	Q 10.92 di 3.37 or 16.12 hy 18.38 ab 20.96 mt 3.25 an 22.52 il 1.98 ap 0.67	Bolmke Thal, n. Wernigerode, Harz.	K. Hampe.	K. A. Lossen, Jb. Pr. G. L.-A. (1889), p. 309, 1892.	Enstatite porphyrite.	In W. T., p. 229.
47	(I)II.″4.(2)3.3.	Q 23.94 hy 11.63 or 22.80 mt 3.71 ab 16.77 an 13.34 C 5.61	Arnsdorf, Riesengebirge, Silesia.	Herz.	L. Milch, N. J. B. B., XII, p. 223, 1899.	Schliere in granite.	In W. T., p. 231.
48	(I)II.4.2.″3.	Q 22.50 di 3.40 or 25.02 hy 9.20 ab 17.82 mt 2.55 an 18.63 il 0.76	Wachberg, Silesia.	H. Traube.	H. Traube, N. J., 1890, I, p. 218.	Syenite.	In W. T., p. 231.
49	II.4.(2)3.3.	Q 19.62 di 9.31 or 21.13 hy 8.70 ab 20.44 mt 4.64 an 13.34	Neudeck, Silesia.	H. Traube.	H. Traube, N. J., 1890, I, p. 220.	Syenite.	In W. T., p. 231.
50	II(III).″4.3(4).″3.	Q 21.18 di 12.49 or 15.01 hy 15.08 ab 9.43 mt 4.64 an 19.74 il 1.98	Neudeck, Silesia.	H. Traube.	H. Traube, N. J., 1890, I, p. 222.	Syenite.	In W. T., p. 231.
51	II″.4″.3.3(4).	Q 11.16 di 11.02 or 15.01 hy 4.90 ab 21.48 il 4.71 an 18.35 hm 7.33 tn 0.20 ap 1.34	Alvernia, n. Cracow, Galicia.	Z. Rozen.	Z. Rozen, B. Ac. Sc. Crac., 1909, p. 801.	Melaphyre.	Fresh?
52	(I)II.4.3.3(4).	Q 24.60 hy 10.54 or 14.46 mt 3.94 ab 20.44 ap 0.67 an 22.52 C 1.53	Gomagoi, Vintschgau, Tyrol.	C. v. John.	Hammer and V. John, Jb. G. R.-A., Wien, LIX (3), p. 712, 1910.	Granodiorite.	
53	II.4.3″.3.	Q 18.36 hy 15.38 or 17.79 mt 3.02 ab 18.34 ap 0.67 an 25.30 C 0.61	Valdaschlikopf, Vintschgau, Tyrol.	C. v. John.	Hammer and V. John, Jb. G. R.-A., Wien, LIX (3), p. 709, 1910.	Tonalite.	
54	II.4(5).3″.3″.	Q 10.56 di 13.49 or 15.01 hy 8.18 ab 20.44 mt 4.87 an 26.69	Hinterer Gratspitz, Tyrol.	C. v. John.	W. Hammer, Jb. G. R.-A., Wien, LIII, p. 71, 1904.	Suldenite.	
55	(I)II.(3)4.(2)3.3.	Q 28.56 hy 9.38 or 18.90 mt 1.62 ab 20.44 ap 3.70 an 13.07 C 4.28	Zinsnock, Rieserferner, Tyrol.	R. Pfohl.	F. Becke, Ds. Ak. W. Wien, LXXXV (1), p. 160, 1913.	Tonalite.	P_2O_5 high?
56	II(III).4″.3.3.	Q 11.22 hy 18.76 or 19.46 mt 10.21 ab 14.67 il 2.13 an 17.51 ap 3.70 C 2.04	Taufers, Rieserferner, Tyrol.	R. Pfohl.	F. Becke, Ds. Ak. W. Wien, LXXV (1), p. 160, 1913.	Diorite.	Schlieren in No. 7, II.4.4.3. SiO_2 given as 72.15.
57	II.4″.3(4).3.	Q 13.20 di 0.22 or 18.90 hy 14.89 ab 18.34 mt 3.02 an 29.47 il 0.30	Töll, n. Meran, Ulten Massif, Tyrol.	E. Zdarek.	F. Becke, Ds. Ak. W. Wien, LXXV (1), p. 160, 1913.	Töllite (tonalite porphyry).	Border.

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. TONALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
58	61.23	16.96	1.80	4.16	2.18	4.60	3.27	3.37	0.61	0.20	0.78	0.66			99.82	
A2. II	1.021	.166	.011	.058	.055	.082	.053	.036			.010	.005				
59	60.38	15.74	5.10	1.13	2.82	4.77	3.37	3.34	1.95	0.07	1.64				100.31	2.77
A3. III	1.006	.154	.032	.015	.071	.086	.055	.035			.021					
60	57.97	17.65	6.17	1.74	4.00	4.74	2.11	3.67	1.09	0.06	1.08	0.17			100.45	2.836
A2. II	.966	.173	.039	.024	.100	.085	.034	.039			.014	.001			(100.15)	
61	60.15	16.65	2.80	3.21	2.99	4.32	2.07	3.88	3.47	0.28	0.82				100.64	2.817
A3. III	1.003	.163	.018	.044	.075	.077	.034	.041			.010				(100.61)	
62	59.29	15.18	3.82	2.84	2.92	3.77	2.22	5.09	3.78	0.24	0.68				99.83	2.804
A3. III	.988	.149	.024	.039	.073	.068	.035	.054			.009					
63	68.6	16.5	0.8	2.3	0.6	1.9	2.8	5.6	1.0		0.3				100.7	
B3. IV	1.143	.162	.005	.032	.015	.034	.045	.060			.004					
64	60.03	17.05	1.83	4.15	1.12	6.58	2.31	5.12	1.40			0.42	0.09		100.12	2.543
A?3. III	1.001	.167	.011	.058	.028	.118	.037	.055				.003	.001			
65	56.32	18.17	2.23	6.47	2.84	5.33	1.80	4.18	2.15			0.34			99.83	2.520
A?3. III	.939	.178	.014	.090	.071	.095	.029	.045				.002				
66	59.41	19.06	1.87	3.42	2.05	4.09	2.58	5.29	0.64	0.91	1.00	0.29		CO_2 none	100.61	
A2. II	.990	.187	.012	.047	.051	.073	.042	.056			.012	.002				
67	59.08	17.75	2.66	3.41	3.59	6.38	2.31	3.82	0.88						99.84	2.70
A3. III	.985	.174	.017	.047	.090	.114	.037	.040								
68	56.43	19.00	3.54	2.83	4.03	5.08	2.08	4.23	0.65	0.13	0.82	0.91	trace	Cl 0.09	99.82	
A2. II	.941	.186	.022	.039	.101	.091	.034	.045			.010	.006	—			
69	64.02	15.00	1.80	4.35	3.93	3.80	3.10	2.83	0.75		0.88	0.30			100.76	
A2. II	1.067	.147	.011	.061	.098	.068	.050	.030			.011	.002				
70	60.30	18.44	2.54	2.92	3.34	5.53	3.03	3.12	0.68						99.90	
A3. III	1.005	.181	.016	.040	.084	.098	.048	.033								
71	60.68	16.19	5.37	1.58	2.96	5.88	3.11	3.95	0.98						100.70	2.640
A3. III	1.011	.159	.034	.022	.074	.105	.050	.042								17°
72	64.90	12.61	0.79	4.30	2.46	8.22	2.00	3.82	0.20		0.30			CO_2 0.53	100.13	
A3. III	1.082	.124	.005	.060	.062	.146	.032	.040			.004					
73	62.86	15.43	0.80	4.02	4.40	6.11	2.50	2.81	0.38		0.27				99.58	
A3. III	1.048	.151	.005	.056	.110	.109	.040	.030			.003					

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 3. SODIPOTASSIC. HARZOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
58	"II.4."3.3".	Q 15.90 hy 10.38 or 20.02 mt 2.55 ab 27.77 il 1.52 an 18.07 ap 1.68 C 1.22	Mätteli, St. Gotthard, Switzerland.	K. M. Jene.	P. Waindziok, In. Diss. Zür., p. 44, 1906.	Quartz diorite porphyry.	
59	"II.4"."3.3(4).	Q 14.70 di 3.46 or 19.46 hy 5.50 ab 28.82 il 2.28 an 17.79 hm 5.10 tn 1.18	Stücklistock, Aarmassif, Switzerland.	O. Fischer.	O. Fischer, T. M. P. M., XXIV, p. 95, 1905.	Diorite porphyrite.	
60	II.4.3.3.⊙	Q 15.84 hy 10.00 or 21.68 mt 2.32 ab 17.82 il 2.13 an 22.80 hm 4.64 C 1.84 ap 0.34	Piz Giuf, Aarmassif, Switzerland.	Not stated.	F. Weber, Btr. G. Kt. Schw., XIV, p. 86, 1904.	Kersantite.	
61	"II.4.3.3	Q 18.48 hy 9.61 or 22.80 mt 4.18 ab 17.82 il 1.52 an 21.41 C 1.12	Platta Mala, Lower Engadine, Switzerland.	O. Züst.	U. Grubenmann, Btr. G. Kt. Schw., XXII, p. 193, 1909.	Monzonite.	Basic facies of granite. Cf. No. 191, I.4.1.3.
62	"II.4".(2)3.(2)3.	Q 14.82 di 1.76 or 30.02 hy 7.26 ab 18.34 mt 5.57 an 16.68 il 1.37	Alp Laret, Lower Engadine, Switzerland.	O. Züst.	O. Züst, In. Diss. Zür., p. 22, 1905.	Syenite.	Mica vogesite in U. Grubenmann, Btr. G. Kt. Schw., XXIII, p.204, 1909.
63	II.4.3."3.	Q 24.42 hy 4.54 or 33.36 mt 1.16 ab 23.58 il 0.61 an 9.45 C 2.35	Bed of Letimbro River, Savona, Liguria.	J. de Lapparent.	Termier and Boussoe, B. Soc. G. Fr., XII, p. 276, 1912.	Granite.	
64	"II.4(5).3.(2)3.	Q 11.58 di 7.37 or 30.58 hy 5.23 ab 19.39 mt 2.55 an 20.85 ap 1.01	San Magno, Latera, Lake Bolsena, Italy.	A. Ricciardi.	C. Klein, Sb. Berl. Ak., V, p. 99, 1888.	Trachyte.	Also in N.J. B. B., VI, p. 10, 1889. In W. T., p. 231.
65	II.4(5).3.3(4).	Q 10.32 hy 17.13 or 25.02 mt 3.25 ab 15.20 ap 0.67 an 24.46 C 1.63	Mont'Alfina, Lake Bolsena, Italy.	A. Ricciardi.	C. Klein, Sb. Berl. Ak., V, p. 96, 1888.	Trachyte.	Also in N. J. B. B., VI, p.7, 1889. In W. T., p. 271.
66	(I)II.4(5).(2)3."3.	Q 11.76 hy 8.14 or 31.14 mt 2.78 ab 22.01 il 1.82 an 18.35 ap 0.67 C 2.35	La Cava, Monte Cimino, n. Viterbo, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 56, 1906.	Biotite latite.	
67	"II.4(5).3.3.	Q 11.52 di 3.80 or 22.24 hy 10.13 ab 19.39 mt 3.94 an 26.97	Sant' Egidio, Vico Volcano, n. Viterbo, Italy.	G. Aichino.	V. Sabatini, Vulc. Cim., p. 506, 1912.	Oligolabradorite (vulsinite).	
68	II.4".3."3.	Q 13.02 hy 11.02 or 25.02 mt 5.10 ab 17.82 il 1.52 an 19.74 ap 2.02 C 3.67	Santa Teresa Volcano, Phlegrean Fields, n. Naples, Italy.	F. S. Starrabba.	F. S. Starrabba, Atti Ac. Sc. Nap. (2), XIV, No. 7, p. 6, 1910.	Andesite.	Inclusions in tuff.
69	II.4."3.(2)3.	Q 19.68 hy 14.95 or 16.68 mt 2.55 ab 26.20 il 1.67 an 16.96 ap 0.67 C 0.62	San Gimiliano, Capo Bellavista, Sardinia.	C. Riva.	C. Riva, Atti Ac. Sc. Nap. (2), XII, No. 9, p. 45, 1905.	Quartz diorite porphyry.	
70	(I)II.4".3.3".	Q 12.90 hy 11.57 or 18.35 mt 3.71 ab 25.15 an 27.24 C 0.20	Blota, Kasbek, Caucasus.	F. Loewinson-Lessing.	F. Loewinson-Lessing, Mat. G. Russ., XXI, p. 107, 1901.	Andesite.	
71	II.4"."3.3.	Q 12.78 di 8.21 or 23.35 hy 3.60 ab 26.20 mt 5.10 an 18.63 hm 1.82	Mount Pagos, Smyrna, Asia Minor.	H. S. Washington.	H. S. Washington, A. J. S., III, p. 43, 1897.	Andesite.	In W. T., p. 231.
72	II.4."3.3.	Q 20.34 di 21.41 or 22.24 hy 2.19 ab 16.77 mt 1.16 an 14.46 il 0.61	Tatarka River, Jenissei District, Siberia.	Not stated.	A. Meister, Reg. Aurif. Sib., IX, p. 148, 1910.	Banatite.	
73	II.4.3.3.⊙	Q 16.80 di 6.31 or 16.68 hy 14.28 ab 20.96 mt 1.16 an 22.52 il 0.46	Tatarka River, Jenissei District, Siberia.	Not stated.	A. Meister, Reg. Aurif. Sib., IX, p. 143, 1910.	Banatite.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. TONALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
74	61.36	15.38	2.51	3.76	3.44	7.12	2.85	2.72	0.59				0.12		99.85	2.784
A3. III	1.023	.151	.016	.052	.086	.127	.046	.029					.002			
75	60.78	17.63	3.82	2.18	2.25	5.75	2.86	2.56	1.38	0.24	0.62	0.06			100.13	
A2. II	1.013	.173	.024	.030	.056	.103	.046	.028			.008	—				
76	66.58	14.36	1.53	3.19	1.70	4.18	3.09	3.37	0.79	0.17	0.65	0.10	0.07	CO_2 0.04 ZrO_2 none Cl none S none Cr_2O_3 none NiO none BaO 0.04 SrO trace V_2O_3 trace	99.86	2.718
A1. I	1.110	.141	.009	.044	.043	.075	.050	.036			.008	.001	.001			
77	66.06	15.25	1.10	3.69	2.27	4.86	2.16	2.77	0.94	0.30	0.70	0.11	0.02	CO_2 0.07 ZrO_2 0.03 SO_3 none Cl 0.01 S 0.06 Cr_2O_3 none V_2O_3 0.03 NiO 0.02 BaO 0.06 SrO trace Cu,Pb trace	100.51	2.726
A1. I	1.101	.150	.007	.051	.057	.087	.035	.030			.009	.001	—			
78	65.94	15.10	1.20	2.34	2.53	4.48	3.09	3.73	0.80	0.11	0.55	0.21	0.04	CO_2 0.12 ZrO_2 none Cl,F none S none Cr_2O_3 none NiO trace BaO 0.13	100.37	2.725
A1. I	1.099	.148	.008	.032	.063	.080	.050	.039			.007	.001	—			
79	64.04	15.58	0.80	4.47	2.64	3.52	2.42	2.80	2.25	0.38	0.80	0.18	trace	CO_2 none Cl trace S none Li_2O trace	99.88	2.722
A2. II	1.067	.153	.005	.063	.066	.063	.039	.030			.010	.001	—			
80	62.54	16.66	1.04	5.54	2.68	3.92	2.66	2.47	0.46	0.17	1.20	0.20	trace	CO_2 none Cl trace S none Li_2O trace	99.54	2.781
A2. II	1.042	.163	.006	.077	.067	.070	.043	.027			.015	.001	—			
81	63.27	16.50	0.68	5.10	2.48	4.18	2.36	2.68	0.52	0.09	1.30	0.15	0.03	CO_2 none S 0.16	99.50	2.76
A2. II	1.055	.162	.004	.071	.062	.075	.038	.029			.016	.001	—			
82	65.65	14.27	1.52	3.96	2.62	3.30	2.22	4.01	1.18	0.12	0.66	0.28	0.06	CO_2 none	99.85	
A2. II	1.094	.140	.019	.055	.066	.059	.035	.043			.008	.002	—			
83	61.77	16.48	2.38	3.08	3.03	5.80	1.46	3.72	1.73		0.75		0.15		100.35	
A2. II	1.030	.162	.015	.043	.076	.104	.024	.039			.009		.002			
84	58.20	18.35	1.44	3.46	3.49	6.20	2.63	2.96	2.05		0.87		0.35	CO_2 none	100.00	
A2. II	.970	.180	.009	.048	.087	.111	.042	.032			.011		.005			
85	60.96	16.62	3.87	2.61	0.95	6.35	3.01	3.40	1.03	0.18	0.50	0.25	trace	CO_2 0.10 Cl trace S trace Cr_2O_3 0.04 BaO none SrO none Li_2O none	99.87	2.54
A1. I	1.016	.163	.024	.036	.024	.114	.048	.036			.006	.002	—			
86	57.46	15.95	1.96	5.82	3.77	7.26	2.28	2.82	1.60		1.15	0.19			99.76	
A2. II	.958	.156	.012	.081	.094	.130	.037	.024			.014	.001				

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 3. SODIPOTASSIC. HARZOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
74	II.4.3.3(4).	Q 15.00 di 11.47 or 16.12 hy 7.54 ab 24.10 mt 3.71 an 21.13	Atar Volcano, Sumatra.	L. Serrurier.	R. D. M. Verbeek, Sum. Westk., p. 232, 1883.	Quartz diorite.	Not in W. T.
75	(I)II.4.3″.3(4).	Q 18.66 di 0.86 or 15.57 hy 5.20 ab 24.10 mt 5.10 an 27.52 il 1.22 hm 0.32	Bulu-Nipis, Batak Land, Sumatra.	M. Dittrich.	H. Stegmann, N. J. B. B., XXVII, p. 420, 1909.	Quartz trachyte-andesite.	
76	(I)II.4.(2)3.3″.	Q 23.76 di 3.89 or 20.02 hy 6.07 ab 26.20 mt 2.09 an 15.29 il 1.22 ap 0.34	Kybean Road, Bega, New South Wales.	Not stated.	Dep. Mines, N. S. W. A. R. (1908), p. 184, 1909.	Granite.	
77	(I)II.″4.3″.3.	Q 27.06 hy 10.32 or 16.68 mt 1.62 ab 18.34 il 1.37 an 23.35 ap 0.34 C 0.10	Wombeyan Road, Wollondilly River, New South Wales.	J. C. H. Mingaye.	G. W. Card, Rec. G. S. N. S. W., VIII, (3), p. 261, 1907.	Dacite.	
78	(I)II.4.(2)3.3.	Q 20.34 di 4.02 or 21.68 hy 6.62 ab 26.20 mt 1.86 an 16.40 il 1.06 ap 0.34	Kiama, New South Wales.	Not stated.	Dep. Mines, N. S. W. A. R. (1909), p. 198, 1910.	Granite.	
79	″II.″4.3.3.	Q 25.14 hy 12.94 or 16.68 mt 1.16 ab 20.44 il 1.52 an 16.68 ap 0.34 C 2.45	Braemar House, Macedon, Victoria.	R. J. Lewis.	Skeats and Summers, G. S. Vict. B. 24, p. 20, 1912.	Granodiorite.	
80	II.4.3.3(4).	Q 21.90 hy 14.14 or 15.01 mt 1.39 ab 22.53 il 2.28 an 18.63 ap 0.34 C 2.65	Braemar House, Macedon, Victoria.	A. G. Hall.	Skeats and Summers, G. S. Vict. B. 24, p. 17, 1912.	Dacite.	
81	″II.4.3.3″.	Q 23.76 hy 12.93 or 16.12 mt 0.93 ab 19.91 il 2.43 an 20.02 ap 0.34 C 2.35	Upwey, Mount Dandenong, Victoria.	H. C. Richards.	H. C. Richards, Pr. R. Soc. Vict., XXI (2), p. 533, 1909.	Dacite.	
82	″II.4.(2)3.3.	Q 25.68 hy 10.30 or 23.91 mt 4.41 ab 18.34 il 1.22 an 14.46 ap 0.67 C 1.02	Mahikinui, Westport District, New Zealand.	Not stated.	P. G. Morgan, pers. com.	Granodiorite.	
83	(I)II.4.3(4).(2)3.	Q 21.12 di 1.11 or 21.68 hy 9.64 ab 12.58 mt 3.48 an 27.52 il 1.37	Ramarana Creek, n. Whiritoa, Hauraki, New Zealand.	Not stated.	Bell and Fraser, G. S. N. Z. B. 15, p. 45, 1912.	Andesite.	
84	″II.4(5).(2)3.3″.	Q 11.34 di 1.11 or 17.79 hy 12.52 ab 22.01 mt 2.09 an 29.47 il 1.67	St. Pauls, Whangaroa, New Zealand.	J. S. Maclaurin.	Bell and Clarke, N. Z. G. S. B. 8, p. 68, 1909.	Andesite.	
85	(I)II.4.3.3″.	Q 17.76 di 6.24 or 20.02 hy 0.20 ab 25.15 mt 5.57 an 21.96 il 0.91 ap 0.67	Wai Malikoliko, Espiritu Santo Island, New Hebrides.	D. Mawson.	D. Mawson, Pr. Linn. Soc. N. S. W., XXX, p. 470, 1905.	Andesite.	
86	II.4″.3(4).3(4).	Q 13.26 di 7.29 or 13.34 hy 13.08 ab 19.39 mt 2.78 an 26.41 il 2.13 ap 0.34	Hovgaard Island, Weddell Quadrant, Antarctica.	Boiteau.	E. Gourdon, pers. com.	Quartz diorite.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. TONALASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	59.03	13.16	none	7.02	5.50	6.75	2.47	1.43	2.86		1.19	0.13		CO_2 0.25	99.79	
A2. ?II	.984	.129	—	.097	.138	.121	.040	.015			.015	.001				
2	63.22	17.46	1.35	3.40	2.05	4.91	5.12	1.31	0.60		0.74	0.07		FeS_2 0.44	100.67	
A2. II	1.054	.171	.008	.047	.051	.088	.082	.014			.009	—				
3	63.44	18.84	0.16	4.05	1.99	4.23	4.35	2.07	0.33	0.06	1.41	0.32		CO_2 none	101.25	
B2. III	1.057	.185	.001	.057	.050	.075	.070	.022			.018	.002				
4	61.40	16.59	2.13	3.05	2.73	6.17	3.83	1.34	0.88	0.82	0.79	0.20	0.13	CO_2 none ZrO_2 none S none Cr_2O_3 trace V_2O_3 0.02 BaO 0.02 SrO trace	100.10	
A1. I	1.023	.163	.013	.042	.063	.110	.061	.015			.010	.001	.002			
5	56.78	14.33	5.76	9.27	1.58	5.26	3.43	1.75	0.10	0.33	1.44	0.36	0.25		100.64	
A2. II	.946	.140	.036	.129	.040	.094	.055	.019			.018	.003	.004			
6	64.26	15.88	2.74	1.44	2.80	7.44	3.43	0.77	0.50	0.15	0.45	0.16	0.02	ZrO_2 0.02 S trace BaO none	100.06	
A1. I	1.071	.156	.017	.020	.070	.133	.055	.008			.006	.001	—			
7	66.68	14.93	1.58	3.32	2.19	4.89	2.65	2.05	1.09	0.16	0.50	0.10	0.10	BaO 0.08 SrO trace Li_2O trace	100.32	
A2. II	1.111	.146	.010	.046	.055	.088	.043	.022			.006	.001	.001			
8	63.61	15.70	1.98	3.81	3.58	4.50	3.47	2.12	0.97	0.14	0.40	0.15	0.05	CO_2 trace S trace	100.48	
A2. II	1.060	.154	.012	.053	.090	.080	.056	.022			.005	.001	—			
9	56.61	14.89	1.04	4.32	4.05	4.94	3.19	1.51	1.58	0.08	7.26	0.26	0.01	CO_2 0.22 S 0.03	99.94	
A2. II	.944	.146	.007	.060	.101	.088	.051	.016			.091	.002	—			
10	54.80	14.28	3.08	7.55	2.52	6.57	2.61	2.00	1.23	0.16	4.15	0.70	0.02	CO_2 trace S 0.02	99.69	
A2. II	.913	.140	.019	.105	.063	.118	.042	.021			.052	.005	—			
11	50.97	13.13	1.44	5.42	4.68	3.66	2.72	2.24	1.41	0.05	13.64	0.31	0.05		99.76	
A2. II	.850	.129	.009	.075	.117	.065	.044	.023			.171	.002	—			
12	61.19	15.22	3.20	3.55	2.38	7.94	3.17	2.62	0.40				trace		99.67	
A3. III	1.020	.149	.020	.050	.060	.142	.051	.027					—			
13	60.32	15.80	5.42	0.89	5.08	4.65	4.09	1.82	1.67			0.12			99.86	
A3. III	1.005	.155	.034	.012	.127	.083	.066	.020				.001				
14	64.09	16.20	2.61	2.40	2.06	4.51	3.88	2.51	0.44	0.22	0.49	0.24	0.09	BaO 0.15 SrO 0.03	99.92	
A1. I	1.068	.159	.016	.033	.052	.080	.063	.027			.006	.002	.001			
15	60.19	17.39	2.04	4.28	2.10	5.69	3.30	2.67	0.89	0.31	0.85	0.30	0.11	CO_2 0.21 ZrO_2 0.04 SO_3 none S none BaO 0.08 SrO 0.02	100.47	
A1. I	1.003	.170	.013	.060	.053	.102	.053	.029			.011	.020	.002			

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 4. DOSODIC. TONALOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II″.4.3″.4.	Q 14.52 di 10.01 or 8.34 hy 19.71 ab 20.96 il 2.28 an 20.57 ap 0.34	Ivigsarkut, Disko, Greenland.	M. Dittrich.	T. Nicolau, Medd. Gron., XXIV, p. 243, 1900.	Andesite.	Iron bearing. $NOFe_2O_3$? Not in W. T.
2	(I)II.4″.3.4(5).	Q 14.04 di 2.97 or 7.78 hy 7.60 ab 42.97 mt 1.86 an 20.85 il 1.37 pr 0.44	Reindeer Point, Foulke Fjord, Ellesmere Land.	P. Schei.	C. Bugge, 2d Fram. Exp., No. 22, p. 18, 1910.	Quartz diorite.	
3	(I)II.4.″3.4.	Q 16.86 hy 10.02 or 12.23 mt 0.23 ab 36.68 il 2.74 an 18.90 ap 0.67 C 2.55	Southport Island, Boothbay quadrangle, Maine.	M. W. Adams.	I. H. Ogilvie, Ann. N. Y. Ac. Sci., XVII, p. 536, 1907.	Quartz diorite.	
4	″II.4.3.4.	Q 17.34 di 4.48 or 8.34 hy 6.91 ab 31.96 mt 3.02 an 24.19 il 1.52 ap 0.34	Edmunds Hill, Aroostook County, Maine.	W. F. Hillebrand.	H. E. Gregory, A. J. S., VIII, p. 365, 1899.	Andesite.	Also in U. S. G. S. B. 165, p. 171, 1900. In W. T., p. 231.
5	II.4.3.4.⊙	Q 13.98 di 4.27 or 10.56 hy 12.24 ab 28.82 mt 8.35 an 18.35 il 2.74 ap 1.01	Rocky Hill, New Jersey.	A. H. Phillips.	A. H. Phillips, A. J. S., VIII, p. 279, 1899.	Diabase.	In W. T., p. 231.
6	″II.4.3(4).4(5).	Q 23.82 di 8.64 or 4.45 hy 3.00 ab 28.82 mt 3.25 an 25.85 il 0.91 hm 0.48	Devault, Pennsylvania.	R. C. Wells.	F. Bascom, U. S. G. S. rec. lab.	Quartz diorite. gneiss.	
7	(I)II.″4.3:″4.	Q 28.26 di 1.19 or 12.23 hy 8.90 ab 22.53 mt 2.32 an 22.52 il 0.91 ap 0.34	Rowlandsville, Cecil County, Maryland.	W. F. Hillebrand.	G. H. Williams, U. S. G. S. A. R. 15, p. 672, 1895.	Granite.	Also in F. Bascom, Md. G. S., Cecil County, p. 120, 1902. In W. T., p. 231.
8	″II.4.3.4.	Q 18.84 hy 13.75 or 12.23 mt 2.78 ab 29.34 il 0.76 an 21.13 ap 0.34	Rose's mill, Nelson County, Virginia.	W. M. Thornton.	Watson and Taber, Va. G. S. B. III A, p. 76, 1913.	Hornblende syenite.	
9	II.4.3.4.⊙	Q 16.86 di 0.43 or 8.90 hy 9.90 ab 26.72 il 9.12 an 21.96 hm 1.04 ru 2.48 ap 0.67	Roseland, Nelson County, Virginia.	W. M. Thornton.	Watson and Taber, Va. G. S. B. III A, p. 76, 1913.	Hornblende syenite.	
10	II.4.3.″4.	Q 15.60 di 5.44 or 11.68 hy 8.13 ab 22.01 mt 4.41 an 21.41 il 7.90 ap 1.68	Roseland, Virginia.	W. H. Thornton.	Watson and Taber, U. S. G. S. B. 430, p. 208, 1910.	Gabbro.	
11	II″.4.3.(3)4.	Q 12.90 hy 11.70 or 12.79 il 11.40 ab 23.06 hm 1.44 an 16.12 ru 7.68 C 0.41 ap 0.67	Roseland, Nelson County, Virginia.	W. M. Thornton.	Watson and Taber, Va. G. S. B. III A, p. 76, 1913.	Hornblende syenite.	
12	II.4.3.(3)4.	Q 14.94 di 16.11 or 15.01 hy 2.09 ab 26.72 mt 4.64 an 19.74	St. Cloud, Minnesota.	Dodge and Sidener.	M. E. Wadsworth, G. N. H. S. Minn. B. 2, p. 86, 1887.	Gabbro.	Light portion. Cf. No. 4, II.4.3.3. In W. T., p. 231.
13	II.4″.3.4.	Q 12.78 di 2.38 or 11.12 hy 11.60 ab 34.58 mt 2.78 an 19.18 hm 3.52 ap 0.34	Epsilon Lake, Lake County, Minnesota.	J. A. Dodge.	U. S. Grant, G. N. H. S. Minn. A. R. 21, p. 58, 1893.	Porphyrite.	In W. T., p. 231.
14	(I)II.4.″3.4.	Q 19.32 di 0.89 or 15.01 hy 6.35 ab 33.01 mt 3.71 an 19.18 il 0.91 ap 0.67	Haystack Stock, Park County, Montana.	G. Steiger.	W. H. Emmons, J. G., XVI, p. 210, 1908.	Granodiorite porphyry.	
15	″II.4″.3.(3)4.	Q 14.22 di 1.61 or 16.12 hy 9.52 ab 27.77 mt 3.02 an 24.46 il 1.67 ap 0.67	Cable, Philipsburg quadrangle, Montana.	G. Steiger.	Emmons and Calkins, U. S. G. S. P. P. 78, p. 96, 1913.	Granodiorite.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. TONALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
16	57.98	17.01	3.34	3.34	2.74	7.35	3.92	2.02	0.49	0.14	0.90	0.43	0.12	NiO trace BaO 0.06 SrO 0.02	99.86	
A1. I	.966	.167	.021	.046	.069	.131	.063	.021			.011	.003	.002			
17	59.48	16.37	3.21	3.17	3.29	4.88	3.30	2.81	2.01		0.93	0.41	0.19	Cr_2O_3 0.03 NiO trace BaO 0.13	100.21	
A1. I	.991	.160	.020	.044	.082	.087	.053	.030			.012	.003	.003			
18	56.61	17.91	4.22	2.70	2.21	6.88	3.10	2.71	1.16	0.29	0.71	0.46	0.58	CO_2 0.13 S 0.03 BaO 0.14	99.84	
A1. I	.994	.176	.026	.038	.055	.123	.050	.029			.009	.003	.008			
19	57.78	16.28	1.02	4.92	4.60	6.65	3.25	2.22	0.92	0.34	1.07	0.30	0.15	CO_2 0.15 S 0.02 NiO 0.02 BaO 0.12 SrO 0.07	99.88	
A1. I	.963	.160	.006	.068	.115	.119	.052	.023			.013	.002	.002			
20	65.11	16.21	1.06	3.19	2.57	3.97	4.00	2.51	0.94		0.71	0.02	none	SO_3 trace Cl none Li_2O 0.04	100.33	
A2. II	1.085	.159	.007	.044	.064	.071	.064	.027			.009	——	——			
21	64.07	15.82	3.40	1.44	3.39	4.43	4.06	2.27	0.42	0.10	0.45	0.18	trace	NiO 0.05	100.08	
A2. II	1.068	.155	.021	.020	.085	.079	.065	.024			.005	.001	——			
22	61.22	16.14	3.01	2.58	4.21	5.46	4.48	1.87	0.40	0.04	0.61	0.25	trace	NiO 0.09	100.36	
A2. II	1.020	.158	.019	.036	.105	.098	.072	.020			.008	.002	——			
23	58.49	16.70	3.85	2.37	3.12	5.90	3.47	1.59	2.44		1.71	trace	0.24	SO_3 0.63 Li_2O 0.01	100.52	
A2. II	.975	.164	.024	.033	.078	.105	.056	.017			.021	——	.003			
24	56.28	14.23	4.69	4.05	6.37	7.94	2.98	1.23	0.93		0.84	0.40	0.16	SO_3 trace Cl 0.17 Li_2O 0.01	100.28	
A2. II	.938	.140	.029	.056	.159	.142	.048	.013			.010	.003	.002			
25	60.30	16.31	4.35	1.41	2.39	5.62	3.99	2.36	1.86	0.64	0.76	0.20	0.13	SO_3 0.10 BaO 0.15	100.57	
A1. I	1.005	.160	.027	.020	.060	.100	.064	.025			.010	.001	.002			
26	56.61	13.62	5.89	2.60	5.48	6.61	3.13	2.71	1.07	1.20	0.79	0.06	0.35	Cr_2O_3 0.05 BaO 0.14 SrO trace	100.31	
A1. I	.944	.134	.037	.036	.137	.118	.050	.029			.010	——	.005			
27	55.83	17.11	4.07	3.75	5.05	7.40	2.94	1.71	1.28		1.05	0.21	none	SO_3 trace Cl none Li_2O none	100.40	
A2. II	.931	.168	.025	.052	.126	.132	.047	.018			.013	.001	——			
28	63.76	16.01	2.22	1.96	2.43	4.55	3.98	2.84	0.57	0.28	0.52	0.25	0.09	CO_2 0.23 Cl trace NiO none BaO 0.17 SrO 0.09	99.95	
A1. I	1.063	.157	.014	.028	.061	.081	.065	.030			.006	.002	.001			
29	61.45	15.07	4.46	1.18	3.02	5.37	4.00	1.22	1.23		2.80	trace	none	SO_3 0.29 Li_2O 0.05	100.14	
A2. II	1.024	.148	.028	.017	.076	.096	.064	.013			.034	——	——			
30	61.16	16.17	2.89	2.18	3.89	4.26	3.87	3.20	2.09		0.23	0.13	trace		100.07	
A2. II	1.019	.159	.018	.030	.097	.076	.062	.034			.003	.001	——			

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 4. DOSODIC. TONALOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
16	II.4(5).3.4.	Q 10.44 di 8.53 or 11.68 hy 4.89 ab 33.01 mt 4.87 an 23.07 il 1.67 ap 1.01	Haystack Stock, Park County, Montana.	G. Steiger.	W. H. Emmons, J. G., XVI, p. 212, 1908.	Quartz diorite.	
17	″II.4″.3.(3)4.	Q 14.52 hy 10.18 or 16.68 mt 4.64 ab 27.77 il 1.82 an 21.41 ap 1.01	Near Red Bluff, Montana.	L. G. Eakins.	G. P. Merrill, Pr. U. S. Nat. Mus., XVII, p. 651, 1895.	Andesite.	Complete in U. S. G. S. B. 148, p. 140, 1897. In W. T., p. 233.
18	″II.4(5).3.(3)4.	Q 11.64 di 3.56 or 16.12 hy 5.26 ab 26.20 mt 6.03 an 26.97 il 1.37 ap 1.01	Keating mine, Radersburg, Montana.	C. Palmer.	A. N. Winchell, U. S. G. S. rec. lab.	Andesite.	
19	II.4(5).3.4.	Q 9.30 di 6.09 or 12.79 hy 15.28 ab 27.25 mt 1.39 an 23.63 il 1.98 ap 0.67	Croesus mine, Hailey, Idaho.	W. F. Hillebrand.	W. Lindgren, U. S. G. S. A. R. 20, III, p. 81, 1900.	Diorite.	In W. T., p. 273.
20	(I)II.4.″3.4.	Q 18.48 di 0.68 or 15.01 hy 9.76 ab 33.54 mt 1.62 an 18.90 il 1.37	Electric Peak, Yellowstone National Park.	J. F. Whitfield.	J. P. Iddings, U. S. G. S. A. R. 12, (I), p. 627, 1891.	Quartz diorite.	Also in U.S.G.S. Mon. 32, II, p. 116, 1899. In W. T., p. 233.
21	(I)II.4.″3.4.	Q 18.42 di 2.16 or 13.34 hy 7.50 ab 34.06 mt 3.48 an 18.35 il 0.76 hm 0.96 ap 0.34	Electric Peak, Yellowstone National Park.	W. H. Melville.	J. P. Iddings, U. S. G. S. A. R. 12, I, p. 627, 1891.	Quartz diorite.	Also in U.S.G.S. Mon. 32, II, p. 116, 1899. In W. T., p. 233.
22	II.4(5).″3.4.	Q 11.82 di 5.46 or 11.12 hy 9.82 ab 37.73 mt 4.41 an 18.35 il 1.28 ap 0.67	Electric Peak, Yellowstone National Park.	W. H. Melville.	J. P. Iddings, U. S. G. S. A. R. 12, II, p. 627, 1891.	Diorite.	Also in U.S.G.S. Mon. 32, II, p. 116, 1899. In W. T., p. 233.
23	II.4.3.4.⊙	Q 15.78 di 3.03 or 9.45 hy 6.40 ab 29.34 mt 5.57 an 25.30 il 3.19	Electric Peak, Yellowstone, National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32, II, p. 81, 1899.	Porphyrite.	In W. T., p. 233.
24	II″.4″.3″.4.	Q 11.04 di 11.61 or 7.23 hy 12.82 ab 25.15 mt 6.73 an 21.96 il 1.67 ap 1.01	Electric Peak, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32, II, p. 116, 1899.	Diorite.	In W. T., p. 233.
25	″II.4″.3.4.	Q 14.58 di 5.62 or 13.90 hy 3.40 ab 33.54 mt 2.78 an 19.74 il 1.52 hm 2.40 ap 0.34	Sepulcher Mountain, Yellowstone National Park.	T. M. Chatard.	J. P. Iddings, U. S. G. S. A. R. 12, I, p. 648, 1891.	Andesite.	Also in U.S.G.S. Mon. 32, II, p. 135, 1899. In W. T., p. 233.
26	II″.4(5).″3.(3)4.	Q 9.60 di 13.61 or 16.12 hy 7.40 ab 26.20 mt 7.19 an 15.29 il 1.52 hm 0.96	Sepulcher Mountain, Yellowstone National Park.	T. M. Chatard.	J. P. Iddings, U. S. G. S. A. R. 12, I, p. 648, 1899.	Andesite.	Also in U.S.G.S. Mon. 32, II, p. 135, 1899. In W. T., p. 233.
27	II.4(5).3(4).4.	Q 10.14 di 5.72 or 10.01 hy 11.75 ab 24.63 mt 5.80 an 28.63 il 1.98 ap 0.36	Sepulcher Mountain, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. A. R. 12, I, p. 648, 1891.	Andesite.	Also in U.S.G.S. Mon. 32, II, p. 135, 1899. In W. T., p. 233.
28	(I)II.4.(2)3.″4.	Q 17.28 di 2.65 or 16.68 hy 5.89 ab 34.06 mt 0.91 an 17.24 il 3.25 ap 0.67	Needle Mountain, Yellowstone National Park.	W. F. Hillebrand.	Hague and Jaggar, U. S. G. S. B. 168, p. 96, 1900.	Diorite.	In W. T., p. 187.
29	II.4.3.4″.	Q 19.14 di 1.73 or 7.23 hy 6.80 ab 33.54 il 2.58 an 19.74 hm 4.46 tn 3.33	Agate Creek, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. B. 148, p. 134, 1897.	Andesite.	In W. T., p. 233.
30	″II 4′5).(2‵3.″4.	Q 12.06 di 2.19 or 18.90 hy 10.66 ab 32.49 mt 4.18 an 17.51 il 0.46 ap 0.34	Hurricane Ridge, Crandall Basin, Yellowstone National Park.	L. G. Eakins.	J. P. Iddings, U. S. G. S. Mon. 32 II, p. 261, 1899.	Andesite porphyry.	In W. T., p. 233.

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. TONALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
31	60.15	17.85	2.00	2.02	3.26	5.48	3.95	2.36	1.24	0.25	0.47	0.22	0.07	CO_2 none Cr_2O_3 none NiO none BaO 0.20 SrO 0.10 Li_2O none	99.62	
A1. I	1.003	.175	.013	.028	.082	.098	.064	.025			.007	.002	.001			
32	60.00	16.37	2.28	2.46	3.81	4.96	3.73	2.70	1.42	0.61	0.59	0.35	0.05	CO_2 0.17 NiO none BaO 0.26 SrO 0.11 Li_2O trace	99.87	
A1. I	1.000	.160	.014	.034	.095	.089	.059	.029			.007	.002	—			
33	62.71	17.06	3.79	2.74	1.78	5.51	3.54	2.96	0.24				trace		100.33	2.79
A3. III	1.045	.167	.024	.038	.045	.098	.057	.032								30°
34	60.69	15.90	4.52	1.72	1.93	5.23	3.55	3.22	0.96	0.93	0.73	0.31	0.13	CO_2 0.27 NiO none BaO 0.10 SrO 0.03	100.22	
A1. I	1.012	.156	.028	.024	.048	.093	.057	.034			.009	.002	.002			
35	59.42	16.79	3.23	3.29	2.24	5.57	4.15	2.82	0.79	0.27	0.68	0.35	0.13	CO_2 0.44 BaO 0.14 SrO 0.07 Li_2O trace	100.38	
A1. I	.990	.164	.020	.046	.056	.100	.067	.030			.008	.002	.002			
36	59.19	18.00	3.07	2.32	1.41	6.55	4.01	2.74	1.06	0.46	0.58	0.29	0.19	BaO 0.18 SrO 0.13 Li_2O trace	100.18	
A1. I	.970	.176	.020	.032	.034	.117	.064	.029			.007	.002	.003			
37	58.88	15.93	3.12	2.94	2.30	6.05	3.17	1.86	2.48	1.66	0.73	0.34	0.16	ZrO_2 0.02 FeS_2 0.07 BaO 0.12 SrO 0.14 Li_2O trace	99.97	
A1. I	.981	.156	.019	.041	.058	.108	.052	.020			.009	.002	.002			
38	60.00	18.10	1.75	3.77	2.41	5.30	3.36	2.10	0.73	0.76	0.93	0.63	0.13	CO_2 trace ZrO_2 0.02 S 0.02 BaO 0.09 SrO 0.01	100.11	
A1. I	1.000	.177	.011	.053	.060	.095	.054	.022			.012	.004	.002			
39	57.28	17.55	4.07	3.96	2.08	6.61	3.54	2.00	0.66	0.94	0.81	0.38	0.16	CO_2 none ZrO_2 none S 0.01 Cr_2O_3 none V_2O_3 0.01 BaO 0.08 SrO 0.05	100.19	
A1. I	.955	.172	.025	.055	.052	.118	.057	.021			.010	.003	.002			
40	56.93	17.03	3.67	4.54	3.30	6.51	3.19	2.58	0.45	0.13	1.03	0.44	0.10	CO_2 none SO_3 none Cl trace BaO 0.08 SrO 0.06 Li_2O none	100.04	2.860
A1. I	.949	.167	.023	.063	.083	.116	.050	.027			.013	.003	.001			33°
41	56.19	16.12	4.92	4.43	4.60	7.00	2.96	2.37	1.03			0.27	trace	Cl 0.02	99.91	2.742
A3. III	.937	.158	.031	.061	.115	.125	.048	.025				.002	—			
42	63.16	17.21	2.43	2.30	1.27	6.27	4.70	1.84	0.69		0.21	0.12	trace	SO_3 trace BaO 0.09 SrO trace Li_2O trace	100.29	
A2. II	1.053	.169	.015	.032	.032	.112	.076	.020			.003	.001	—			
43	62.88	17.13	1.86	2.58	1.48	5.39	4.50	2.25	0.42	0.16	0.51	0.26	0.16	BaO 0.16 SrO 0.12 Li_2O trace	99.86	
A1. I	1.048	.168	.012	.036	.037	.096	.072	.024			.006	.002	.002			
44	62.10	15.47	2.64	3.15	2.57	5.31	3.56	3.15	0.72	0.14	0.81	0.27		CO_2 trace	99.89	2.72
A2. II	1.035	.152	.016	.044	.064	.095	.057	.034			.010	.002				
45	60.42	17.27	2.60	3.47	2.30	6.36	3.14	2.34	0.86	0.40	0.83	0.20	0.13	CO_2 none ZrO_2 none SO_3 none S 0.05 BaO 0.03 SrO 0.06	100.46	
A1. I	1.007	.169	.016	.049	.058	.114	.051	.025			.010	.002	.002			

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 4. DOSODIC. TONALOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
31	(I)II.4(5).3.4.	Q 12.06 or 13.90 ab 33.54 an 23.91 di 1.08 hy 8.89 mt 3.02 il 1.06 ap 0.67	Wind River Plateau, Yellowstone National Park.	H. N. Stokes.	Hague and Jaggar, U. S. G. S. B. 168, p. 97, 1900.	Andesite.	In W. T., p. 233.
32	″II.4″.3.″4.	Q 12.60 or 16.12 ab 30.92 an 20.02 di 2.19 hy 10.18 mt 3.25 il 1.06 ap 0.67	Cabin Creek, Yellowstone National Park.	H. N. Stokes.	Hague and Jaggar, U. S. G. S. B. 168, p. 96, 1900.	Diorite porphyry.	In W. T., p. 233.
33	(I)II.4.3.(3)4.	Q 16.44 or 17.79 ab 29.87 an 22.24 di 4.02 hy 4.44 mt 5.57	Brush Creek, Elk Mountains, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. B. 150, p. 242, 1898.	Diorite.	In W. T., p. 235.
34	(I)II.4.″3.(3)4.	Q 16.38 or 18.90 ab 29.87 an 18.07 di 3.24 hy 3.30 mt 3.94 il 1.37 hm 1.76 ap 0.67	Pinnacle Ridge, Ouray quadrangle, Colorado.	G. Steiger.	Cross and Howe, U. S. G. S. Fol. 153, p. 12, 1907.	Quartz latite.	
35	″II.4(5).″3.4.	Q 10.32 or 16.68 ab 35.11 an 18.63 di 5.88 hy 5.38 mt 4.64 il 1.22 ap 0.67	Ute Peak, Sierra El Late, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. A. R. 14, II, p. 227, 1894.	Porphyrite.	In W. T., p. 233.
36	(I)II.4(5).3.″4.	Q 10.62 or 16.12 ab 33.54 an 23.07 di 5.99 hy 1.60 mt 4.64 il 1.06 ap 0.67	Lone Cone, San Miguel Mountains, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. A. R. 14, II, p. 227, 1894.	Diorite.	In W. T., p. 233.
37	″II.4.3.4.	Q 17.46 or 11.12 ab 27.25 an 23.35 di 3.77 hy 5.98 mt 4.41 il 1.37 ap 0.67	Edith Mountain, Silverton, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. Fol. 120, p. 9, 1905.	Andesite.	
38	″II.4.3.4.	Q 17.40 or 12.23 ab 28.30 an 22.52 C 2.04 hy 10.22 mt 2.55 il 1.82 ap 1.34	Red Mountain, San Cristobal quadrangle, Colorado.	G. Steiger.	W. Cross, U. S. G. S. rec. lab.	Diorite.	
39	″II.4″.3.4.	Q 12.66 or 11.68 ab 29.87 an 26.13 di 3.16 hy 6.58 mt 5.80 il 1.52 ap 1.01	Woodbine Creek, San Cristobal quadrangle, Colorado.	G. Steiger.	W. Cross, U. S. G. S. rec. lab.	Andesite.	
40	II.4(5).3.(3)4.	Q 10.80 or 15.01 ab 26.20 an 25.02 di 3.59 hy 10.27 mt 5.34 il 1.98 ap 1.01	Ophir Needles, Telluride, Colorado.	H. N. Stokes.	W. Cross, U. S. G. S. Fol. 57, p. 6, 1899.	Diorite-monzonite.	In W. T., p. 235.
41	II.4(5).3.″4.	Q 9.06 or 13.90 ab 25.15 an 23.63 di 7.42 hy 11.87 mt 7.19 ap 0.67	Buffalo Peaks, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 1, p. 26, 1883.	Hypersthene andesite.	Also in A. J. S., XXV, p. 142, 1883. In W. T., p. 277.
42	(I)II.4″.″3.4.	Q 14.34 or 11.12 ab 39.82 an 20.29 di 8.13 hy 1.10 mt 3.48 il 0.46 ap 0.34	Henry Mountains, Utah.	R. B. Riggs.	J. S. Diller, U. S. G. S. B. 148, p. 183, 1897.	Porphyry.	In W. T., p. 233.
43	(I)II.4″.″3.4.	Q 15.24 or 13.34 ab 37.73 an 20.02 di 3.87 hy 4.45 mt 2.78 il 0.91 ap 0.67	Mount Hillers, Henry Mountains, Utah.	W. F. Hillebrand.	W. Cross, U. S. G. S. A. R. 14, II, p. 227, 1894.	Porphyrite.	In W. T., p. 233.
44	″II.4.(2)3.(3)4.	Q 15.48 or 18.90 ab 29.87 an 16.96 di 6.02 hy 5.88 mt 3.71 il 1.52 ap 0.67	Frisco District, Utah.	G. Steiger.	B. S. Butler, U. S. G. S. rec. lab.	Monzonite.	
45	″II.4.3.″4.	Q 16.08 or 13.90 ab 26.72 an 25.85 di 3.16 hy 7.57 mt 3.71 il 1.52 ap 0.67	Kelvin, Ray District, Arizona.	G. Steiger.	F. L. Ransome, U. S. G. S. rec. lab.	Quartz diorite.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. TONALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
46	60.16	15.34	3.07	2.18	3.41	5.79	3.88	2.59	1.79	0.25	0.84	0.46	0.08	ZrO_2 0.01 SO_3 0.08 S trace NiO trace BaO 0.14 SrO 0.08	100.15	2.635
A1. I	1.003	.150	.020	.030	.085	.103	.063	.027			.011	.003	.001			21°
47	61.96	17.04	2.71	2.66	2.41	3.99	4.00	3.10	0.89	0.21	0.87	0.22	trace	CO_2 none SO_3 none Cl trace	100.06	2.59
A2. II	1.033	.167	.017	.037	.060	.071	.065	.033			.011	.002	—			
48	60.40	17.01	2.05	3.92	2.97	4.45	3.85	2.97	0.70	0.11	1.00	0.22		CO_2 none Cl trace	99.65	2.75
A2. II	1.007	.167	.013	.054	.074	.080	.062	.032			.013	.002				
49	58.74	16.02	4.16	3.50	2.18	5.12	3.26	2.39	1.60	0.83	1.29	0.56	0.22	ZrO_2 0.05 FeS_2 0.11 BaO 0.10 SrO trace Li_2O trace	100.13	
A1. I	.979	.157	.026	.049	.055	.091	.053	.026			.016	.004	.003			
50	62.78	17.16	1.96	2.31	2.32	4.84	4.11	2.15	0.88	0.24	0.56	0.15	0.06	CO_2 none Cl trace S 0.02 BaO 0.04 SrO trace Li_2O trace	99.58	
A1. I	1.046	.168	.013	.032	.058	.086	.066	.023			.007	.001	.001			
51	62.67	16.62	3.25	1.17	3.08	5.56	4.24	1.67	1.01	0.23	0.48	0.15	0.11	CO_2 none ZrO_2 0.01 S none NiO 0.01 BaO 0.06 SrO 0.03	100.35	
A1. I	1.045	.163	.020	.017	.077	.099	.068	.018			.006	.001	.002			
52	61.31	16.70	1.30	4.08	3.44	6.10	4.05	1.58	0.36	0.22	0.73	0.18	0.14	CO_2 none ZrO_2 0.01 S none NiO 0.02 BaO 0.05 SrO 0.02 Li_2O trace	100.29	
A1. I	1.022	.164	.008	.057	.086	.109	.066	.017			.009	.001	.002			
53	58.63	16.23	1.91	4.20	4.28	6.59	3.51	2.09	1.17	0.15	0.74	0.20	0.11	CO_2 none FeS_2 0.04 NiO 0.02 BaO 0.06 SrO trace Li_2O trace	99.93	
A1. I	.977	.159	.012	.058	.107	.118	.057	.022			.009	.001	.002			
54	62.64	17.75	1.64	3.44	2.53	4.44	3.53	2.14	1.65		0.60	0.25	0.14		100.75	2.71
A2. II	1.044	.174	.010	.048	.063	.079	.056	.022			.008	.002	.002			
55	60.36	17.23	1.93	3.74	3.66	6.07	3.58	1.74	0.55	0.06	0.70	0.11	0.14	CO_2 0.08	99.95	2.757
A2. II	1.006	.169	.012	.052	.092	.109	.058	.019			.009	.001	.002			
56	58.36	18.38	0.53	5.30	2.60	7.20	3.15	1.98	0.80	0.10	0.54	0.12	0.14	CO_2 0.13 BaO 0.10 SrO trace	99.43	
A2. II	.973	.180	.003	.074	.065	.129	.051	.021			.007	.001	.002			
57	64.04	15.58	1.26	3.22	3.23	4.51	4.01	2.22	1.17	0.19	0.69	0.16	trace	CO_2 none S trace NiO none BaO 0.11 SrO trace Li_2O trace	100.39	
A1. I	1.067	.153	.008	.044	.081	.080	.064	.023			.009	.001	—			
58	63.78	16.39	1.12	2.76	3.27	4.07	3.84	2.03	1.82	0.22	0.44	0.11	0.05	CO_2 none S trace Cr_2O_3 none NiO none BaO 0.08 SrO trace	99.98	
A1. I	1.063	.161	.007	.039	.082	.073	.062	.021			.005	.001	—			
59	63.37	15.90	1.41	3.18	3.33	4.63	4.05	2.10	1.16	0.18	0.69	0.17	trace	CO_2 none S trace Cr_2O_3 none NiO trace BaO 0.06 SrO none	100.23	
A1. I	1.056	.156	.009	.044	.084	.083	.065	.022			.009	.001	—			

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 4. DOSODIC. TONALOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
46	II.4″.(2)3.4.	Q 13.50 or 15.01 ab 33.01 an 16.68 di 7.13 hy 5.20 mt 4.64 il 1.67 ap 1.01	Sierra Grande, Colfax County, New Mexico.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 168, p. 171, 1900.	Andesite.	In W. T., p. 235.
47	(I)II.4″.(2)3.″4.	Q 14.88 or 18.35 ab 34.06 an 17.79 C 0.51 hy 7.19 mt 3.94 il 1.67 ap 0.67	Kendrick Peak, San Francisco Mountains, Arizona.	H. H. Robinson.	H. H. Robinson, U. S. G. S. P. P. 76, p. 131, 1913.	Dacite.	
48	″II.4(5).3.″4.	Q 11.70 or 17.79 ab 32.49 an 20.29 hy 11.10 mt 3.02 il 1.98 ap 0.67	Kendrick Peak, San Francisco Mountains, Arizona.	H. H. Robinson.	H. H. Robinson, U. S. G. S. P. P. 76, p. 133, 1913.	Dacite.	
49	″II.4.3.″4.	Q 17.04 or 14.46 ab 27.77 an 21.68 hy 6.82 mt 6.03 il 2.43 ap 1.34	Near Pinal Peak, Globe District, Arizona.	W. F. Hillebrand.	F. L. Ransome, U. S. G. S. P. P. 12, p. 60, 1903.	Quartz diorite.	
50	(I)II.4.3.4.	Q 16.74 or 12.79 ab 34.58 an 21.96 di 0.89 hy 7.08 mt 3.02 il 1.06 ap 0.34	Yentna River, Alaska.	H. N. Stokes.	J. E. Spurr, A. J. S., X, p. 310, 1900.	Yentnite.	Scapolite plagioclase rock. In W. T., p. 235
51	(I)II.4.3.4.	Q 16.62 or 10.01 ab 35.63 an 21.41 di 4.10 hy 6.00 mt 2.55 il 0.91 hm 1.44 ap 0.34	Mount Drum, Copper River basin, Alaska.	W. F. Hillebrand.	W. C. Mendenhall, U. S. G. S. P. P. 41, p. 60, 1905.	Andesite.	
52	II.4″.3.4.	Q 12.66 or 9.45 ab 34.58 an 22.52 di 5.66 hy 11.12 mt 1.86 il 1.37 ap 0.34	Mount Wrangell, Copper River basin, Alaska.	W. F. Hillebrand.	W. C. Mendenhall, U. S. G. S. P. P. 41, p. 59, 1905.	Andesite.	
53	II.4(5).3.4.	Q 10.32 or 12.23 ab 29.87 an 22.40 di 5.62 hy 13.12 mt 2.78 il 1.37 ap 0.34	Captains Bay, Unalaska Island, Alaska.	W. F. Hillebrand.	G. F. Becker, U. S. G. S. B. 148, p. 232, 1897.	Diorite.	In W. T., p. 235.
54	(I)II.4.3.4.	Q 20.22 or 12.23 ab 29.34 an 20.02 C 2.45 hy 10.52 mt 2.32 il 1.22 ap 0.67	Shoal Harbor, Saanich District, Vancouver Island, British Columbia.	M. F. Connor.	C. H. Clapp, Can. G. S. Mem. 36, p. 33, 1913.	Granodiorite.	
55	II.4″.3.4.	Q 13.26 or 10.56 ab 30.39 an 25.58 di 3.10 hy 12.03 mt 2.78 il 1.37 ap 0.34	Chilliwalk, Batholith, Skagit Range, British Columbia.	M. Dittrich.	R. A. Daly, Can. G. S. Mem. 38 (1), p. 536, 1912.	Quartz diorite.	
56	II.4(5).3(4).4.	Q 10.56 or 11.68 ab 26.72 an 30.02 di 4.18 hy 13.12 mt 0.70 il 1.06 ap 0.34	Stemwinder Hill, Hedley District, British Columbia.	M. F. Connor.	C. Camsell, Can. G. S. Mem. 2, p. 78, 1910.	Quartz diorite.	
57	″II.4.″3.4.	Q 17.58 or 12.79 ab 33.54 an 18.35 di 2.48 hy 10.63 mt 1.86 il 1.37 ap 0.34	Mount Stuart, Kittitas County, Washington.	H. N. Stokes.	G. O. Smith, U. S. G. S. Fol. 106, p. 5, 1904.	Granodiorite.	In W. T., p. 235.
58	″II.4.3.4.	Q 18.96 or 11.68 ab 32.45 an 19.46 C 0.82 hy 11.76 mt 1.62 il 0.76 ap 0.34	Mount Stuart, Kittitas County, Washington.	H. N. Stokes.	G. O. Smith, U. S. G. S. Fol. 106, p. 5, 1904.	Granodiorite porphyry.	In W. T., p. 235.
59	″II.4.3.4.	Q 16.56 or 12.23 ab 34.06 an 18.91 di 2.69 hy 10.54 mt 2.09 il 1.37 ap 0.34	Near Cascade Creek, Kittitas County, Washington.	H. N. Stokes.	G. O. Smith, U. S. G. S. Fol. 106, p. 5, 1904.	Granodiorite.	In W. T., p. 235.

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. TONALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
60	57.21	12.99	3.28	10.18	1.59	5.97	3.07	1.61	1.03	0.68	1.72	0.44	0.24	FeS_2 0.13 Cr_2O_3 none V_2O_3 none NiO trace BaO 0.06 SrO trace	100.20	
A1. I	.954	.127	.021	.141	.040	.107	.050	.017			.022	.003	.003			
61	53.35	12.90	2.64	11.28	2.68	6.96	2.83	1.40	1.76	0.91	2.44	0.45	0.25	FeS_2 0.13 Cr_2O_3 none V_2O_3 0.04 NiO trace BaO 0.05 SrO trace	100.07	
A1. I	.889	.126	.016	.157	.067	.124	.045	.015			.031	.003	.004			
62	62.77	14.96	1.62	4.36	1.48	3.90	4.31	2.13	2.49	0.51	0.79	0.22	0.10	CO_2 none ZrO_2 0.03 S none NiO none BaO 0.10 SrO none	99.77	
A1. I	1.046	.147	.010	.061	.037	.070	.069	.022			.010	.002	.001			
63	60.49	17.77	1.98	3.29	2.94	6.20	3.67	1.37	1.13	0.27	0.69	0.08	0.09	CO_2 none S none NiO trace BaO 0.04 SrO 0.02	100.05	
A1. I	1.008	.175	.013	.046	.074	.111	.060	.015			.009	——	.001			
64	62.09	17.03	2.38	2.69	3.08	5.65	4.10	1.67	0.13	0.04	0.65	0.19	trace	CO_2 none Cl trace S none Cr_2O_3 none NiO none BaO 0.07 SrO 0.07 Li_2O none	99.84	
A1. I	1.035	.167	.015	.038	.077	.101	.066	.018			.008	.001	——			
65	60.98	17.82	1.83	3.33	2.76	5.73	4.26	1.43	0.45	0.13	0.71	0.17	trace	CO_2 none Cl trace S none Cr_2O_3 none NiO none BaO 0.06 SrO 0.05 Li_2O none	99.71	
A1. I	1.016	.174	.011	.046	.069	.102	.069	.015			.009	.001	——			
66	60.09	17.85	2.03	3.45	3.50	6.28	4.17	1.31	0.26	0.12	0.54	0.23	trace	CO_2 none ZrO_2 none Cl trace S none Cr_2O_3 none NiO 0.05 BaO 0.05 SrO 0.05	99.98	
A1. I	1.002	.175	.013	.049	.088	.112	.068	.014			.008	.002	——			
67	59.39	18.45	1.79	3.90	3.13	6.29	4.29	1.29	0.42	0.10	0.41	0.22	trace	CO_2 none ZrO_2 none Cl trace S none Cr_2O_3 none NiO none BaO 0.05 SrO 0.04	99.77	
A1. I	.990	.181	.011	.054	.078	.112	.069	.014			.005	.002	——			
68	58.41	17.85	2.67	3.29	3.61	6.81	3.77	1.23	0.86	0.34	0.69	0.24	trace	CO_2 none Cl trace S none Cr_2O_3 none NiO none BaO 0.05 SrO 0.05 Li_2O trace	99.87	
A1. I	.974	.175	.017	.046	.090	.121	.061	.013			.009	.002	——			
69	58.65	18.35	1.59	4.21	3.49	6.95	3.70	1.32	0.70	0.20	0.81	0.17	trace	CO_2 none S none Cr_2O_3 none BaO 0.06 SrO trace Li_2O none	100.20	
A1. I	.978	.180	.010	.058	.087	.124	.060	.014			.010	.001	——			
70	59.61	15.98	1.12	5.42	5.04	5.54	3.68	1.10	1.14	0.20	0.65	0.14	0.21	NiO 0.05 BaO 0.04	99.92	
A2. II	.994	.157	.007	.075	.126	.099	.060	.012			.008	.001	.003			
71	57.49	17.22	4.34	3.01	3.38	6.48	3.90	1.30	1.37	0.62	1.12	0.28	0.22	BaO trace	100.73	
A2. II	.958	.169	.027	.042	.084	.116	.063	.014			.014	.002	.003			
72	63.03	17.72	2.27	1.92	3.63	5.97	3.92	1.06	0.44						99.96	
A3. III	1.051	.174	.014	(.026)	.091	.107	.063	.012								

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 4. DOSODIC. TONALOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
60	II″.4.3.4.	Q 15.24 di 8.83 or 9.45 hy 12.80 ab 26.20 mt 4.87 an 16.68 il 3.34 ap 1.01	Turnpike Creek, Kittitas County, Washington.	W. F. Hillebrand.	G. O. Smith, U. S. G. S. Fol. 106, p. 6, 1904.	Diabase.	In W. T., p. 235.
61	II(III).4″.3.4.	Q 10.32 di 11.33 or 8.34 hy 15.46 ab 23.58 mt 3.71 an 18.35 il 4.71 ap 1.01	Teanaway River, Kittitas County, Washington.	W. F. Hillebrand.	G. O. Smith, U. S. G. S. Fol. 106, p. 6, 1904.	Basalt.	In W. T., p. 311.
62	(I)II.4.(2)3.4.	Q 18.12 di 1.64 or 12.23 hy 8.42 ab 36.15 mt 2.32 an 15.57 il 1.52 ap 0.67	Naches Valley, Snoqualmie quadrangle, Washington.	G. Steiger.	Smith and Calkins, U. S. G. S. Fol. 139, p. 8, 1906.	Andesite.	
63	″II.4″.3″.4.	Q 14.88 di 2.48 or 8.34 hy 9.50 ab 31.44 mt 3.02 an 27.80 il 1.37	Gold Creek, Snoqualmie quadrangle, Washington.	G. Steiger.	Smith and Calkins, U. S. G. S. Fol. 139, p. 9, 1906.	Granodiorite.	
64	″II.4″.3.4.	Q 15.48 di 3.30 or 10.01 hy 8.12 ab 34.58 mt 3.48 an 23.07 il 1.22 ap 0.34	Palisades, Crater Lake, Oregon.	H. N. Stokes.	H. B. Patton, U. S. G. S. P. P. 3, p. 94, 1902.	Andesite.	In W. T., p. 235.
65	″II.4″.3.4″.	Q 13.68 di 2.00 or 8.34 hy 9.37 ab 36.16 mt 2.55 an 25.02 il 1.37 ap 0.34	The Watchman, Crater Lake, Oregon.	H. N. Stokes.	H. B. Patton, U. S. G. S. P. P. 3, p. 94, 1902.	Andesite.	In W. T., p. 235.
66	II.4(5).3.4″.	Q 11.70 di 2.69 or 7.78 hy 11.33 ab 35.63 mt 3.02 an 25.85 il 1.22 ap 0.67	Crater rim, Crater Lake, Oregon.	H. N. Stokes.	H. B. Patton, U. S. G. S. P. P. 3, p. 94, 1902.	Andesite.	In W. T., p. 235.
67	″II.4(5).3.4″.	Q 10.74 di 2.51 or 7.78 hy 11.59 ab 36.16 mt 2.55 an 27.24 il 0.76 ap 0.34	Wizard Island, Crater Lake, Oregon.	H. N. Stokes.	H. B. Patton, U. S. G. S. P. P. 3, p. 94, 1902.	Andesite.	In W. T., p. 235.
68	II.4″.3″.4″.	Q 12.30 di 2.87 or 7.23 hy 10.28 ab 31.96 mt 3.94 an 28.08 il 1.37 ap 0.67	Llao Rock, Crater Lake, Oregon.	H. N. Stokes.	H. B. Patton, U. S. G. S. P. P. 3, p. 94, 1902.	Andesite.	In W. T., p. 235.
69	II.4(5).3″.4.	Q 10.92 di 3.40 or 7.78 hy 12.06 ab 31.44 mt 2.32 an 29.47 il 1.52 ap 0.34	Desert Cove, Crater Lake, Oregon.	H. N. Stokes.	H. B. Patton, U. S. G. S. P. P. 3, p. 161, 1902.	Andesite.	Not in W. T.
70	II.4″.3.4″.	Q 11.52 di 2.04 or 6.67 hy 19.92 ab 31.44 mt 1.62 an 23.91 il 1.22 ap 0.34	Cherry Creek, John Day Basin, Oregon.	F. C. Calkins.	F. C. Calkins, Un. Cal., Dep. G., B. III, p. 136, 1902.	Quartz basalt.	
71	II.4(5).3.4″.	Q 12.42 di 3.67 or 7.78 hy 7.23 ab 33.01 mt 6.26 an 25.58 il 2.13 ap 0.67	Halds Canyon, John Day Basin, Oregon.	F. C. Calkins.	F. C. Calkins, Un. Cal., Dep. G., B. III, p. 127, 1902.	Andesite.	
72	(I)II.4.3″.4″.	Q 17.52 di 1.76 or 6.67 hy 9.85 ab 33.01 mt 3.25 an 27.52	Mount Shasta, California.	W. H. Melville.	J. S. Diller, U. S. G. S. B. 150, p. 228, 1898.	Andesite.	In W. T., p. 235.

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. TONALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
73	62.44	16.39	4.66	1.00	2.65	6.22	3.16	2.25	1.02		0.31	0.05	trace	SO_3 trace BaO 0.03 SrO trace Li_2O trace	100.18	
A2. II	1.041	.160	.029	.014	.066	.110	.051	.024			.004	—	—			
74	61.58	16.96	1.75	2.85	3.67	6.28	3.94	1.28	1.06	0.24	0.49	0.22	trace	BaO 0.03 SrO trace Li_2O trace	100.35	
A2. II	1.026	.166	.011	.040	.092	.112	.063	.014			.006	.002	—			
75	60.04	17.43	5.39	0.53	3.51	6.65	4.15	1.24	0.90		0.49	0.04	0.08	SO_3 trace BaO 0.04 Li_2O trace	100.49	
A2. II	1.001	.171	.034	.007	.088	.119	.067	.014			.006	—	.001			
76	61.17	17.74	1.78	3.51	2.76	5.90	3.79	1.71	0.83		0.45	0.14	0.12	Cr_2O_3 none BaO 0.06 SrO 0.04 Li_2O trace	100.00	
A1. I	1.020	.174	.011	.049	.069	.105	.061	.018			.006	.001	.002			
77	60.93	18.56	2.68	2.19	2.37	6.63	3.79	1.33	0.90		0.61	0.18	0.10	BaO 0.02 SrO 0.12 Li_2O none	100.41	
A1. I	1.016	.182	.017	.030	.059	.118	.061	.014			.008	.001	.001			
78	59.84	16.81	1.88	3.60	3.85	6.30	3.63	2.13	1.04		0.57	0.19	0.14	Cr_2O_3 trace BaO 0.07 SrO 0.02 Li_2O trace	100.07	
A1. I	.998	.165	.012	.050	.096	.112	.058	.022			.007	.001	.002			
79	62.62	17.51	0.49	4.06	2.84	5.49	3.49	1.76	0.92	0.22	0.55	0.12	0.05	BaO trace SrO trace Li_2O trace	100.12	
A2. II	1.044	.172	.003	.057	.071	.098	.056	.019			.007	.001	—			
80	58.09	17.46	1.12	5.08	4.06	6.24	2.94	2.02	1.45	0.29	0.95	0.17	none	CO_2 0.21 SO_3 0.05 Cl 0.02 F trace BaO 0.07 SrO 0.04 Li_2O none Org 0.11		
A1. I	.968	.171	.007	.071	.102	.111	.047	.022			.012	.001				
81	60.20	17.21	3.12	2.69	3.18	6.04	3.35	1.44	1.10	1.12	0.57	0.17	0.12	BaO 0.11 SrO trace Li_2O trace	100.50	
A2. II	1.003	.169	.020	.038	.080	.108	.054	.015			.007	.001	.002			
82	59.68	17.09	2.85	2.75	3.54	6.62	3.87	1.31	1.00	0.15	0.65	0.25	trace	CO_2 0.20 SO_3 trace Cl 0.03 BaO 0.04 SrO trace Li_2O trace	100.03	
A1. I	.995	.167	.018	.039	.089	.118	.063	.014			.008	.002	—			
83	58.47	18.80	3.34	2.64	2.69	6.60	3.58	2.01	0.92	0.14	0.51	0.22	0.13	BaO 0.09 SrO 0.05 Li_2O trace	100.19	
A1. I	.975	.184	.020	.037	.067	.118	.058	.021			.006	.002	.002			
84	63.47	16.75	2.15	2.75	3.04	5.72	3.94	1.62	0.55		0.37	0.13	0.09	BaO 0.04 SrO 0.04 Li_2O trace	100.66	
A1. I	1.058	.164	.014	.039	.076	.102	.063	.017			.005	.001	.001			
85	58.08	18.37	2.92	3.38	3.35	7.05	3.66	1.33	1.09		0.44	0.16	0.13	BaO 0.03 SrO 0.02 Li_2O trace	100.01	
A1. I	.968	.180	.018	.048	.084	.126	.059	.014			.006	.001	.002			
86	60.02	16.07	2.17	3.46	4.57	7.01	3.55	1.59	0.45	0.24	0.42	0.17	0.10	SO_3 0.06 Cr_2O_3 trace BaO 0.08 SrO trace Li_2O trace	99.96	
A1. I	1.000	.157	.014	.049	.114	.125	.057	.018			.005	.001	.001			
87	59.34	17.61	3.63	2.28	3.50	6.45	3.40	1.94	0.74	0.64	0.32	0.25	0.12	BaO 0.11 SrO 0.04 Li_2O trace	100.37	
A1. I	.989	.172	.022	.032	.088	.115	.055	.020			.004	.002	.002			

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 4. DOSODIC. TONALOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
73	″II.4.3.″4.	Q 19.80 di 5.40 or 13.34 hy 4.10 ab 26.72 mt 2.32 an 23.63 il 0.61 hm 3.04	Burney Butte, Shasta County, California.	R. B. Riggs.	J. S. Diller, U. S. G. S. B. 148, p. 195, 1897.	Andesite.	In W. T., p. 237.
74	II.4.3.4″.	Q 15.30 di 3.56 or 7.78 hy 10.54 ab 33.01 mt 2.55 an 24.74 il 0.91 ap 0.67	Mount Shasta, California.	H. N. Stokes.	J. S. Diller, U. S. G. S. B. 148, p. 190, 1897.	Andesite.	In W. T., p. 237.
75	″II.4″.3.4″.	Q 13.08 di 6.26 or 7.78 hy 5.90 ab 35.12 mt 0.46 an 25.02 il 0.91 hm 5.12	Burney Creek, Shasta County, California.	R. B. Riggs.	J. S. Diller, U. S. G. S. B. 148, p. 195, 1897.	Andesite.	In W. T., p. 237.
76	″II.4″.3.4.	Q 14.76 di 1.57 or 10.01 hy 10.62 ab 31.96 mt 2.55 an 26.41 il 0.91 ap 0.34	Crater Peak, n. Lassen Peak, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 148, p. 197, 1897.	Andesite.	In W. T., p. 237.
77	(I)II.4.3″.4″.	Q 16.74 di 1.76 or 7.78 hy 5.86 ab 31.96 mt 3.94 an 29.75 il 1.22 ap 0.34	Tuscan Buttes, Lassen Peak, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 148, p. 195, 1897.	Andesite.	In W. T., p. 237.
78	II.4(5).3.4.	Q 11.76 di 5.59 or 12.23 hy 11.26 ab 30.39 mt 2.78 an 23.35 il 1.06 ap 0.34	Bailey Creek, Lassen Peak, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 148, p. 197, 1897.	Andesite.	In W. T., p. 237.
79	(I)II.4.3.4.	Q 17.16 hy 13.30 or 10.56 mt 0.70 ab 29.34 il 1.06 an 26.41 ap 0.34 C 0.20	Chowchilla River, Mariposa County, California.	W. F. Hillebrand.	H. W. Turner, J. G., III, p. 403, 1895.	Quartz diorite.	Also in U.S.G.S. A. R. 17, I, p. 691, 1896. In W. T., p. 239.
80	II.4(5).3(4).″4.	Q 11.40 di 1.36 or 12.23 hy 16.40 ab 24.63 mt 1.62 an 28.36 il 1.82 ap 0.34	Yaqui Creek, Mariposa County, California.	G. Steiger.	H. W. Turner, U. S. G. S. B. 150, p. 342, 1898.	Quartz diorite.	Also in J. G., VII, p. 150, 1899. In W. T., p. 239.
81	″II.4.3″.4.	Q 17.46 di 1.11 or 8.34 hy 9.18 ab 28.30 mt 4.64 an 27.80 il 1.06 ap 0.34	Near Pilot Peak, Plumas County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 14, II, p. 490, 1894.	Andesite.	In W. T., p. 237.
82	II.4″.3.4.	Q 13.80 di 4.64 or 7.78 hy 8.42 ab 33.01 mt 4.18 an 25.02 il 1.22 ap 0.67	Spanish Peak, Plumas County, California.	H. N. Stokes.	H. W. Turner, U. S. G. S. A. R. 17, I, p. 724, 1896.	Quartz diorite.	In W. T., p. 237.
83	(I)II.4(5).3″.4.	Q 12.30 di 1.33 or 11.68 hy 7.78 ab 30.39 mt 4.64 an 29.19 il 0.91 ap 0.67	Mount Ingalls, Plumas County, California.	W. F. Hillebrand.	H. W. Turner, J. G., III, p. 407, 1895.	Andesite.	Also in U.S.G.S. A. R. 17, I, p. 731, 1896. In W. T., p. 237.
84	″II.4.3.4.	Q 17.88 di 3.34 or 9.45 hy 8.78 ab 33.01 mt 3.25 an 23.35 il 0.76 ap 0.34	Near Suppans Mountain, Tehama County, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 148, p. 196, 1897.	Andesite.	In W. T., p. 237.
85	II.4(5).3″.4.	Q 11.40 di 3.62 or 7.78 hy 10.07 ab 30.92 mt 4.18 an 29.75 il 0.91 ap 0.34	Suppans Mountain, Tehama County, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 148, p. 196, 1897.	Andesite.	In W. T., p. 237.
86	II.4.″.3.4.	Q 12.06 di 8.93 or 10.01 hy 11.20 ab 29.87 mt 3.25 an 22.80 il 0.76 ap 0.34	Downieville, Sierra County, California.	H. N. Stokes.	H. W. Turner, J. G., III, p. 407, 1895.	Andesite (quartz-bearing).	Also in U.S.G.S. A. R. 17, I, p. 731, 1896. In W. T., p. 237.
87	II.″4.3″.4.	Q 14.28 di 2.41 or 11.12 hy 8.72 ab 28.82 mt 5.10 an 26.97 il 0.61 ap 0.67	Poker Flat, Sierra County, California.	W. F. Hillebrand.	H. W. Turner, J. G., III, p. 407, 1895.	Andesite.	Also in U.S.G.S. A. R. 17, I, p. 731, 1896. In W. T., p. 237.

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. TONALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
88	65.54	16.52	1.40	2.49	2.52	4.88	4.09	1.95	0.59	0.12	0.39	0.18	0.06	BaO trace SrO trace Li_2O trace	100.73	
A2. II	1.092	.162	.009	.035	.063	.087	.066	.021			.005	.001	.001			
89	59.48	17.25	2.15	4.06	2.67	6.50	3.53	2.27	0.71	0.09	0.93	0.33	0.11	BaO 0.09 SrO trace Li_2O trace	100.17	
A2. II	.991	.169	.014	.057	.067	.116	.057	.024			.012	.002	.002			
90	63.43	14.20	1.54	4.56	2.35	5.51	3.49	2.19	1.50	0.15	0.73	0.11	0.03	BaO 0.06 SrO trace Li_2O none	99.85	
A2. II	1.057	.139	.010	.063	.059	.099	.056	.023			.009	.001	—			
91	63.39	16.58	1.41	3.08	2.15	4.76	3.47	2.79	1.87	0.22	0.44	0.14	trace	BaO 0.11	100.41	
A2. II	1.057	.162	.009	.043	.054	.085	.056	.030			.006	.001	—			
92	62.09	16.69	1.45	3.76	1.93	6.08	3.36	1.84	1.47	0.19	0.32	0.39	trace	SO_3 0.10 BaO 0.10	99.77	
A2. II	1.035	.163	.009	.052	.048	.109	.054	.020			.004	.003	—			
93	58.05	15.46	1.69	5.09	4.84	6.94	2.86	2.14	2.02	0.10	0.72	0.16	0.14	CO_2 none S none NiO none BaO 0.07 SrO trace Li_2O trace	100.28	
A1. I	.968	.152	.011	.071	.121	.124	.047	.022			.009	.001	.002			
94	57.41	17.71	2.16	5.01	3.38	6.73	3.12	1.82	1.14	0.20	1.04	0.24	0.15	CO_2 none S none NiO 0.02 BaO 0.09 SrO 0.04 Li_2O trace	100.26	
A1. I	.964	.173	.014	.070	.085	.120	.050	.020			.013	.002	.002			
95	61.05	18.30	3.49	1.11	2.59	7.75	4.06	1.36	0.71		0.09	trace	trace		100.51	2.668
A3. III	1.018	.179	.022	.015	.065	.138	.065	.015			.001	—	—			
96	63.13	16.00	4.34	1.52	2.07	4.45	3.87	2.65	2.00						99.54	
A3. III	1.051	.157	.027	.021	.052	.079	.063	.029								
97	60.41	16.59	3.18	1.70	2.13	5.26	3.94	1.70	2.64	1.94	0.62	0.31	0.07		100.49	
A2. II	1.007	.163	.020	.024	.053	.094	.064	.018			.008	.002	.001			
98	59.95	15.77	3.34	2.34	2.73	5.84	3.07	2.52	2.00	0.95	0.82	0.26	0.09	CO_2 none ZrO_2 0.02 F none BaO 0.11 SrO 0.13	99.94	
A1. I	.999	.154	.021	.032	.068	.104	.050	.027			.010	.002	.001			
99	58.06	17.43	3.83	1.91	2.60	6.33	3.34	2.61	1.88	0.97	0.87	0.27	0.09	CO_2 none	100.19	
A2. II	.968	.171	.024	.026	.065	.113	.054	.028			.011	.002	.001			
100	60.25	17.90	3.08	2.44	2.44	5.57	4.29	1.89	1.24	0.20	0.65	0.25	0.06	CO_2 none SrO 0.07	100.33	
A2. II	1.004	.175	.019	.034	.061	.100	.069	.020			.008	.002	.001			
101	62.89	16.42	2.64	2.24	2.50	4.77	4.07	2.15	1.00	0.55	0.83	0.20	0.08	Cr_2O_3 0.01 BaO 0.07 SrO 0.03 Li_2O trace	100.45	
A1. I	1.048	.161	.016	.031	.063	.086	.066	.023			.010	.001	.001			
102	62.51	16.62	1.12	3.75	3.30	5.10	4.28	1.86	0.53	0.15	1.02	0.23	0.10	Cr_2O_3 0.02 BaO 0.14 SrO 0.03 Li_2O trace	100.76	
A1. I	1.042	.163	.007	.052	.083	.091	.069	.020			.013	.002	.001			

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 4. DOSODIC. TONALOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
88	(I)II.4.3.4.	Q 19.56 di 2.00 or 11.68 hy 8.24 ab 34.58 mt 2.09 an 20.85 il 0.76 ap 0.34	Ophir, Placer County, California.	W. F. Hillebrand.	W. Lindgren, U. S. G. S. A. R. 14, II, p. 255, 1894.	Granodiorite.	In W. T., p. 237.
89	II.4″.3.4.	Q 12.48 di 4.76 or 13.34 hy 8.73 ab 29.87 mt 3.25 an 24.46 il 1.82 ap 0.67	Donner Pass, Placer County, California.	W. F. Hillebrand.	W. Lindgren, U. S. G. S. B. 148, p. 212, 1897.	Granodiorite.	In W. T., p. 237.
90	II.4.(2)3.4.	Q 19.44 di 8.29 or 12.79 hy 7.60 ab 29.34 mt 2.32 an 16.68 il 1.37 ap 0.34	Near Bangor, Butte County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 14, II, p. 482, 1894.	Granodiorite.	In W. T., p. 237.
91	(I)II.4.3.(3)4.	Q 18.06 di 1.33 or 16.68 hy 8.43 ab 29.34 mt 2.09 an 21.13 il 0.91 ap 0.34	Grass Valley, Nevada County, California.	H. N. Stokes.	W. Lindgren, U. S. G. S. A. R. 17, II, p. 75, 1896.	Quartz porphyrite.	In W. T., p. 237.
92	(I)II.4.3.4.	Q 18.96 di 2.29 or 11.12 hy 8.82 ab 28.30 mt 2.09 an 24.74 il 0.61 ap 1.01	Nevada City, Nevada County, California.	H. N. Stokes.	W. Lindgren, U. S. G. S. A. R. 17, II, p. 59, 1896.	Porphyrite.	In W. T., p. 237.
93	II.4(5).3.″4.	Q 10.26 di 8.59 or 12.23 hy 14.91 ab 24.63 mt 2.55 an 23.07 il 1.37 ap 0.34	Sonora, Tuolumne County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 17, I, p. 731, 1896.	Diorite.	In W. T., p. 239.
94	II.4(5).3″.4.	Q 11.28 di 2.29 or 11.12 hy 13.31 ab 26.20 mt 3.25 an 28.63 il 1.98 ap 0.67	Tuolumne River, Amador County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 17, I, p. 702, 1896.	Quartz diorite gneiss.	In W. T., p. 237.
95	″II.4″.3.4.	Q 14.16 di 8.42 or 8.34 hy 2.60 ab 34.06 mt 3.25 an 27.52 il 0.15 ap 1.28	Santa Catalina Island, California.	W. S. T. Smith.	W. S. T. Smith, Pr. Cal. Ac. Sci., (3), Geol., I, No. 1, p. 41, 1897.	Andesite.	In W. T., p. 237.
96	(I)II.4.″3.″4.	Q 18.18 di 3.03 or 16.12 hy 3.80 ab 33.01 mt 4.87 an 18.07 hm 0.96	Cross Spur Quarry, Washoe, Nevada.	R. W. Woodward.	G. F. Becker, U. S. G. S. Mon. 3, p. 152, 1882.	Andesite.	Also in U. S. G. S. B. 17, p. 33, 1885. In W. T., p. 239.
97	(I)II.4.3.4.	Q 17.64 di 1.73 or 10.01 hy 4.70 ab 33.54 mt 3.71 an 22.52 il 1.22 hm 0.64 ap 0.67	Vindicator Mountain, Goldfield District, Nevada.	G. Steiger.	F. L. Ransome, U. S. G. S. P. P. 66, p. 50, 1909.	Andesite.	
98	″II.4.3.(3)4.	Q 17.58 di 4.32 or 15.01 hy 5.06 ab 26.20 mt 4.87 an 21.41 il 1.52 ap 0.67	Columbia Mountain, Goldfield District, Nevada.	G. Steiger.	F. L. Ransome, U. S. G. S. P. P. 66, p. 56, 1909.	Dacite.	Also in Ec. G., II, p. 680, 1907.
99	″II.4″.3.″4.	Q 12.90 di 3.67 or 15.57 hy 4.90 ab 28.30 mt 3.48 an 24.74 il 1.67 hm 1.44 ap 0.67	Black Butte, Goldfield District, Nevada.	G. Steiger.	F. L. Ransome, U. S. G. S. P. P. 66, p. 50, 1909.	Andesite.	
100	(I)II.4″.3.4.	Q 13.32 di 1.54 or 11.12 hy 6.42 ab 36.15 mt 4.41 an 23.91 il 1.22 ap 0.67	Masons Butte, Walker River Valley, Nevada.	H. N. Stokes.	J. E. Spurr, J. G., IX, p. 593, 1901.	Quartz diorite.	
101	(I)II.4.3.4.	Q 17.46 di 2.41 or 12.79 hy 5.86 ab 34.58 mt 3.71 an 20.02 il 1.52 ap 0.34	Chapultepec, Mexico City, Mexico.	F. N. Guild.	F. N. Guild, A. J. S., XXII, p. 167, 1906.	Andesite.	
102	″II.4″.3.4.	Q 14.04 di 2.26 or 11.12 hy 11.56 ab 36.15 mt 1.62 an 20.57 il 1.98 ap 0.67	Malacate, Popocatepetl, Mexico.	F. N. Guild.	F. N. Guild, A. J. S., XXII, p. 164, 1906.	Andesite.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. TONALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
103	60.91	18.08	2.40	3.85	3.54	5.56	4.16	1.01	0.71		0.33	trace			100.55	2.641
A3. III	1.015	.177	.015	.054	.089	.099	.067	.011			.004	—				
104	59.61	16.68	2.66	3.56	2.10	5.58	3.51	2.95	1.31	0.50	0.73	0.18	0.14	CO_2 0.14	99.65	
A2. II	.994	.164	.017	.050	.053	.100	.056	.032			.009	.001	.002			
105	59.13	16.97	2.18	4.31	2.38	7.69	3.36	2.57	0.76	0.23	0.68	0.19	0.12	CO_2 trace	100.57	
A2. II	.986	.166	.014	.060	.060	.138	.054	.028			.009	.001	.002			
106	64.95	18.60	2.00	3.96	2.52	4.67	2.81	0.94	0.12		0.33				100.90	
A3. III	1.083	.182	.013	.055	.063	.084	.045	.010			.004					
107	64.25	19.30	1.70	3.64	2.06	4.20	2.71	1.42	0.37		0.32	0.12			100.09	
A2. II	1.071	.189	.011	.050	.052	.075	.044	.015			.004	.001				
108	63.23	16.73	2.58	3.12	1.84	6.01	3.71	1.11	0.48	0.17	0.40	0.15	0.18	CO_2 none Cl none S trace NiO none BaO 0.03 SrO none Li_2O trace	99.74	
A1. I	1.054	.164	.016	.043	.046	.107	.060	.012			.005	.001	.003			
109	63.10	18.05	2.37	3.95	2.48	5.96	3.35	1.16	0.25		0.21	0.12			101.00	
A2. II	1.052	.177	.015	.055	.062	.106	.054	.013			.003	.001				
110	62.75	17.90	2.38	3.74	2.56	5.56	3.40	1.20	0.12		0.32	0.11			100.12	
A2. II	1.046	.175	.015	.052	.064	.099	.055	.013			.004	.001				
111	62.72	18.30	1.41	3.65	1.97	6.11	3.12	1.46	1.00		0.42	0.17			100.33	
A2. II	1.045	.179	.009	.051	.049	.109	.050	.016			.005	.001				
112	62.45	18.05	2.02	4.00	2.58	5.81	3.27	1.16	0.43		0.19	0.10			100.06	
A2. II	1.041	.177	.013	.056	.065	.104	.053	.012			.002	.001				
113	61.95	18.59	1.43	4.41	2.61	5.23	3.47	0.90	0.89		0.19	0.12			99.79	
A2. II	1.033	.182	.009	.061	.065	.093	.056	.010			.002	.001				
114	61.61	17.95	3.35	3.38	2.09	4.91	3.22	1.04	1.50		0.37	0.19			99.71	
A2. II	1.027	.176	.021	.047	.052	.088	.052	.011			.005	.001				
115	61.40	19.70	1.35	4.19	2.27	4.80	2.80	1.17	2.50		0.33	0.09			100.60	
A2. II	1.023	.193	.009	.058	.057	.086	.045				.004	.001			(100.56)	
116	61.25	17.35	3.42	3.33	2.86	4.67	2.80	1.71	1.50		0.47				99.36	
B2. III	1.021	.170	.021	.046	.072	.084	.045	.018			.006					
117	61.07	17.55	2.13	4.13	2.26	6.28	3.50	0.98	1.37	0.23	0.47	0.15	0.21	CO_2 none Cl none S 0.02 NiO none BaO 0.02 SrO none Li_2O trace	100.34	
A1. I	1.018	.172	.013	.057	.057	.113	.056	.010			.006	.001	.003			

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 4. DOSODIC. TONALOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
103	″II. 4″.3.4(5).	Q 13.56 hy 13.52 or 6.12 mt 3.48 ab 35.11 il 0.61 an 27.52	Iztaccihuatl, Mexico.	A. Röhrig.	H. Lenk in Felix and Lenk, Btr. G. Mex., II, p. 233, 1899.	Andesite.	In W. T., p. 239.
104	″II.4″.3.(3)4.	Q 12.90 di 4.76 or 17.79 hy 6.28 ab 29.34 mt 3.94 an 21.13 il 1.37 ap 0.34	Boquete, Panama.	W. C. Wheeler.	D. F. McDonald, U. S. G. S. rec. lab.	Diorite.	
105	II.4(5).3.4″.	Q 10.56 di 11.69 or 15.57 hy 5.38 ab 28.30 mt 3.25 an 23.35 il 1.37 ap 0.34	Boquete, Panama.	W. C. Wheeler.	D. F. McDonald, U. S. G. S. rec. lab.	Diorite.	
106	(I)II.(3)4.3(4).4″.	Q 29.04 hy 11.32 or 5.56 mt 3.02 ab 23.58 il 0.61 an 23.35 C 4.39	Mont Pelée, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 550, 1904.	Micronorite.	Inclusion in andesite.
107	(I)II.(3)4.3.4.	Q 29.16 hy 9.82 or 8.34 mt 2.55 ab 23.06 il 0.61 an 20.02 ap 0.34 C 5.92	Mont Pelée, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 550, 1904.	Cordierite micronorite.	Inclusion in andesite.
108	(I)II.4.3.4″.	Q 21.30 di 2.72 or 6.12 hy 6.57 ab 31.44 mt 3.71 an 25.58 il 0.76 ap 0.34	Mont Pelée, Martinique, West Indies.	W. F. Hillebrand.	J. S. Diller, Nat. Geog. Mag., XIII, p. 291, 1902.	Volcanic dust (andesite).	Eruption of May 20, 1902.
109	(I)II.4.(3)4.4.	Q 20.70 hy 11.08 or 7.23 mt 3.48 ab 28.30 il 0.46 an 28.63 ap 0.34 C 0.71	Mont Pelée, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 527, 1904.	Andesite.	Bomb of Aug. 30, 1902.
110	(I)II.4.3″.4.	Q 20.94 hy 10.76 or 7.23 mt 3.48 ab 28.82 il 0.61 an 26.69 ap 0.34 C 1.12	Eruption of Aug. 30, 1902, Mont Pelée, Martinique.	Pisani.	A. Lacroix, Mont Pelée, p. 531, 1904.	Andesite ash.	Collected on Dominica.
111	(I)II.4.3(4).4.	Q 21.06 hy 9.78 or 8.90 mt 2.09 ab 26.20 il 0.76 an 29.47 ap 0.34 C 0.71	Anse Thurin, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 573, 1904.	Andesite.	
112	(I)II.4.3(4).4.	Q 20.58 hy 11.91 or 6.67 mt 3.02 ab 27.77 il 0.46 an 28.08 ap 0.34 C 1.12	Mont Pelée, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 527, 1904.	Andesite.	Pumice of July 9, 1902.
113	″II.4.3″.4(5).	Q 20.52 hy 13.10 or 5.56 mt 2.09 ab 29.34 il 0.30 an 25.02 ap 0.34 C 2.65	Eruption of Aug. 30, 1902, Mont Pelée, Martinique.	Pisani.	A. Lacroix, Mont Pelée, p. 531, 1904.	Andesite ash.	
114	(I)II.4.3″.4″.	Q 24.36 hy 7.97 or 6.12 mt 4.87 ab 27.25 il 0.76 an 23.63 ap 0.34 C 2.86	Piton Pierreux, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 573, 1904.	Andesite (quartzose).	
115	(I)II.″4.3″.4.	Q 24.42 hy 11.64 or 7.23 mt 2.09 ab 23.58 il 0.61 an 23.07 ap 0.34 C 5.30	Font Saint-Denis, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 573, 1904.	Dacite.	
116	″II.4.3″.4.	Q 23.04 hy 9.71 or 10.01 mt 4.87 ab 23.58 il 0.91 an 23.35 C 2.35	Morne de Macouba, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 573, 1904.	Andesite.	
117	″II.4.3(4).4(5).	Q 18.48 di 0.92 or 5.56 hy 10.65 ab 29.34 mt 3.02 an 29.47 il 0.91 ap 0.34	Mont Pelée, Martinique, West Indies.	W. F. Hillebrand.	J. S. Diller, Nat. Geog. Mag., XIII, p. 291, 1902.	Andesite pumice.	Eruption of May 8, 1902.

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. TONALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
118	59.97	18.13	2.28	3.95	2.44	6.62	4.11	1.09	0.48		0.72	0.21	trace	NiO trace	100.00	
A2. II	1.000	.178	.014	.055	.061	.118	.066	.012			.009	.009	—			
119	59.40	18.51	0.77	4.59	2.45	6.87	3.77	0.86	2.12		0.39				99.73	
A3. III	.990	.181	.005	.064	.061	.123	.061	.009			.005					
120	60.15	18.31	2.75	3.33	2.88	5.75	3.11	1.61	2.00		0.39				100.32	
A3. III	1.003	.180	.017	.046	.072	.103	.050	.017			.005					
121	63.50	15.80	1.91	3.22	2.32	5.31	3.07	1.54	2.37		0.38	0.05			99.47	
A2. II	1.058	.155	.012	.044	.058	.095	.050	.016			.005	—				
122	62.74	13.67	3.39	4.35	1.74	6.01	4.25	1.23	2.02		trace	0.18	0.42	CO_2 none S trace	100.00	
A2. II	1.046	.134	.021	.061	.044	.107	.069	.013			—	.001	.006			
123	61.12	17.73	2.52	3.10	2.39	5.45	3.01	2.09	2.54						99.95	2.582
A3. III	1.019	.173	.015	.043	.060	.097	.048	.022								
124	61.35	15.39	4.41	3.40	3.32	6.60	3.87	0.95	0.58						99.87	2.860
A3. III	1.023	.151	.028	.047	.083	.118	.063	.010								
125	59.24	18.16	3.26	3.56	2.84	6.31	4.00	1.31	0.87						99.55	2.801
A3. III	.987	.178	.020	.050	.071	.113	.065	.014								
126	61.38	15.24	3.31	3.43	2.61	4.79	3.29	2.05	2.38		0.50	0.70	0.10	CO_2 0.02 ZrO_2 trace Cl 0.04 S none NiO none BaO 0.12 CuO trace	99.96	
A1. I	1.023	.149	.021	.047	.065	.086	.053	.022			.006	.005	.001			
127	61.12	16.23	1.76	3.68	7.05	4.83	3.01	0.97	0.41		0.48	0.08	trace		99.73	
A2. II	1.019	.159	.011	.051	.176	.086	.048	.010			.006	—	—			
128	59.89	15.85	5.21	3.82	4.15	5.98	2.77	1.34	0.74		0.48	trace	0.12	CO_2 0.02 ZrO_2 none Cl 0.06 S none NiO none BaO 0.03 Cu 0.07 Pb none	100.53	
A1. I	.998	.155	.032	.053	.104	.107	.045	.014			.006	—	.002			
129	63.56	15.43	3.02	2.43	2.55	4.33	4.02	2.41	1.09		0.95	0.17		SO_3 0.05	100.01	
A2. II	1.059	.151	.019	.033	.064	.077	.064	.025			.012	.001				
130	63.36	16.35	2.12	3.05	3.28	4.79	3.58	2.92	0.99			0.13			100.57	
A3. III	1.056	.160	.013	.043	.082	.086	.058	.031				.001				
131	61.09	15.96	4.29	2.03	1.06	6.66	2.89	2.51	1.44		0.95	0.22			99.10	2.655
B2. III	10.18	.156	.027	.028	.027	.119	.047	.027			.012	.002				
132	61.04	15.72	5.03	2.15	3.61	5.34	4.02	2.66	0.58		0.45				100.60	
A.3 III	1.017	.154	.031	.030	.090	.095	.064	.029			.006					

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 4. DOSODIC. TONALOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
118	"II.4".3".4".	Q 12.84 or 6.67 ab 34.58 an 27.80 di 3.40 hy 8.66 mt 3.25 il 1.37 ap 0.34	Eruption of May, 1902, Mont Pelée, Martinique.	W. Pollard.	J. J. H. Teall, Nature, June 5, 1902, p. 130.	Andesite pumice.	Fell at Barbados.
119	"II.4".3(4).4(5).	Q 12.66 or 5.00 ab 31.96 an 30.86 di 2.81 hy 11.87 mt 1.16 il 0.76	Eruption of May 2–3, 1902, Mont Pelée, Martinique.	Pisani.	A. Lacroix, Mont Pelée, p. 531, 1904.	Andesite ash.	
120	(I)II.4.3(4).4.	Q 17.94 or 9.45 ab 26.20 an 28.63 C 1.02 hy 10.37 mt 3.94 il 0.76	Mont Pelée, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 573, 1904.	Andesite.	"Old pumice."
121	(I)II.4.3".4.	Q 23.58 or 8.90 ab 26.20 an 24.74 di 1.36 hy 8.70 mt 2.78 il 0.76	Rivière Madame, Guadeloupe, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 588, 1904.	Perlite.	
122	II.4.(2)3.4".	Q 18.36 or 7.23 ab 36.16 an 15.01 di 11.63 hy 4.64 mt 4.87 ap 0.34	Island of Grenada, West Indies.	J. B. Harrison.	J. B. Harrison. Rocks of Grenada, p. 10, 1896.	Andesite.	In W. T., p. 239.
123	(I)II.4.3"."4.	Q 19.02 or 12.23 ab 25.15 an 26.97 C 0.61 hy 9.70 mt 3.48	Old Providence Island, Caribbean Sea.	J. J. H. Teall.	T. G. Bonney, Min. Mag., VI, p. 42, 1886.	Andesite.	In W. T., p. 239.
124	II.4.3.4(5).	Q 17.22 or 5.56 ab 33.01 an 21.68 di 8.86 hy 6.58 mt 6.50	Beef Island, West Indies.	P. T. Cleve.	P. T. Cleve, Sver. Vet. Ak. Hand., IX, No. 12, p. 35, 1871.	Quartz diorite.	Cf. Hogbom. B. G. Inst. Ups., VI, p. 230, 1905. Not in W. T.
125	"II.4(5).3.4.	Q 12.00 or 7.78 ab 34.06 an 27.52 di 3.16 hy 9.53 mt 4.64	Marys Point, St. John Island, West Indies.	P. T. Cleve.	P. T. Cleve, Sver. Vet. Ak. Hand., IX, No. 12, p. 36, 1871.	Quartz diorite.	Cf. Hogbom, B. G. Inst. Ups., VI, p. 230, 1905. Not in W. T.
126	"II.4.3.4.	Q 20.94 or 12.23 ab 27.77 an 19.18 C 0.51 hy 8.94 mt 4.87 il 0.91 ap 1.68	Cuyuni River, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Brit. Guiana, p. 40, 1908.	Diorite gneiss.	
127	II.4.3(4).4".	Q 17.34 or 5.56 ab 25.15 an 23.91 C 1.53 hy 22.09 mt 2.55 il 0.91	Northwestern District, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Brit. Guiana, p. 77, 1908.	Quartz diorite.	
128	II.4.3(4).4.	Q 19.32 or 7.78 ab 23.58 an 26.69 di 2.44 hy 11.22 mt 7.42 il 0.91	Mazaruni District, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Brit. Guiana, p. 61, 1908.	Porphyrite.	In W. T., p. 239.
129	(I)II.4."3.4.	Q 19.38 or 13.90 ab 33.54 an 17.24 di 2.59 hy 5.46 mt 4.41 il 1.82 ap 0.34	Tajumbina, Colombia.	Fernandez.	R. Küch, G. Stud. Colomb., I, p. 125, 1892.	Dacite.	In W. T., p. 239.
130	"II.4".3."4.	Q 15.36 or 17.24 ab 30.39 an 19.74 di 2.69 hy 10.86 mt 3.02 ap 0.34	Cerro Negro de Mayasquer, Colombia.	Fischer.	R. Küch, G. Stud. Colomb., I, p. 186, 1892.	Dacite.	In W. T., p. 239.
131	(I)II.4.3.(3)4.	Q 21.18 or 15.01 ab 24.63 an 22.80 di 5.83 wo 0.35 mt 3.71 il 1.82 hm 1.76 ap 0.67	Loma de Ales, Colombia.	Bragard.	R. Küch, G. Stud. Colomb., I, p. 145, 1892.	Andesite.	In W. T., p. 239.
132	II.4(5).(2)3."4.	Q 12.78 or 16.12 ab 33.54 an 16.96 di 7.34 hy 5.60 mt 5.57 il 0.91 hm 1.12	Penon de Pitayo, Colombia.	Schröder.	R. Küch, G. Stud. Colomb., I, p. 105, 1892.	Andesite.	In W. T., p. 239.

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. TONALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
133	60.05	15.59	6.95	0.65	3.61	6.43	3.83	1.76	0.47		0.85	0.25			100.44	2.728
A2. II	1.001	.152	.044	.010	.090	.114	.061	.019			.010	.002				
134	60.32	16.92	5.88	1.40	3.52	5.64	3.83	2.42	0.44						100.37	
A3. III	1.005	.166	.036	.019	.087	.101	.061	.025								
135	57.91	16.45	6.55	2.32	4.59	3.73	3.59	1.61	1.70		0.37	0.41	0.06	S 0.07	99.36	2.932
B2. III	.965	.161	.041	.032	.115	.066	.058	.017			.005	.003	.001			
136	60.32	17.10	4.74	1.12	2.89	3.51	5.06	2.11	1.99	0.81		0.05	trace		99.70	2.609
A3. III	1.005	.168	.029	.015	.072	.063	.082	.022				—	—			
137	57.82	17.31	4.82	2.20	2.40	6.87	3.69	1.85	2.02			0.34	0.17	CO_2 0.31 S 0.11	99.91	2.679
A2. II	.964	.170	.030	.030	.060	.123	.060	.020				.002	.002			
138	56.09	16.04	8.81	0.90	3.21	6.09	3.68	1.79	0.49	0.43	1.67	0.29	none	CO_2 none S none	99.49	
A2. II	.935	.157	.055	.013	.080	.109	.060	.019			.021	.002	—			
139	64.13	13.15	1.08	6.31	1.08	3.62	3.64	2.32	2.71	0.36	1.19	0.31	0.27	S none NiO none BaO 0.09	100.26	
A1. I	1.069	.129	.007	.088	.027	.064	.059	.024			.015	.002	.004			
140	61.69	14.43	1.23	5.86	2.81	4.97	3.20	1.72	2.32	0.25	1.00	0.24	0.30	Cl 0.02 S none NiO none BaO 0.04	100.08	
A1. I	1.028	.142	.008	.082	.070	.089	.052	.018			.013	.002	.004			
141	53.78	12.69	3.44	8.94	2.58	6.36	2.74	2.27	2.19	1.19	2.28	0.55	0.53	CO_2 0.08 FeS_2 0.42 NiO none BaO 0.09	100.13	
A1. I	.895	.124	.022	.124	.065	.114	.044	.024			.029	.004	.008			
142	58.67	14.37	1.64	6.94	4.65	7.39	3.01	1.42	2.02				trace		100.11	
A3. III	.978	.141	.010	.096	.116	.132	.048	.015					—			
143	60.10	14.40	0.87	5.73	5.10	5.85	4.15	1.55	1.70		0.63	0.05			100.13	
A2. II	1.002	.141	.005	.079	.128	.105	.067	.017			.008	—				
144	56.50	15.20	1.60	7.20	5.15	7.28	2.60	1.52	0.95		1.62	0.07			99.69	
A2. II	.942	.149	.010	.100	.129	.130	.042	.016			.020	—				
145	68.06	14.59	2.61	1.64	3.88	3.97	3.10	1.50	0.75			0.31			100.41	
A3. III	1.134	.143	.016	.023	.097	.071	.050	.016				.002				
146	67.32	13.76	4.12	1.44	1.70	4.32	3.10	2.10	0.76		0.49		0.49		99.60	
A2. II	1.122	.135	.026	.020	.043	.077	.050	.023			.006		.007			
147	62.49	15.14	6.85	1.95	1.72	3.53	3.36	2.07	0.63		0.67		0.36	S 0.58	99.35	
B2. III	1.042	.148	.043	.027	.043	.063	.054	.022			.008		.005			
148	62.38	17.66	1.50	3.71	3.27	4.52	3.46	1.58	0.36		0.64	0.43	0.32		99.83	
A2. II	1.040	.173	.009	.051	.082	.080	.056	.017			.008	.003	.005			

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 4. DOSODIC. TONALOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
133	II.4.3.4.⊙	Q 15.12 di 7.56 or 10.56 hy 5.50 ab 31.96 il 1.52 an 20.02 hm 6.95 ap 0.67	Azufral de Tuquerres, Colombia.	Bragard.	R. Küch, G. Stud. Colomb., I, p. 151, 1892.	Andesite.	Iron oxides? In W. T., p. 239.
134	"II.4".3.4.	Q 13.26 di 4.54 or 13.90 hy 6.60 ab 31.96 mt 4.41 an 22.24 hm 2.72	Chimborazo, Ecuador.	A. Schwager.	Schwager and v. Gümbel, Geogn. Jhft., Cassel, VII, p. 74, 1895.	Andesite.	In W. T., p. 239.
135	II.4."3.4.	Q 17.28 hy 11.50 or 9.45 mt 6.50 ab 30.39 il 0.76 an 15.57 hm 2.08 C 3.06 ap 1.01	Don Pablo, Coquimbo, Chile.	F. v. Wolff.	F. v. Wolff, Z. D. G. G., LI, p. 502, 1899.	Porphyrite.	In W. T., p. 239.
136	(I)II.4(5).(2)3.4.	Q 10.98 hy 7.20 or 12.23 mt 3.48 ab 42.97 hm 2.24 an 17.51 C 0.10	Aconcagua, Argentina.	R. W. Gray.	T. G. Bonney, G. Mag., XXXVI, p. 4, 1899.	Andesite.	Also in Fitzgerald, Highest Andes, p. 321, 1899. In W. T., p. 241.
137	"II.4".3.4.	Q 12.96 di 5.65 or 11.12 hy 3.63 ab 31.44 mt 6.96 an 25.02	Cerros Largos, San Luis, Argentina.	H. Stokes.	F. Tannhäuser, N. J. B. B., XXII, p. 599, 1906.	Hornblende andesite.	
138	II.4".3.4.	Q 12.06 di 3.46 or 10.56 hy 6.40 ab 31.44 il 3.02 an 21.68 hm 8.81 tn 1.57 ap 0.67	San Blas, Argentina.	J. G. Fairchild.	Wright and Fenner, Bur. Am. Ethn., B. 52, p. 86, 1912.	Andesite scoria.	Fresh?
139	"II.4."3.4.	Q 21.48 hy 11.94 or 13.34 mt 1.62 ab 30.92 il 2.28 an 15.85 ap 0.67	Beinn an Lochain, Pennygael, Mull, Scotland.	E. G. Radley.	G. S. Grt. Brit., Sum Prog. (1912), p. 69, 1913.	Glassy rock.	
140	II.4.3.4.⊙	Q 19.26 di 2.32 or 10.01 hy 14.42 ab 27.25 mt 1.86 an 20.02 il 1.98 ap 0.67	Mullach Glach, Pennygael, Mull, Scotland.	E. G. Radley.	G. S. Grt. Brit., Sum. Prog. (1912), p. 69, 1913.	Tholeite.	Glassy portion. Cf. No. 32, II.4.3.3.
141	II".4".3.(3)4.	Q 11.04 di 10.52 or 13.34 hy 11.89 ab 23.06 mt 5.10 an 15.57 il 4.41 ap 1.34	Loch Ba, Gruline, Mull, Scotland.	E. G. Radley.	G. S. Grt. Brit., Sum. Prog. (1912), p. 68, 1913.	Trachyte.	
142	II".4".3.4.	Q 11.28 di 12.40 or 8.34 hy 16.82 ab 25.15 mt 2.32 an 21.68	Eskdale Muir, Dumfries, Scotland.	Wilson.	Cited in J. J. H. Teall, Brit. Petrog., p. 196, 1888.	Andesite (glassy).	
143	II.4(5).(2)3.4	Q 8.52 di 10.88 or 9.45 hy 16.20 ab 35.11 mt 1.16 an 15.85 il 1.22	Mont de Valais, Brittany, France.	Pisani.	L. Vandernotte, Mass. Armor., p. 128, 1913.	Microdiorite.	
144	II".4(5).3(4).4.	Q 10.44 di 8.87 or 8.90 hy 17.79 ab 22.01 mt 2.32 an 25.30 il 3.04	Les Rondellieres, Brittany, France.	Pisani.	L. Vandernotte, Mass. Armor., p. 125, 1913.	Biotite diabase.	
145	(I)II.(3)4.3.4.	Q 30.36 hy 10.62 or 8.90 mt 3.71 ab 26.20 ap 0.67 an 17.79 C 1.33	San Eliseo, Corsica.	J. Deprat.	J. Deprat, B. Soc. G. Fr. (4), VI, p. 435, 1906.	Quartz diorite.	
146	(I)II.(3)4.3."4.	Q 30.12 di 3.24 or 12.79 hy 2.80 ab 26.20 mt 4.87 an 17.24 il 0.91 hm 0.80	Fabbemala, Karlskrona, Blekinge, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 268, 1906.	Granite gneiss.	
147	(I)II.4.3.4.	Q 25.02 hy 4.30 or 12.23 mt 5.57 ab 28.30 il 1.22 an 17.51 hm 3.04 C 0.92	Palnotjakko, Lapland, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 256, 1906.	Granite.	
148	"II.4.3.4.	Q 21.06 hy 13.35 or 9.45 mt 2.09 ab 29.34 il 1.22 an 19.46 ap 1.01 C 3.06	Ivalojoki, Lapland, Finland.	N. Sahlbom.	V. Hackmann, B. C. G. Finl., No. 15, p. 51, 1905.	Granite gneiss.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. TONALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
149	63.18	17.03	0.24	6.37	0.92	4.17	4.44	2.91	0.52			0.23		SO_3 0.19	100.20	
A3. III	1.053	.167	.002	.089	.023	.075	.072	.031				.002				
150	61.27	15.96	1.88	3.35	5.31	4.33	4.08	2.52	0.74		0.40	0.32			100.16	
A2. II	1.021	.156	.012	.047	.133	.077	.066	.027			.005	.002			(100.15)	
151	57.73	16.05	2.54	5.14	1.93	4.76	4.04	2.58	2.02		1.85	0.52		CO_2 0.20 SO_3 0.77	100.13	2.723
A2. II	.962	.157	.015	.071	.048	.085	.065	.027			.023	.004				
152	58.06	15.44	2.19	4.24	4.68	6.52	3.13	1.51	2.79		1.11	0.21		CO_2 0.32 SO_3 0.16 Org. 0.01	100.37	2.659
A2. II	.968	.151	.014	.059	.117	.116	.050	.016			.013	.001				
153	57.38	16.92	5.70	5.84	2.00	3.66	4.03	2.08	0.84		0.83	trace	trace		99.28	
B3. IV	.956	.166	.035	.080	.050	.066	.064	.022			.010	——	——			
154	60.80	17.24	3.95	2.97	2.83	5.34	2.69	0.95	0.90	0.22	1.12	0.78		CO_2 0.05 SO_3 0.10	99.94	
A2. II	1.013	.169	.025	.042	.071	.095	.044	.010			.014	.005				
155	63.75	15.24	2.21	3.46	1.99	5.04	3.64	2.76	0.71	none	0.51	0.32		FeS_2 0.24	99.87	
A2. II	1.063	.149	.014	.048	.050	.090	.059	.030			.006	.002				
156	59.86	17.12	7.54	0.52	4.02	5.08	3.08	1.72	0.25	0.15	0.22	0.22			99.79	2.75
A2. II	.998	.168	.047	.007	.101	.091	.050	.018			.003	.002				
157	58.09	16.24	3.74	3.07	3.08	5.88	3.35	2.92	1.25	0.25	0.05	1.75		SO_3 0.83	100.50	
A2. II	.968	.159	.023	.043	.077	.105	.054	.031			——	.012				
158	55.58	16.58	5.02	2.72	4.56	8.16	3.02	1.66	0.69	0.18	0.18	1.43		SO_3 0.33	100.11	
A2. II	.926	.163	.031	.038	.114	.146	.048	.018			.002	.010				
159	58.98	13.07	3.39	4.35	1.79	8.63	3.70	1.61	1.41		1.63	0.53			99.09	
B2. III	.983	.128	.021	.061	.045	.154	.060	.017			.020	.004				
160	60.12	16.82	3.18	3.27	2.73	4.31	4.27	2.70	1.35		0.45	0.27		CO_2 0.19 SO_3 0.12	99.78	2.746
A2. II	1.002	.165	.020	.046	.068	.078	.069	.029			.006	.002				
161	60.08	13.90	7.16	3.50	2.91	4.04	3.23	2.35	2.61						99.78	2.735
A3. III	1.001	.136	.045	.049	.073	.072	.052	.025								
162	61.44	15.39	1.73	6.80	2.59	4.35	3.43	1.88	1.35		0.41	0.13		SO_3 0.19	99.69	2.793
A2. II	1.024	.151	.011	.094	.065	.078	.055	.020			.005	.001			(99.72)	
163	60.72	13.96	2.80	8.28	2.71	4.20	2.63	1.42	1.74		1.80	0.85		S trace	101.11	2.878
B2. III	1.012	.136	.018	.115	.068	.075	.042	.015			.023	.006				
164	67.1	13.6	2.1	1.2	2.1	4.9	3.2	2.6	2.1					CO_2 0.5	99.4	
B3. IV	1.118	.133	.013	.017	.053	.088	.052	.028								

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 4. DOSODIC. TONALOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
149	(I)II.4(5).(2)3.″4.	Q 11.58 di 0.96 or 17.23 hy 13.29 ab 37.73 mt 0.46 an 17.51 ap 0.67	Zwingenberg, Melibocus Mountains, Baden.	Heurich.	A. Osann, Mt. Bad. G. L.-A., II, p. 385, 1893.	Malchite.	In W. T., p. 241.
150	II.4(5).(2)3.4.	Q 10.02 di 1.54 or 15.01 hy 16.53 ab 34.58 mt 2.78 an 17.51 il 0.76 ap 0.67	Grossachsener Thal, Baden.	M. Dittrich.	M. Dittrich, Mt. Bad. G. L.-A., IV, p. 202, 1901.	Hornblende diorite.	
151	II.4(5).″3.4.	Q 11.40 di 1.61 or 15.01 hy 8.62 ab 34.06 mt 3.48 an 18.07 il 3.50 ap 1.34	Staffelhof, Nahe River, Rhenish Prussia.	K. Gremse.	K. A. Lossen, Jb. Pr. G. L.-A., X, p. 309 (1889), 1892.	Porphyrite.	In W. T., p. 241.
152	II.4.3.4.⊙	Q 13.50 di 6.24 or 8.90 hy 12.93 ab 26.20 mt 3.24 an 23.63 il 1.98 ap 0.34	Kronweiler, Saar-Nahe Gebiet, Rhenish Prussia.	Böttchar.	K. A. Lossen, Jb. Pr. G. L.-A., X, p. 290 (1889), 1892.	Porphyrite pitchstone.	In W. T., p. 241.
153	II.″4.″3.4.	Q 13.38 hy 9.62 or 12.23 mt 8.12 ab 33.54 il 1.52 an 18.35 C 1.43	Lauterbach, Siebengebirge, Rhenish Prussia.	E. Kaiser.	E. Kaiser, Vh. Nh. Ver. Bonn, LIV, p. 178, 1897.	Andesite.	In W. T., p. 241.
154	″II.(3)4.3″.4″.	Q 27.54 hy 7.50 or 5.56 mt 5.80 ab 23.06 il 2.13 an 21.68 ap 1.68 C 3.77	Pulverkeller, Odenwald.	Stadler.	G. Klemm, Nbl. Ver. Erdk. Darm. (4), XXVII, p. 21, 1906.	Granitic "mixed rock."	
155	″II.4.(2)3.″4.	Q 18.48 di 5.23 or 16.68 hy 6.14 ab 30.92 mt 3.25 an 16.68 il 0.91 ap 0.67	Walderlenbach, Hesse.	Surv. lab.	C. Chelius, Erl. G. Kt. Hes., Bl. Lindenberg, p. 36, 1901.	Granite.	
156	II.4.3.4.⊙	Q 19.26 hy 10.10 or 10.01 mt 0.93 ab 26.20 il 0.46 an 23.35 hm 6.88 C 1.63 ap 0.67	Galgenberg, Hesse.	Surv. lab.	Chelius and Klemm, Erl. G. Kt. Hes., Bl. Neustadt, p. 8, 1894.	Granite.	In W. T., p. 241.
157	II.4″.″3.(3)4.	Q 13.86 hy 10.34 or 17.24 mt 5.34 ab 28.30 ap 4.03 an 18.07 C 0.92	Weinheim, Hesse.	Surv. lab.	C. Chelius, Erl. G. Kt. Hes., Bl. Lindenfels, p. 34, 1901.	Quartz diorite.	
158	II.4″.3″.4.	Q 12.06 di 3.49 or 10.01 hy 10.43 ab 25.15 mt 7.19 an 26.97 il 0.30 ap 3.36	Felsenmeer, Hesse.	Surv. lab.	C. Chelius, Erl. G. Kt. Hes., Bl. Neunkirchen, p. 16, 1901.	Granite.	P_2O_5 high?
159	II.4.(2)3.4	Q 16.74 di 14.68 or 9.45 wo 1.74 ab 31.44 mt 4.87 an 14.18 il 3.04 ap 1.34	Bergfeld, Westerwald, Germany.	H. Schneiderhöhn.	H. Schneiderhöhn, Jb. Pr. G. L.-A., XXX (II), p. 306 (1909), 1910.	Trachyandesite.	
160	″II.4(5).(2)3.4.	Q 11.28 di 0.89 or 16.12 hy 9.01 ab 36.15 mt 4.64 an 18.63 il 0.91 ap 0.67	Ilmenau, Thuringerwald, Germany.	Eyme.	R. Cronacher, In. Diss. Greifs., p. 49, 1909.	Quartz syenite.	
161	II.4.″3.″4.	Q 19.80 di 2.84 or 13.90 hy 6.60 ab 27.25 mt 10.44 an 16.40	Suhl, Thuringia.	J. Fromme.	J. Fromme, Sb. Ph. Med. Soc. Erl., XXV, p. 30, 1893.	Granite.	Not in W. T.
162	II.4.3.4.⊙.	Q 16.86 hy 16.90 or 11.12 mt 2.55 ab 28.82 il 0.76 an 20.85 ap 0.34 C 0.10	Huyseburge Häu, Brocken, Harz.	Eyme.	O. H. Erdmannsdörfer, Jb. Pr. G. L.-A., XXVII, p. 355, 1906.	Quartz diorite.	Inclusion in granite. Cf. No. 268, I.4.2.3.
163	II.(3)4.3.4.	Q 25.08 hy 16.57 or 8.34 mt 4.18 ab 22.01 il 3.50 an 15.29 ap 2.02 C 2.45	Schmalenberg, Brocken, Harz.	Hampe.	O. H. Erdmannsdörfer, Jb. Pr. G. L.-A., XXVII, p. 356, 1906.	Quartz diorite.	
164	(I)II.″4.(2)3.(3)4.	Q 26.40 di 7.66 or 15.57 hy 2.23 ab 27.25 mt 3.02 an 14.73	Near Erdmannsdörf, Riesengebirge, Silesia.	W. Herz.	L. Milch, N. J., 1905, II, p. 22.	Quartz porphyry.	Border of dike. Cf. No. 36, I.4.3.3.

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. TONALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
165	61.40	19.98	1.28	4.08	3.67	4.43	2.21	1.33	1.44						99.82	
A3. III	1.023	.196	.008	.057	.092	.078	.035	.014								
166	62.51	14.81	1.68	2.97	3.12	5.04	3.49	2.03	1.52		1.85	0.51	0.64	CO_2 0.36 Li_2O trace	100.53	
A2. II	1.042	.145	.011	.042	.078	.090	.056	.021			.023	.004	.009		(100.57)	
167	60.23	13.87	2.46	4.15	3.14	7.97	3.21	1.34	0.79		1.80	0.61		S 0.48	100.50	
A2. II	1.004	.136	.015	.058	.079	.143	.052	.014			.023	.004				
168	61.05	15.86	2.95	2.14	1.90	4.09	3.46	3.18	3.95		1.24		0.44		100.26	
A2. II	1.018	.156	.019	.030	.048	.073	.056	.033			.016		.006			
169	56.90	17.34	5.51	5.23	2.25	5.20	4.27	1.26	1.40			0.59	0.08	S 0.21	100.24	
A2. II	.948	.170	.034	.072	.056	.093	.069	.014				.004	.001			
170	60.84	18.75	1.40	3.48	1.95	5.32	2.88	2.13	3.15		0.29				100.19	
A3. III	1.014	.184	.009	.049	.049	.094	.047	.022			.004					
171	64.95	16.11	3.16	2.18	2.04	4.68	4.40	1.53	1.45		0.11	trace			100.61	
A3. III	1.083	.158	.020	.031	.051	.084	.071	.016			.001	—				
172	57.49	17.18	5.45	6.18	3.23	5.35	2.59	1.59	0.35		0.28	0.02	trace		99.71	
A2. II	.958	.168	.034	.086	.081	.096	.042	.017			.004	—	—			
173	59.95	17.35	1.44	5.59	2.88	6.75	3.30	2.08	1.42						100.76	
A3. III	.999	.170	.009	.078	.072	.121	.053	.022								
174	62.24	17.49	1.37	3.36	2.57	3.44	3.59	3.08	1.90	0.18	1.00				100.22	2.78
A3. III	1.037	.171	.009	.047	.064	.062	.058	.033			.013					
175	56.58	15.31	6.95	1.50	4.14	7.20	3.28	2.67	1.49	0.03	1.35				100.20	2.81
A3. III	.943	.150	.044	.021	.104	.129	.053	.029			.017					
176	58.50	15.51	5.13	0.92	5.45	7.32	2.72	2.33	1.16	0.10	0.58				99.72	2.899
A3. III	.975	.152	.032	.013	.136	.130	.044	.024			.007					
177	62.27	16.92	2.40	2.59	2.87	4.78	4.72	1.47	1.22		0.16	trace		Cl 0.07	99.47	2.584
A?3. III?	1.038	.166	.015	.036	.072	.086	.076	.016			.002	—				22°
178	60.63	16.96	2.87	2.31	3.27	6.41	3.58	2.44	1.98						100.45	2.594
A?3. III?	1.011	.166	.018	.032	.082	.114	.058	.026								22°
179	59.29	15.27	5.21	2.08	4.42	6.15	3.31	2.61	1.46			0.18		Cl 0.04	100.02	2.614
A?3. III?	.988	.150	.032	.030	.111	.110	.053	.027				.001				22°
180	63.18	14.64	1.50	5.18	2.26	7.69	2.48	1.57	0.21			1.36	0.41		100.48	
A?2. II?	1.053	.144	.009	.072	.057	.137	.040	.017				.010	.006			

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 4. DOSODIC. TONALOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
165	″II.(3)4.3(4).4.	Q 25.92 hy 15.67 or 7.78 mt 1.86 ab 18.34 an 21.68 C 7.04	Bärenstein, n. Schmiedeberg, Riesengebirge.	Herz.	L. Milch, N. J. B. B., XII, p. 211, 1899.	Monzonite.	In W. T., p. 243.
166	″II.4.3.4.	Q 20.40 di 2.00 or 11.68 hy 9.08 ab 29.34 mt 2.55 an 18.90 il 3.50 ap 1.34	Appmannsberg, Bayrischer Wald, Germany.	A. Schwager.	Oebbeke and Schwager, Geogn. Jhft., XIV, p. 249, 1901.	Granite-diorite.	
167	II.4.3.4.⊙.	Q 18.54 di 13.34 or 7.78 hy 4.16 ab 27.25 mt 3.48 an 19.46 il 3.50 ap 1.34	Steining, n. Passau, Bayrischer Wald? Germany.	E. Lay.	A. Frentzel, Geogn. Jhft., XXIV, p. 143, 1911.	Diorite.	
168	(I)II.4.″3.(3)4.	Q 17.70 di 1.30 or 18.35 hy 4.33 ab 29.34 mt 4.41 an 18.63 il 2.43	Giesshübel, Bohemia.	Z. Weyberg.	Z. Weyberg, Ref. N. J., 1912, I, p. 398.	Andesite.	
169	II.4(5).3.4″.	Q 11.70 hy 10.75 or 7.78 mt 7.89 ab 36.15 ap 1.34 an 22.24 C 0.70	Near Huch, Eisengebirge, Bohemia.	C. v. John.	v. John and Hinterlechner, Jb. G.R.-A., Wien, LIX (1), p. 149, 1909.	Diorite.	
170	(I)II.4.3″.″4.	Q 19.62 hy 9.65 or 12.23 mt 2.09 ab 24.63 il 0.61 an 26.13 C 2.14	Wolfsgrube, Ursulaberg, Carinthia.	Not stated.	H. v. Foullon, Vh. Wien. G. R.-A., XXIII, p. 93, 1889.	Quartz porphyrite.	In W T., p. 243.
171	(I)II.4.3.4″.	Q 20.70 di 2.87 or 8.90 hy 5.06 ab 37.20 mt 4.64 an 19.74 il 0.15	Romanszaszka, Krasso-Szöreny, Hungary.	K. Emszt.	Rozlozsnik and Emszt, Mt. Ung. G. A., XVI, p. 187, 1908.	Banatite.	
172	II.4.3(4).4.	Q 16.98 hy 14.44 or 9.45 mt 7.89 ab 22.01 il 0.61 an 26.69 C 1.33	Osopot, Krasso-Szöreny, Hungary.	K. Emszt.	Rozlozsnik and Emszt, Mt. Ung. G. A., XVI, p. 189, 1908.	Banatite.	
173	II.4(5).3.4.	Q 11.52 di 6.04 or 12.23 hy 13.29 ab 27.77 mt 2.09 an 26.41	Lienz, Tyrol.	C. v. John.	W. Hammer, Jb. G. R.-A. Wien, LIII, p. 71, 1904.	Andesite.	
174	(I)II.4.(2)3.(3)4.	Q 16.68 hy 9.70 or 18.35 mt 2.09 ab 30.39 il 1.98 an 17.24 C 1.84	Piz Glievers Dado, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Granite.	
175	II.4(5).3.(3)4.	Q 9.00 di 13.18 or 16.12 hy 4.30 ab 27.77 mt 0.93 an 18.90 il 2.58 hm 6.40	Piz Tiarus, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Diorite porphyrite.	
176	II.4″.3.(3)4.	Q 13.02 di 9.94 or 13.34 hy 9.00 ab 23.06 mt 1.39 an 23.35 il 1.06 hm 4.16	Piz Giuf, Aar Massif, Switzerland.	L. Hezner.	F. Weber, Btr. G. Kt. Schw., XIV, p. 77, 1904.	Spessartite.	
177	(I)II.4″.3.4″.	Q 14.10 di 2.65 or 8.90 hy 8.44 ab 39.82 mt 3.48 an 20.57 il 0.30	Punta della Civitate, Capraia Island, Italy.	A. Röhrig.	H. Emmons, Q. J. G. S., XLIX, p. 142, 1893.	Andesite.	In W. T., p. 243.
178	″II.4″.3.4.	Q 12.90 di 7.07 or 14.46 hy 6.69 ab 30.39 mt 4.18 an 22.80	Poppa alla Nave, Capraia Island, Italy.	A. Röhrig.	H. Emmons, Q. J. G. S., XLIX, p. 141, 1893.	Andesite.	In W. T., p. 243.
179	II.4″.3.″4.	Q 13.20 di 7.99 or 15.01 hy 7.40 ab 27.77 mt 6.96 an 19.46 hm 0.32	Monte Patello, Capraia Island, Italy.	A. Röhrig.	H. Emmons, Q. J. G. S., XLIX, p. 142, 1893.	Andesite.	In W. T., p. 243.
180	II.4.3(4).4.	Q 23.70 di 3.96 or 9.45 hy 12.69 ab 20.96 mt 2.09 an 24.19 ap 3.34	Lava of 1888, Vulcano, Aeolian Islands.	L. Ricciardi.	G. Mercalli, Gior. Min., III, p. 110, 1892.	Andesite.	In W. T., p. 243.

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. TONALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
181	59.27	14.55	2.02	7.17	3.50	7.76	2.88	1.62	0.36			0.91	0.32		100.36	
A?2. II?	.971	.143	.013	.100	.088	.138	.047	.017				.006	.005			
182	61.19	17.80	0.87	4.25	3.71	6.58	2.73	2.43	0.40		0.66				100.62	
A3. III	1.020	.174	.005	.059	.093	.118	.044	.026			.008				(100.83)	
183	56.34	13.95	1.94	6.73	6.41	6.20	3.10	0.76	1.04	0.63	2.22	0.44			99.79	
A2. II	.939	.137	.012	.093	.160	.111	.050	.008			.028	.003				
184	55.16	18.32	2.42	4.15	2.75	7.04	3.23	1.10	3.58		0.74	1.33			99.82	
A2. II	.919	.180	.015	.058	.069	.126	.052	.012			.009	.009				
185	59.94	15.52	2.53	2.00	3.62	6.76	4.46	1.29	3.35						99.47	
B3. IV	.999	.152	.016	.028	.091	.121	.072	.014								
186	63.61	17.64	1.81	2.09	3.19	5.22	4.70	1.28	0.57						100.11	
A3. III	1.060	.173	.011	.030	.080	.093	.076	.014								
187	61.90	17.28	1.70	5.76	2.76	4.68	2.52	1.80	1.30						99.70	
A3. III	1.032	.169	.011	.080	.069	.084	.040	.019								
188	55.87	18.74	4.88	5.01	1.39	8.20	3.43	1.55	0.36		0.01			Cl trace	99.45	2.767
B3. IV	.931	.184	.031	.069	.035	.146	.055	.017			——					
189	55.46	16.76	5.15	3.00	2.44	10.00	2.94	1.95	1.60		0.21				99.51	2.610
A3. III	.918	.164	.032	.042	.061	.179	.047	.022			.003					
190	62.90	18.29	1.79	4.00	1.61	5.62	2.91	1.48	0.90		0.18			Cl trace	99.77	2.464
A3. III	1.048	.179	.012	.056	.040	.100	.047	.016			.002					
191	59.94	18.40	3.69	2.99	1.95	6.58	3.43	1.67	0.94		0.02				99.61	2.440
A3. III	.999	.180	.023	.042	.048	.118	.055	.019			——					
192	59.83	17.82	3.62	4.60	1.64	6.88	3.31	1.23	0.52		0.01				99.44	2.635
B3. IV	.997	.175	.023	.064	.041	.123	.053	.014			——					
193	60.60	18.21	1.93	4.00	2.52	5.95	3.70	2.29	none		0.70	trace			99.90	
A3. III	1.010	.178	.012	.056	.063	.106	.060	.024			.009	——				
194	62.00	17.53	2.33	2.51	2.39	5.95	3.44	2.63	1.02		0.59	trace	trace		100.39	
A3. III	1.033	.172	.014	.035	.060	.106	.055	.028			.007	——	——			
195	61.93	16.45	4.66	0.40	2.94	4.40	4.03	2.20	2.50						99.51	2.539
A3. III	1.032	.161	.029	.006	.074	.079	.065	.023								15°
196	59.50	18.71	2.32	3.96	3.49	5.10	3.82	1.18	0.60		1.68	0.07			100.43	
A2. II	.992	.183	.014	.055	.087	.091	.061	.013			.021	——				
197	64.4	16.1	3.5	1.0	2.7	5.0	4.2	1.6	1.1		0.65		trace		100.25	
B3. IV	1.073	.158	.022	.014	.068	.089	.068	.017			.008		——			

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 4. DOSODIC. TONALOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
181	II.4″.3.4.	Q 12.60 di 9.06 or 9.45 hy 16.40 ab 24.63 mt 3.02 an 21.96 ap 2.02	Lava of 1888, Vulcano, Aeolian Islands.	L. Ricciardi.	G. Mercalli, Gior. Min., III, p. 110, 1892.	Andesite.	In W. T., p. 243.
182	II.4″.3(4).(3)4.	Q 14.34 di 3.19 or 14.46 hy 13.81 ab 23.06 mt 1.16 an 28.91 il 1.22	Esporlatu, Sardinia.	C. Riva.	C. Riva, Atti Ac. Sci. Nap., (2), XII, No. 9, p. 26, 1905.	Diorite.	
183	II(III).4″.3″.4(5).	Q 11.64 di 4.91 or 4.45 hy 21.04 ab 26.20 mt 2.78 an 21.96 il 4.26 ap 1.01	Canale Perdiera, Monte Arci, Sardinia.	H. S. Washington.	H. S. Washington. A. J. S., XXXVI, p. 587, 1913.	Andesite.	
184	II.4.3(4).4.	Q 14.40 hy 11.39 or 6.67 mt 3.48 ab 27.25 il 1.37 an 26.69 ap 3.02 C 2.04	Seddas de Su Murta, San Antioco, Sardinia.	A. Johnsen.	A. Johnsen, Abh. Pr. Ak. W., Anh. No. 2, p. 56, 1912.	Andesite.	Also in N. J. Cb., 1912, p. 738.
185	II.4(5).″3.4″.	Q 11.58 di 12.04 or 7.78 hy 5.02 ab 37.73 mt 3.71 an 18.35	Mokraja Wolnowacha, Mariupol, Russia.	J. Morozewicz.	J. Morozewicz, Ref. N. J., 1900, I, p. 394.	Andesite.	In W. T., p. 243.
186	(I)II.4″.3.4″.	Q 14.70 di 2.22 or 7.78 hy 9.41 ab 39.82 mt 2.55 an 23.07	Tschchera River, Caucasus.	L. Lessing and Krikmeyer.	Loewinson-Lessing, Ref. N. J., II, p. 239.	Andesite-dacite.	In W. T., p. 243.
187	II.4.3″.″4.	Q 22.26 hy 16.14 or 10.56 mt 2.55 ab 20.96 an 23.35 C 2.65	Kasbek, Caucasus.	L.-Lessing and Krikmeyer.	Loewinson-Lessing, Ref., N. J., 1899, II, p. 237.	Andesite-dacite.	In W. T., p. 243.
188	II.4(5).3(4).4.	Q 10.08 di 7.88 or 9.45 hy 4.57 ab 28.82 mt 7.19 an 31.14	Mount Oros, Aegina, Greece.	A. Röhrig.	H. S. Washington, J. G., III, p. 150, 1895.	Andesite.	In W. T., p. 283.
189	II.4(5).3″.″4.	Q 9.72 di 14.91 or 12.23 wo 1.86 ab 24.63 mt 7.42 an 26.41 il 0.46	Mount Chondos, Aegina, Greece.	A. Röhrig.	H. S. Washington, J. G., III, p. 150, 1895.	Andesite.	In W. T., p. 245.
190	(I)II.4.3(4).4.	Q 23.28 hy 9.54 or 8.90 mt 2.78 ab 24.63 il 0.30 an 27.80 C 1.63	Kosona, Methana, Greece.	A. Röhrig.	H. S. Washington, J. G., III, p. 150, 1895.	Dacite.	In W. T., p. 191.
191	(I)II.4.3″.4.	Q 15.84 di 2.72 or 10.56 hy 5.98 ab 28.82 mt 5.34 an 29.47	Kaimeni, Methana, Greece.	A. Röhrig.	H. S. Washington, J. G., III, p. 150, 1895.	Andesite.	In W. T., p. 245.
192	″II.4.3(4).4.	Q 16.98 di 3.72 or 7.78 hy 7.66 ab 27.77 mt 5.34 an 29.75	Mount Chelona, Methana, Greece.	A. Röhrig.	H. S. Washington, J. G., III, p. 150, 1895.	Andesite.	In W. T., p. 245.
193	″II.4(5).3.4.	Q 12.48 di 2.72 or 13.34 hy 9.59 ab 31.44 mt 2.78 an 26.13 il 1.27	Santorini, Greece.	Pisani.	A. Lacroix, C. R., CXL, p. 974, 1905.	Microtinite (andesite).	
194	(I)II.4.3.″4.	Q 15.96 di 3.77 or 15.57 hy 6.05 ab 28.82 mt 3.48 an 24.74 il 1.06	Kalymnos Island, Aegean Sea.	F. Millosevich.	F. Millosevich, Rend. Ac. Linc., XXI (2), p. 306, 1912.	Andesite.	
195	(I)II.4.3.4.	Q 16.68 di 1.30 or 12.78 hy 6.80 ab 34.06 mt 1.39 an 20.29 hm 3.50	Pergamon, Asia Minor.	R. Lepsius.	R. Lepsius, Geol. Attika, p. 169, 1893.	Dacite.	In W. T., p. 245.
196	″II.4.3.4.	Q 15.54 hy 11.34 or 7.23 mt 3.25 ab 31.96 il 3.19 an 25.30 C 1.84	Mount Zan, n. Zagoué, Ivory Coast.	Pisani.	A. Lacroix, N. Arch. Mus., III, p. 118, 1911.	Hypersthene granite.	
197	(I)II.4.3.4.	Q 19.38 di 5.62 or 9.45 hy 4.20 ab 35.63 mt 1.39 an 20.29 il 1.22 hm 2.56	Gebel Doukhan, Egypt.	Not stated.	J. Couyat, C. R., CXLVII, p. 989, 1908.	Porphyry.	"Porfido rosso."

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. TONALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
198	64.3	16.4	1.85	2.5	3.0	4.7	4.3	2.0	0.6		0.45				100.1	
B3. IV	1.072	.160	.012	.035	.075	.084	.069	.021			.006					
199	62.07	17.15	1.87	3.57	2.39	4.84	4.75	2.15	0.97	0.21	0.21	trace	0.26	S 0.08	100.52	
A2. II	1.035	.168	.012	.050	.060	.087	.077	.023			.003	——	.004			
200	52.53	14.16	10.03	7.46	2.72	5.43	3.02	1.85	1.74		0.69	0.61	trace		100.24	
A2. II	.876	.139	.063	.104	.068	.096	.048	.020			.009	.004	——			
201	64.10	15.65	6.66	2.38	1.44	4.40	2.57	1.71	0.85						99.76	
A3. III	1.068	.153	.042	.033	.036	.079	.042	.018								
202	58.15	13.11	2.72	6.27	2.87	5.51	3.09	2.73	2.67	0.27	1.84	0.40			99.63	
A2. II	.969	.128	.017	.088	.072	.098	.050	.029			.023	.003			(99.3)	
203	62.20	16.58	5.00	2.80	4.20	4.40	2.10	1.80	n. d.			0.37	trace	FeS_2 0.17	99.62	2.686
A3. III	1.037	.163	.031	.039	.105	.079	.034	.019				.003	——			
204	62.10	16.03	2.55	1.95	2.67	6.05	3.12	1.48	1.70	1.07	0.71	0.14	trace	F 0.09	99.66	2.565
A2. II	1.035	.157	.016	.027	.067	.108	.050	.016			.009	.001	——			
205	55.90	17.00	5.29	3.64	3.36	8.08	3.27	1.45	0.66		1.31	0.29	trace	F 0.09	100.34	2.781
A2. II	.932	.167	.033	.050	.084	.145	.053	.016			.016	.002	——			
206	58.31	18.40	3.70	3.29	2.57	5.74	3.98	2.22	2.08					CO_2 0.13	100.42	2.72
A3. III	.972	.180	.023	.046	.064	.103	.065	.023								
207	65.32	14.03	3.23	4.65	1.24	5.25	3.46	1.28	1.46						99.92	
A3. III	1.089	.137	.020	.065	.016	.094	.056	.014								
208	63.68	16.18	0.93	4.62	2.25	4.84	3.31	2.59	0.31		0.93	0.38	0.02		100.02	
A2. II	1.061	.159	.006	.064	.056	.087	.053	.028			.012	.003	——			
209	62.38	17.77	0.44	4.53	1.80	5.01	4.09	1.85	0.55	0.30	0.86	0.39	0.08	CO_2 none ZrO_2 none SO_3 trace Cl 0.07 F none S 0.04 NiO 0.05 BaO none	100.21	
A1. I	1.040	.174	.003	.063	.045	.089	.066	.020			.011	.003	.001			
210	62.38	15.86	1.01	4.33	2.22	4.83	3.65	2.49	1.36		0.99	0.29	0.10		99.51	
A2. II	1.040	.156	.006	.060	.056	.086	.059	.027			.012	.002	.001			
211	57.42	18.53	1.55	5.08	4.72	4.90	2.59	2.15	2.59		0.60	trace	0.07		100.20	
A2. II	.957	.182	.010	.071	.118	.088	.042	.023			.008	——	.001			
212	57.13	14.40	6.03	5.45	3.17	6.81	3.04	1.41	1.76		0.80	0.18	0.14		100.32	
A2. II	.952	.141	.038	.076	.079	.121	.049	.015			.010	.001	.002			
213	63.85	14.87	2.32	5.07	3.29	4.48	3.72	1.09	0.11		0.83	0.08	0.05	ZrO_2 trace Cl none S 0.15 Cr_2O_3 none BaO none SrO 0.04	99.95	
A1. I	1.064	.146	.014	.071	.082	.080	.060	.012			.010	——	——			

ORDER 4. QUARDOFELIC. AUSTRARE—Continued

SUBRANG 4. DOSODIC. TONALOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
198	(I)II.4.3.4.	Q 17.16 di 3.13 or 11.68 hy 8.25 ab 36.15 mt 2.78 an 19.46 il 0.91	Gebel Doukhan, Egypt.	Not stated.	J. Couyat, C. R., CXLVII, p. 868, 1908.	Andesite.	
199	″II.4(5).(2)3.4.	Q 10.86 di 4.32 or 12.79 hy 9.02 ab 40.35 mt 2.78 an 18.90 il 0.46	Kadero, Kordofan, Soudan.	D. Schimpff.	G. Linck, N. J. B. B., XVII, p. 420, 1903.	Malchite.	
200	II.4″.3.4.	Q 12.84 di 2.72 or 11.12 hy 9.70 ab 25.15 mt 14.62 an 19.74 il 1.37 ap 1.34	Delen, Kordofan, Soudan.	Sprockhoff.	G. Linck, N. J. B. B., XVII, p. 435, 1903.	Gabbro porphyrite.	Al_2O_3 corr. for P_2O_5. "With absorbed granite."
201	(I)II.(3)4.3″.4.	Q 30.84 hy 3.60 or 10.01 mt 7.66 ab 22.01 hm 1.44 an 21.96 C 1.43	Bander Saleh, Abd el Keri, n. Socotra Island.	F. Eichleiter.	A. Pelikan, Ds. Ak. W. Wien., LXXI, p. 85, 1902.	Quartz diorite porphyrite.	
202	II.4.(2)3.(3)4.	Q 14.28 di 8.93 or 16.12 hy 9.12 ab 26.20 mt 3.94 an 13.62 il 3.50 ap 1.01	Ihovitika, Sakalave District, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVII, p. 20, 1913.	Hyalo-andesite.	
203	II.(3)4.3.(3)4.	Q 28.08 hy 11.56 or 10.56 mt 7.19 ab 17.82 ap 1.01 an 19.18 C 4.18	Palmietkine, East Rand, Transvaal.	H. Eckstein & Co.	C. B. Horwood, Tr. R. Soc. S. Af., XIII, p. 51, 1911.	Tonalite.	
204	(I)II.4.3″.4.	Q 22.44 di 3.06 or 8.90 hy 5.55 ab 26.20 mt 3.71 an 25.30 il 1.27 ap 0.34	Copper Island, Commander Islands, Bering Sea.	Z. Starzynski.	Z. Starzynski, B. Ac. Sc. Crac., Ser. A, 1912, p. 659.	Andesite.	
205	II.4(5).3(4).4.	Q 11.46 di 10.15 or 8.90 hy 3.70 ab 27.77 mt 7.66 an 27.24 il 2.43 ap 0.67	Bering Island, Commander Islands, Bering Sea.	Z. Starzynski.	Z. Starzynski, B. Ac. Sc. Crac., Ser. A, 1912, p. 665.	Andesite.	
206	″II.4(5).3.4.	Q 9.72 di 2.48 or 12.79 hy 8.24 ab 34.06 mt 5.34 an 25.58	Dsun-mo-lun, Northeast Tibet.	C. Pfeil.	K. Futterer, Durch Asien, III (4), p. 23, 1911.	Porphyry.	
207	″II.″4.3.4.	Q 26.82 di 6.47 or 7.78 hy 4.20 ab 29.34 mt 4.64 an 18.63	Usu, Iburi, Hokkaido, Japan.	Takaminé.	Pr. G. Soc. Jap., 1884?	Andesite pumice.	Not in W. T.
208	″II.4.3.(3)4.	Q 19.02 hy 11.67 or 15.57 mt 1.39 ab 27.77 il 1.82 an 21.68 ap 1.01	Ontake Volcano, Japan.	K. Yokoyama.	S. Kozu, pers. com.	Andesite.	
209	(I)II.4.3.4.	Q 16.26 hy 11.10 or 11.12 mt 0.70 ab 34.58 il 1.67 an 21.96 ap 1.01 C 0.92	Kurokami crater, Sakurajima Volcano, n. Kagoshima, Japan.	J. B. Ferguson.	F. A. Perret collector.	(Andesite.) Ash.	Eruption of 1914, A. L. Day, pers. com.
210	″II.4.3.4.	Q 16.56 di 2.07 or 15.01 hy 10.25 ab 30.92 mt 1.39 an 19.46 il 1.82 ap 0.67	Eboshidake, Norikura Volcano, Japan.	K. Yokoyama.	S. Kozu, pers. com.	Andesite.	
211	II.4″.3″.(3)4.	Q 13.14 hy 18.93 or 12.79 mt 2.32 ab 22.01 il 1.22 an 24.46 C 2.96	Takahama, Izu Province, Japan.	C. Sugiura.	S. Kozu, pers. com.	Andesite.	
212	II.4.3.4.⊙	Q 15.84 di 9.24 or 8.34 hy 7.38 ab 25.68 mt 8.82 an 21.41 il 1.52 ap 0.34	Kashima, Izu Province, Japan.	T. Ohashi.	S. Kozu, pers. com.	Olivine andesite.	
213	II.4.3.4″.	Q 20.94 di 1.36 or 6.67 hy 13.74 ab 31.44 mt 3.25 an 20.57 il 1.52	Yercaud, Shevaroy Hills, Madras, India.	H. S. Washington.	H. S. Washington, A. J. S., XLI, p. 328, 1916.	Charnockite (quartz hypersthene diorite).	Cf. No. 214, p. 398.

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. TONALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
214	63.52	14.78	1.98	5.01	3.00	4.65	4.22	1.15	0.22		0.91		0.10		99.54	
A2. II	1.059	.145	.013	.069	.075	.083	.068	.012			.011		.001			
215	58.54	17.62	1.89	3.33	2.27	7.25	3.76	1.62	1.24	0.04	0.70	none	0.13	ZrO_2 0.01 Cl 0.04 F 0.05 S 0.04 Cr_2O_3 0.01 BaO 0.04 SrO 0.01	99.59	
A1. I	.976	.173	.012	.046	.082	.130	.061	.017			.009	—	.002			
216	57.49	18.40	5.46	1.71	3.05	7.61	3.38	1.99	1.61	0.14					100.84	
A3. III	.958	.180	.034	.024	.076	.136	.055	.021								
217	62.70	16.37	2.81	1.62	2.50	4.84	4.05	1.83	1.79	0.87	0.64				100.02	
A3. III	1.045	.160	.018	.022	.063	.087	.066	.020			.008					
218	66.53	15.96	2.65	2.89	1.99	2.96	4.05	1.60	1.11				0.19		99.93	2.740
A3. III	1.109	.156	.017	.040	.050	.053	.066	.017					.003			
219	57.70	16.36	4.20	3.47	3.41	7.32	3.22	2.11	1.14	0.16	0.71	0.14			99.94	
A2. II	.962	.160	.026	.049	.085	.130	.052	.022			.009	.001				
220	56.40	17.66	5.60	1.83	3.76	7.24	2.96	2.10	1.31	0.32	0.66	trace		S trace	99.84	
A2. II	.940	.173	.035	.025	.094	.129	.048	.022			.008	—				
221	55.99	18.19	4.10	3.85	3.02	8.27	3.28	1.53	0.99	0.20	0.70	0.13		S trace	100.25	
A2. II	.933	.178	.026	.054	.076	.148	.053	.016			.009	.001				
222	59.39	16.73	5.03	1.60	3.48	6.98	3.18	1.32	1.52		0.72	trace	0.10		100.05	
A2. II	.990	.164	.031	.022	.087	.125	.052	.014			.009	—	.001			
223	63.80	13.32	3.29	2.30	2.32	4.63	3.13	1.53	1.34	0.19	2.23	0.18	0.24	SO_3 0.40 BaO 0.70	99.60	2.72
A2. II	1.063	.131	.021	.032	.058	.082	.050	.016			.025	.001	.003			
224	58.50	17.54	3.32	2.56	2.93	7.04	3.48	1.62	1.23		1.41	0.23	0.08	BaO 0.10	100.05	2.495
A2. II	.975	.172	.021	.036	.073	.126	.056	.017			.018	.002	.001			
225	62.15	16.73	2.90	3.22	2.70	3.98	3.58	2.81	1.06	0.14	0.83	trace	0.12	CO_2 0.04 ZrO_2 trace Cl trace S 0.11 Cr_2O_3 none NiO 0.08 BaO none SrO none Li_2O none	100.45	2.61
A1. I	1.036	.164	.018	.044	.068	.071	.058	.030			.010	—	.002			
226	59.94	15.61	1.55	6.25	2.53	6.65	2.88	2.06	0.57	0.39	1.08	0.64			100.15	
A2. II	.999	.153	.010	.087	.063	.119	.047	.022			.014	.004				
227	60.26	16.46	1.15	4.87	3.09	5.25	4.23	0.98	2.22	0.22	0.84	0.29	0.08	CO_2 none S 0.03 Cr_2O_3 none BaO none SrO none	99.97	
A1. I	1.004	.161	.007	.068	.077	.094	.068	.010			.011	.002	.001			

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 4. DOSODIC. TONALOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
214	II.4.3.4(5).	Q 18.24 di 3.98 or 6.67 hy 11.05 ab 35.63 mt 3.02 an 18.07 il 1.67	Yercaud, Shevaroy Hills, Madras, India.	M. Kawamura.	Unpublished.	Charnockite.	Same specimen as No. 213.
215	II.4(5)3.4.	Q 10.44 di 7.85 or 9.45 hy 7.98 ab 31.96 mt 2.78 an 26.41 il 1.37	Benguet Road, Luzon, Philippine Islands.	E. W. Morley.	J. P. Iddings, pers. com.	Andesite.	
216	"II.4(5).3"4.	Q 11.16 di 6.91 or 11.68 hy 4.40 ab 28.82 mt 5.57 an 28.91 hm 1.60	Antamok River, Benguet, Luzon, Philippine Islands.	P. J. Fox.	A. J. Eveland, Philip. J. Sci., (A), II, p. 226, 1907.	Basalt.	
217	(I)II.4.3.4.	Q 18.20 di 2.81 or 11.12 hy 5.00 ab 34.58 mt 3.25 an 20.57 il 1.22 hm 0.64	Nangah Oeroli, Boe kit Loebock, Muller Mountains, Borneo.	M. Dittrich.	J. Schmutzer, Pr. K. Ac. Wet. Amst., 1908, p. 410.	Andesite.	
218	(I)II.4.(2)3.4.	Q 25.74 hy 8.43 or 9.45 mt 3.94 ab 34.58 an 14.73 C 2.04	Siboemboem, Sumatra.	L. Serrurier.	R. D. M. Verbeek, Sum. West K., p. 232, 1883.	Granite.	Not in W. T.
219	II.4".3.4.	Q 12.18 di 9.69 or 12.23 hy 5.76 ab 27.25 mt 6.03 an 23.91 il 1.37 ap 0.34	Si Nabun, Karoland, Sumatra.	M. Dittrich.	H. Stegmann, N. J. B. B., XXVII, p. 444, 1909.	Andesite.	
220	II.4(5).3(4)."4.	Q 11.64 di 5.62 or 12.23 hy 6.80 ab 25.15 mt 3.94 an 28.63 il 1.22 hm 2.88	Sibajak, Karoland, Sumatra.	M. Dittrich.	H. Stegmann, N. J. B. B., XXVII, p. 441, 1909.	Andesite.	
221	II.4(5).3(4).4.	Q 10.02 di 8.68 or 8.90 hy 5.95 ab 27.77 mt 6.03 an 30.30 il 1.37 ap 0.34	Su Kanulu, Si Nabun, Karoland, Sumatra.	M. Dittrich.	H. Stegmann, N. J. B. B., XXVII, p. 445, 1909.	Andesite.	
222	II.4.3(4).4.	Q 17.04 di 5.83 or 7.78 hy 6.00 ab 27.25 mt 3.25 an 27.24 il 1.37 hm 2.72	Tumleo, Kaiser Wilhelm Land, New Guinea.	E. Ludwig.	S. Richarz, N. J. B. B., XXIX, p. 445, 1910.	Andesite.	
223	"II."4.3.4.	Q 27.42 di 4.75 or 8.90 hy 3.60 ab 26.20 mt 2.32 an 18.07 il 3.80 hm 1.76 ap 0.34	Ndoera River, Flores Island.	A. Lindner.	G. Rack, N. J. B. B., XXXIV, p. 79, 1912.	Andesite.	BaO high?
224	"II.4".3".4.	Q 14.34 di 5.83 or 9.45 hy 4.60 ab 29.34 mt 4.41 an 27.52 il 2.74 hm 0.32 ap 0.67	Tandjoeng Lok, Sumbawa Island.	A. Lindner.	G. Rack, N. J. B. B., XXXIV, p. 52, 1912.	Andesite.	
225	(I)II.4.3."4.	Q 16.80 hy 9.18 or 16.68 mt 4.18 ab 30.39 il 1.52 an 19.74 C 0.51	Bankfoot House, Glasshouse Mountains, Queensland.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXI, p. 169, 1906.	Dacite.	
226	II.4.3."4.	Q 16.14 di 5.10 or 12.23 hy 12.06 ab 24.63 mt 2.32 an 23.35 il 2.13 ap 1.34	Glenrock Falls, Merulam, New South Wales.	G. J. Barrows.	W. G. Woolnough, Pr. Linn. Soc. N. S. W., XXXIV, p. 797, 1909.	Granodiorite.	
227	II.4".3.4(5).	Q 14.28 di 0.92 or 5.56 hy 13.97 ab 35.63 mt 1.62 an 23.07 il 1.67 ap 0.67	Currabubula, New South Wales.	W. N. Benson.	W. N. Benson, pers. com.	Hypersthene andesite.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. TONALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
228	66.86	14.91	4.06	3.65	1.28	3.25	4.22	1.49	0.58	0.09			trace		100.39	
A3. III	1.114	.146	.026	.051	.032	.058	.068	.016					—			
229	62.56	16.60	1.02	5.98	2.70	4.30	2.98	2.57	0.68	0.18	1.10	0.17	trace	CO_2 none Cl trace S none Li_2O trace	100.85	2.773
A2. II	1.043	.163	.006	.083	.068	.077	.048	.028			.014	.001	—			
230	62.04	16.50	0.66	6.67	3.06	4.56	2.27	2.14	0.54	0.16	1.16	0.19	trace	CO_2 none Cl trace S none Li_2O none	99.95	2.789
A2. II	1.034	.162	.004	.093	.077	.081	.037	.022			.015	.001	—			
231	63.62	14.38	3.29	3.47	3.13	5.43	4.40	1.20	0.06	0.22	0.72		0.28	CO_2 none S none	100.20	2.76
A2. II	1.060	.141	.021	.049	.078	.096	.071	.013			.009		.004			
232	59.35	15.83	5.41	1.76	4.58	6.43	3.38	0.90	0.83	0.07	0.78		0.33	CO_2 0.06 FeS_2 0.07	99.78	2.86
A2. II	.989	.155	.034	.025	.115	.114	.055	.010			.010		.005			
233	56.74	15.46	3.08	7.58	2.54	7.64	3.08	1.59	1.28		1.26	0.15	trace		100.40	2.906
A2. II	.946	.151	.019	.106	.064	.137	.050	.017			.016	.001	—			
234	61.25	16.53	1.28	3.60	3.19	4.95	3.71	2.10	1.82	0.82	0.58	0.02		CO_2 0.40	100.25	
A2. II	1.021	.162	.008	.050	.080	.089	.060	.022		.010	.004	—				
235	59.20	18.03	1.40	2.88	2.51	7.03	2.93	2.28	2.08		1.26		0.40	CO_2 none	100.00	
A2. II	.987	.173	.015	.040	.063	.125	.047	.024			.016		.006			
236	58.90	17.89	2.67	3.42	2.64	6.40	2.92	1.75	1.13	1.32	0.78	0.25	0.09		100.16	
A2. II	.982	.175	.017	.047	.066	.114	.047	.019			.010	.002	.001			
237	58.83	19.51	3.28	3.67	1.64	5.38	2.49	2.22	0.56	1.24	0.82	0.32	0.08	CO_2 none	100.04	
A2. II	.981	.195	.021	.051	.041	.096	.040	.023			.010	.002	.001			
238	51.65	15.07	2.08	9.65	5.48	6.04	2.57	0.98	1.85		3.53	1.15	0.07	CO_2 none	100.12	
A2. II	.861	.148	.013	.134	.137	.108	.042	.010			.044	.008	.001			
239	54.01	17.49	6.61	5.60	3.15	7.26	3.12	1.48	0.93						99.65	
A3. III	.900	.171	.041	.078	.079	.130	.050	.016								
240	59.85	16.90	1.92	5.22	3.12	6.63	3.45	1.28	0.87		0.84	0.06			100.08	
A2. II	.998	.166	.012	.072	.078	.118	.056	.014			.011	—				
241	62.97	14.75	2.98	3.31	2.12	5.51	3.78	1.21	2.15		0.10	0.07	0.17		99.12	
B2. III	1.050	.145	.019	.046	.053	.098	.061	.013			.001	—	.002			
242	55.33	14.72	6.11	5.34	3.91	7.56	3.23	1.26	1.57		0.14	0.53	0.18		99.88	
A2. II	.922	.144	.038	.074	.098	.135	.052	.014			.002	.004	.003			
243	61.79	16.20	2.64	3.62	1.96	4.68	3.69	2.98	0.78		1.22	0.28			99.84	
A2. II	1.030	.159	.017	.050	.049	.084	.060	.032			.015	.002				

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 4. DOSODIC. TONALOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
228	(I)II.4.″3.4.	Q 26.22 hy 6.50 or 8.90 mt 6.03 ab 35.63 an 16.12 C 0.41	Nekeeya, Ripon County, Victoria.	H. C. Jenkins.	A. W. Howitt, Rec. G. S. Vict., I (1), p. 40, 1902.	Quartz diorite.	
229	II.4.3.(3)4.	Q 18.48 hy 15.12 or 15.57 mt 1.39 ab 25.15 il 2.13 an 20.57 ap 0.34 C 1.33	Willmingongong Creek, Macedon, Victoria.	A. G. Hall.	Skeats and Summers, G. S. Vict. B. 24, p. 17, 1912.	Dacite.	
230	II.4.3″.(3)4.	Q 22.38 hy 17.47 or 12.23 mt 0.93 ab 19.39 il 2.28 an 21.68 ap 0.34 C 2.55	Cherokees, Macedon, Victoria.	A. G. Hall.	Skeats and Summers, G. S. Vict. B. 24, p. 17, 1912.	Dacite.	
231	II.4.(2)3.4″.	Q 18.66 di 8.71 or 7.23 hy 5.75 ab 37.20 mt 4.87 an 15.85 il 1.37	Cue, West Australia.	E. S. Simpson.	C. G. Gibson, W. Aust. G. S. B. 14, p. 14, 1904.	Granodiorite.	
232	II.4.3″.4(5).	Q 16.80 di 5.18 or 5.56 hy 9.10 ab 28.82 mt 4.64 an 25.02 il 1.52 hm 2.24	Mount Margaret Goldfield, West Australia.	Not stated.	C. G. Gibson, W. Aust. G. S. B. 24, p. 15, 1906.	Diorite.	
233	II.4(5).3.4.	Q 11.46 di 11.63 or 9.45 hy 9.94 ab 26.20 mt 4.41 an 23.35 il 2.43 ap 0.34	Northwest Bay, n. Hobart, Tasmania.	R. Pohl.	F. P. Paul, T. M. P. M., XXV, p. 316, 1906.	Quartz diabase.	
234	″II.4.3.4.	Q 15.90 hy 12.22 or 12.23 mt 1.86 ab 31.44 il 1.52 an 21.13 ap 1.34 C 0.41	Slug Creek, Orikaka District, New Zealand.	Not stated.	P. G. Morgan, pers. com.	Diorite.	
235	″II.4.3″.″4.	Q 15.36 di 5.13 or 13.34 hy 5.82 ab 24.63 mt 3.48 an 28.36 il 2.43	Coal Point, North Cape, New Zealand.	J. S. Maclaurin.	Bell and Clarke, G. S. N. Z. B. 8, p. 68, 1909.	Andesite.	
236	″II.4.3(4).4.	Q 15.30 hy 9.37 or 10.56 mt 3.94 ab 24.63 il 1.52 an 29.75 ap 0.67 C 0.20	Aroha, Hauraki, New Zealand.	Surv. lab.	Henderson and Bartrum, N. Z. G. S. B. 16, p. 62, 1913.	Pyroxene andesite.	
237	(I)II.4.3″.(3)4.	Q 21.78 hy 6.87 or 12.79 mt 4.87 ab 20.96 il 1.52 an 24.74 ap 0.67 C 4.39	Kirikiri Creek, Te Puke District, New Zealand.	Not stated.	J. A. Bartrum, G. S. N. Z. Mines Statem. (1912), p. 141, 1913.	Andesite.	
238	II(III).4″.3(4).4.	Q 10.32 hy 24.00 or 5.56 mt 3.02 ab 22.01 il 6.69 an 22.52 ap 2.69 C 1.53	Stillwater Creek, Mohikinui, Westport District, New Zealand.	Not stated.	P. G. Morgan, pers. com.	Diorite.	
239	II.4(5).3(4).4.	Q 9.18 di 5.66 or 8.90 hy 10.03 ab 26.20 mt 9.51 an 29.19	St. Paul Island, Atlantic Ocean.	R. Reinisch.	R. Reinisch, D. Südp. Exp., II (5), p. 390, 1909.	Basalt.	
240	II.4″.3″.4.	Q 14.22 di 5.01 or 7.78 hy 11.81 ab 29.34 mt 2.78 an 26.69 il 1.67	Wandel Island, Graham Land, Antarctica.	Pisani.	G. Gourdon, Exp. Ant. Fr., Pet. Vol., p. 151, 1908.	Quartz diorite.	
241	″II.4.3.4″.	Q 21.36 di 6.22 or 7.23 hy 6.01 ab 31.96 mt 4.41 an 19.74 il 0.15	Banck Island, 64° 51′ S., 62° 46′ W., Danco Land, Antarctica.	E. Zdarek.	A. Pelikan, Voy. Belgica, V, Petr. Unt., I, p. 45, 1909.	Malchite.	
242	II.4″.3.4.	Q 11.46 di 9.88 or 7.78 hy 9.90 ab 27.25 mt 8.82 an 21.68 il 0.30 ap 1.34	Moreno Island, 64° 4′ S., 61° 20′ W., Antarctica.	E. Zdarek.	A. Pelikan, Voy. Belgica., V, Petr. Unt., I, p. 7, 1909.	Quartz diorite.	
243	(I)II.4.″3.″4.	Q 16.02 di 2.26 or 17.79 hy 6.18 ab 31.44 mt 3.94 an 18.63 il 2.28 ap 0.67	Sounding, 70° S., 81° W. Paris, Weddell Quadrant, Antarctica.	Boiteau.	E. Gourdon, pers. com.	Diorite.	Dredged block.

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. TONALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
244	58.85	17.48	2.98	3.27	2.53	6.24	3.56	1.97	2.03		0.82	0.12			99.85	
A2. II	.981	.171	.019	.046	.063	.112	.057	.021			.010	.001				
245	55.15	17.56	4.12	4.46	3.27	6.94	3.18	1.31	1.88		1.57	0.21			99.75	
A2. II	.919	.172	.026	.062	.082	.124	.052	.014			.020	.001				

RANG 3. ALKALICALCIC. TONALASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	56.72	15.06	1.73	6.33	2.58	6.61	4.73	0.69	0.51	0.15	4.04	0.40	0.35	CO_2 none	99.91	
A2. II	.945	.148	.011	.088	.065	.118	.076	.007			.051	.003	.005			
2	50.36	17.37	8.13	4.33	3.57	4.29	4.74	0.08	2.73	0.16	3.10	0.63	0.24	CO_2 trace	99.73	
A2. II	.839	.170	.051	.060	.089	.077	.077	.001			.039	.004	.003			
3	62.32	15.79	3.57	4.61	2.53	3.65	4.51	0.76	1.89		0.06		0.35	CO_2 none	100.04	
A2. II	1.039	.155	.023	.064	.063	.065	.073	.008			.001		.005			
4	56.60	17.84	2.55	4.09	3.16	6.28	4.45	0.45	3.20		1.59	0.14	trace	BaO none SrO none	100.35	
A2. II	.943	.175	.016	.057	.079	.114	.072	.005			.020	.001	——			
5	60.40	16.89	1.88	3.72	3.82	7.25	3.80	0.77	0.20	0.09	0.61	0.16	0.12	CO_2 none FeS_2 0.08 NiO 0.02 BaO 0.06 SrO trace Li_2O trace	99.87	
A1. I	1.007	.165	.012	.052	.096	.129	.061	.008			.008	.001	.002			
6	64.67	16.62	0.51	0.76	2.26	9.50	4.10	0.34	0.37	0.08	0.51	0.12	trace	BaO 0.02 SrO trace Li_2O trace	99.86	
A2. II	1.078	.163	.003	.011	.047	.169	.066	.003			.006	.001	——			
7	60.09	16.43	2.28	3.01	4.37	5.76	4.52	0.70	1.16	0.20	0.63	0.12	0.12	CO_2 0.07 SO_3 trace FeS_2 0.34 BaO trace SrO trace Li_2O none	99.80	
A1. I	1.002	.161	.014	.042	.109	.103	.072	.007			.008	.001	.002			
8	61.37	15.41	3.15	3.89	3.48	4.42	3.76	0.34	2.70	0.29	0.60	0.08	0.47	BaO 0.08 SrO trace Li_2O none	100.04	
A2. II	1.023	.151	.020	.054	.087	.078	.060	.003			.007	——	.007			
9	64.22	16.36	2.93	2.50	1.94	5.85	3.96	0.73	0.84		0.21	trace			99.54	2.598
A3. III	1.070	.160	.018	.035	.049	.104	.064	.008			.003	——				
10	56.63	17.01	6.15	2.80	4.08	6.83	4.48	0.25	1.17		0.18	0.28	0.05	CO_2 0.02 ZrO_2 trace Cl 0.06 S none NiO none BaO none Cu 0.04 Pb none	100.02	
A1. I	.944	.164	.039	.039	.102	.121	.072	.003			.002	.002	——			
11	61.80	18.65	2.08	2.49	2.60	6.41	4.51	0.82	0.25		0.50	0.18	0.08	S 0.01	100.66	
A2. II	1.030	.183	.013	.035	.065	.114	.073	.009			.006	.001	.001			
12	61.35	17.84	4.13	2.28	1.81	6.08	4.39	0.45	0.52		0.32		0.37		99.54	
A2. II	1.023	.175	.026	.032	.045	.109	.071	.005			.004		.005			
13	56.96	14.65	9.16	4.87	1.65	4.56	4.93	0.85	2.10	0.19	0.31	0.09		CO_2 trace	100.32	2.90
A2. II	.949	.144	.058	.068	.041	.081	.079	.009			.004	——				

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 4. DOSODIC. TONALOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
244	″II.4″.3.4.	Q 13.86 di 3.59 or 11.68 hy 6.82 ab 29.87 mt 4.41 an 25.85 il 1.52 ap 0.34	Berthelot Island, Weddell quadrant, Antarctica.	Boiteau.	E. Gourdon, pers. com.	Quartz diorite.	
245	II.4(5).3(4).4.	Q 11.88 di 3.30 or 7.78 hy 8.75 ab 27.25 mt 6.03 an 29.47 il 3.04 ap 0.34	Jenny Island, Weddell quadrant, Antarctica.	Boiteau.	E. Gourdon, pers. com.	Andesite.	

SUBRANG 5. PERSODIC. PLACEROSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.4(5).3.″5.	Q 10.68 di 10.75 or 3.89 hy 5.84 ab 39.82 mt 2.55 an 18.07 il 7.55 ap 1.01	Sheepscot River, Boothbay quadrangle, Maine.	M. W. Adams.	I. H. Ogilvie, Ann. N. Y. Ac. Sci., XVII, p. 549, 1907.	Diabase.	
2	II.4″.3.5.	Q 9.60 hy 8.90 or 0.56 mt 5.57 ab 39.82 il 5.93 an 17.79 hm 4.32 C 2.96 ap 1.34	South Mountain, Fairchild quadrangle, Pennsylvania.	W. T. Schaller.	F. Bascom, U. S. G. S. Rec. lab.	Metabasalt.	
3	II.4.3.(4)5.	Q 18.90 hy 12.24 or 4.45 mt 5.34 ab 38.25 il 0.15 an 18.07 C 0.92	Virgilina, Granville County, North Carolina.	T. L. Watson.	T. L. Watson, B. G. S. A., XIII, p. 364, 1902.	"Greenstone" (andesite).	
4	II.4(5).3.″5.	Q 10.32 di 2.91 or 2.78 hy 9.26 ab 37.73 mt 3.71 an 27.24 il 3.04 ap 0.34	Little Saganaga Lake, Minnesota.	A. N. Winchell.	A. N. Winchell, Am. G., XXVI, p. 352, 1900.	Quartz gabbro.	In W. T., p. 285.
5	II.4″.3″.(4)5.	Q 14.46 di 6.74 or 4.45 hy 10.83 ab 31.96 mt 2.78 an 26.69 il 1.22 ap 0.34	St. Augustine Volcano, Cooks Inlet, Alaska.	W. F. Hillebrand.	G. F. Becker, U. S. G. S. A. R. 18, III, p. 52, 1898.	Augite-bronzite andesite.	In W. T., p. 245.
6	(I)II.4.3″.5.	Q 21.30 di 10.64 or 1.67 wo 2.67 ab 34.58 mt 0.70 an 26.13 il 0.91 ap 0.34	English Mountain, Placer County, California.	W. F. Hillebrand.	W. Lindgren, U. S. G. S. B. 148, p. 212, 1897.	Augite granite.	In W. T., p. 245.
7	II.4″.3.″5.	Q 12.90 di 3.99 or 3.89 hy 11.91 ab 37.73 mt 3.25 an 22.80 il 1.22 ap 0.34	Ophir District, Placer County, California.	W. F. Hillebrand.	W. Lindgren, U. S. G. S. A. R. 14, II, p. 262, 1894.	Camptonite.	In W. T., p. 245.
8	II.4.3.5.⊙	Q 22.08 hy 13.19 or 1.67 mt 4.64 ab 31.44 il 1.06 an 21.68 C 1.02	Jenny Lind, Calaveras County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 14, II, p. 473, 1894.	Porphyrite.	In W. T., p. 245.
9	(I)II.4.3.(4)5.	Q 22.98 di 3.63 or 4.45 hy 5.02 ab 33.54 mt 4.18 an 24.46 il 0.46	Xico Island, Lake Chalco, Mexico.	A. Röhrig.	H. Lenk, Btr. G. Mex., II, p. 233, 1899.	Hornblende andesite.	In W. T., p. 245.
10	II.4(5).3.5.	Q 11.34 di 5.40 or 1.67 hy 7.70 ab 37.73 mt 8.58 an 24.74 il 0.30 hm 0.32 ap 0.67	Mazaruni District, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Br. Gui., p. 77, 1908.	Mica diorite.	In W. T., p. 245.
11	″II.4″.3.(4)5.	Q 14.70 di 2.22 or 5.00 hy 7.55 ab 38.25 mt 3.02 an 28.08 il 0.91 ap 0.34	Mount Burney, Smyth Canal, Patagonia, Chile.	G. Nyblom.	P. D. Quensel, B. G. Inst. Ups., XI, p. 107, 1911.	Hypersthene andesite.	
12	(I)II.4.3″.″5.	Q 18.42 di 2.22 or 2.78 hy 4.36 ab 37.20 mt 6.03 an 27.52 il 0.61	Stjärnvik, Huseby, Smaland, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VII, p. 264, 1906.	Granite.	
13	II.4″.(2)3.(4)5.	Q 14.22 di 5.50 or 5.00 hy 2.30 ab 41.39 mt 13.46 an 15.57 il 0.61	Kernize, Montenegro.	E. Manasse.	E. Manasse, Pr. Soc. Tosc., XIII, p. 164, 1903.	Diorite porphyry.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. TONALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
14	59.48	19.57	3.30	4.65	1.30	6.14	3.85	0.46	1.48						100.23	
A3. III	.991	.192	.021	.065	.033	.110	.062	.005								
15	57.66	18.15	2.02	6.01	2.06	7.97	3.86	0.48	1.46						99.67	
A3. III	.961	.178	.013	.083	.052	.143	.062	.005								
16	60.13	18.13	3.25	0.91	3.35	6.54	3.78	.077	0.90	1.45	0.44	0.06	0.27	ZrO_2 none Cl 0.09 F 0.02 S 0.02 Cr_2O_3 none BaO 0.03 SrO 0.01	100.15	
A1. I	1.002	.178	.020	.013	.084	.117	.061	.008			.006	——	.004			
17	65.48	14.37	3.51	3.09	1.09	4.58	4.20	0.72	1.73		0.83				99.60	2.61
A3. III	1.091	.141	.022	.043	.027	.082	.068	.008			.010					
18	58.79	17.51	2.11	3.87	2.23	6.18	4.84	0.68	2.61	0.71	1.21			CO_2 trace	100.74	
A3. III	.980	.172	.013	.054	.056	.111	.078	.007			.015					
19	55.27	16.59	6.03	5.81	2.80	6.65	4.23	0.64	1.59		trace	0.52	trace		100.13	
A3. III	.921	.163	.038	.081	.070	.119	.068	.007			——	.004	——			

RANG 4. DOCALCIC. BANDASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	56.15	17.57	4.22	4.05	4.17	6.72	0.74	2.45	2.24		trace	0.35	0.82	CO_2 0.28	99.76	2.84
A2. II	.936	.172	.026	.057	.104	.120	.012	.027			——	.002	.012			
2	55.48	19.61	4.06	6.05	3.06	8.75	0.15	1.94	1.18						100.28	
A3. III	.925	.192	.025	.084	.077	.156	.002	.021								
3	57.98	18.18	2.00	4.59	3.67	7.28	1.26	4.07	0.45		0.84	0.12			100.44	
A2. II	.966	.178	.013	.064	.092	.130	.020	.043			.011	.001				

RANG 4. DOCALCIC. BANDASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	52.63	16.76	2.86	10.74	4.33	6.17	1.41	2.29	1.17	0.12	0.62	0.33	0.38	CO_2 0.10	99.91	3.020
A2. II	.877	.164	.018	.149	.108	.110	.023	.024			.008	.002	.005			
2	59.78	16.43	0.92	6.84	2.94	9.15	1.44	2.36	0.93	0.12					100.91	
A3. III	.996	.161	.006	.095	.074	.164	.023	.026								
3	58.61	16.39	2.36	5.53	3.45	6.06	2.04	2.03	1.94		0.83	0.36		SO_3 0.32	99.92	2.850
A2. II	.977	.161	.015	.076	.086	.108	.033	.021			.010	.003				
4	50.85	16.72	4.31	10.25	2.45	7.25	2.01	1.86	1.15		1.96	0.57		CO_2 0.09 SO_3 0.15 Org 0.07	99.69	2.976
A2. II	.848	.164	.027	.143	.061	.130	.032	.020			.025	.004				
5	60.50	15.95	6.27	2.89	3.82	6.51	1.65	2.24	0.84						100.67	2.69
A3. III	1.008	.156	.039	.040	.096	.116	.027	.023								

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 5. PERSODIC. PLACEROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
14	(I)II.4.3(4).″5.	Q 17.52 hy 9.11 or 2.78 mt 4.87 ab 32.49 an 30.58 C 1.53	Shirebeshi, Hokkaido, Japan.	Takamine.	Pr. G. Soc. Jap. 1884?	Andesite.	
15	II.4(5).3(4).″5.	Q 10.98 di 7.49 or 2.78 hy 10.66 ab 32.49 mt 3.02 an 30.86	Kunishiri, Chishima, Japan.	Takamine.	Pr. G. Soc. Jap. 1884?	Andesite.	
16	(I)II.4.3(4).(4)5.	Q 16.68 di 1.73 or 4.45 hy 7.60 ab 31.96 mt 2.55 an 30.30 il 0.91 hm 1.44	Olongapo, Luzon, Philippine Islands.	E. W. Morley.	J. P. Iddings, pers. com.	Andesite.	
17	(I)II.″4.3.(4)5.	Q 27.00 di 3.83 or 4.45 hy 2.29 ab 35.63 mt 5.10 an 18.07 il 1.52	Manoe-Bala River, Flores Island.	Tillmans.	G. Rack, N. J. B. B., XXXIV, p. 75, 1912.	Dacite.	
18	″II.4(5).3.″5.	Q 11.40 di 5.44 or 3.89 hy 6.38 ab 40.87 mt 3.02 an 24.19 il 2.28	Pokolbin, New South Wales.	Not stated.	Browne and Walkom, Pr. R. Soc. N. S. W., p. 404, 1911.	Pitchstone.	
19	II.4(5).3.(4)5.	Q 9.78 di 3.98 or 3.89 hy 10.78 ab 35.63 mt 8.82 an 24.46 il 1.34	Cape Anna Osterrieth, Dancoland, Antarctica.	E. Zdarek.	A. Pelikan, Voy. Belgica, V, Pet. Unt., I, p. 21, 1909.	Quartz diorite.	

SUBRANG 1–2. PREPOTASSIC. SAGAMOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.4.4.2.⊙	Q 19.74 hy 16.08 or 15.01 mt 6.03 ab 6.29 ap 0.67 an 31.41 C 2.04	Ping-you-ki, Nan-shan, China.	C. Pfeil.	K. Futterer, Durch Asien, II (2), p. 47, 1909.	Quartz diorite.	
2	II.4.4(5).1.	Q 20.34 hy 15.49 or 11.68 mt 5.80 ab 1.05 an 43.37 C 1.33	Hokizawa, Sagami, Japan.	Not stated.	T. Harada, Jap. Inseln, p. 118, 1890.	Tonalite.	In W. T., p. 247.
3	II.4″.(3)4.2″.	Q 12.84 di 2.72 or 23.91 hy 13.15 ab 10.48 mt 3.02 an 31.97 il 1.67 ap 0.34	Wedel Island, Weddell quadrant, Antarctica.	Lassieur.	E. Gourdon, pers. com.	Quartz-mica diorite.	

SUBRANG 3. SODIPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II″.4(5).4.3.	Q 8.34 hy 27.70 or 13.34 mt 4.18 ab 12.05 il 1.22 an 30.58 ap 0.67 C 0.71	Moyie Sill, Purcell Mountains, British Columbia.	M. Dittrich.	R. A. Daly, Ros. Fests., p. 217, 1906.	Quartz gabbro.	Also in Can. G. S. Mem. 38 (I), p. 232, 1912.
2	II.4.4.3.⊙	Q 15.78 di 12.13 or 14.46 hy 13.05 ab 12.05 mt 1.39 an 31.14	Glendalough, County Wicklow, Ireland.	J. A. Thompson.	J. A. Thompson, Q. J. G. S., LXIV, p. 489, 1908.	Quartz diorite.	"Mixed rock."
3	II.4.(3)4.3(4).	Q 19.20 hy 15.33 or 11.68 mt 3.48 ab 17.29 il 1.52 an 27.24 ap 1.01 C 0.92	Gruhe, Brocken, Harz.	Eyme.	O. H. Erdmannsdörfer, Jb. Pr. G. L.-A., XXVII, p. 357, 1906.	Quartz diorite.	
4	II.4(5).″4.3(4).	Q 9.30 di 1.18 or 11.12 hy 17.52 ab 16.77 mt 6.26 an 31.14 il 3.80 ap 1.34	Bastebeck, Brocken, Harz.	Haefcke.	O. H. Erdmannsdörfer, Jb. Pr. G. L.-A., XXVII, p. 363, 1906.	Mica-augite diorite.	
5	II.4.″4.3.	Q 23.40 di 2.16 or 12.79 hy 8.60 ab 14.15 mt 9.05 an 29.47	Unkersdorf, Saxony.	W. Bruhns.	W. Bruhns, Z. D. G. G., XXXVIII, p. 752, 1886.	Porphyrite.	In W. T., p. 247.

CLASS II. DOSALANE—Continued.

RANG 4. DOCALCIC. BANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
6	55.7	18.8	5.9	1.8	6.0	6.5	1.4	1.8	1.8						99.7	
B3. IV	.926	.184	.037	.025	.150	.116	.023	.019								
7	61.35	18.24	2.00	4.62	2.69	6.35	1.88	1.80	1.41		trace		trace		100.34	2.790
A3. III	1.023	.179	.013	.064	.067	.114	.030	.019			—		—			
8	59.84	18.70	2.96	4.20	2.79	6.70	2.28	1.38	0.70		0.32	0.48	0.07		100.42	
A2. II	.997	.183	.019	.058	.070	.120	.037	.023			.004	.003	.001			
9	51.15	15.92	9.34	2.87	6.48	10.40	1.19	1.61	0.11		0.44	0.06	0.09		99.66	3.19
A2. II	.853	.156	.058	.040	.162	.185	.019	.017			.006	—	.001			
10	63.41	16.50	2.53	3.36	2.74	5.80	1.90	2.26	1.55			0.10	trace		100.15	2.498
A3. III	1.057	.161	.015	.047	.069	.103	.030	.024				.001	—			
11	57.68	18.84	4.96	1.44	4.00	6.05	2.16	2.15	0.90		0.82		0.21		99.96	
A2. II	.961	.185	.031	.020	.100	.108	.035	.023			.010		.003			
12	52.30	16.29	3.20	7.09	4.17	6.90	1.38	2.44	2.23	0.45	3.46	0.25	0.07	SO_3 0.11	100.34	
A2. II	.872	.160	.020	.099	.104	.123	.023	.036			.043	.002	.001			

RANG 4. DOCALCIC. BANDASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	58.57	16.10	2.89	6.12	2.33	7.39	2.11	1.01	1.27	0.21	1.41	0.37	0.18	CO_2 none ZrO_2 0.09 S trace Cr_2O_3 none V_2O_3 0.02 NiO none BaO trace SrO trace Li_2O trace	100.07	2.890
A1. I	.976	.158	.018	.085	.058	.132	.034	.011			.018	.003	.003			
2	55.16	17.51	2.62	5.83	4.35	8.50	1.83	1.08	2.01	0.18	0.64	0.21	0.15	CO_2 none ZrO_2 0.02 FeS_2 0.03 Cr_2O_3 trace V_2O_3 0.04 NiO 0.01 BaO trace SrO trace Li_2O trace	100.17	2.902
A1. I	.919	.174	.016	.081	.109	.145	.029	.012			.008	.002	.002			
3	55.97	15.60	1.21	6.28	6.83	7.31	2.23	1.25	1.85	0.18	1.11	0.16	0.08	Cr_2O_3 0.04	100.10	
A2. II	.933	.153	.007	.088	.171	.130	.036	.014			.013	.001	.001			
4	56.41	15.19	1.60	6.24	7.18	6.77	2.21	1.34	2.00	0.08	0.69	0.05	0.11	ZrO_2 0.14 Cr_2O_3 0.05	100.06	
A1. I	.940	.149	.010	.087	.180	.121	.035	.014			.009		.002			
5	53.16	15.12	5.95	6.75	4.76	5.74	2.38	1.54	1.92	0.38	1.68	0.09	0.17	CO_2 0.05 BaO 0.02 CuO 0.02	99.75	2.882
A1. I	.886	.148	.037	.094	.119	.103	.039	.016			.021	.001	.002			
6	50.48	16.33	5.99	7.10	4.08	6.47	2.44	1.39	2.70	0.46	2.15	0.21	0.16	CO_2 0.01 S 0.01 BaO 0.04 CuO 0.02	100.04	2.886
A1. I	.841	.160	.038	.099	.102	.116	.039	.015			.027	.001	.002			
7	52.31	18.35	5.90	11.06	1.00	7.33	2.90	0.49	0.35						99.69	
A3. III	.872	.180	.037	.154	.025	.130	.047	.005								

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 3. SODIPOTASSIC—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
6	II.4.4.3.⊙	Q 17.52, or 10.56, ab 12.05, an 32.25, C 2.65, hy 15.00, mt 5.80, hm 1.92	Fuchsberg, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XV, p. 182, 1902.	Lamprophyre.	
7	″II.4.4.3(4).	Q 22.98, or 10.56, ab 15.72, an 31.69, C 1.63, hy 13.43, mt 3.02	Taufers, Rieserferner, Tyrol.	T. Panzer.	F. Becke, Ds. Ak. W. Wien, LXXV (1), p. 160, 1913.	Tonalite.	Cf. No. 55, II.4.3.3.
8	″II.4.(3)4.3(4).	Q 18.66, or 12.79, ab 19.39, an 30.58, C 1.33, hy 11.18, mt 4.41, il 0.61, ap 1.01	Brixen, Tyrol.	C. v. John.	W. Petrascheck, Jb. G. R.-A., Wien, LIV, p. 62, 1905.	Tonalite gneiss.	
9	II(III).4″.4.3.	Q 10.20, or 9.45, ab 9.96, an 33.36, di 14.04, hy 9.70, mt 8.12, il 0.91, ap 3.68	Seven Pagodas, Chingelput District, Madras, India.	P. Brühl.	T. H. Holland, Rec. G. S. Ind., XXX, p. 35, 1897.	Augite diorite.	Also in Q. J. G. S., LIII, p. 409, 1897. In W. T., p. 247.
10	(I)II.4.(3)4.3.	Q 25.56, or 13.34, ab 15.72, an 27.80, C 0.71, hy 11.12, mt 3.48, ap 0.34	Singalang Volcano, Sumatra.	K. Sillib.	A. Merian, N. J. B. B., III, p. 302, 1885.	Hypersthene andesite.	In W. T., p. 247.
11	″II.4.″4.3(4).	Q 17.82, or 12.79, ab 18.34, an 30.02, C 1.94, hy 10.00, mt 3.02, il 1.52, hm 2.88	Beesons Island, Coromandel, Hauraki, New Zealand.	J. J. Maclaurin.	Fraser and Adams, G. S. N. Z. B. 4, p. 82, 1907.	Hypersthene andesite.	
12	II.4(5).(3)4.(2)3.	Q 9.48, or 20.02, ab 12.05, an 28.08, di 3.17, hy 13.86, mt 4.64, il 6.54, ap 0.67	Mount Albert, Waitahu, Reefton District, New Zealand.	Not stated.	P. G. Morgan, pers. com.	Mica vogesite.	

SUBRANG 4-5. PRESODIC. BANDOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.4.4.4.⊙	Q 21.66, or 6.12, ab 17.82, an 31.41, di 2.07, hy 11.64, mt 4.18, il 2.74, ap 1.01	Stone Run, Cecil County, Maryland.	W. F. Hillebrand.	A. G. Leonard, Am. G., XXVIII, p. 146, 1901.	Quartz diorite.	In W. T., p. 247.
2	II.4.4.4.⊙	Q 13.98, or 6.67, ab 15.20, an 36.97, di 1.36, hy 18.02, mt 3.71, il 1.22, ap 0.67	Octoraro Creek, Cecil County, Maryland.	W. F. Hillebrand.	A. G. Leonard, Am. G., XXVIII, p. 146, 1901.	Quartz diorite.	In W. T., p. 247.
3	II(III).4(5).″4.4	Q 9.78, or 7.78, ab 18.86, an 28.63, di 5.40, hy 23.58, mt 1.62, il 1.98, ap 0.34	Triadelphia, Montgomery County, Maryland.	W. F. Hillebrand.	G. H. Williams, U. S. G. S. A. R. 15, p. 673, 1895.	Biotite diorite.	In W. T., p. 247.
4	II″.4″.″4.4.	Q 10.50, or 7.78, ab 18.34, an 27.80, di 4.73, hy 24.95, mt 2.32, il 1.37	Georgetown, District of Columbia.	W. F. Hillebrand.	G. H. Williams, U. S. G. S. A. R. 15, p. 673, 1895.	Biotite diorite.	In W. T., p. 247.
5	II.4″.(3)4.4.	Q 12.36, or 8.90, ab 20.44, an 25.85, di 1.57, hy 16.15, mt 8.58, il 3.19, ap 0.34	Crooked Creek, Pine County, Minnesota.	F. F. Grout.	F. F. Grout, J. G., XVIII, p. 648, 1910.	Diabase.	
6	II.4(5).″4.4.	Q 9.60, or 8.34, ab 20.44, an 29.47, di 1.61, hy 14.19, mt 8.82, il 4.10, ap 0.34	Kettle River, n. Hinckley, Minnesota.	F. F. Grout.	F. F. Grout, J. G., XVIII, p. 650, 1910.	Porphyritic diabase.	
7	II.4(5).4.(4)5.	Q 9.60, or 2.78, ab 24.63, an 35.58, di 0.49, hy 17.68, mt 8.58	Granite Falls, Yellow Medicine County, Minnesota.	H. N. Stokes.	W. S. Bayley, U. S. G. S. B. 150, p. 286, 1898.	Gabbro.	In W. T., p. 247.

CLASS II. DOSALANE—Continued.

RANG 4. DOCALCIC. BANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
8	56.74	18.80	0.15	6.91	5.57	7.34	2.32	0.77	1.09			0.20	0.07		99.96	2.876
A2. II	.946	.184	.001	.096	.139	.131	.037	.008				.001	.001			27°
9	61.58	15.89	2.19	5.50	2.69	6.49	3.04	0.51	1.26	0.16	0.63	0.12	0.20	CO_2 none FeS_2 0.06 NiO trace BaO 0.06 SrO trace Li_2O trace	100.38	
A1. I	1.026	.156	.014	.076	.067	.116	.049	.006			.008	.001	.003			
10	57.25	18.25	1.44	4.73	4.57	8.12	2.85	0.99	0.65	0.31	0.42	0.18	0.11	ZrO_2 0.01 S none BaO 0.05 SrO 0.08	100.01	
A1. I	.954	.179	.009	.065	.114	.145	.046	.011			.005	.001	.002			
11	57.04	19.11	4.37	2.48	3.94	7.34	3.48	1.16	1.09		0.47	0.08	0.12	BaO trace SrO 0.02 Li_2O trace	100.70	
A2. II	.951	.187	.027	.035	.099	.131	.056	.013			.006	—	.002			
12	56.51	18.10	4.26	2.68	4.52	8.15	3.23	1.15	0.69		0.48	0.14	0.11	Cr_2O_3 trace BaO 0.04 SrO 0.04 Li_2O trace	100.10	
A1. I	.942	.177	.027	.038	.113	.145	.051	.013			.006	.001	.002			
13	53.19	17.12	4.35	5.16	3.98	9.39	2.79	0.28	1.21	0.17	1.34	0.13	trace	FeS_2 0.94 BaO trace	100.05	
A2. II	.887	.168	.027	.072	.100	.168	.045	.003			.016	.001	—			
14	63.77	19.13	1.66	1.15	4.29	5.63	2.20	0.99	0.60		0.17	0.02	0.20	CO_2 0.14 FeS_2 trace CuS trace	99.95	
A2. II	1.063	.187	.010	.017	.107	.101	.035	.011			.002	—	.003			
15	62.90	18.20	1.28	4.30	2.52	6.76	3.18	1.32	0.15		0.33	0.14			101.08	
B2. III	1.048	.178	.008	.060	.063	.121	.052	.014			.004	.001				
16	62.55	18.75	2.40	3.52	2.84	6.52	3.07	1.07	n. d.		0.19	trace			100.91	
B3. IV	1.043	.184	.015	.049	.071	.116	.050	.012			.002	—				
17	61.90	18.81	1.82	4.30	2.42	6.92	3.17	1.07	0.10		0.35	0.15			101.00	
B2. III	1.032	.184	.011	.060	.061	.123	.051	.011			.004	.001				
18	61.88	18.30	1.97	4.32	2.71	6.32	3.17	1.09	0.19		0.31	0.09			100.35	
A2. II	1.031	.179	.012	.060	.068	.113	.051	.012			.004	—				
19	61.65	18.64	2.20	4.35	3.08	6.08	3.05	1.08	0.12		0.25	0.06			100.57	
A2. II	1.028	.183	.014	.061	.077	.109	.049	.012			.003	—			(100.56)	
20	61.45	18.71	2.30	4.23	2.45	6.07	3.06	1.06	0.50		0.32	trace			100.15	
A3. III	1.024	.183	.014	.058	.061	.108	.049	.011			.004	—				
21	61.45	18.61	2.02	4.95	2.58	6.60	3.30	1.05	0.12		0.32	0.09			100.15	
A2. II	1.024	.182	.013	.069	.065	.118	.053	.011			.004	—				
22	61.25	18.90	2.12	3.69	2.87	6.78	2.74	1.18	0.87		0.19				100.59	
A3. III	1.021	.185	.013	.051	.072	.121	.044	.013			.002					

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 4-5. PRESODIC. BANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
8	II.4″.4.4″.	Q 11.16 hy 26.44 or 4.45 mt 0.23 ab 19.39 ap 0.30 an 35.58 C 1.12	Mount Morrison, Denver, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. B. 148, p. 159, 1897.	Enstatite diabase porphyry.	In W. T., p. 249.
9	II.4.(3)4.(4)5.	Q 21.48 di 2.75 or 3.34 hy 12.86 ab 25.68 mt 3.25 an 28.08 il 1.22 ap 0.34	Karluk, Kadiak Island, Alaska.	W. F. Hillebrand.	G. F. Becker, U. S. G. S. A. R. 18, III, p. 42, 1898.	Diorite.	In W. T., p. 249.
10	II.4(5).″4.4.	Q 10.86 di 4.51 or 6.12 hy 16.20 ab 24.10 mt 2.09 an 33.92 il 0.76 ap 0.34	Lake Tartarus, n. Lassen Peak, California.	W. C. Wheeler.	J. S. Diller, U. S. G. S. rec. lab.	Basalt.	
11	II4(5).(3)4.4.	Q 11.10 di 2.81 or 7.23 hy 9.13 ab 29.34 mt 6.26 an 32.80 il 0.91	Suppans Mountain, Tehama County, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 148, p. 196, 1897.	Andesite.	Inclusion in No. 84, II.4.3.4. In W. T., p. 249.
12	II.4(5).(3)4.4.	Q 10.98 di 6.32 or 7.23 hy 9.26 ab 26.72 mt 6.26 an 31.41 il 0.91 ap 0.34	Lassen Peak, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 79, p. 29, 1891.	Quartz basalt.	In W. T., p. 249.
13	II.4″.4.5.	Q 11.10 di 10.04 or 1.67 hy 9.01 ab 23.58 mt 6.26 an 33.36 il 2.43 ap 0.34	Grass Valley, Nevada County, California.	H. N. Stokes.	W. Lindgren, U. S. G. S. A. R. 17, II, p. 71, 1896.	Diabase.	In W. T., p. 249.
14	(I)II.(3)4.″4.4.	Q 28.20 hy 11.76 or 6.12 mt 2.32 ab 18.34 il 0.30 an 28.08 C 4.18	Essequibo River (average sample), British Guiana.	J. B. Harrison.	J. B. Harrison, Rep. G. Ess., etc., Rivers, p. 34, 1900.	Granitite gneiss.	Also in Goldf. Br. Gui., p. 40, 1908. In W. T., p. 193.
15	″II.4.(3)4.4.	Q 18.66 di 1.40 or 7.78 hy 11.94 ab 27.25 mt 1.86 an 31.14 il 0.61 ap 0.34	Mont Pelée, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 527, 1904.	Andesite.	Eruption of January, 1904.
16	(I)II.4.(3)4.4.	Q 20.16 hy 11.32 or 6.67 mt 3.48 ab 26.20 il 0.30 an 32.25 C 0.61	Mont Pelée, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 527, 1904.	Andesite.	Lapilli of Aug. 30, 1902.
17	(I)II.4.(3)4.4″.	Q 18.96 hy 12.04 or 6.12 mt 2.55 ab 26.72 il 0.61 an 33.08 ap 0.34 C 0.20	Le Précheur, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 573, 1904.	Andesite.	
18	″II.4.(3)4.4.	Q 18.90 hy 12.61 or 6.67 mt 2.78 ab 26.72 il 0.61 an 31.41 C 0.31	Mont Pelée, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 527, 1904.	Andesite.	Mean of 8 analyses, 1902–1904.
19	″II.4.(3)4.4.	Q 19.38 hy 13.51 or 6.67 mt 3.25 ab 25.68 il 0.46 an 30.30 C 1.33	Mont Pelée, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 527, 1904.	Andesite obsidian.	May, 1902.
20	(I)II.4.(3)4.4.	Q 22.02 hy 11.38 or 6.12 mt 3.25 ab 25.68 il 0.61 an 30.02 C 1.53	Rivière Claire, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 573, 1904.	Andesite.	Old bomb.
21	″II.4.(3)4.4″.	Q 17.22 hy 13.36 or 6.12 mt 3.02 ab 27.77 il 0.61 an 32.80	Mont Pelée, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 527, 1904.	Andesite.	Scoria of Jan. 25, 1903.
22	(I)II.4.″4.4.	Q 19.74 hy 11.95 or 7.23 mt 3.02 ab 23.06 il 0.30 an 33.64 C 0.71	Colson, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 573, 1904.	Dacite.	

CLASS II. DOSALANE—Continued.

RANG 4. DOCALCIC. BANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
23	61.25	18.50	1.72	4.32	2.87	6.35	3.38	0.96	0.20		0.48	0.12			100.15	
A2. II	1.021	.181	.011	.060	.072	.114	.055	.010			.006	.001				
24	61.20	19.61	2.35	4.20	3.04	6.01	3.22	0.76	n. d.		0.46	0.06			100.91	
B2. III	1.020	.192	.015	.058	.076	.107	.052	.008			.006	—				
25	60.60	18.63	1.77	5.10	2.76	6.52	2.80	0.97	0.25		0.56	0.09			100.05	
A2. II	1.010	.183	.011	.071	.069	.116	.045	.010			.007	—				
26	60.25	19.05	1.35	4.72	3.34	6.85	3.40	0.98	0.62		0.37				100.93	
B3. IV	1.004	.187	.009	.065	.084	.122	.055	.010			.005					
27	60.25	18.30	2.78	3.61	2.73	6.75	2.98	1.09	0.68		0.48	0.09			100.04	
A2. II	1.004	.179	.018	.050	.068	.121	.048	.012			.006	—				
28	60.01	17.54	2.88	4.30	2.76	6.80	3.41	0.89	0.30	0.10	0.45	0.15	0.18	CO_2 none Cl none S trace NiO none BaO 0.03 SrO none Li_2O trace	99.85	
A1. I	1.000	.172	.018	.060	.069	.121	.055	.009			.006	.001	.003			
29	59.95	19.40	2.25	4.59	2.84	6.75	3.10	0.78	0.62		0.23	0.09			100.60	
A2. II	.999	.190	.014	.064	.071	.121	.050	.008			.003	—				
30	59.90	17.40	3.54	4.50	2.25	6.70	3.35	0.54	0.50		0.55	0.11	trace	SO_3 0.48 Cl 0.10 SrO trace	100.23	
A2. II	.998	.171	.022	.063	.056	.120	.054	.006			.007	.001				
31	58.30	19.43	4.40	3.33	2.64	7.46	3.07	0.88	0.37		0.49	0.22			100.57	
A2. II	.973	.190	.028	.046	.066	.133	.050	.009			.006	.002				
32	58.20	19.60	3.12	3.42	4.06	6.97	2.77	1.12	1.04		0.52	trace			100.82	
A3. III	.970	.192	.019	.047	.102	.124	.045	.012			.007	—				
33	58.10	19.06	3.37	4.20	3.37	7.84	2.33	1.37	0.87		0.64				101.15	
B3. IV	.968	.187	.021	.058	.084	.140	.037	.015			.008					
34	57.15	20.50	2.70	5.10	3.42	7.75	1.98	0.91	n. d.		0.46	0.09			100.06	
A2. II	.973	.201	.017	.071	.085	.139	.032	.010			.006	—				
35	56.10	20.42	1.90	6.15	4.16	7.50	2.49	1.02	0.37		0.43	0.07			100.61	
A2. II	.935	.200	.012	.086	.104	.134	.040	.011			.005	—				
36	55.42	21.35	3.37	4.87	3.87	7.51	2.94	0.68	0.37		0.33	trace			100.71	
A3. III	.924	.209	.021	.068	.097	.134	.047	.007			.004	—				
37	54.10	20.41	4.02	4.90	4.45	8.95	2.48	0.62	0.18		0.75	trace			100.86	
A3. III	.902	.200	.025	.068	.111	.160	.040	.007			.009	—				
38	53.21	18.81	5.15	6.45	4.54	5.85	2.46	1.08	0.50		1.69	trace			99.54	
A3. III	.887	.184	.032	.090	.114	.105	.040	.012			.021	—				

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 4-5. PRESODIC. BANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
23	″II.4.(3)4.4″.	Q 17.40 hy 13.40 or 5.56 mt 2.55 ab 28.82 il 0.91 an 30.86 ap 0.34 C 0.51	Mont Pelée, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 527, 1904.	Andesite.	Dec. 16, 1902.
24	″II.4.(3)4.4(5).	Q 19.98 hy 12.48 or 4.45 mt 3.48 ab 27.25 il 0.91 an 29.75 C 2.55	Morne La Croix, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 573, 1904.	Andesite.	
25	″II.4.″4.4″.	Q 19.56 hy 13.90 or 5.56 mt 2.55 ab 23.58 il 1.06 an 32.25 C 1.22	Mont Pelée, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 527, 1904.	Andesite.	Scoria of Jan. 25, 1903.
26	″II.4″.(3)4.4″.	Q 14.10 hy 15.13 or 5.56 mt 2.09 ab 28.82 il 0.76 an 33.92	Rivière Blanche, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 573, 1904.	Andesite.	
27	″II.4.″4.4.	Q 18.60 di 0.43 or 6.67 hy 10.03 ab 25.15 mt 4.18 an 33.08 il 0.91	Eruption of Aug. 30, 1902, Mont Pelée, Martinique.	Pisani.	A. Lacroix, Mont Pelée, p. 531, 1904.	Andesite ash.	
28	II.4.(3)4.4(5).	Q 16.98 di 2.51 or 5.00 hy 10.82 ab 28.82 mt 4.18 an 29.75 il 0.91 ap 0.34	Mont Pelée, Martinique, West Indies.	W. F. Hillebrand.	J. S. Diller, Nat. Geog. Mag., XIII, p. 291, 1902.	Andesite ash.	May 8, 1902, coll. on S. S. Roddam.
29	″II.4.″4.4(5).	Q 17.46 hy 13.30 or 4.45 mt 3.25 ab 26.20 il 0.46 an 33.64 C 1.12	Eruption of Aug. 30, 1902, Mont Pelée, Martinique.	Pisani.	A. Lacroix, Mont Pelée, p. 531, 1904.	Andesite ash.	
30	″II.4.(3)4.(4)5.	Q 19.20 di 1.36 or 3.34 hy 9.42 ab 28.30 mt 5.10 an 30.86 il 1.06 ap 0.34	Coll. June 5, 1902, Mont Pelée, Martinique.	E. Colonna.	E. Colonna, At. Ac. Sc. Torino, XXXVIII, p. 472, 1903.	Andesite ash.	
31	(I)II.4.″4.4″.	Q 17.34 hy 8.18 or 5.00 mt 6.50 ab 26.20 il 0.91 an 35.03 ap 0.67 C 0.51	Carbet, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 573, 1904.	Andesilabradorite.	
32	″II.4.″4.4.	Q 15.42 hy 12.97 or 6.67 mt 4.41 ab 23.58 il 1.06 an 34.47 C 1.12	Fonds Saint-Denis, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 573, 1904.	Andesilabradorite.	
33	″II.4.4.4.	Q 16.08 di 0.64 or 8.34 hy 11.66 ab 19.39 mt 4.87 an 37.53 il 1.22	Morne Diamant, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 573, 1904.	Andesilabradorite.	
34	II.4.4.4.⊙	Q 17.40 hy 14.84 or 5.56 mt 3.94 ab 16.77 il 0.91 an 38.64 C 1.94	Mont Pelée, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 543, 1904.	Diabase.	Inclusion in andesite.
35	II.4(5).4.4.	Q 11.28 hy 19.51 or 6.12 mt 2.78 ab 20.96 il 0.76 an 37.25 C 1.43	Chateaubriand, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 573, 1904.	Andesilabradorite.	
36	II.4(5).4.4(5).	Q 11.52 hy 15.38 or 3.89 mt 4.87 ab 24.63 il 0.61 an 37.25 C 2.14	Mont Pelée, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 543, 1904.	Diabase.	Inclusion in andesite.
37	II.4(5).4.4(5).	Q 9.72 di 1.57 or 3.89 hy 14.82 ab 20.96 mt 5.80 an 42.53 il 1.44	Mont Pelée, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 543, 1904.	Diorite.	Inclusion in andesite.
38	II.4″.″4.4.	Q 12.84 hy 16.28 or 6.67 mt 7.42 ab 20.96 il 3.19 an 29.19 C 2.75	Route de Lamentin, Martinique, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 573, 1904.	Labradorite (basalt).	

CLASS II. DOSALANE—Continued.

RANG 4. DOCALCIC. BANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
39	58.48	18.90	4.03	4.00	3.10	6.70	2.84	1.13	0.62		0.58	0.05			100.03	
A2. II	.975	.185	.025	.056	.078	.120	.046	.012			.007	—				
40	57.62	19.46	3.43	3.90	1.82	6.25	3.79	0.71	0.59	0.41	0.87	0.17	0.08	SO_3 none S 0.11 Sol. in H_2O CaO 0.20 Na_2O 0.08 SO_3 0.29	100.08	
A2. II	.960	.191	.021	.054	.046	.112	.061	.008			.011	.001	.001			
41	55.75	19.20	3.20	4.77	4.48	7.47	2.18	0.86	0.87		0.77	0.07			99.62	
A2. II	.929	.188	.020	.067	.112	.134	.035	.009			.010	—				
42	55.08	18.00	2.46	4.57	3.34	7.74	3.45	0.65	1.39	0.66	0.80	0.17	0.21	CO_2 none SO_3 0.24 Cl none FeS 0.91 NiO none BaO trace SrO none	99.67	
A1. I	.918	.176	.016	.064	.084	.138	.056	.007			.010	.001	.003			
43	55.64	18.21	3.63	4.83	3.48	8.14	3.55	0.58	0.54	0.20	0.98	0.11	0.19	CO_2 none SO_3 none S 0.04 NiO none BaO 0.03 SrO none	100.15	
A1. I	.927	.178	.023	.067	.087	.145	.057	.006			.012	.001	.003			
44	57.10	18.50	2.66	4.08	4.62	7.74	2.91	1.00	1.05		0.51	trace			100.17	
A3. III	.952	.181	.017	.057	.116	.138	.047	.011			.006	—				
45	53.85	17.15	4.08	6.95	5.29	8.99	3.01	0.24	0.58						100.14	
A3. III	.898	.168	.026	.097	.132	.161	.048	.003								
46	59.25	16.75	4.00	4.82	3.81	6.88	2.56	1.92	n. d.					CO_2 trace	99.99	
A3. III	.988	.164	.025	.067	.095	.123	.041	.020								
47	58.30	15.39	4.76	4.50	2.68	10.96	1.74	0.94	n. d.		0.75				100.02	2.842
A3. III	.972	.151	.030	.062	.067	.196	.028	.010			.009					
48	54.30	17.21	0.05	9.27	5.78	7.45	2.10	0.49	1.50		1.42	0.07			99.64	
A2. II	.905	.169	—	.129	.145	.133	.034	.005			.018	—				
49	60.50	20.40	1.49	2.93	2.91	6.20	3.48	1.32	0.50						99.77	
A3. III	1.008	.200	.009	.040	.073	.110	.050	.013								
50	58.6	19.2	0.6	4.3	3.8	6.9	2.4	1.5	2.8						100.1	
B3. IV	.977	.188	.004	.060	.095	.123	.039	.016								
51	62.21	15.60	5.26	1.36	2.61	6.55	2.50	1.63	2.25						99.97	
A3. III	1.035	.153	.033	.019	.065	.117	.040	.017								
52	54.28	19.41	7.14	2.68	2.63	6.83	3.02	2.05	0.64		1.24		0.41		100.33	
A2. II	.905	.190	.045	.038	.066	.121	.048	.022			.016		.006			
53	49.57	18.91	4.58	4.71	6.01	10.30	1.91	0.26	0.46	none	1.17	0.80		CO_2 0.25 SO_3 0.77	99.70	
A2. II	.826	.185	.029	.065	.150	.184	.031	.003			.015	.006				

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 4-5. PRESODIC. BANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
39	″II.4.″4.4.	Q 17.10 hy 10.97 or 6.67 mt 5.80 ab 24.10 il 1.06 an 33.36 C 0.71	Riviere Noire, Guadeloupe, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 588, 1904.	Andesilabradorite.	
40	(I)II.4.(3)4.(4)5.	Q 15.54 hy 7.64 or 4.45 mt 4.87 ab 31.96 il 1.67 an 30.30 ap 0.34 C 1.22	La Soufrière, St. Vincent, West Indies.	G. Steiger.	Diller and Steiger, Science, XV, p. 948, 1902.	Andesite ash.	Coll. May 7, 1902; lat. 11° 21′ N., long. 57° 47′ W.
41	II.4.4.4.⊙	Q 14.88 hy 16.08 or 5.00 mt 4.64 ab 18.34 il 1.52 an 37.25 C 1.02	La Soufrière, Guadeloupe, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 588, 1904.	Labradorite.	
42	II.4(5).(3)4.(4)5.	Q 10.02 di 4.97 or 3.89 hy 11.39 ab 29.34 mt 3.71 an 31.41 il 1.52 ap 0.34	Eruption of 1902, La Soufrière, St. Vincent, West Indies.	W. F. Hillebrand.	E. O. Hovey, A. J. S., XIV, p. 327, 1902.	Andesite ash.	
43	II.4(5).(3)4.(4)5.	Q 10.20 di 6.09 or 3.34 hy 10.36 ab 29.87 mt 5.34 an 31.97 il 1.82 ap 0.34	La Soufrière, St. Vincent, West Indies.	G. Steiger.	J. S. Diller, Nat. Geog. Mag., XIII, p. 291, 1902.	Andesite pumice.	
44	II.4(5).4.4.	Q 10.98 di 1.11 or 6.12 hy 15.56 ab 24.63 mt 3.94 an 36.97 il 0.91	Saba Island, West Indies.	A. Pisani.	A. Lacroix, Mont Pelée, p. 579, 1904.	Andesilabradorite.	
45	II″.4(5).4.5.	Q 6.66 di 9.98 or 1.67 hy 17.69 ab 25.15 mt 6.03 an 32.53	Ginger Island, West Indies.	P. T. Cleve.	P. T. Cleve, Sv. Vet. Ak. Hand., IX, No. 12, p. 36, 1871.	Diorite.	Cf. A. G. Högbom, B. G. Inst. Ups., VI, p. 230 (1903), 1905.
46	II.4.(3)4.″4.	Q 15.54 di 4.51 or 11.12 hy 12.85 ab 21.48 mt 5.80 an 28.63	Great Ayton, England.	J. E. Stead.	J. J. H. Teall, Q. J. G. S., XL, p. 224, 1884.	Andesite.	In W. T., p. 249.
47	II.4.4.4.⊙	Q 20.70 di 18.60 or 5.56 hy 0.76 ab 14.67 mt 6.96 an 31.41 il 1.37	Castle Rock, Tynemouth, England.	J. E. Stead.	J. J. H. Teall, Q. J. G. S., XL, p. 235, 1884.	Andesite.	Al_2O_3 corr. for TiO_2; cf. Q. J. G. S., LXVI, p. 3, 1910. In W. T., p. 249.
48	II″.4(5).4.4(5).	Q 9.12 di 0.68 or 2.78 hy 28.82 ab 17.82 il 2.74 an 36.14	Pont en X, Brittany, France.	Pisani.	L. Vandernotte, Mass. Armor., p. 105, 1913.	Gabbro-norite.	
49	(I)II.4.(3)4.4.	Q 18.36 hy 11.39 or 7.23 mt 2.09 ab 26.20 an 30.59 C 2.75	Vallée de Barboullère, Pyrenees, France.	Pisani.	A. Lacroix, B. Serv. Ct. G. Fr., XI, No. 71, p. 31, 1900.	Granite.	In W. T., p. 249.
50	″II.4.4.4.	Q 15.00 hy 16.89 or 8.90 mt 0.93 ab 20.44 an 34.19 C 1.02	Pic du Midi d'Ossan, Pyrenees, France.	Not stated.	J. de Lapparent, B. Soc. Min. Fr., XXXIV, p. 291, 1911.	Quartz microdiorite.	
51	″II.4.(3)4.4.	Q 24.90 di 4.54 or 9.45 hy 4.40 ab 20.96 mt 4.41 an 26.69 hm 2.24	San Pedro, Cabo de Gata, Spain.	Kottenhain.	A. Osann, Z. D. G. G., XLIII, p. 702, 1891.	Dacite.	In W. T., p. 249.
52	″II.4(5).(3)4.″4.	Q 10.68 di 0.22 or 12.23 hy 6.50 ab 25.15 mt 6.73 an 33.36 il 2.43 hm 2.56	Källhult, Hvetlanda, Smaland, Sweden.	H. Santesson.	P. J. Holmquist, B. Un. Ups., VIII, p. 264, 1906.	Granite.	
53	II″.4″.4.4(5).	Q 11.16 di 5.07 or 1.67 hy 15.38 ab 16.24 mt 6.73 an 39.20 il 2.28 ap 2.02	Burg Frankenstein, Odenwald, Germany.	G. Butzbach.	G. Klemm, Nbl. Ver. Erdk. Darm. (4), XXVII, p. 12, 1906.	Gabbro.	

CLASS II. DOSALANE—Continued.

RANG 4. DOCALCIC. BANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
54	60.80	17.24	3.95	2.97	2.83	5.34	2.69	0.95	0.90	0.22	1.12	0.78		CO_2 0.05 SO_3 0.10	99.94	
A2. II	1.013	.169	.025	.042	.071	.095	.044	.010			.014	.005				
55	54.73	18.64	5.47	8.24	2.01	6.22	2.17	0.74	0.21		1.43	0.36			100.22	
A2. II	.912	.183	.034	.114	.050	.111	.035	.008			.018	.003				
56	50.28	16.46	6.66	6.08	4.62	7.89	2.10	1.03	1.17	0.04	1.81	0.75		CO_2 0.13 SO_3 0.83	99.85	
A2. II	.838	.161	.042	.085	.116	.141	.034	.011			.023	.005				
57	56.31	20.83	4.13	1.87	4.91	7.54	1.85	1.07	1.23						99.74	
A3. III	.939	.204	.025	.026	.123	.134	.030	.012								
58	62.53	17.18	2.38	0.77	1.79	8.61	3.40	0.40	1.82		0.37	0.14		SrO 0.03	99.42	
A2. II	1.042	.168	.015	.011	.045	.154	.055	.004			.005	.001				
59	54.39	17.85	6.53	4.71	3.98	6.37	2.99	1.05	2.59						100.46	
A3. III	.907	.175	.041	.065	.100	.114	.048	.011								
60	53.14	17.82	8.69	1.98	4.58	7.26	1.51	1.18	3.26						99.42	
A3. III	.886	.174	.054	.028	.115	.129	.024	.013							(99.52)	
61	56.02	18.08	2.49	6.63	3.92	7.50	1.91	1.09	2.14				trace		99.68	2.829
A3. III	.934	.177	.016	.092	.098	.134	.031	.012					—			
62	56.60	16.80	2.52	5.12	3.80	7.29	2.43	1.98	1.80	0.58	0.99	0.12	0.13		100.16	
A2. II	.943	.165	.016	.071	.095	.130	.039	.021			.012	.001	.002			
63	56.38	17.48	5.30	2.72	3.10	10.89	1.77	1.38	0.52		0.33				99.87	2.468
A3. III	.935	.171	.033	.038	.077	.194	.029	.015			.004					
64	55.83	18.96	5.64	3.23	2.76	7.40	3.12	1.17	1.20		0.32			Cl trace	99.63	2.647
A3. III	.931	.186	.035	.045	.068	.132	.050	.013			.004					
65	59.63	16.18	7.34	2.66	1.91	8.63	1.80	1.23	n. d.			0.13	trace	S trace	99.51	2.880
A3. III	.994	.159	.046	.037	.048	.154	.029	.013				.001	—			
66	54.52	16.20	5.70	3.09	5.82	8.18	2.16	0.98	0.34	0.18	1.98	0.59		FeS_2 0.23	99.97	2.86
A2. II	.909	.159	.036	.043	.146	.146	.035	.010			.025	—				
67	53.69	17.94	7.57	2.56	3.40	11.68	1.36	0.86	0.49			0.07	0.39	SO_3 0.22	100.23	
A3. III	.895	.176	.048	.036	.085	.209	.022	.009				—	.006			
68	49.25	16.31	6.47	3.13	6.16	10.58	2.22	0.05	3.14		2.03	0.10	trace	S none	99.48	
A2. II	.821	.160	.040	.043	.154	.189	.035	—			.025	.001	—			

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 4-5. PRESODIC. BANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
54	″II.(3)4.″4.4″.	Q 27.54 or 5.56 ab 23.06 an 21.68 C 3.77 hy 7.50 mt 5.80 il 2.13 ap 1.34	Eberstadt, Bl. Rossdorf, Hesse.	Stadler.	G. Klemm, Erl. G. Kt. Hes., Bl. Rossdorf, p. 43, 1912.	Biotite granite.	
55	II.4.4.4.⊙	Q 21.00 or 4.45 ab 18.34 an 28.08 C 3.98 hy 13.88 mt 7.89 il 2.74 ap 1.00	Buschhorn, Hesse.	C. Trenzen.	C. Trenzen, N. J., 1902, II, p. 6.	Basalt glass.	
56	II(III).4″.4.4.	Q 11.52 or 6.12 ab 17.82 an 32.25 di 1.76 hy 13.41 mt 9.74 il 3.50 ap 1.68	Ober Ramstadt, Bl. Rossdorf, Hesse.	Stadler.	G. Klemm, Erl. G. Kt. Hes., Bl. Rossdorf, p. 29, 1912.	Gabbro.	
57	″II.4.4.4.	Q 17.70 or 6.67 ab 15.72 an 37.25 C 2.86 hy 12.43 mt 5.80	Arnsdorf, Riesengebirge, Silesia.	W. Herz.	L. Milch, N. J. B. B., XII, p. 213, 1899.	Lamprophyre.	In W. T., p. 249.
58	(I)II.4.(3)4.″5.	Q 23.22 or 2.22 ab 28.82 an 30.30 di 9.07 hy 0.30 mt 1.39 il 0.76 hm 1.44 ap 0.34	Ujmoldava, Krasso-Szoreny, Hungary.	K. Emszt.	Rozlozsnit and Emszt, Mt. Ung. G. A., XVI, p. 198, 1908.	Quartz diorite porphyrite.	
59	II.4″.″4.4″.	Q 12.06 or 6.12 ab 25.15 an 31.69 C 0.20 hy 13.17 mt 9.51	Lupsa Valley, Persanyer Mountains, Hungary.	Herbich.	J. Budai, F. K., XVI, p. 267, 1886.	Diabase.	In W. T., p. 249.
60	II.4.4.″4.	Q 17.46 or 7.22 ab 12.58 an 35.86 C 0.82 hy 11.50 mt 6.50 hm 4.16	Szekelykö, Siebenburgen, Hungary.	J. v. Szadeczky.	J. v. Szadeczky, F. K., XXII, p. 324, 1892.	Labradorite porphyry.	In W. T., p. 249.
61	II.4.4.4.⊙	Q 14.28 or 6.67 ab 16.24 an 37.25 hy 19.83 mt 3.71	Raffeiner Tobel, n. Lana, Ulten Massif, Tyrol.	F. Erben.	F. Becke, Ds. Ak. W. Wien, LXXV, (1), p. 160, 1913.	Tonalite.	
62	II.4″.(3)4.(3)4.	Q 12.66 or 11.68 ab 20.44 an 29.19 di 4.97 hy 13.02 mt 3.71 il 1.82 ap 0.34	Monte Pischinale, n. Bosa, Sardinia.	H. S. Washington.	H. S. Washington, A. J. S., XXXVI, p. 587, 1913.	Andesite.	Not described.
63	II.4.4.″4.	Q 16.32 or 8.34 ab 15.20 an 35.31 di 14.50 hy 1.10 mt 7.66 il 0.61	Kaimeni, Methana, Greece.	A. Röhrig.	H. S. Washington, J. G., III, p. 150, 1895.	Hornblende andesite.	Segregation in No. 191, II.4.3.4. In W. T., p. 249.
64	″II.4″.″4.4.	Q 13.44 or 7.23 ab 26.20 an 34.19 di 1.97 hy 6.66 mt 8.12 il 0.61	Kosona, Methana, Greece.	A. Röhrig.	H. S. Washington, J. G., III, p. 150, 1895.	Hornblende andesite.	Segregation in No. 190, II.4.3.4.
65	II.″4.4.4.	Q 25.32 or 7.23 ab 15.20 an 32.53 di 7.34 hy 1.80 mt 8.58 hm 1.44 ap 0.34	Zonderwater, Transvaal.	H. Eckstein & Co.	C. B. Horwood, Tr. G. Soc. S. Af., XIII, p. 51, 1911.	Granophyre.	
66	II.4.4.4.⊙	Q 13.98 or 5.56 ab 18.34 an 31.69 di 6.91 hy 11.40 mt 4.18 il 3.80 hm 2.88 ap 0.59	Zeia River, Amur District, Siberia.	Not stated.	E. Ahnert, Reg. Aurif. Sib., X, Tab. VII, 1910.	Augite porphyrite.	"P_2O_5" is $Ca_3P_2O_8$.
67	II.4.4″.4.	Q 16.20 or 5.00 ab 11.53 an 40.31 di 13.82 hy 2.10 mt 9.74 hm 0.96	Werkh Issetsk, Mursinsk, Ural Mountains.	G. Katerfeld.	W. Nikitin, Mem. C. G. Rus., XXII, p. 86, 1907.	Diorite.	
68	II(III).4(5).4.5.	Q 8.76 or —— ab 18.34 an 34.75 di 13.18 hy 9.30 mt 4.18 il 3.80 hm 3.52 ap 0.34	Retschnaia Bay, Copper Island, Commander Islands, Bering Sea.	W. Staronka.	J. Morozewicz, Mem. Com. G. Russ., No. 72, p. 72, 1912.	Basalt.	

CLASS II. DOSALANE—Continued.

RANG 4. DOCALCIC. BANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
69	57.32	19.79	5.33	1.52	3.48	6.82	3.51	1.26	0.56				trace		99.59	2.71
A3. III	.955	.194	.033	.021	.087	.121	.057	.015								
70	60.93	16.46	3.35	5.94	2.88	7.84	1.44	0.79	n. d.		0.42	0.13	0.55		100.78	
A2. II	1.016	.161	.021	.082	.072	.140	.023	.009			.005	.001	.008			
71	59.66	15.51	3.76	5.40	3.67	6.56	2.50	1.08	n. d.			0.18	1.40		100.31	
A?2. II	.994	.152	.024	.075	.092	.117	.040	.011				.001	.020			
72	59.47	17.12	2.33	5.69	4.04	7.24	2.23	0.30	1.35						99.77	
A3. III	.991	.168	.014	.079	.101	.128	.035	.003								
73	56.08	18.12	2.46	6.97	3.13	7.14	2.02	1.50	0.15		1.31		0.34		99.22	
B2. III	.935	.178	.015	.097	.078	.128	.032	.016			.016		.005			
74	53.17	18.94	4.65	3.36	2.99	7.89	3.25	0.69	3.71		1.25	trace	0.18		100.08	
A2. II	.886	.186	.029	.047	.075	.141	.053	.007			.016	—	.003			
75	51.40	17.42	1.74	10.26	4.36	10.51	1.44	0.22	0.49		1.44	0.15	0.03		99.46	
A2. II	.857	.171	.011	.143	.109	.188	.023	.002			.018	.001	—			
76	49.77	20.57	6.06	5.11	5.00	10.37	1.08	0.84	0.73			0.16	0.20		99.89	2.642
A2. II	.830	.201	.038	.071	.125	.186	.018	.009				.001	.003			
77	57.09	19.42	5.50	3.19	4.11	6.00	2.74	0.58	0.91				0.16		99.70	2.852
A3. III	.952	.190	.034	.044	.103	.107	.044	.006					.002			
78	55.18	18.02	3.29	4.94	3.81	7.51	2.60	1.89	1.09	0.58	0.96	trace		CO_2 0.10 S trace	99.97	
A3. III	.920	.176	.021	.068	.095	.134	.042	.020			.012	—				
79	53.94	18.93	4.06	5.08	3.23	7.85	2.56	1.68	0.92	0.42	1.06	trace			99.73	
A3. III	.899	.186	.026	.071	.081	.140	.041	.018			.013	—				
80	55.52	17.42	5.14	5.35	3.30	8.12	2.47	0.77	0.36	0.34	0.63	0.15	0.05	SO_3 0.18	99.80	2.80
A2. II	.926	.171	.032	.075	.083	.145	.040	.008			.008	.001	—			
81	54.49	16.89	4.88	5.44	3.35	8.49	2.39	0.94	0.87	0.12	1.25	0.28	0.04		99.67	2.81
A2. II	.908	.166	.031	.075	.084	.152	.039	.010			.016	.002	—			
82	63.65	16.54	0.95	4.69	2.43	6.49	2.61	0.29	1.23	0.45	0.36	trace	0.28	ZrO_2 none Cl 0.11 F 0.05 S 0.08 Cr_2O_3 none BaO 0.05 SrO 0.05	100.31	
A1. I	1.061	.162	.006	.065	.061	.116	.042	.003			.005	—	.004			
83	51.74	15.86	4.39	4.39	5.73	10.07	1.54	0.64	2.60	2.05	0.73	trace	0.26	ZrO_2 none Cl 0.10 F 0.03 S 0.11 Cr_2O_3 none BaO 0.02 SrO 0.02	100.28	
A1. I	.862	.155	.028	.061	.143	.180	.025	.007			.009	—	.004			

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 4-5. PRESODIC. BANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
69	″II.4(5).(3)4.4.	Q 11.64 hy 8.70 or 8.34 mt 4.87 ab 29.87 hm 1.92 an 33.64	Korjaka Volcano, Kamchatka.	Not stated.	K. Bogdanovitsch, Pet. Mitth., L, p. 172, 1904.	Augite andesite.	
70	II.″4.4.4.	Q 25.32 di 1.86 or 5.00 hy 14.72 ab 12.05 mt 4.87 an 35.86 il 0.76 ap 0.34	Tarumai Volcano, Hokkaido, Japan.	N. Yoshioka.	S. Kozu, J. G., XIX, p. 636, 1911.	Pyroxene andesite.	Eruption of 1909.
71	II.4.″4.4.	Q 18.60 di 2.97 or 6.11 hy 17.11 ab 20.96 mt 5.57 an 28.08 ap 0.34	Obandai, Bandai San, Japan.	Shimidzu.	T. Wada, Mt. D. Ges. Ostas., V, p. 74, 1889.	Augite andesite.	MnO high? Alkalies corr. Cf. N. J., 1890, II, p. 102. In W. T., p. 251.
72	II.4.4.″5.	Q 20.46 hy 18.68 or 1.67 mt 3.25 ab 18.34 an 35.58 C 0.20	Bandai San, Japan.	Nishiyama.	Nishiyama, Ref. N. J., 1890, II, p. 102.	Andesite.	In W. T., p. 251.
73	II.4.4.″4.	Q 14.52 hy 17.17 or 8.90 mt 3.48 ab 16.77 il 2.43 an 35.58 C 0.20	Kasa Yama, n. Hagi, Nagato, Japan.	T. Ono.	S. Kozu, J. G., XIX, p. 564, 1911.	Quartz basalt.	
74	II.4(5).″4.(4)5.	Q 10.74 di 3.27 or 3.89 hy 6.63 ab 27.77 mt 6.73 an 35.03 il 2.43	Ujiki, Dogo, Oki Islands, Japan.	K. Yokoyama.	S. Kozu, Sci. Rep. Tohoku Un. (2), I, p. 49, 1913.	Andesite.	
75	II(III).4(5).4(5).(4)5.	Q 9.00 di 9.74 or 1.12 hy 21.08 ab 12.05 mt 2.55 an 40.59 il 2.74 ap 0.34	Mihara Volcano, Izu Islands, Japan.	Tokayanagi.	S. Kozu, pers. com.	Andesite basalt.	Eruption of December, 1912.
76	II.4(5).4(5).4.	Q 9.12 di 2.00 or 5.00 hy 16.02 ab 9.43 mt 8.82 an 48.37 il 0.34	Crater, Fuji Yama, Japan.	Hida.	T. Wada, Tr. Seism. Soc. Jap., IV, p. 33, 1882.	Anorthite basalt.	Also in Milne and Burton, Volc. of Jap., I, p. 6, 1893. Not in W. T.
77	II.4.″4.(4)5.	Q 19.50 hy 11.62 or 3.34 mt 7.89 ab 23.06 an 29.75 C 3.37	Ahoer, Sumatra.	L. Serrurier.	R. D. M. Verbeck, Sum. Westk., p. 232, 1883.	Quartz diorite.	Not in W. T.
78	II.4(5).(3)4.4″.	Q 10.20 di 4.48 or 11.12 hy 11.96 ab 22.01 mt 4.87 an 31.69 il 1.82	Parsambilan, Tobaland, Sumatra.	M. Dittrich.	H. Stegmann, N. J. B. B., XXVII, p. 409, 1909.	Andesite.	
79	II.4(5).″4.4.	Q 9.90 di 2.94 or 10.01 hy 10.90 ab 21.48 mt 6.03 an 35.31 il 1.98	Singalang Volcano, Timorland, Sumatra.	M. Dittrich.	H. Stegmann, N. J. B. B., XXVII, p. 422, 1909.	Andesite.	
80	II.4.4.4″.	Q 15.12 di 4.97 or 4.45 hy 10.50 ab 20.96 mt 7.42 an 34.19 il 1.22 ap 0.34	Kampong Gadja, Flores Island.	A. Lindner.	G. Rack, N. J. B. B., XXXIV, p. 81, 1912.	Labradorite andesite.	
81	II.4.4.4.⊙	Q 14.40 di 6.27 or 5.56 hy 9.07 ab 20.44 mt 7.19 an 32.53 il 2.43 ap 0.67	Bara Volcano, Flores Island.	A. Lindner.	G. Rack, N. J. B. B., XXXIV, p. 82, 1912.	Labradorite andesite.	
82	″II.″4.4.″5.	Q 26.40 hy 13.76 or 1.67 mt 1.39 ab 22.01 il 0.76 an 32.25 C 0.10	Timor Island.	E. W. Morley.	J. P. Iddings, pers. com.	Not named.	
83	II″.4″.4.4.	Q 11.76 di 12.17 or 3.89 hy 11.94 ab 13.10 mt 6.50 an 34.75 il 1.37	Timor Island.	E. W. Morley.	J. P. Iddings, pers. com.	Not named.	

CLASS II. DOSALANE—Continued.

RANG 4. DOCALCIC. BANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
84	56.60	12.50	6.55	9.30	2.55	9.50	1.45	0.35	0.90		trace	trace		Cr_2O_3 trace	100.00	
A3. III	.943	.122	.041	.129	.064	.170	.024	.004			—	—				
85	61.30	16.31	2.68	4.14	2.65	6.65	2.58	1.70	0.54	0.75	0.60	0.22	0.09		100.21	
A2. II	1.022	.160	.017	.057	.066	.119	.042	.018			.008	.002	.001			
86	59.29	17.71	1.98	3.78	3.21	6.63	2.81	1.54	1.46	0.73	0.93	0.11	0.03		100.21	
A2. II	.988	.174	.012	.053	.080	.118	.045	.016			.012	.001	—			
87	59.20	17.00	3.96	3.13	3.02	6.70	2.63	1.64	1.30	0.33	0.98	0.25	0.08	CO_2 none	100.22	
A2. II	.987	.164	.025	.043	.076	.120	.042	.017			.012	.002	.001			
88	57.15	19.26	1.36	4.17	3.58	7.13	2.88	1.10	1.41	0.68	0.84	0.10	0.42	CO_2 none SO_3 0.12	100.20	
A2. II	.953	.189	.009	.058	.090	.127	.047	.012			.011	.001	.006			
89	55.85	15.95	4.72	5.67	3.33	6.54	2.94	0.75	3.00		1.15		0.10	BaO none	100.00	
A2. II	.931	.156	.029	.079	.083	.117	.047	.008			.014		.001			
90	52.07	17.25	6.16	5.40	2.92	8.12	3.18	1.09	1.12	0.14	1.23	0.78	0.20	CO_2 0.02 SO_3 0.20	99.88	
A2. II	.868	.169	.039	.075	.073	.145	.051	.012			.015	.005	.003			
91	51.70	18.04	9.46	4.47	3.32	8.15	2.41	1.22	0.94						99.71	
A3. III	.862	.177	.059	.063	.083	.146	.039	.013								
92	57.00	17.47	4.59	4.43	3.23	8.51	2.98	1.15	0.21			0.19			99.76	
A3. III	.950	.171	.029	.061	.081	.152	.048	.012				.001				
93	58.35	16.91	1.79	5.71	4.34	6.88	2.99	1.33	0.35		0.80				99.45	
A2. II	.973	.166	.011	.079	.109	.123	.048	.014			.010					
94	57.30	17.97	2.17	3.79	2.57	6.72	3.25	0.96	4.26		0.56	0.20			99.75	
A2. II	.955	.176	.014	.053	.064	.120	.053	.010			.007	.001				

RANG 5. PERCALCIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	46.27	19.76	8.91	3.18	6.47	12.02	0.65	0.13	1.76			trace	0.36	SO_3 0.08 NiO 0.19 CuO 0.10	99.88	
A2. II	.771	.194	.056	.044	.162	.214	.010	.001				—	.005			

CLASS II. DOSALANE.

RANG 1. PERALKALIC. UMPTEKASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	53.70	11.16	3.10	1.21	6.44	3.46	1.67	11.16	2.61	0.80	1.92	1.75	0.04	SO_3 0.06 Cl 0.03 F 0.44 Cr_2O_3 0.04 BaO 0.62 SrO 0.19 Li_2O trace	100.40	
A1. I	.893	.109	.019	.017	.161	.062	.027	.119			.024	.012	—			

ORDER 4. QUARDOFELIC. AUSTRARE—Continued.

SUBRANG 4-5. PRESODIC. BANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
84	II(III).″4.4.4(5)	Q 21.54 di 17.83 or 2.22 hy 9.01 ab 12.58 mt 9.51 an 26.13	Tasmania. Locality not given.	Not stated.	G. Cosyns, B. Soc. Belg. G., XXII, p. 258, 1908.	Diabase.	
85	″II.4.(3)4.4.	Q 21.06 di 2.72 or 10.01 hy 9.63 ab 22.01 mt 3.94 an 27.80 il 1.22 ap 0.67	Romunga Creek, Aroha, Hauraki, New Zealand.	Surv. lab.	Henderson and Bartrum, N. Z. G. S. B. 16, p. 75, 1913.	Andesite.	
86	II″.4.(3)4.4.	Q 17.22 di 0.43 or 8.90 hy 11.63 ab 23.58 mt 2.78 an 31.41 il 1.82 ap 0.34	Wairakau Creek, Aroha, Hauraki, New Zealand.	Surv. lab.	Henderson and Bartrum, N. Z. G. S. B. 16, p. 75, 1913.	Andesite.	
87	″II.4.(3)4.4.	Q 19.74 di 1.08 or 9.45 hy 8.02 ab 22.01 mt 5.80 an 30.02 il 1.82	Sheehan Creek, Aroha, Hauraki, New Zealand.	Surv. lab.	Henderson and Bartrum, N. Z. G. S. B. 16, p. 62, 1913.	Andesite.	
88	II.4″.″4.4.	Q 13.02 hy 14.81 or 6.67 mt 2.09 ab 24.63 il 1.67 an 34.47 ap 0.34 C 0.61	Thames Mine, Hauraki, Aukland, New Zealand.	J. S. Maclaurin.	C. Fraser, N. Z. G. S. B. 10, p. 24, 1910.	Andesite.	
89	II.4.(3)4.4(5).	Q 15.78 di 3.63 or 4.45 hy 11.42 ab 24.63 mt 6.73 an 28.08 il 2.13	Thames, Hauraki, Aukland, New Zealand.	J. S. Maclaurin.	C. Fraser, N. Z. G. S. B. 10, p. 24, 1910.	Andesite.	
90	II.4(5).(3)4.4.	Q 9.54 di 4.91 or 6.67 hy 8.11 ab 26.72 mt 9 05 an 29.47 il 2.28 ap 1.68	Inangahua, Reefton District, New Zealand.	Not stated.	P. G. Morgan, pers com.	Diorite.	
91	II.4(5).4.4.	Q 11.52 di 4.57 or 7.23 hy 6.70 ab 20.44 mt 13.69 an 34.75	St. Paul Island, Atlantic Ocean.	R. Reinisch.	R. Reinisch, D. Tiefsee Exp., X, (3), p. 69, 1908.	Basalt.	
92	II.4″.(3)4.4.	Q 13.02 di 8.50 or 6.67 hy 8.24 ab 25.15 mt 6.73 an 30.86 ap 0.34	Farállon de Pajaros, Mariana Islands.	Eyme.	E. Kaiser, Jb. Pr. G. L.-A., XXIV (1903), p. 117, 1907.	Augite andesite.	
93	II.4″.(3)4.4.	Q 12.42 di 4.32 or 7.78 hy 16.43 ab 25.15 mt 2.55 an 28.91 il 1.52	Hovgaard Island, Weddell quad- rant, Antarctica.	Lassieur.	E. Gourdon, pers. com.	Quartz- biotite diorite.	
94	II″.4.(3)4.4″.	Q 15.06 di 0.92 or 5.56 hy 10.16 ab 27.77 mt 3.25 an 31.41 il 1.06 ap 0.34	Admiralty Bay, S. Shetland Island, Weddell quadrant, Antarctica.	Lassieur.	E. Gourdon, pers. com.	Hypersthene andesite.	

SUBRANG. NOT NEEDED.

1	II″.4(5).5.0.	Q 8.46 di 5.62 or 0.56 hy 13.60 ab 5.24 mt 11.37 an 52.26 hm 1.12	Werkh Issetsk, Mursinsky, Ural Mountains, Russia.	G. Katerfeld.	W. Nikitin, Mem. Com. G. Russ., XXII, p. 75, 1907.	Gabbro.	

ORDER 5. PERFELIC. GERMANARE. (C. I. P. W., 1902.)

SUBRANG 1. PERPOTASSIC.

1	II(III).5.1.1.	or 60.60 ac 8.78 ns 0.98 ks 1.54 di 4.54 hy 4.60 ol 6.58 ap 4.03 p 0.95	Fifteen-mile Spring, Leucite Hills, Wyoming.	W. F. Hille- brand.	W. Cross, A. J. S., IV, p. 130, 1897.	Wyomingite.	In W. T., p. 313.

CLASS II. DOSALANE—Continued.

RANG 1. PERALKALIC. UMPTEKASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	58.04	17.24	2.49	1.24	1.79	3.50	3.37	10.06	1.95		0.30	0.22	trace	SO_3 trace Cl 0.38	100.58	
A2. II	.967	.169	.015	.017	.045	.062	.055	.107			.004	.002	—			
2	54.99	12.98	3.13	3.92	5.50	5.67	2.83	7.08	0.58	0.41	0.99	1.00	0.13	CO_2 none ZrO_2 0.04 S 0.05 Cr_2O_3 0.01 NiO 0.04 BaO 0.47 SrO 0.17	99.99	
A1. I	.917	.127	.019	.054	.138	.101	.045	.076			.012	.007	.002			
3	61.28	14.71	1.21	2.85	1.69	5.61	2.99	7.70	0.43	0.28	0.41	0.16	trace	SO_3 0.08 BaO 0.72 SrO 0.04	100.16	
A1. I	1.021	.144	.007	.040	.042	.100	.048	.082			.005	.001	—			
4	52.52	15.33	8.37	5.36	2.25	1.66	3.28	8.55	0.28		1.71	0.53	0.04	S 0.02 BaO 0.11	100.01	
A2. II	.875	.150	.052	.075	.056	.030	.053	.091			.021	.004	—			
5	51.43	14.88	6.30	3.14	6.67	5.01	1.83	9.22	0.74		1.12	0.51			100.85	
A2. II	.857	.146	.039	.043	.167	.089	.030	.098			.014	.004				

RANG 1. PERALKALIC. UMPTEKASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	60.00	15.33	6.02	0.67	0.61	1.12	6.44	8.15	0.32	0.08	0.40		0.63	Cl 0.09	99.86	
A2. II	1.000	.150	.038	.009	.015	.020	.104	.087			.005		.009			
2	59.89	17.70	1.95	2.71	1.56	2.53	5.74	5.83	0.29		0.96	0.17		CO_2 0.39	99.72	
A2. II	.998	.174	.012	.038	.039	.045	.093	.062			.012	.001				
3	58.81	13.37	3.88	6.97	0.51	3.89	4.96	5.42	0.75	0.29	0.75	0.31	0.20		100.11	2.75
A2. II	.980	.131	.024	.097	.013	.070	.080	.057			.009	.002	.003		(100.06)	17.5°
4	62.99	14.25	2.78	5.15	1.30	2.72	4.86	6.35	0.18		0.16		0.18		100.92	2.732
A2. II	1.050	.140	.017	.072	.033	.049	.078	.068			.002		.003			
5	63.02	14.87	6.53	none	0.95	1.12	5.85	5.62	1.45				0.46		99.87	
A3. III	1.050	.146	.041	—	.024	.020	.095	.060					.007			
6	61.46	14.55	2.30	5.78	0.50	2.74	4.71	4.88	0.74	0.54	1.07	0.27	0.25	ZrO_2 0.02 F 0.14 S 0.01 BaO 0.17	100.13	
A1. I	1.024	.143	.014	.081	.013	.049	.076	.052			.013	.002	.004			
7	61.79	16.90	3.10	1.07	0.90	2.44	5.26	6.96	0.29	0.14	0.90	0.34	0.19		100.28	
A2. II	1.030	.166	.019	.015	.023	.044	.085	.074			.011	.002	.003			
8	62.57	16.72	1.32	4.25	0.52	1.76	6.27	6.00	0.37		0.22	0.20	0.07	S 0.13 BaO 0.05	100.45	
A1. I	1.043	.164	.008	.059	.013	.031	.102	.064			.003	.001	.001			
9	55.73	15.47	8.16	3.88	0.99	3.56	5.09	4.86	0.95		0.34		0.76		99.79	
A2. II	.929	.152	.051	.054	.025	.064	.082	.052			.004		.011			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 2. DOPOTASSIC. HIGHWOODOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(I)II.5″.1″.2″.	or 59.49 di 9.29 ab 14.67 ol 0.14 an 3.34 mt 3.02 ne 6.25 il 0.61 hl 0.59 hm 0.32 ap 0.67	Highwood Gap, Highwood Mountains, Montana.	E. B. Hurlbut.	L. V. Pirsson, U. S. G. S. B. 237, p. 128, 1905.	Tinguaite porphyry.	In W. T., p. 251.
2	II″.5.1.2(3).	or 42.26 di 17.24 ab 19.91 ol 8.25 an 1.67 mt 4.41 ne 1.99 il 1.82 ap 2.35	Wildcat Gulch, Uncompaghre quadrangle, Colorado.	G. Steiger.	E. S. Larsen, U. S. G. S. rec. lab.	Syenite.	
3	II.5.1(2).2(3).	Q 3.60 di 16.02 or 45.59 wo 1.51 ab 25.15 mt 1.62 an 3.89 il 0.76 ap 0.34	Turnback Creek, Tuolumne County. California.	H. N. Stokes.	H. W. Turner, U. S. G. S. B. 148, p. 217, 1897.	Augite syenite.	In W. T., p. 251.
4	II.5.1.2(3).	or 50.60 di 2.38 ab 21.48 ol 3.35 an 1.67 mt 12.06 ne 3.41 il 3.19 ap 1.34	Wälkomman, Gellivare, Sweden.	R. Mauzelius.	A. G. Högbom, G. F. F., XXXII, p. 569, 1910.	Syenite.	Gneissoid.
5	II″.5(6).1(2).2.	or 54.49 di 12.53 ab 0.26 ol 7.63 an 5.00 mt 6.73 ne 8.38 il 2.13 hm 1.60 ap 1.34	Gaussberg, Kaiser Wilhelm II Land, Antarctica.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (I), p. 81, 1906.	Leucite basalt.	

SUBRANG 3. SODIPOTASSIC. ILMENOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.5(6).1.″3.	or 48.37 ac 17.56 ab 19.91 ns 0.37 ne 7.10 di 4.61 ol 0.69 il 0.76	St. Hilaire Mountain, Rouville County, Quebec.	M. F. Connor.	J. J. O'Neill, Can. G. S. Mem. 43, p. 61, 1914.	Tinguaite.	
2	(I)II.5.1(2).3(4).	or 34.47 di 5.16 ab 44.54 ol 2.36 an 5.28 mt 2.78 ne 2.27 il 1.82 ap 0.34	Lachute, Quebec.	M. Dittrich.	A. Osann, Can. G. S. A. R. XII (1899), p. 90, 1902.	Syenite gneiss.	Probably igneous.
3	II.5.1.3.⊙.	Q 1.26 ac 2.77 or 31.69 di 15.37 ab 38.77 hy 2.91 mt 4.18 il 1.37 ap 0.67	Peninsula, Port Coldwell, Ontario.	A. H. A. Robinson.	A. P. Coleman, A. J. S., XIV, p. 152, 1902.	Augite syenite.	Also in Rep. Bur. Min. Ont., XI, p. 211, 1902.
4	II.5.1.3.⊙.	Q 2.52 ac 2.77 or 37.81 di 11.60 ab 37.73 hy 5.56 mt 2.55 il 0.30	Beverly, Essex County, Massachusetts.	F. E. Wright.	F. E. Wright, T. M. P. M., XIX, p. 318, 1900.	Umptekite.	In W. T., p. 251.
5	(I)II.5.1.3″.	Q 5.22 ac 4.16 or 33.36 di 4.32 ab 45.06 hy 1.30 hm 5.12	Rand Hill, Beekmantown, Clinton County, New York.	E. W. Morley.	H. P. Cushing, N. Y. St. Mus. A. R. LIV (1900), p. R 78, 1902.	Syenite porphyry.	
6	″II.(4)5.1(2).3″.	Q 7.68 di 6.53 or 28.91 hy 5.55 ab 39.82 mt 3.25 an 4.17 il 1.98 ap 0.67	Bear Creek Canyon, Colorado Springs quadrangle, Colorado.	G. Steiger.	G. I. Finlay, U. S. G. S. B. 419, p. 100, 1910.	Lamprophyre.	
7	(I)II.5.1.3.	Q 0.54 di 4.97 or 41.14 wo 0.81 ab 44.54 mt 1.62 an 1.95 il 1.67 hm 1.92 ap 0.67	Braemar, Aberdeenshire, Scotland	W. Pollard.	J. J. H. Teall, G. S. U. K., Mem. N. W. Highl., p. 444, 1907.	Aegirite granulite.	
8	(I)II.5.1.3(4).	or 35.58 ac 0.92 ab 49.25 di 6.75 ne 1.70 ol 3.45 mt 1.39 il 0.46 ap 0.34	Seglinde, Almunge, Sweden.	N. Sahlbom.	P. Quensel, B. G. Inst. Ups., XII, p. 154 (1913), 1914.	Umptekite.	Cf. No. 27, I.5.1.4.
9	II.5.1(2).3(4).	Q 0.48 di 7.88 or 28.91 wo 1.28 ab 42.97 mt 11.83 an 5.00 il 0.61	Böle, Ragunda Massif, Jemtland, Sweden.	H. Santesson.	A. G. Högbom, Sver. G. Und. Afh., 182, p. 45, 1899.	Syenite.	Not in W. T.

CLASS II. DOSALANE—Continued.

RANG. 1. PERALKALIC. UMPTEKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
10	60.61	15.04	1.31	3.03	3.11	3.78	4.70	5.30	1.32		0.78	0.89			99.87	
A2. II	1.010	.147	.008	.042	.078	.068	.076	.056			.010	.006				
11	57.21	17.87	5.92	0.76	2.26	4.50	5.83	5.72	n. d.		0.43	0.14			100.64	
A2. II	.953	.175	.037	.011	.057	.080	.094	.061			.005	.001				
12	57.49	16.54	4.85	0.63	4.73	1.07	3.79	7.23	3.08		0.94	0.43		SO_3 0.11	100.89	2.618
B2. III	.958	.162	.030	.009	.118	.019	.061	.077			.012	.003				
13	56.99	15.65	3.56	1.99	4.43	3.75	4.41	6.50	2.22		0.83	0.41		SO_3 0.10	100.84	2.681
B2. III	.950	.153	.022	.028	.111	.067	.071	.069			.010	.003				
14	64.46	14.96	0.95	3.73	1.36	3.30	4.39	5.44	1.07		trace	none	trace		99.66	
A3. III	1.074	.147	.006	.052	.034	.059	.071	.058			——	——	——			
15	57.33	14.06	2.07	3.59	3.55	5.68	3.34	6.32	3.08		1.05		0.09		100.16	
A2. II	.956	.138	.013	.050	.089	.102	.054	.067			.013		.001			
16	63.40	13.99	2.14	1.65	2.31	5.27	5.04	5.41	0.92						100.13	
A3. III	1.057	.137	.013	.023	.058	.095	.081	.057								
17	62.12	16.17	2.08	4.84	1.40	2.56	5.15	5.27	0.57		0.74				100.90	2.72
A3. III	1.035	.159	.013	.067	.035	.046	.083	.056			.009					
18	59.92	14.30	7.50	0.42	0.72	1.90	5.32	5.77	2.49	0.34	0.87	0.58	0.06	ZrO_2 0.11 SO_3 0.06 BaO 0.05	100.30	
A1. I	.999	.140	.047	.006	.018	.034	.085	.062			.011	.004	.001			
19	61.80	16.39	3.44	0.48	0.58	2.30	6.70	7.04	0.94			0.57			100.24	
A3. III	1.030	.161	.022	.007	.015	.041	.108	.075				.004				
20	61.60	17.11	3.09	0.54	1.04	3.25	5.35	6.11	0.63		0.79	0.06			99.57	
A2. II	1.027	.168	.019	.008	.026	.058	.086	.065			.010	——				
21	65.10	14.10	2.70	1.71	2.45	1.55	5.45	4.92	2.10		0.39				100.47	
A3. III	1.085	.138	.017	.024	.061	.028	.088	.052			.005					
22	56.40	15.84	6.48	3.54	0.21	1.52	5.80	5.78	3.96			0.13			99.66	
A3. III	.940	.155	.041	.049	.005	.027	.094	.062				.001				
23	60.20	17.86	1.10	2.02	0.32	3.60	6.36	5.94	2.46						99.86	
A3. III	1.003	.175	.007	.028	.008	.064	.103	.063								
24	59.04	16.21	1.04	2.64	0.24	1.93	9.78	6.59	1.60		0.76			Cl 0.22	100.05	
A3. III	.984	.159	.006	.037	.006	.034	.158	.070			.010					

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 3. SODIPOTASSIC. ILMENOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
10	II.5.1(2).3″.	Q 3.18 di 7.39 or 31.14 hy 7.41 ab 39.82 mt 1.86 an 4.17 il 1.52 ap 2.02	Sommerau, Bl. Triberg, Baden.	M. Dittrich.	A. Sauer, Erl. G. Kt. Bad., No. 100, p. 24, 1899.	Kersantite.	Not in W. T.
11	II.5(6).1(2).3(4).	or 33.92 di 12.31 ab 31.96 mt 1.39 an 5.56 il 0.76 ne 9.37 hm 4.96 ap 0.34	Remscheid, Siebengebirge.	Güttes.	H. Laspeyres, D. Siebengebirge, p. 320, 1901.	Trachyte.	Cf. No. 44, II.5.2.3.
12	II.5.1.3.⊙.	or 42.81 hy 10.60 ab 31.96 ol 0.84 an 2.50 il 1.37 C 1.53 hm 4.85 ru 0.24 ap 1.01	Gotteskopf, Ilmenau, Thuringia.	Fischer.	H. Loretz, Jb. Pr. G. L.-A., XIII (1892), p. 135, 1893.	Porphyrite.	In W. T., p. 251.
13	II.5.1″.3.	or 38.36 di 9.50 ab 32.49 ol 4.69 an 3.61 mt 4.18 ne 2.56 il 1.52 hm 0.64 ap 1.01	Gotteskopf, Ilmenau, Thuringia.	Fischer.	H. Loretz, Jb. Pr. G. L.-A., XIII (1892), p. 135, 1893.	Porphyrite.	In W. T., p. 251.
14	″II.(4)5.1(2).3.	Q 8.58 di 9.63 or 32.25 hy 4.60 ab 37.20 mt 1.39 an 5.00	Hengstberg, n. Grimma, Saxony.	P. Jannasch.	H. Rosenbusch, Elem. Gest., p. 269, 1898.	Quartz porphyry.	In W. T., p. 251.
15	II.5.1(2).3.	or 37.25 di 18.97 ab 28.30 hy 2.46 an 4.73 ol 0.45 mt 3.02 il 1.98	Gailbach, Spessart, Bavaria.	E. Goller.	E. Goller, N. J. B. B., VI, p. 566, 1889.	Kersantite.	In W. T., p. 251.
16	II.5.1.3″.	Q 4.08 ac 0.46 or 31.69 di 15.01 ab 41.92 wo 3.13 mt 3.02	Monte Inverno, Monzoni, Tyrol.	C. Doelter.	C. Doelter, Anz. Ak. Wiss. Wien, XXXIX, p. 231, 1902.	Syenite porphyry.	
17	″II.5.1″.3″.	Q 3.30 di 6.10 or 31.14 hy 6.36 ab 43.49 mt 3.02 an 5.56 il 1.37	Isla Persa, Bernina Gebiet, Switzerland.	L. Hezner.	U. Grubenmann, Schw. Chem. Zeit., I, p. (2), 1914.	Syenite.	
18	″II.5.1.3.	Q 5.40 ac 2.77 or 34.47 di 3.67 ab 41.39 hy 0.10 il 1.06 hm 6.56 tn 0.78 ap 1.34	Monte Muradu, Macomer, Sardinia.	H. S. Washington.	H. S. Washington, A. J. S., XXXVI, p. 584, 1913.	Trachyte.	Not described.
19	″II.5″.1.3.	or 41.70 ac 10.16 ab 35.37 di 4.97 ne 5.25 wo 0.70 ap 1.34	Coral Island, Los Islands, French Guinea.	Lassieur.	A. Lacroix, N. Arch. Mus., III, p. 68, 1911.	Pulaskite.	
20	(I)II.5.1(2).3″.	Q 0.06 di 5.62 or 36.14 wo 3.48 ab 45.06 il 1.22 an 4.73 hm 3.09 tn 0.39	Melfi, Sokoro Region, Chad Territory, French Kongo.	Pisani.	Gentil and Freydenberg, C. R., CXLVI, p. 354, 1908.	Arfvedsonite syenite.	
21	(I)II.(4)5.1.3(4).	Q 9.48 ac 0.92 or 28.91 di 6.08 ab 45.06 hy 3.53 mt 3.94 il 0.76	Bet. Tunbaba and Haumeni, Timor Island.	F. Pisani.	H. A. Brouwer, N. J. Cb., 1913, p. 572.	Trachyte.	
22	(I)II.5.1.3(4).	or 34.47 ac 0.46 ab 44.54 di 3.07 ne 2.27 wo 1.28 mt 9.51	Mohanui, Dunedin, New Zealand.	P. Marshall.	P. Marshall, Q. J. G. S., LXII, p. 405, 1906.	Phonolite.	
23	(I)II.5″.1.3(4).	or 35.03 di 6.93 ab 40.35 wo 4.06 an 2.50 mt 1.62 ne 7.38	Mount Tapioi, Raiatea, Society Islands.	P. Marshall.	P. Marshall, Aust. A. A. S., XIII, p. 199, 1912.	Phonolite.	
24	II.5(6).1.3.	or 38.92 ac 2.77 ab 30.39 ns 7.69 ne 8.80 di 8.10 il 1.52	Pahiraia, Society Islands.	P. Marshall.	P. Marshall, Aust. A. A. S., XIII, p. 198, 1912.	Phonolite.	

CLASS II. DOSALANE—Continued.

RANG 1. PERALKALIC. UMPTEKASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	58.17	16.07	1.30	5.04	1.20	3.42	7.41	4.65	0.41	0.19	2.09	0.42	0.07	CO_2 none SO_3 none Cl none	100.44	2.74
A2. II	.970	.157	.008	.070	.030	.061	.119	.050			.026	.003	.001			
2	56.05	17.02	9.10	4.20	0.12	0.72	6.10	5.12	0.36		0.47	0.04	0.08		99.38	
A2. II	.934	.167	.057	.058	.003	.013	.098	.054			.006	—	.001			
3	58.74	14.61	0.48	3.70	5.47	3.34	5.70	3.79	0.27	0.17	1.87	1.00		CO_2 none	99.14	
B2. III	.979	.143	.003	.051	.137	.060	.092	.040			.023	.007				
4	59.01	18.18	1.63	3.65	1.05	2.40	7.03	5.34	0.50	0.15	0.81	trace	0.03	ZrO_2 trace Cl 0.12 BaO 0.08 SrO trace Li_2O trace	99.98	
A1. I	.983	.178	.010	.050	.026	.043	.113	.056			.010	—	—			
5	64.28	15.97	2.91	3.18	0.03	0.85	7.28	5.07	0.20		0.50	0.08	trace	BaO none	100.33	2.703
A2. II	1.071	.156	.018	.044	.001	.015	.117	.054			.006	—	—			22°
6	60.02	14.86	2.80	6.57	0.38	3.33	5.64	4.26	0.78	0.20	0.90	0.63	0.20		100.57	2.80
A2. II	1.000	.146	.018	.092	.010	.060	.091	.046			.011	.004	.003			20°
7	59.52	15.58	7.24	1.86	2.11	1.81	6.82	3.48	2.23						100.65	
A3. III	.992	.152	.045	.026	.053	.032	.110	.037								
8	57.45	15.75	11.12	1.74	1.94	0.12	7.84	3.51	1.23						100.70	
A3. III	.958	.154	.069	.024	.049	.002	.139	.037								
9	59.66	16.97	3.18	1.15	0.80	2.32	8.38	4.17	2.53	0.07	trace	0.14	0.19		99.56	
A2. II	.994	.166	.020	.016	.020	.041	.135	.044			—	.001	.003			
10	63.69	15.03	2.51	2.41	0.80	3.30	6.54	2.46	2.23			trace	0.55	SO_3 trace Cl trace Cu trace	99.52	2.55
A3. III	1.062	.147	.015	.033	.020	.059	.105	.026				—	.008			15°
11	59.54	13.09	4.74	6.13	1.33	3.81	5.88	3.86	0.68			0.59	0.49	CO_2 0.18	100.32	
A2. II	.992	.128	.029	.085	.033	.068	.095	.041				.004	.007			
12	58.75	17.46	2.37	2.45	1.03	2.55	6.81	5.87	0.74		0.77	0.30	trace	CO_2 0.12 SO_3 0.16 Cl 0.65	100.03 .15 99.88	2.672
A1. I	.979	.171	.015	.034	.026	.046	.110	.063			.010	.002	—			
13	58.46	16.56	5.69	2.59	0.62	2.62	6.23	5.44	1.21		0.28	0.23	trace	CO_2 0.04 SO_3 0.16 Cl 0.29	100.26	2.674
A1. I	.974	.162	.036	.036	.016	.046	.100	.058			.004	.002				
14	60.13	16.53	2.86	2.55	1.20	1.61	8.06	3.99	0.97	0.55	0.73	0.57	0.46	S none NiO none BaO 0.11	100.32	
A1. I	1.002	.162	.018	.036	.030	.029	.130	.042			.009	.004	.007			
15	58.81	14.81	4.58	4.21	0.80	2.33	5.60	4.96	0.82	2.00	0.76	0.20	0.27	S none NiO none BaO 0.03	100.18	
A1. I	.980	.145	.029	.058	.020	.041	.090	.053			.010	.001	.004			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. UMPTEKOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.		Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.5(6).1. ″4.	or 27.80 ab 40.61 re 8.38	ac 3.70 ns 0.49 di 11.85 ol 2.26 il 3.95 ap 1.01	Kakarsuak, Ilimausak Region, Greenland.	C. Winther.	N. V. Ussing. G. Juehb., p. 196, 1911.	Nord-markite.	
2	(I)II.5.1″.(3)4.	or 30.02 ab 50.56 an 3.61 ne 0.42 C 0.20	ol 0.31 mt 12.06 il 0.91 hm 0.80	Craigmont, Renfrew County, Ontario.	M. F. Connor.	Adams and Barlow, Tr. R. Soc. Can., II (4), p. 69, 1909.	Syenite.	Also in Can. G. S. Mem. 6, p. 324, 1910.
3	II.5.1″.4.	or 22.24 ab 48.21 an 3.06	di 5.75 hy 9.45 ol 3.44 mt 0.70 il 3.50 ap 2.35	South Newcastle, Boothbay quadrangle, Maine.	M. W. Adams.	I. H. Ogilvie, Ann. N. Y. Ac. Sci., XVII, p. 542, 1907.	Monzonite.	
4	(I)II.5(6).1.″4.	or 31.14 ab 42.97 an 2.50 ne 8.80	di 7.92 ol 1.92 mt 2.32 il 1.52	Red Hill, New Hampshire.	W. F. Hillebrand.	W. S. Bayley, B. G. S. A., III, p. 250, 1892.	Nephelite syenite.	In W. T., p. 253.
5	(I)II.5.1.(3)4.	Q 2.04 or 30.03 ab 53.45	ac 6.93 di 3.72 hy 2.74 mt 0.70 il 0.91	Andrews Point, Cape Ann, Essex County, Massachusetts.	H. S. Washington.	H. S. Washington, A. J. S., VI, p. 178, 1898.	Sölvsbergite.	In W. T., p. 253.
6	II.5.1.″4.	Q 2.76 or 25.58 ab 47.68 an 2.50	di 9.35 hy 4.86 mt 4.18 il 1.67 ap 1.34	Pine Hill, West Quincy, Massachusetts.	C. H. Warren.	C. H. Warren, Proc. Am. Ac., XLIX, p. 282, 1913.	Rhomben porphyry.	Xenolith in granite, No. 25, I.4.1.3.
7	″II.5.1.4.	Q 1.20 or 20.57 ab 57.64 an 1.39	di 5.83 hy 2.60 mt 6.03 hm 2.04	Little Montreal River, Keweenaw Point, Michigan.	F. P. Burrall.	L. L. Hubbard, Mich. G. S., VI (II), p. 26, 1898.	Felsite porphyrite.	Not in W. T.
8	II.5″.1.4.	or 20.57 ab 50.56 ne 5.82	ac 10.16 di 0.43 ol 3.29 mt 5.57 hm 3.68	Little Montreal River, Keweenaw Point, Michigan.	F. P. Burrall.	L. L. Hubbard, Mich. G. S., VI (II), p. 26, 1898.	Felsite porphyrite.	Not in W. T.
9	″II.5(6).1.4.	or 24.46 ab 47.68 ne 8.80	ac 6.01 di 7.29 wo 0.70 mt 1.62 ap 0.34	Peaked Butte, Crazy Mountains, Montana.	W. H. Melville.	Wolff and Tarr, B. Mus. Comp. Zool., XVI, p. 232, 1893.	Nephelite syenite.	In W. T., p. 253.
10	(I)II.(4)5.1(2).4.	Q 9.30 or 14.46 ab 55.02 an 4.45	di 10.06 hy 0.36 mt 3.48	Yate Volcano, Chile.	H. Ziegenspeck.	H. Ziegenspeck, In. Diss. Jena, p. 42, 1883.	Andesite.	In W. T., p. 253.
11	II.5.1.″4.	Q 1.98 or 22.80 ab 45.59	ac 3.70 di 13.10 hy 5.96 mt 4.87 ap 1.34	Tamaya, Chile.	C. Schwarz.	A. v. Groddeck, Z. D. G. G., XXXIX, p. 251, 1887.	Porphyry.	In W. T., p. 253.
12	(I)II.5″.1.(3)4.	or 35.03 ab 41.39 an 1.95 ne 6.25 hl 1.05	di 7.39 ol 1.04 mt 3.48 il 1.52 ap 0.67	Cabo Frio, Rio de Janeiro, Brazil.	F. E. Wright.	F. E. Wright, T. M. P. M., XX, p. 248, 1901.	Umptekite.	
13	(I)II.5.1.(3)4.	or 32.25 ab 48.73 an 2.22 ne 0.85 hl 0.47	di 3.46 wo 1.74 mt 7.42 il 0.61 hm 0.64 ap 0.67	Cabo Frio, Rio de Janeiro, Brazil.	F. E. Wright.	F. E. Wright, T. M. P. M., XX, p. 243, 1901.	Nordmarkite.	
14	(I)II.5.1.4.	or 27.35 ab 55.02 ne 4.26	ac 4.62 di 3.65 ol 2.73 mt 1.86 il 1.37 ap 1.34	Tobermory Mull, Scotland.	E. G. Radley.	J. J. H. Teall, G. S. G. B., Sum. Prog.(1913), p. 80, 1914.	Phonolitic trachyte.	
15	″II.5.1.(3)4.	Q 2.40 or 29.47 ab 47.16 an 0.56	di 8.39 hy 0.70 mt 6.73 il 1.52 ap 0.34	Garnhnaich Mhor, Carsaig Bay Mull, Scotland.	E. G. Radley.	J. J. H. Teall, G. S. G. B., Sum. Prog. (1912), p. 70, 1913.	Alkali syenite.	

CLASS II. DOSALANE—Continued.

RANG 1. PERALKALIC. UMPTEKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
16	57.98	17.92	4.23	2.72	0.34	2.12	6.99	5.24	1.76	0.64	0.20	0.08	0.21	CO_2 none S none NiO none BaO none SrO none	111.43	
A1. I	.966	.176	.026	.038	.009	.038	.113	.055			.003	—	.003			
17	58.47	18.60	1.92	4.77	0.94	0.99	5.52	3.30	2.19	0.50	2.17	0.45	0.19	Cl 0.02 BaO 0.04 Li_2O trace	100.11	
A1. I	.975	.182	.012	.067	.024	.018	.089	.035			.027	.003	.003			
18	62.70	16.40	3.34	2.35	0.79	0.95	7.13	5.25	0.70		0.92		trace		100.53	
A3. III	1.045	.161	.021	.033	.020	.017	.115	.056			.012		—			
19	58.90	17.70	3.94	2.37	0.54	1.05	7.39	5.59	1.90		0.40	trace	0.55		100.33	
A2. II	.982	.173	.025	.033	.014	.019	.119	.060			.005	—	.008			
20	58.81	18.54	5.00	1.80	1.02	3.81	7.90	3.06	n. d.						99.94	
A3. III	.980	.182	.031	.025	.026	.068	.127	.033								
21	61.56	13.59	2.16	3.16	5.44	4.41	6.17	2.77	0.24		0.12	0.03	0.07	BaO 0.04	99.72	
A2. II	1.026	.133	.014	.044	.136	.079	.100	.030			.002	—	.001			
22	63.82	14.81	1.63	1.25	3.48	5.26	6.37	2.78	0.20	(0.06)	0.38	0.02	0.07	CO_2 0.25 S 0.01	100.33	
A2. II	1.064	.145	.010	.018	.087	.094	.103	.030			.005	—	.001			
23	61.24	13.95	3.81	1.45	4.23	3.69	5.13	4.53	0.38	(0.09)	0.82	0.01	0.14	CO_2 0.51 S 0.02 BaO 0.05	99.96	
A1. I	1.021	.137	.024	.020	.106	.066	.082	.048			.010	—	.002			
24	60.78	14.95	4.04	2.27	2.39	3.22	5.81	3.53	0.53	(0.18)	2.14	0.01	0.07		99.74	
A2. II	1.013	.147	.025	.032	.060	.057	.094	.037			.027	—	.001			
25	59.57	15.14	5.50	1.62	2.46	3.42	6.13	3.27	0.57		1.82		0.36		99.86	
A2. II	.993	.147	.034	.022	.062	.061	.098	.035			.023		.005			
26	53.31	14.19	10.92	4.29	1.96	4.38	6.27	2.19	0.40	(0.15)	1.80	0.43	0.06	S 0.01	100.25	
A2 II	889	.139	.068	.060	.049	.079	.102	.023			.023	.003	.001			
27	63.71	16.59	2.92	0.66	0.90	3.11	8.26	2.79	0.19		0.86		0.20		100.19	
A2. II	1.062	.163	.018	.009	.023	.056	.135	.030			.010		.003			
28	60.89	17.16	3.60	3.18	0.49	3.07	6.88	4.23	0.37						99.87	
A3. III	1.015	.168	.022	.044	.012	.055	.111	.045								
29	63.45	15.87	1.81	0.77	0.72	4.08	6.84	4.31	1.08		0.44	1.16			100.53	
A2. II	1.058	.155	.011	.011	.018	.073	.110	.046			.005	.008				
30	58.28	12.65	6.17	7.38	1.54	2.54	6.34	1.40	2.22		1.38			FeS_2 0.61	100.81	2.80
A3. III	.971	.124	.039	.103	.039	.045	.102	.015			.017					
31	64.95	14.27	3.37	1.89	0.87	2.60	6.85	3.39	0.24	0.35	0.81	0.11			99.70	
A2. II	1.083	.140	.021	.026	.022	.046	.111	.036			.010	.001				

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. UMPTEKOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
16	(I)II.5″.1.″4.	or 30.58 di 4.92 ab 45.06 wo 1.04 an 2.22 mt 6.03 ne 7.67 il 0.46	Newton o' Fintry, n. Glasgow, Scotland.	E. G. Radley.	J. J. H. Teall, G. S. G. B., Sum. Prog. (1907), p. 56, 1908.	Phonolite.	
17	(I)II.(4)5.1.4.	Q 9.60 hy 6.49 or 19.46 mt 2.78 ab 46.63 il 4.10 an 2.22 ap 1.01 C 5.10	Skomer Island, Pembrokeshire, Wales.	E. G. Radley.	H. H. Thomas, Q. J. G. S., LXVII, p. 192, 1911.	Soda trachyte.	
18	(I)II.5.1.(3)4.	or 31.14 ac 4.62 ab 55.02 di 3.86 ol 1.14 mt 2.55 il 1.82	Lougenthal, Norway.	L. Schmelck.	W. C. Brögger, Eg. Kg., I, p. 80, 1894.	Sölvsbergite.	In W. T., p. 253.
19	(I)II.5(6).1.(3)4.	or 33.36 ac 2.77 ab 42.97 di 4.45 ne 8.80 ol 1.03 mt 4.41 il 0.76	Kjose Aklungen, Norway.	V. Schmelck.	W. C. Brögger, Eg. Kg., I, p. 102, 1894.	Sölvsbergite.	In W. T., p. 253.
20	(I)II.5″.1(2).4.	or 18.35 di 5.62 ab 53.91 wo 2.32 an 6.12 mt 5.80 ne 6.82 hm 0.96	Ostvaagö, Lofoten Islands, Norway.	T. Matthiesen.	C. F. Kolderup, Berg. Mus. Aarb., 1898, No. 7, p. 23.	Soda syenite.	In W. T., p. 253.
21	II.5.1.4.⊙	or 16.65 di 16.84 ab 52.40 hy 9.41 an 0.83 mt 3.25 il 0.30	Liné Adit, Gellivare, Sweden.	R. Mauzelius.	A. G. Högbom, G. F. F., XXXII, p. 569, 1910.	Syenite.	
22	II.5.1″.4.	Q 4.14 di 17.81 or 16.68 hy 0.93 ab 53.97 mt 2.32 an 3.34 il 0.76	Kiirunavaara, Lapland, Sweden.	K. Schröder.	P. Geijer, G. Kir. Dist., p. 49, 1910.	Syenite porphyry.	
23	II.5.1.(3)4.	Q 4.38 di 10.37 or 26.69 hy 5.80 ab 42.97 mt 2.78 an 1.95 il 1.52 hm 1.92	Luossavaara, Lapland, Sweden.	R. Mauzelius.	P. Geijer, G. Kir. Dist., p. 54, 1910.	Syenite porphyry.	
24	II.5.1(2).4.	Q 5.64 di 8.86 or 20.57 hy 1.90 ab 49.25 mt 1.39 an 4.45 il 4.10 hm 3.04	Near Kiirunavaara, Lapland, Sweden.	G. Nyblom.	P. Geijer, G. Kir. Dist., p. 33, 1910.	Syenite porphyry.	
25	II.5.1(2).4.	Q 3.48 di 10.15 or 19.46 hy 1.50 ab 51.35 mt 0.93 an 3.89 il 3.50 hm 4.80	Kiruna, Lapland, Sweden.	H. Santesson.	O. Stutzer, N. J. B. B., XXIV, p. 563, 1907.	Soda syenite.	
26	II.5.1(2).4″.	Q 0.42 di 10.58 or 12.79 wo 0.70 ab 53.45 mt 8.82 an 3.89 il 3.50 hm 4.80 ap 1.01	Geologen, Kiirunavaara, Lapland, Sweden.	G. Nyblom.	P. Geijer, G. Kir. Dist., p. 10, 1910.	Syenite.	
27	(I)II.5.1.4.	or 16.68 ac 0.92 ab 69.69 di 4.97 wo 3.60 il 1.37 hm 2.56 pf 0.27	Umpjärvi, Umptek, Kola, Finland.	W. Petersson.	W. Ramsay, Fennia, XI, p. 205, 1894.	Umptekite.	In W. T., p. 253.
28	(I)II.5.1″.4.	or 25.02 di 8.04 ab 55.54 wo 1.04 an 3.34 mt 5.10 ne 1.42	Steinburg, Hartenfels, Westerwald, Germany.	W. Bruhns.	W. Bruhns, Vh. Nh. Ver. Bonn., LIII, p. 51, 1886.	Trachyte.	In W. T., p. 253.
29	(I)II.5.1.4.	Q 3.48 di 3.89 or 25.58 wo 3.25 ab 57.64 mt 1.39 il 0.76 hm 0.80 ap 2.69	Hielsberg, Westerwald, Germany.	H. Schneiderhöhn.	H. Schneiderhöhn, Jb. Pr. G. L.-A., XXX (1909), p. 306, 1910.	Phonolitic trachyte.	
30	II.(4)5.1.4(5).	Q 7.86 di 8.88 or 8.34 hy 5.63 ab 53.45 mt 9.05 an 1.95 il 2.58	Bohulib, Bohemia.	Laxa.	Barvir, Arch. Nw. Df. Böhm., XII, 1901.	Kersantite.	Osann, III (1), p. 129.
31	(I)II.(4)5.1.4.	Q 8.88 ac 3.23 or 20.02 di 5.24 ab 54.49 wo 2.20 mt 3.25 il 1.52 ap 0.34	Between Ghadames and Tripoli, Tripoli, Libya.	G. Manasse.	G. Manasse, B. Soc. G. It., XXIV, p. 143, 1905.	Andesite.	

CLASS II. DOSALANE—Continued.

RANG 1. PERALKALIC. UMPTEKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
32	57.95	13.80	5.72	1.73	0.53	1.43	8.95	2.71	1.71		0.55		2.76	ZrO_2 1.57 Cl 0.17	99.58	
A2. II	.966	.135	.036	.024	.013	.025	.145	.029			.007		.039			
33	51.26	16.90	6.11	5.32	2.59	2.96	6.86	2.28	4.07		0.76	1.59	0.15		100.85	
A2. II	.854	.166	.038	.074	.065	.053	.111	.024			.010	.011	.002			
34	59.49	17.17	2.27	3.33	1.12	2.62	6.48	5.26	0.57	0.37	0.59	0.38			99.65	
A2. II	.992	.168	.014	.046	.028	.046	.105	.056			.007	.003				
35	58.37	16.65	4.09	3.03	0.37	1.66	7.28	5.46	1.40	0.96	0.21	0.08	0.43		99.99	
A2. II	.973	.163	.026	.042	.009	.030	.118	.058			.003	—	.006			
36	60.75	14.50	6.18	2.94	0.43	3.36	5.88	3.74	1.44		0.46	0.25	0.55	CO_2 trace	100.48	
A2. II	1.013	.142	.039	.041	.011	.060	.095	.039			.006	.002	.008			
37	59.56	13.94	5.82	2.98	0.61	4.72	6.05	3.01	2.31		0.31	0.11	0.48	SO_3 trace	99.90	
A2. II	.993	.137	.036	.042	.015	.084	.098	.032			.004	.001	.007			
38	52.05	15.10	2.15	5.67	2.44	6.93	6.10	3.47	3.10		1.82	0.60			99.43	
A2. II	.868	.148	.014	.079	.061	.123	.098	.037			.023	.004				
39	59.39	14.34	6.64	0.92	1.92	8.65	5.83	3.09	0.12						100.90	2.604
A3. III	.990	.141	.041	.013	.048	.155	.094	.033								
40	62.25	15.49	5.44	0.15	0.84	1.82	8.18	2.57	1.26		1.85				99.85	
A2. II	1.038	.152	.034	.002	.021	.032	.132	.028			.023					
41	56.78	14.47	2.80	6.05	0.34	2.47	8.67	4.51	1.70	0.56	2.00		trace	NiO 0.05	100.40	
A2. II	.946	.142	.018	.084	.009	.045	.140	.048			.025		—			
42	55.66	17.18	4.43	3.56	0.73	1.14	7.02	5.30	4.53						99.55	
A3. III	.928	.168	.028	.050	.018	.020	.113	.056								
43	54.15	16.09	7.35	4.90	1.61	3.86	5.94	4.41	1.40		0.41	0.42		Cl 0.40	100.74	
A2. II	.903	.158	.046	.068	.040	.069	.096	.047			.005	.003				
44	53.56	15.28	7.36	5.42	1.29	4.30	5.51	4.88	3.12						100.72	
A3. III	.893	.150	.046	.075	.032	.077	.089	.052								
45	53.28	16.38	6.11	4.52	2.50	3.09	6.42	4.18	3.52			0.15			100.15	
A3. III	.888	.161	.038	.063	.063	.055	.103	.045				.001				
46	62.19	17.43	1.65	2.64	0.40	0.86	8.28	5.03	0.39	0.14	0.37	0.14	0.32	CO_2 0.02 ZrO_2 0.04 SO_3 none Cr_2O_3 trace NiO none BaO 0.03 SrO none	99.93	
A1. I	1.037	.171	.010	.037	.010	.015	.134	.053			.005	.001	.005			
47	60.12	17.67	3.75	3.40	0.53	2.40	6.78	4.43	0.49						99.57	
A3. III	1.002	.173	.023	.047	.013	.043	.110	.047								

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. UMPTEKOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
32	II.5″.1.4.	or 16.12 ac 16.63 ab 45.85 ns 0.12 ne 5.25 di 6.04 hl 0.28 ol 4.23 Z 2.38 il 1.06	Rouma, Los Islands, French Guinea.	Pisani.	A. Lacroix, N. Arch. Mus., III, p. 38, 1911.	Lujavrite.	"Endialyte-rich" Al_2O_3 low? MnO high?
33	II.5.1(2).4″.	or 13.34 ol 7.41 ab 53.45 mt 8.82 an 4.45 il 1.52 ne 2.56 ap 3.70 C 1.53	Handeda District, Mulazenai, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Eritr., p. 105, 1909.	Kersantite.	
34	(I)II.5.1.(3)4.	or 31.14 di 6.71 ab 47.42 ol 2.03 an 1.95 mt 3.25 ne 4.12 il 1.06 ap 1.01	Bongatsana, Ankaratra, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVI, p. 176, 1913.	Phonolitic trachyte.	
35	″II.5(6).1.(3)4.	or 32.25 ac 6.01 ab 40.87 di 7.28 ne 7.67 mt 3.02 il 0.46	Mount Höhnel, Kenya Volcano, Brit. East Africa.	G. T. Prior.	G. T. Prior, Min. Mag., XIII, p. 240, 1903.	Phonolite.	
36	II.(4)5.1.4.	Q 7.98 di 3.37 or 21.68 wo 3.48 ab 49.78 mt 9.05 an 2.22 il 0.91 ap 0.67	Aden, Arabia.	E. Manasse.	E. Manasse, Mem. Soc. Tosc., XXIV, p. 181, 1908.	Trachy-andesite.	
37	II.″5.1.4.	Q 6.06 di 5.54 or 17.79 wo 5.80 ab 51.35 mt 8.35 an 1.95 il 0.61 ap 0.34	Aden, Arabia.	E. Manasse.	E. Manasse, Mem. Soc. Tosc., XXIV, p. 182, 1908.	Trachy-andesite.	
38	II.5.1″.4.	Q 1.92 di 22.23 or 20.57 hy 0.66 ab 51.35 mt 3.25 an 3.61 il 3.50	Vo-men-Ko, Yunnan, China.	Pisani.	J. Deprat, Mem. Serv. G. Indoch., I (1), p. 229, 1912.	Augite syenite.	
39	II.5.1(2).4.	Q 0.66 di 10.37 or 18.35 wo 10.79 ab 49.25 mt 3.02 an 3.89 hm 4.48	Simaboer, Merapi Volcano, Sumatra.	A. Clausinger.	R. D. M. Verbeek, Sum. Westk., p. 518, 1883.	Andesite pitchstone.	Not in W. T.
40	(I)II.5.1.4.	Q 2.76 ac 3.70 or 15.57 di 2.38 ab 64.97 ol 0.70 il 0.30 hm 4.16 tn 4.12	Engelsberg, Queensland.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXIV, p. 96, 1909.	Syenite pegmatite.	"Like bowralite."
41	II.5(6).1.″4.	or 26.69 ac 8.32 ab 34.58 ns 3.42 ne 7.67 di 10.97 ol 2.25 il 3.80	Mount Flinders, Queensland.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXIV, p. 93, 1909.	Phonolitic trachyte	
42	(I)II.5(6).1.″4.	or 31.14 ac 0.46 ab 40.87 di 4.67 ne 9.94 ol 1.75 mt 6.50	Purakanui, Dunedin, New Zealand.	P. Marshall.	P. Marshall, Q. J. G. S. LXII, p. 402, 1906.	Phonolite.	
43	II.5.1″.″4.	or 26.13 di 10.82 ab 41.65 ol 0.73 an 3.06 mt 10.67 ne 2.98 il 0.76 hl 0.70 ap 1.01	Signal Hill, Dunedin, New Zealand.	C. A. Cotton.	C. A. Cotton, Tr. N. Z. Inst., XLI, p. 120, 1909.	Phonolite.	
44	II.5(6).1″.(3)4.	or 28.91 di 14.11 ab 33.54 wo 0.81 an 2.50 mt 10.67 ne 7.10	See House, Dunedin, New Zealand.	P. Marshall.	P. Marshall, Q. J. G. S., LXII, p. 402, 1906.	Trachytoid phonolite.	
45	II.5(6).1″.4.	or 25.02 di 8.77 ab 37.20 ol 3.88 an 3.61 mt 8.82 ne 9.09 ap 0.34	Otago Harbor, Dunedin, New Zealand.	P. Marshall.	P. Marshall, Q. J. G. S., LXII, p. 397, 1906.	Ulrichite (camptonitic tinguaite).	
46	(I)II.5.1.4.	or 29.47 ac 4.62 ab 51.87 ns 0.73 ne 5.40 di 2.88 ol 3.35 il 0.76 ap 0.34	Puu Waa Waa, North Kona, Hawaii.	W. F. Hillebrand.	W. Cross, J. G., XII, p. 514, 1904.	Trachyte obsidian.	
47	(I)II.5.1″.4.	or 26.13 di 6.41 ab 53.45 ol 0.89 an 4.45 mt 5.34 ne 2.27	Heard Island, Indian Ocean.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (3), p. 262, 1908.	Trachyte.	

CLASS II. DOSALANE—Continued.

RANG 1. PERALKALIC. UMPTEKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
48	59.52	11.48	1.62	9.93	1.03	4.11	5.31	2.03	2.88	0.82	0.27	none	0.22	CO_2 0.41	99.63	2.51
A2. II	.992	.113	.010	.138	.026	.073	.085	.021			.003	—	.003			
49	61.01	16.62	3.55	2.81	0.06	3.27	5.92	5.22	1.13			trace	0.55	Cl trace	100.14	
A3. III	1.017	.163	.022	.039	.002	.058	.095	.056				—	.008			

RANG 1. PERALKALIC. UMPTEKASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	60.00	16.88	1.83	3.02	1.40	3.16	9.31	0.94	1.53	0.43	0.42	0.14	0.12	CO_2 0.59 ZrO_2 0.03 S trace BaO 0.06 SrO 0.02 Li_2O trace	99.88	
A1. I	1.000	.166	.011	.042	.035	.056	.150	.010			.005	.001	.002			
2	45.32	13.09	21.74	7.12	0.18	2.19	7.51	0.17	0.24	(0.08)	1.15	0.32	0.04	CO_2 1.26 S 0.02	100.35	
A2. II	.755	.128	.136	.099	.005	.039	.121	.002			.014	.002	—			

RANG 2. DOMALKALIC. MONZONASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	51.05	14.49	4.16	4.37	8.16	5.11	1.85	7.25	1.05		1.76	0.70			99.94	
A2. II	.851	.142	.026	.061	.204	.091	.030	.077			.022	.005				
2	59.58	14.45	1.52	3.09	4.19	4.74	2.69	7.54	0.50		0.77	0.51	trace	CO_2 0.11 Cl trace Ce_2O_3 0.13	2.764	
A2. II	.993	.142	.009	.043	.105	.085	.044	.080			.010	.004	—			
3	57.36	14.07	4.11	1.82	4.94	4.63	2.25	6.56	3.06		1.10				99.90	2.816
A3. III	.956	.138	.026	.025	.124	.082	.036	.070			.014					
4	56.39	12.88	2.36	3.54	7.83	4.06	1.30	7.84	1.33		2.07		trace		99.60	
A3. III	.940	.126	.015	.049	.196	.072	.021	.083			.026		—			
5	55.85	18.34	3.77	1.88	1.73	3.84	3.39	8.77	1.14		0.59	0.38		CO_2 none ZrO_2 none SO_3 0.05 BaO 0.17	99.90	
A1. I	.931	.180	.024	.026	.043	.069	.055	.094			.007	.003				
6	57.32	19.07	2.21	2.35	1.60	3.82	3.22	9.15	0.57		0.61	0.17		CO_2 none SO_3 trace BaO 0.12	100.21	2.611
A2. II	.955	.187	.014	.033	.040	.068	.052	.097			.008	.001				
7	57.31	14.41	1.21	4.37	7.80	6.90	1.35	6.38	0.18		0.40	0.30		CO_2 none BaO none	100.61	
A2. II	.955	.141	.008	.061	.195	.123	.022	.068			.005	.002				
8	55.46	14.63	1.34	4.50	7.90	6.69	1.79	6.63	0.23	0.15	0.53	0.36		CO_2 none	100.21	2.70
A2. II	.924	.143	.008	.062	.198	.119	.029	.071			.007	.003				10°
9	55.21	18.78	2.69	2.86	1.68	4.61	3.13	8.45	0.99		0.71	0.22		CO_2 none ZrO_2 0.10 SO_3 none BaO 0.18	99.61	
A1. I	.920	.184	.017	.040	.042	.082	.050	.090			.009	.002				

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. UMPTEKOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
48	II″.(4)5.1.4.	Q 7.32 di 16.02 or 11.68 hy 11.14 ab 44.54 mt 2.32 an 1.95 il 0.46	Musgrave Peninsula, Carnley Island, Auckland Islands.	A. M. Wright.	Speight and Finlayson, Subant. Islds., p. 724, 1909.	Trachyte pitchstone.	
49	(I)II.5.1″.(3)4.	Q 0.84 di 6.63 or 31.14 wo 2.20 ab 49.78 mt 5.10 an 3.34	Cape Adare, Victoria Land, Antarctica.	J. A. Schofield.	David, Smeeth, and Schofield, J. R. Soc. N. S. W., XXIX, p. 473, 1895.	Trachyte.	In W. T., p. 253.

RANG 5. PERSODIC. KIRUNOSE. (P. GEIJER, 1910.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″II.5″.1.5.	or 5.56 di 10.82 ab 68.90 ol 1.34 an 1.67 mt 2.55 ne 5.25 il 0.76 ap 0.34	Coalinga, Fresno County, California.	W. F. Hillebrand.	Arnold and Anderson, U. S. G. S. B. 398, p. 159, 1910.	Soda syenite.	Not fresh.
2	II″.5.1.5.	Q 0.42 hy 0.50 or 1.11 mt 19.72 ab 63.40 il 2.13 an 1.39 hm 8.16 ap 0.67 cc 2.80	Nokutusjärvi, Luossavaara, Lapland, Sweden.	R. Mauzelius.	P. Geijar, G. Kir. Dist., p. 67, 1910.	Magnetite syenite.	

RANG 2. DOPOTASSIC. CIMINOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II″.5.2.2.	or 42.81 di 8.48 ab 12.05 ol 12.81 an 9.73 mt 6.03 ne 1.99 il 3.34 ap 1.68	Durbach, Schwarzwald, Baden.	Not stated.	A. Sauer, Mt. Bad. G. L.-A., II, p. 258 (1890), 1892.	Durbachite.	Cf. No. 146, p. 951. In W. T., p. 255.
2	II.5.(1)2.2(3).	Q 1.80 di 11.98 or 44.48 hy 7.95 ab 23.06 mt 2.09 an 5.00 il 1.52 ap 0.34	Piz Giuf, Aarmassif, Switzerland.	M. Dittrich.	F. Weber, Btr. G. Kt. Schw., XIV, p. 43, 1904.	Syenite.	
3	II.″5.2.2″.	Q 4.92 di 10.80 or 38.92 hy 7.40 ab 18.86 mt 2.55 an 8.90 il 2.13 hm 2.40	Alp Tobel, Rofna, Switzerland.	G. Ruetschi.	G. Ruetschi, In. Diss. Zür., p. 27, 1903.	Lamprophyre.	
4	II(III).5.″2.2.	Q 1.08 di 10.92 or 46.15 hy 15.59 ab 11.00 mt 3.48 an 6.12 il 3.95	Monte Catini, n. Volterra, Tuscany.	H. S. Washington.	H. S. Washington, A. J. S., IX, p. 47, 1900.	Mica trachyte (selagite).	In W. T., p. 255.
5	(I)II.5″.″2.2(3).	or 52.26 di 6.05 ab 17.29 ol 1.05 an 8.62 mt 4.41 ne 6.25 il 1.06 hm 0.80 ap 1.01	Bagnorea, n. Orvieto, Italy.	H. S. Washington.	H. S. Washington, J. G., V, p. 370, 1897.	Leucite trachyte.	Complete in R. C. R., p. 67, 1906. In W. T., p. 255.
6	(I)II.5″.2.2(3).	or 53.93 di 5.99 ab 16.77 ol 1.87 an 10.56 mt 3.25 ne 5.68 il 1.22 ap 0.34	Vetralla, Monte Vico, n. Viterbo, Italy.	H. S. Washington.	H. S. Washington, J. G., IV, p. 849, 1896.	Vulsinite.	Complete in R. C. R., p. 59, 1906. In W. T., p. 255.
7	II(III).5.2(3).2.	Q 0.30 di 14.46 or 37.81 hy 18.92 ab 11.53 mt 1.86 an 14.18 il 0.76 ap 0.67	La Colonetta, Monte Cimino, n. Viterbo, Italy.	H. S. Washington.	H. S. Washington, A. J. S., IX, p. 44, 1900.	Ciminite.	Complete in R. C. R., p. 63, 1906. In W. T., p. 255.
8	II″.5.2.2.	or 39.48 di 14.64 ab 15.20 hy 3.46 an 11.95 ol 11.18 mt 1.86 il 1.06 ap 1.01	Fontana Fiescoli, Monte Cimino, n. Viterbo, Italy.	H. S. Washington.	H. S. Washington, A. J. S., IX, p. 44, 1900.	Ciminite.	Complete in R. C. R., p. 63, 1906. In W. T., p. 255.
9	(I)II.5″.2.2(3).	or 50.04 di 7.17 ab 15.20 ol 1.87 an 12.23 mt 3.94 ne 5.94 il 1.37 ap 0.67	Monte Venere, Vico Volcano, n. Viterbo, Italy.	H. S. Washington.	H. S. Washington, J. G., IV, p. 849, 1896.	Leucite trachyte.	Complete in R. C. R., p. 67, 1906. In W. T., p. 255.

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. MONZONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
10	52.14	15.91	2.15	5.19	5.11	8.55	1.92	7.24	0.10	0.09	1.22	0.24		CO_2 none ZrO_2 trace SO_3 0.07 BaO 0.20	100.13	
A1. I	.869	.156	.014	.072	.128	.153	.031	.077			.015	.002				
11	50.28	19.58	10.60	3.63	1.11	1.16	1.30	9.15	1.97					S 0.35 Insol. 0.33	99.21	2.815
B3. IV	.836	.192	.066	.050	.028	.021	.021	.098								21°
12	50.53	14.62	6.82	2.88	6.16	5.00	1.70	8.32	0.90		0.80	0.62			99.35	
A2. II	.842	.143	.043	.040	.154	.089	.027	.088			.010	.004				

RANG 2. DOMALKALIC. MONZONASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	62.62	15.69	2.07	4.73	1.61	2.60	3.87	5.95	0.61				0.10		99.76	2.68
A3. III	1.046	.154	.013	.065	.040	.046	.063	.063					.001			
2	58.37	15.11	1.91	8.99	0.57	3.32	3.76	4.09	2.25		0.97	0.21	0.48		100.03	
A2. II	.973	.148	.012	.125	.014	.059	.061	.044			.012	.001	.007			
3	58.77	15.78	2.33	6.03	0.24	3.55	4.47	5.29	1.22	0.29	0.94	1.45	0.10		100.46	2.72
A2. II	.980	.155	.015	.083	.006	.064	.073	.056			.012	.010	.001			
4	62.85	16.80	2.96	2.89	1.48	3.24	4.09	5.49	0.24	0.13	0.09	0.13	0.21	F 0.01 S 0.02 BaO 0.06	100.69	
A1. I	1.048	.165	.019	.040	.037	.058	.066	.059			.001	.001	.003			
5	62.34	17.22	1.75	2.49	1.30	3.28	5.28	5.14	0.28		0.60	trace	trace	SO_3 trace	99.68	2.68
A3. III	1.039	.169	.011	.035	.033	.059	.085	.054			.008	—	—			
6	60.56	16.19	5.19	2.41	1.30	2.09	4.78	4.82	0.51		1.19	0.30	0.36		99.70	2.633
A2. II	1.009	.159	.032	.033	.033	.037	.077	.051			.015	.002	.005			
7	61.65	15.07	2.03	2.25	3.67	4.61	4.35	4.50	0.41	0.26	0.56	0.33	0.09	Cr_2O_3 trace BaO 0.27 SrO 0.10 Li_2O trace	100.15	
A1. I	1.028	.148	.013	.031	.092	.083	.070	.048			.007	.002	.001			
8	54.42	14.28	3.32	4.13	6.12	7.72	3.44	4.22	0.38	0.22	0.80	0.59	0.10	Cr_2O_3 trace BaO 0.32 SrO 0.13 Li_2O trace	100.19	
A1. I	.907	.140	.021	.059	.153	.138	.055	.045			.010	.004	.001			
9	52.26	13.96	2.76	4.45	8.21	7.06	2.80	3.87	1.34	1.53	0.58	0.52	0.14	CO_2 0.49 Cr_2O_3 trace BaO 0.23 SrO 0.05 Li_2O trace	100.25	
A1. I	.871	.137	.017	.062	.205	.126	.045	.041			.007	.004	.002			
10	55.23	18.31	4.90	2.06	1.85	3.62	4.02	6.43	1.84		0.42	0.58	trace	CO_2 none SO_3 0.23 Cl 0.32 BaO 0.46 SrO trace	100.27	
A1. I	.921	.179	.031	.029	.046	.064	.065	.068			.005	.004	—			
11	52.81	15.66	3.06	4.76	4.99	7.57	3.60	4.84	0.93	0.16	0.71	0.75	trace	SO_3 trace Cl 0.07 F trace BaO 0.24 SrO 0.09 Li_2O trace	100.24	
A1. I	.880	.152	.019	.066	.125	.135	.058	051			.009	.005	—			

ORDER 5. PERFELIC. GERMANARE—Continued.

RANG 2. DOPOTASSIC. CIMINOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
10	II″.5(6).2.2.	or 42.81 di 21.97 ab 2.10 ol 5.69 an 13.34 mt 3.25 ne 7.67 il 2.28 ap 0.67	San Martino, Vico Volcano, n. Viterbo, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 72, 1906.	Leucite tephrite.	
11	″II.5.(1)2.″2.	Q 3.36 hy 2.80 or 54.49 mt 11.60 ab 11.00 hm 2.56 an 5.84 C 5.30	Atatsch Mountain, South Ural Mountains, Russia.	J. Morozewicz.	J. Morozewicz, Mem. Com. G. Russ., XVIII, No. 1, p. 18, 1901.	Atatschite breccia.	Also in T. M. P. M., XXIII, p. 137, 1904.
12	II″.5″.2.2.	or 48.93 di 13.18 ab 4.72 ol 6.51 an 7.78 mt 6.96 ne 5.11 il 1.52 hm 2.08 ap 1.34	Gaussberg, Kaiser Wilhelm II Land, Antarctica.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II, (1), p. 81, 1906.	Leucite basalt.	

SUBRANG 3. SODIPOTASSIC. MONZONOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″II.″5.″2.3.	Q 7.44 di 4.21 or 35.03 hy 8.74 ab 33.01 mt 3.02 an 7.78	Rigaud Mountain, Quebec.	O. E. Le Roy.	O. E. Le Roy, B. G. S. A., XII, p. 386, 1901.	Hornblende syenite.	
2	II.″5.2.3″.	Q 6.72 di 3.16 or 24.46 hy 14.00 ab 31.96 mt 2.78 an 11.95 il 1.82 ap 0.34	Peninsula, Port Coldwell, Ontario.	F. H. Genth.	H. L. Kerr, Rep. Bur. Min. Ont., XIX (1), p. 220, 1910.	Laurvikite.	
3	″II.5.″2.3″.	Q 5.22 di 1.24 or 31.14 hy 7.33 ab 38.25 mt 3.48 an 7.23 il 1.82 ap 3.36	Pine Hill, West Quincy, Massachusetts.	C. H. Warren.	C. H. Warren, Pr. Am. Ac., XLIX, p. 271, 1913.	Rhomben porphyry.	
4	(I)II.(4)5.2.3.	Q 8.58 di 3.43 or 32.80 hy 5.04 ab 34.58 mt 4.41 an 11.12 il 0.15 ap 0.34	Long Lake, Adirondack Mountains, New York.	E. W. Morley.	H. P. Cushing, N. Y. St. Mus., A. R., LX (2), p. 521, 1907.	Syenite.	
5	(I)II.5.″2.3(4).	Q 4.02 di 6.55 or 30.02 hy 2.22 ab 44.54 mt 2.55 an 8.34 il 1.22	Pendleton, Oconee County, South Carolina.	Hardin and Robertson.	E. Sloan, S. C. G. S. (IV), B. 2, p. 178, 1908.	Granite.	
6	(I)II.(4)5.2.3(4).	Q 8.88 hy 3.30 or 28.36 mt 5.34 ab 40.35 il 2.28 an 8.34 hm 1.44 C 0.10 ap 0.67	Near Willard, Elliott County, Kentucky.	T. M. Chatard.	J. S. Diller, A. J. S., XXXII, p. 125, 1886.	Syenite.	Also in U.S.G.S. B. 38, p. 24, 1887. In W. T., p. 255.
7	II.″5.2.3″.	Q 6.60 di 10.10 or 26.69 hy 6.02 ab 36.68 mt 3.02 an 8.34 il 1.06 ap 0.67	Yogo Peak, Little Belt Mountains, Montana.	W. F. Hillebrand.	Weed and Pirsson, A. J. S., L, p. 471, 1895.	Syenite.	Also in U.S.G.S. A. R. 20, III, p. 473, 1900. In W. T., p. 255.
8	II(III).5.2.3.	or 25.02 di 18.81 ab 28.82 hy 1.80 an 11.12 ol 5.98 mt 4.87 il 1.52 ap 1.34	Yogo Peak, Little Belt Mountains, Montana.	W. F. Hillebrand.	Weed and Pirsson, A. J. S., L, p. 473, 1895.	Monzonite ("yogoite").	Also in U.S.G.S. A. R. 20, III, p. 478, 1900. In W. T., p. 255.
9	II(III).5.2(3).3.	or 22.80 di 14.36 ab 23.58 hy 6.95 an 14.18 ol 8.59 mt 3.94 il 1.06 ap 1.01	Sheep Creek, Little Belt Mountains, Montana.	W. F. Hillebrand.	L. V. Pirsson, U. S. G. S. A. R. 20, III, p. 531, 1900.	Augite minette.	In W. T., p. 255.
10	(I)II.5.2.3.	or 37.81 di 1.08 ab 34.06 hy 0.10 an 12.79 ol 2.80 mt 5.57 il 0.76 hm 1.12 ap 1.34	Aspen Creek, Highwood Mountains, Montana.	H. W. Foote.	L. V. Pirsson, U. S. G. S. B. 237, p. 134, 1905.	Gauteite.	In W. T., p. 255.
11	II(III).5.2.3.	or 28.36 di 16.74 ab 23.32 ol 6.83 an 11.95 mt 4.41 ne 3.83 il 1.37 ap 1.68	Beaver Creek, Bearpaw Mountains, Montana.	H. N. Stokes.	Weed and Pirsson, A. J. S., I, p. 357, 1896.	Monzonite.	In W. T., p. 255.

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. MONZONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
12	58.53	16.85	3.49	2.37	1.46	3.93	4.05	7.12	0.49	0.12	0.71	0.24	0.19	SO_3 0.04 BaO 0.10 SrO 0.14	99.83	
A1. I	.976	.165	.022	.033	.037	.070	.066	.076			.009	.002	.003			
13	51.65	13.89	2.70	4.80	11.56	4.07	2.99	4.15	1.89	1.30	0.55	0.21	0.15	SO_3 0.19 Cr_2O_3 0.08 BaO 0.19	100.37	
A1. I	.861	.136	.017	.067	.289	.073	.048	.044			.007	.001	.002			
14	57.29	18.45	4.38	1.20	2.08	3.57	4.43	5.43	2.01	0.17	0.72	0.46	trace	NiO 0.12	100.31	
A2. II	.955	.181	.027	.017	.052	.064	.071	.058			.009	.003	—			
15	52.33	18.70	4.95	1.83	2.69	4.71	4.51	5.45	2.71	0.74	0.71	0.81	0.03	NiO 0.14	100.31	
A2. II	.872	.183	.031	.025	.067	.084	.072	.059			.009	.006	—			
16	52.63	16.87	4.52	3.11	3.69	4.77	3.86	5.17	3.65		0.81	0.63	0.10	BaO 0.29	100.10	
A2. II	.877	.164	.028	.043	.092	.086	.062	.056			.010	.004	.001			
17	51.82	16.75	4.56	3.36	4.03	4.94	3.91	5.02	3.97		0.71	0.52	0.23	BaO 0.26	100.08	
A2. II	.864	.164	.029	.047	.101	.088	.063	.054			.009	.004	.003			
18	52.10	16.34	3.84	6.82	4.33	4.73	4.02	4.20	1.74		0.79	0.68	trace	SO_3 0.22 Cl 0.24 Li_2O 0.13	100.18	
A2. II	.868	.160	.024	.094	.108	.084	.065	.045			.010	.005	—			
19	51.46	18.32	4.61	2.71	2.91	6.03	4.11	4.48	3.89		0.83	0.86	0.17		100.38	
A2. II	.858	.180	.029	.038	.073	.108	.066	.048			.010	.006	.002			
20	59.79	17.25	3.60	1.59	1.24	3.77	5.04	5.05	0.39	0.19	0.67	0.35	0.20	CO_2 0.72 SO_3 0.04 Cl trace BaO 0.14 SrO 0.11 Li_2O trace	100.14	2.704
A1. I	.997	.170	.023	.022	.031	.068	.081	.055			.008	.002	.003			25°
21	57.48	18.04	5.73	0.73	1.17	5.03	4.28	4.15	0.55	0.62	1.00	0.66	trace	ZrO_2 0.04 SO_3 0.16 V_2O_3 0.02 BaO 0.20 SrO 0.12	99.96	
A1. I	.958	.176	.035	.010	.029	.089	.069	.044			.012	.005	—			
22	59.35	16.36	2.90	3.36	3.08	5.03	3.73	3.85	0.64	0.28	0.87	0.44	0.07	ZrO_2 0.03 SO_3 none Cl 0.05 FeS_2 0.02 Cr_2O_3 none BaO 0.16 SrO 0.05 Li_2O trace CuO 0.01 ZnO 0.01	100.29	
A1. I	.989	.160	.018	.047	.077	.089	.060	.041			.011	.003	.001			
23	57.16	16.69	3.47	2.76	2.47	5.86	3.82	4.49	1.06	0.83	0.87	0.41	trace	CO_2 none S 0.02 Cr_2O_3 trace BaO 0.30	100.21	
A1. I	.953	.164	.022	.039	.062	.105	.061	.048			.011	.003	—			
24	61.12	15.78	2.69	3.15	1.90	3.95	4.14	4.48	0.56	0.32	1.30	0.45	0.09	CO_2 0.22 ZrO_2 0.04 S 0.05 BaO 0.07 SrO 0.04	100.35	
A1. I	1.019	.155	.017	.044	.048	.071	.067	.048			.016	.003	.001			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 3. SODIPOTASSIC. MONZONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
12	″II.5.(1)2.3.	or 42.26 di 8.80 ab 33.01 ol 0.14 an 6.39 mt 5.10 ne 0.85 il 1.37 ap 0.67	Bradyville, Coeur d'Alene District, Idaho.	G. Steiger.	Ransome and Calkins, U. S. G. S. P. P. 62, p. 47, 1908.	Syenite.	
13	II(III).5.2″.3.	or 24.46 di 5.68 ab 25.15 hy 3.13 an 12.23 ol 20.71 mt 3.94 il 1.06 ap 0.34	Cottonwood Creek, Montana.	T. M. Chatard.	G. P. Merrill, Pr. U. S. Nat. Mus., XVII, p. 670, 1895.	Lamprophyre.	In W. T., p. 255.
14	(I)II.5.2.3.	Q 1.38 di 0.43 or 32.25 hy 5.00 ab 37.20 mt 1.86 an 14.46 il 1.37 hm 3.04 ap 1.01	Stinkingwater River, Yellowstone National Park.	W. H. Melville.	J. P. Iddings, J. G., III, p. 947, 1895.	Quartz banakite.	Also in U. S. G. S. Mon. 32 (II), p. 349, 1899. In W. T., p. 255.
15	″II.5.2.3.	or 32.80 di 2.59 ab 28.56 ol 3.85 an 14.46 mt 3.71 ne 4.97 il 1.37 hm 2.40 ap 2.02	Stinkingwater River, Yellowstone National Park.	W. H. Melville.	J. P. Iddings, J. G., III, p. 947, 1895.	Banakite.	Also in U. S. G. S. Mon. 32 (II), p. 349, 1899. In W. T., p. 257.
16	II.5.2.3.⊙	or 31.14 di 5.96 ab 30.39 ol 6.07 an 12.79 mt 6.50 ne 1.14 il 1.52 ap 1.34	Hoodoo Mountain, Yellowstone National Park.	L. G. Eakins.	J. P. Iddings, J. G., III, p. 927, 1895.	Banakite.	Also in U. S. G. S. Mon. 32 (II), p. 347, 1899. In W. T., p. 257.
17	II.5.2.3⊙	or 30.02 di 6.80 ab 28.30 ol 6.03 an 13.07 mt 6.73 ne 2.56 il 1.37 ap 1.01	Lamar River, Yellowstone National Park.	L. G. Eakins.	J. P. Iddings, J. G., III, p. 947, 1895.	Banakite.	Also in U. S. G. S. Mon. 32 (II), p. 349, 1899. In W. T., p. 257.
18	II.5.2.3″.	or 25.02 di 3.86 ab 34.06 ol 12.30 an 13.90 mt 5.57 il 1.52 ap 1.68	Indian Creek Laccolith, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U.S.G.S.Mon.32 (II), p. 83, 1899.	Andesite porphyry.	Upper part of sheet. Cf. No. 4, III.5.3.3. In W. T., p. 257.
19	II.5.2(3).3.	or 26.69 di 4.75 ab 30.92 ol 3.67 an 18.35 mt 6.73 ne 1.99 il 1.52 ap 2.02	Ishawooa Canyon, Wyoming.	L. G. Eakins.	J. P. Iddings, J. G., III, p. 947, 1895.	Banakite.	Also in U. S. G. S. Mon. 32 (II), p. 349, 1899. In W. T., p. 257.
20	(I)II.5.2.3(4).	Q 3.30 di 5.83 or 30.58 hy 0.40 ab 42.44 mt 3.94 an 9.45 il 1.22 hm 0.91 ap 0.67	Near Tirbircio Gulch, La Plata Mountains, Colorado.	H. N. Stokes.	W. Cross, U. S. G. S. Fol. 60, p. 6, 1899.	Syenite.	Fresh? In W. T., p. 257.
21	(I)II.″5.2(3).3(4).	Q 6.96 di 1.51 or 24.46 hy 2.20 ab 36.16 il 1.52 an 17.51 hm 5.73 tn 0.39 ap 1.68	Wicher Mountain, Pikes Peak, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 148, p. 163, 1897.	Pyroxene latite.	In W. T., p. 257.
22	II.(4)5.2(3).3″.	Q 8.94 di 4.45 or 22.80 hy 8.08 ab 31.44 mt 4.18 an 16.40 il 1.67 ap 1.01	Clayton Peak, Park City quadrangle, Utah.	W. F. Hillebrand.	J. M. Boutwell, U. S. G. S. P. P. 77, p. 79, 1912.	Quartz diorite.	
23	II.5.2″.3.	Q 4.86 di 8.77 or 26.69 hy 2.86 ab 31.96 mt 5.10 an 15.29 il 1.67 ap 1.01	Telegraph Mine, Bingham, Utah.	E. T. Allen.	J. M. Boutwell, U. S. G. S. P. P. 38, p. 178, 1905.	Porphyry.	
24	″II.(4)5.2.3″.	Q 10.08 di 4.67 or 26.69 hy 4.16 ab 35.11 mt 3.94 an 11.12 il 2.43 ap 1.01	Organ City, Organ Mountains, New Mexico.	G. Steiger.	Lindgren, Graton, and Gordon, U. S. G. S. P. P. 68, p. 68, 1910.	Quartz syenite.	

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. MONZONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
25	55.35	12.91	4.67	2.06	6.29	5.77	2.65	4.86	1.18	2.67	0.87	0.58	0.08	NiO 0.05 BaO 0.19 SrO trace Li_2O trace	99.98	
A1. I	.923	.126	.029	.029	.157	.103	.043	.052			.011	.004	.001			
26	57.48	14.09	5.21	1.35	3.49	6.05	3.00	4.69	1.37	1.20	0.94	0.65	0.09	NiO 0.08 BaO 0.23 SrO trace Li_2O none	99.92	
A1. I	.958	.138	.033	.019	.087	.108	.048	.050			.012	.005	.001			
27	57.04	13.66	4.96	1.77	4.43	6.23	3.08	4.95	1.10	1.11	0.94	0.63	0.17	NiO 0.07 BaO 0.22 SrO trace Li_2O trace	100.36	
A1. I	.951	.134	.031	.025	.111	.111	.050	.053			.012	.004	.002			
28	60.51	16.71	1.72	3.34	2.53	3.62	4.64	5.20	0.27	0.03	0.60	0.16	0.10	BaO 0.10 SrO 0.12	99.65	2.667
A2. II	1.009	.164	.009	.046	.063	.064	.075	.055			.008	.001	.001			
29	54.54	18.10	1.14	4.63	4.56	5.85	3.38	5.44	0.50	0.10	0.96	0.46	0.10	BaO 0.21 SrO 0.15	100.12	2.745
A2. II	.909	.177	.007	.064	.114	.105	.055	.057			.024	.003	.001			
30	53.68	16.89	1.28	5.53	3.70	6.08	4.03	4.32	1.85	0.10	0.90	1.05	0.11	BaO 0.38 SrO 0.10	100.00	2.723
A2. II	.895	.166	.008	.076	.093	.109	.065	.046			.011	.007	.002			
31	52.95	14.00	2.57	5.55	7.29	6.93	2.73	5.09	0.50	0.16	0.70	0.47	0.13	BaO 0.32 SrO 0.11	99.50	2.872
A2. II	.883	.137	.016	.077	.182	.123	.044	.054			.009	.003	.002			
32	52.43	19.18	3.51	2.08	2.61	3.71	4.85	5.95	3.19	0.27	0.86	0.42	trace	BaO 0.35 SrO 0.42	99.83	
A2. II	.874	.188	.022	.029	.065	.066	.078	.064			.011	.003				
33	52.38	15.29	2.99	5.53	5.84	7.30	3.68	3.84	0.63	0.21	1.10	0.75	0.10	BaO 0.25 SrO 0.15	100.04	2.847
A2. II	.873	.150	.019	.076	.146	.130	.060	.041			.014	.005	.001			
34	57.32	17.27	1.62	3.94	2.68	4.24	4.52	5.96	0.47	0.08	0.88	0.51	0.09	BaO 0.24 SrO 0.06	99.88	
A1. I	.955	.169	.010	.055	.048	.076	.073	.064			.011	.004	.001			
35	55.90	15.52	1.22	5.22	4.70	5.79	2.89	4.45	1.40	0.60	0.90	0.46	0.08	CO_2 0.14 SrO 0.09	99.36	
A2. II	.932	.152	.008	.072	.118	.104	.047	.048			.011	.003	.001			
36	54.49	16.51	2.79	5.20	3.55	7.06	3.50	4.36	1.18	0.07	0.70	0.20	0.10	CO_2 0.10 S 0.23	100.04	
A2. II	.908	.162	.018	.072	.089	.126	.056	.046			.009	.001	.001			
37	59.43	16.68	2.54	3.48	1.84	4.09	3.72	5.04	0.72	0.27	1.38	0.58	trace	ZrO_2 0.08 BaO 0.14 SrO trace Li_2O none	100.04	2.61
A1. I	.991	.164	.015	.049	.046	.073	.060	.053			.017	.004	——			
38	58.18	18.46	2.31	3.79	1.99	3.11	3.70	6.58	0.64		0.68	0.41		BaO 0.29	100.14	2.777
A2. II	.970	.181	.014	.053	.050	.055	.060	.070			.009	.003				
39	58.22	19.60	0.59	5.19	1.02	3.37	3.64	5.83	0.84	0.14	0.96	0.58	0.19	S none NiO none BaO 0.04 Li_2O none	100.21	
A1. I	.970	.192	.004	.072	.026	.061	.059	.062			.012	.004	.003			

ORDER 5. PERFELIC. GERMANARE—Continued.

SURANG 3. SODIPOTASSIC. MONZONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
25	II″.″5.2.3.	Q 4.50 di 12.74 or 28.91 hy 9.80 ab 22.53 mt 4.41 an 8.62 il 1.67 hm 1.60 ap 1.34	Santa Maria Basin, Arizona.	W. F. Hillebrand.	J. P. Iddings, B. Phil. Soc. Wash., XII, p. 212, 1892.	Mica basalt.	In W. T., p. 257.
26	II.(4)5.2.3.	Q 9.12 di 11.02 or 27.80 hy 3.60 ab 25.15 mt 1.86 an 11.12 il 1.82 hm 4.00 ap 1.68	Santa Maria Basin, Arizona.	W. F. Hillebrand.	J. P. Iddings, B. Phil. Soc. Wash., XII, p. 212, 1892.	Mica basalt.	In W. T., p. 257.
27	II.″5.2.3.	Q 5.46 di 14.04 or 29.47 hy 4.60 ab 26.20 mt 3.48 an 9.17 il 1.82 hm 2.56 ap 1.34	Santa Maria Basin, Arizona.	W. F. Hillebrand.	J. P. Iddings, B. Phil. Soc. Wash., XII, p. 212, 1892.	Mica basalt.	In W. T., p. 257.
28	″II.5.2.3″.	Q 2.34 di 5.85 or 30.58 hy 7.54 ab 39.30 mt 2.09 an 9.45 il 1.22 ap 0.34	Monument 169, Rossland Mountains, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38 (1), p. 364, 1912.	Syenite porphyry.	
29	II.5.2″.3.	or 31.69 di 8.93 ab 27.77 ol 8.36 an 15.29 mt 1.62 ne 0.57 il 3.65 ap 1.01	Stony Creek, Rossland Mountains, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38 (1), p. 325, 1912.	Augite latite.	
30	II.5.2″.3″.	or 25.58 di 7.76 ab 32.49 ol 10.43 an 15.29 mt 1.86 ne 0.85 il 1.67 ap 2.35	Columbia River, Rossland Mountains, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38 (1), p. 310, 1912.	Hornblende minette.	
31	II(III).5.2.3.	or 30.02 di 17.00 ab 20.96 ol 12.35 an 10.84 mt 3.71 ne 1.14 il 1.37 ap 1.01	Christina Lake, Rossland Mountains, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38 (1), p. 357, 1912.	Olivine syenite.	
32	(I)II.5(6).2.3.	or 35.58 di 3.46 ab 24.10 ol 3.43 an 12.79 mt 4.18 ne 9.09 il 1.67 hm 0.64 ap 1.01	Rock Creek Chonolith, Midway Mountains, British Columbia.	M. Dittrich.	R. A. Daly, Can. G. S. Mem. 38 (1), p. 409, 1912.	Rhomben porphyry.	Border of mass. Cf. No. 6, II.6.2.3.
33	II″.5.2″.3″.	or 22.80 di 17.43 ab 24.63 ol 8.67 an 13.62 mt 4.41 ne 3.69 il 2.13 ap 0.34	Coryell Batholith, West Kootenai District, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38 (1), p. 361, 1912.	Monzonite.	
34	″II.5.2.3.	or 35.58 di 7.12 ab 35.63 ol 4.34 an 8.90 mt 2.32 ne 1.42 il 1.67 ap 1.34	Phoenix, British Columbia.	M. F. Connor.	O. E. Le Roy, Can. G. S. Mem. 21, p. 51, 1912.	Pulaskite porphyry.	
35	II.5.2(3).3.	Q 2.34 di 8.31 or 26.69 hy 14.84 ab 24.63 mt 1.86 an 15.85 il 1.67 ap 1.01	Phoenix, British Columbia.	M. F. Connor.	O. E. Le Roy, Can. G. S. Mem. 19, p. 28, 1913.	Augite porphyrite.	
36	II.5.2(3).3.	or 25.58 di 14.28 ab 29.34 hy 3.12 an 16.68 ol 3.56 mt 4.18 il 1.37 ap 0.34	Le Roi Mine, Rossland, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38, (I), p. 343, 1912.	Monzonite.	
37	(I)II.(4)5.2.3.	Q 8.34 di 2.00 or 29.47 hy 5.88 ab 31.44 mt 3.48 an 14.18 il 2.58 ap 1.34	Dardanelle Flow, Tuolumne County, California.	H. N. Stokes.	F. L. Ransome, U. S. G. S. B. 89, p. 58, 1898.	Augite latite.	Also in A. J. S., V, p. 58, 1898. In W. T., p. 257.
38	(I)II.5.2.3.	Q 1.20 hy 8.96 or 38.92 mt 3.25 ab 31.44 il 1.37 an 12.51 ap 1.01 C 0.61	Tito, Coquimbo, Chile.	A. Lindner.	F. v. Wolff, Z. D. G. G., LI, p. 531, 1899.	Odinite.	In W. T., p. 257.
39	(I)II.5.2.3.	Q 3.78 hy 10.39 or 34.47 mt 0.93 ab 30.92 il 1.82 an 13.34 ap 1.34 C 2.35	Ordiquhill, n. Huntley, Aberdeenshire, Scotland.	E. G. Radley.	J. J. H. Teall, G. S. G. Br., Sum. Prog. (1913), p. 83, 1914.	Quartz monzonite.	

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. MONZONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
40	56.4	19.0	3.5	4.8	1.5	2.6	4.5	5.0	2.6						99.9	
B3. IV	.940	.186	.022	.067	.038	.046	.073	.053								
41	52.85	16.55	4.12	2.22	3.01	6.20	4.27	4.25	1.54	0.23	2.30	1.07		SO_3 trace Cl 0.77	99.38	
B2. III	.881	.162	.026	.031	.075	.111	.069	.046			.029	.008				
42	50.98	16.13	4.20	3.24	7.28	5.50	2.99	4.82	1.46	0.44	1.25	0.74	0.17	CO_2 0.58 Cl 0.07 FeS_2 0.43 Cr_2O_3 trace V_2O_3 trace NiO trace BaO 0.20 SrO trace	100.48	
A1. I	.850	.158	.026	.045	.182	.098	.048	.052			.016	.005	.002			
43	58.00	16.91	3.29	3.74	1.96	3.60	5.14	5.20	0.60		0.85		0.80		100.09	
A2. II	.967	.166	.021	.052	.049	.064	.083	.055			.011		.011			
44	57.38	17.93	6.05	0.75	1.91	5.14	4.38	6.38	n. d.		0.26	0.18			100.36	
A2. II	.956	.176	.038	.010	.048	.092	.071	.068			.003	.001				
45	58.41	17.01	3.44	2.61	2.95	4.29	4.39	4.23	1.59		0.98	0.40		CO_2 0.29 SO_3 0.11	100.70	2.729
A2. II	.974	.167	.022	.036	.074	.077	.071	.045			.012	.003				
46	59.86	16.68	2.79	3.00	3.51	3.96	3.58	4.30	1.44		0.75				99.87	
A3. III	.981	.164	.018	.042	.088	.071	.058	.046			.010					
47	59.52	13.65	0.21	5.33	5.11	5.12	2.58	6.26	1.66		trace	0.22	0.96		100.62	2.764
A2. II	.992	.134	.001	.074	.128	.091	.042	.067			—	.002	.013			
48	58.69	13.91	2.41	3.94	6.63	3.41	2.62	4.53	2.69		0.83	0.30			99.96	
A2. II	.978	.136	.015	.055	.166	.061	.042	.048			.010	.002				
49	57.76	17.03	2.05	2.39	2.27	4.16	4.24	7.13	0.62	0.42	1.08	0.47			99.62	2.68
A2. II	.963	.167	.013	.033	.057	.074	.068	.076			.014	.003				15°
50	52.53	17.11	6.96	1.70	2.10	3.10	3.58	7.85	2.48	0.41	1.92	trace	0.31	SO_3 0.41 Cl trace	100.46	2.661
A2. II	.876	.168	.044	.024	.053	.055	.058	.084			.024	—	.004			15°
51	54.64	17.13	6.79	1.17	3.00	3.28	4.43	6.29	2.00		1.47	0.42		SO_3 0.13	100.75	2.720
A2. II	.911	.168	.042	.017	.075	.059	.071	.067			.018	.003				
52	53.92	16.60	6.87	0.99	4.26	3.54	3.22	7.45	2.15		1.08	0.62			100.83	2.709
A2. II	.899	.163	.043	.014	.107	.063	.051	.080			.013	.004				
53	62.49	16.49	2.36	2.04	1.87	4.23	4.38	4.65	0.32	0.28	0.85	0.32		CO_2 none ZrO_2 none SO_3 none BaO 0.15 SrO trace	100.48	
A1. I	1.042	.162	.015	.028	.047	.075	.071	.050			.011	.002				
54	58.70	17.09	3.17	2.29	2.41	4.71	4.38	4.35	0.89	0.23	0.95	0.23		CO_2 none	99.40	
A2. II	.978	.168	.020	.032	.060	.084	.071	.047			.012	.002				

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 3. SODIPOTASSIC. MONZONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
40	(I)II.5.2.3″.	Q 0.54, or 29.47, ab 38.25, an 12.79, C 1.43, hy 9.74, mt 5.10	Dunans, Cowal, Argyllshire, Scotland.	J. H. Player.	C. T. Clough, G. S. Scot. Mem. Cowal, p. 170, 1897.	Trachyte.	Not in W. T.
41	II.5.2″.3″.	Q 2.40, or 25.58, ab 30.39, an 16.12, hl 1.29, di 5.62, hy 4.90, mt 0.46, il 4.41, hm 3.84, ap 2.69	Ledbeg, Assynt, Scotland.	A. Gemmell.	A. Gemmell, Tr. Edin. G. Soc., IX (5), p. 418, 1910.	Assyntite.	Augite-sodalite syenite.
42	II.5.2(3).3.	or 28.91, ab 25.15, an 16.12, di 1.94, hy 5.43, ol 8.81, mt 6.03, il 2.43, ap 1.68	Pentire, Newquay, Cornwall.	W. Pollard.	J. S. Flett, G. S. Eng. Mem. Sh. 346, p. 61, 1906.	Mica trap.	
43	″II.5.2.3(4).	or 30.58, ab 41.92, an 7.78, ne 0.85, di 8.23, ol 3.62, mt 4.87, il 1.67	Tuft, Lougendal, Norway.	V. Schmelck.	W. C. Brögger, Eg. Kg., II, p. 33, 1895.	Akerite.	In W. T., p. 257.
44	″II.5.2.3.	or 37.81, ab 30.39, an 10.29, ne 3.69, di 10.37, wo 0.46, mt 1.62, il 0.46, hm 4.96, ap 0.34	Remscheid, Siebengebirge.	Greiffenberg (student).	H. Lasheyres, D. Siebengebirge, p. 320, 1901.	Trachyte.	Cf. No. 11, II.5.1.3.
45	″II.5.2.3(4).	Q 5.04, or 25.02, ab 37.20, an 14.18, di 3.46, hy 6.06, mt 5.10, il 1.82, ap 1.01	Nahethal, Rhenish Prussia.	Hampe.	H. Loretz, Jb. Pr. G. L.-A., IX, p. 300, 1889.	Porphyrite.	In W. T., p. 257.
46	″II.(4)5.2(3).3.	Q 7.44, or 25.58, ab 30.39, an 16.68, di 2.44, hy 9.48, mt 4.18, il 1.52	Büchereck, n. Farrenkopf, Baden.	M. Dittrich.	A. Sauer, Erl. G. Kt. Bad., Bl. Hornberg, p. 27, 1897.	Syenite.	In W. T., p. 259.
47	II″.5.2.(2)3.	Q 0.24, or 37.25, ab 22.01, an 6.95, di 13.73, hy 18.70, mt 0.23, ap 0.67	Heuelgraben, Wehrathal, Schwarzwald.	O. H. Erdmannsdoerfer.	O. H. Erdmannsdoerfer, Mt. Bad. G. L.-A., IV (2), p. 183, 1901.	Minette.	
48	II.(4)5.2″.3.	Q 8.46, or 26.69, ab 22.01, an 12.79, di 2.00, hy 19.60, mt 3.48, il 1.52, ap 0.67	Frohnau, n. Hausach, Baden.	M. Dittrich.	A. Sauer, Erl. G. Kt. Bad., Bl. Hornberg, p. 27, 1897.	Mica syenite.	In W. T., p. 259.
49	″II.5.(1)2.3.	or 42.26, ab 30.39, an 6.39, ne 2.84, di 8.96, ol 1.63, mt 3.02, il 2.13, ap 1.01	Michelsberg, Katzenbuckel, Odenwald.	W. Freudenberg.	W. Freudenberg, Mt. Bad. G. L.-A., V (1), p. 277, 1907.	Augite syenite.	Inclusion in shonkinite.
50	II.5″.(1)2.(2)3.	or 46.70, ab 17.55, an 7.23, ne 6.96, di 6.26, ol 1.68, mt 0.93, il 3.65, hm 6.40	Michelsberg, Katzenbuckel, Odenwald.	W. Freudenberg.	W. Freudenberg, Mt. Bad. G. L.-A., V (1), p. 277, 1907.	Syenite.	Border facies of shonkinite.
51	″II.5.2.3.	or 37.25, ab 31.44, an 8.34, ne 3.12, di 4.10, ol 3.92, il 2.58, hm 6.79, ap 1.01	Langewiesen, Ilmenau, Thuringia.	Fischer.	H. Loretz, Jb. Pr. G. L.-A., XIII, p. 135, (1892), 1893.	Porphyrite.	In W. T., p. 259.
52	II.5.2.(2)3.	or 44.48, ab 24.63, an 8.90, ne 1.14, di 1.73, ol 6.93, mt 0.23, il 3.02, hm 6.38	Langewiesen, Ilmenau, Thuringia.	Hesse.	H. Loretz, Jb. Pr. G. L.-A., XIII, p. 135, (1892), 1893.	Porphyrite.	In W. T., p. 259.
53	(I)II.(4)5.2.3″.	Q 9.48, or 27.80, ab 37.20, an 11.40, di 5.86, hy 2.23, il 1.67, ap 0.72	Plauen, n. Dresden, Saxony.	H. S. Washington.	H. S. Washington, A. J. S., XXII, p. 132, 1906.	Syenite.	
54	″II.5.2.3(4).	Q 4.98, or 26.13, ab 37.20, an 13.90, di 5.83, hy 3.30, mt 4.64, il 1.82, ap 0.67	Plauen, n. Dresden, Saxony.	H. S. Washington.	H. S. Washington, A. J. S., XXII, p. 132, 1906.	Syenite.	Not same specimen as No. 53.

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. MONZONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
55	55.35	16.71	3.34	6.31	2.04	3.70	3.29	5.69	3.26			trace	trace		99.69	2.74
A3. III	.923	.164	.021	.088	.051	.066	.053	.061				—	—			
56	50.10	17.41	4.56	9.45	2.16	2.49	3.82	6.01	2.56		0.17	0.57			99.30	
B2. III	.835	.171	.029	.132	.054	.045	.061	.064			.002	.004				
57	54.71	19.42	3.21	1.50	2.08	4.45	4.53	6.47	2.62		0.73	0.32	0.42	CO_2 0.53	100.99	
A2. II	.912	.190	.020	.021	.052	.080	.073	.069			.009	.002	.006			
58	58.12	14.62	2.56	4.70	5.94	4.34	3.11	4.67	1.50			0.68	0.08		100.32	
A2. II	.969	.143	.016	.065	.149	.078	.050	.050				.005	.001			
59	56.27	16.24	4.31	2.31	2.61	6.27	4.07	4.61	1.78		0.83	0.19		CO_2 0.35	99.84	2.65
A2. II	.938	.159	.027	.032	.065	.113	.066	.049			.010	.001				
60	55.05	16.32	4.02	2.46	2.72	6.48	3.88	4.55	2.60		0.96	0.38	trace	CO_2 trace	99.42	2.91
A2. II	.918	.160	.025	.034	.068	.116	.063	.049			.012	.003	—			
61	58.38	16.24	1.63	4.85	2.41	4.57	3.98	5.36	0.89		1.01	0.20	0.18	ZrO_2 0.38	100.08	
A2. II	.973	.159	.010	.068	.060	.082	.065	.057			.013	.001	.003			
62	55.52	17.98	3.82	3.74	1.90	5.28	3.86	5.90	0.77		0.81	0.34	0.10		100.02	
A2. II	.925	.176	.024	.051	.048	.095	.063	.063			.010	.002	.001			
63	54.20	15.73	3.67	5.40	3.40	8.50	3.07	4.42	0.50		0.40	0.50	0.70		100.50	
A2. II	.903	.154	.023	.075	.085	.151	.050	.047			.005	.004	.010			
64	52.64	14.96	4.44	5.63	3.92	7.82	3.82	3.98	1.17		1.10	0.27	0.22		99.97	
A2. II	.877	.147	.028	.078	.098	.139	.061	.043			.014	.002	.003			
65	62.55	13.73	0.89	3.55	4.34	3.86	3.38	5.53	1.10		1.01				99.94	2.74
A3. III	1.043	.135	.006	.050	.109	.069	.055	.059			.013					
66	61.82	15.31	1.21	2.47	4.12	3.85	3.71	4.75	1.72	0.11	0.70				99.77	2.74
A3. III	1.030	.150	.008	.035	.103	.069	.060	.051			.009					
67	56.97	13.51	1.78	4.38	6.04	5.72	3.54	4.44	2.08	0.10	1.06				99.62	2.78
A3. III	.950	.132	.011	.061	.151	.102	.057	.047			.013					
68	56.95	18.08	2.56	1.40	3.03	4.61	4.58	5.73	0.74	0.15	1.30	0.80			99.81	2.75
A2. II	.949	.177	.015	.019	.076	.082	.074	.061			.016	.006				

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 3. SODIPOTASSIC. MONZONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
55	II.5.2.3.⊙	Q 0.30 di 3.75 or 33.92 hy 12.06 ab 27.77 mt 4.87 an 13.90	Neudeck, Silesia.	H. Traube.	H. Traube, N. J., 1890, I, p. 225.	Mica syenite.	In W. T., p. 259.
56	II.5.2.3.⊙	or 35.58 ol 14.08 ab 25.68 mt 6.73 an 8.90 il 0.30 ne 3.41 ap 1.34 C 1.43	Striegau, Silesia.	F. Riegner.	F. Riegner, In Diss. Bres., p. 33, 1909.	Schliere in granite.	Cf. No. 182, I.4.1.3. and No. 270, I.4.2.3.
57	(I)II.5″.2.3.	or 38.36 di 5.40 ab 25.15 ol 3.32 an 13.34 mt 4.18 ne 7.10 il 1.37 hm 0.32 ap 0.67	Pihlberg, Polzen District, North Bohemia.	K. H. Scheumann.	K. H. Scheumann, Abh. Säch. Ges. W., XXXII, p. 757, 1913.	Gauteite.	
58	II.5.2.3.⊙	Q 3.96 di 4.05 or 27.80 hy 19.54 ab 26.20 mt 3.71 an 11.95 ap 1.68	Rzikoin, Moravia, Austria.	C. v. John.	V. John and Suess, Jb. G. R.-A., Wien, LVIII, p. 262, 1908.	Granitite.	
59	II. 5.2.3″.	Q 1.80 di 14.04 or 27.24 mt 5.10 ab 34.58 il 1.52 an 12.23 hm 0.80 ap 0.34	Verdnik, Fruska Gora, Hungary.	B. Mauritz.	B. Mauritz, F. K., XLIII, p. 368, 1913.	Trachyte.	
60	II.5.2.3″.	Q 1.44 di 12.53 or 27.24 hy 1.00 ab 33.01 mt 5.10 an 13.34 il 1.82 hm 0.48 ap 1.01	Ledincze, Fruska Gora, Hungary.	B. Mauritz.	B. Mauritz, F. K., XLIII, p. 369, 1913.	Trachyte.	
61	II.5.2.3.⊙	Q 1.02 di 9.68 or 31.69 hy 7.53 ab 34.06 mt 2.32 an 10.29 il 1.98 ap 0.34	Val Caligore, Monte Mulatto, Predazzo. Tyrol.	M. Dittrich.	J. Romberg, Anh. Abh. Pr. Ak. W., 1904, p. 46.	Quartz monzonite.	
62	″II.5.2.3.	or 35.03 di 8.53 ab 30.39 ol 2.22 an 13.90 mt 5.57 ne 1.42 il 1.52 ap 0.67	La Forcella, Predazzo, Tyrol.	M. Dittrich.	J. Romberg, Anh. Abh. Pr. Ak. W., 1904, p. 78.	Gauteite.	
63	II″.5.2(3).3.	or 26.13 di 18.56 ab 26.20 hy 3.28 an 15.85 ol 2.62 mt 5.34 il 0.76 ap 1.34	Monzoni, Tyrol.	V. Schmelck.	W. C. Brögger, Eg. Kg., II, p. 24, 1895.	Monzonite.	In W. T., p. 259.
64	II″.5.2.″3.	or 23.91 di 20.02 ab 27.25 ol 3.81 an 11.95 mt 6.50 ne 2.56 il 2.13 ap 0.67	Monte Mulatto, Predazzo, Tyrol.	M. Dittrich.	J. Romberg, Anh. Abh. Pr. Ak. W., 1904, p. 31.	Monzonite.	
65	II.(4)5.(1)2.3.	Q 7.74 di 10.72 or 32.80 hy 9.84 ab 28.82 mt 1.39 an 5.84 il 1.98	Piz Tgietschen, Punteglia District, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Granite-syenite.	
66	II.(4)5.2.3.	Q 8.10 di 6.61 or 28.36 hy 9.55 ab 31.44 mt 1.86 an 10.84 il 1.37	Piz Tgietschen, Punteglia District, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Syenite porphyry.	
67	II″.5.2.3.	Q 0.48 di 16.46 or 26.13 hy 12.10 ab 29.87 mt 2.55 an 7.78 il 1.98	Piz Tgietschen, Punteglia District, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Diorite.	Dike.
68	(I)II.5.2.3.	or 33.92 di 4.32 ab 38.77 hy 1.40 an 11.68 ol 2.94 mt 0.70 il 2.43 hm 1.82 ap 1.92	Piz Tgietschen, Punteglia District, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Biotite syenite.	

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. MONZONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
69	51.48	16.24	2.69	4.70	7.97	4.41	3.25	5.75	2.32	0.20	0.82	0.40			100.23	2.84
A2. II	.858	.159	.017	.065	.199	.079	.053	.062			.010	.003				
70	58.24	16.14	3.45	2.92	3.28	4.58	4.18	4.03	1.75	0.20	1.31				100.08	2.82
A3. III	.971	.158	.022	.040	.082	.082	.068	.043			.016					
71	52.56	13.37	6.70	0.76	8.53	6.14	3.24	4.62	2.39	0.12	1.56				99.99	2.82
A3. III	.876	.131	.042	.011	.213	.109	.052	.049			.020					
72	54.98	14.10	2.27	4.24	5.74	6.76	3.79	3.94	1.92	0.05	1.32	0.72			99.83	2.81
A2. II	.916	.138	.014	.059	.144	.121	.061	.041			.017	.005				
73	53.10	15.52	2.07	6.11	6.87	5.73	3.57	3.63	2.40	0.10	1.26	0.24			100.60	2.85
A2. II	.885	.152	.013	.085	.172	.102	.058	.038			.016	.002				
74	54.42	12.84	3.04	6.92	3.90	6.33	3.38	5.00	2.03	0.16	2.74				100.72	2.91
A3. III	.907	.126	.019	.096	.098	.113	.055	.053			.034					
75	56.35	13.09	3.77	4.32	5.56	6.57	3.95	3.82	0.90	0.09	1.31				99.73	2.87
A3. III	.939	.128	.024	.060	.139	.118	.064	.040			.016					
76	52.77	16.15	3.85	5.27	7.14	2.20	3.93	5.43	1.51	0.21	1.21				99.67	2.76
A3. III	.880	.158	.024	.074	.179	.039	.063	.057			.015					
77	61.10	15.70	0.71	5.33	2.16	5.64	4.13	4.68	0.81						100.26	
A3. III	1.018	.154	.004	.074	.054	.101	.066	.050								
78	55.10	17.68	2.50	4.58	3.38	7.45	3.74	5.14	0.82						100.39	2.73
A3. III	.918	.173	.016	.064	.085	.133	.060	.054								
79	55.22	18.43	2.02	3.10	2.75	5.70	3.50	7.58	0.46	0.29	0.87	0.21		CO_2 none ZrO_2 0.10 SO_3 0.11 BaO 0.07	100.41	
A1. I	.920	.181	.013	.043	.069	.102	.056	.081			.011	.002				
80	56.74	18.74	3.84	2.87	2.00	4.63	4.36	7.18	0.44				trace	Cl 0.22	101.02	
B3. IV	.946	.184	.024	.040	.050	.082	.070	.017					——			
81	56.27	18.67	5.74	1.58	1.44	4.47	4.65	5.03	1.77					Cl trace	99.62	
A3. III	.938	.183	.036	.022	.036	.080	.075	.053								
82	55.52	18.60	2.70	2.45	2.46	4.58	4.07	6.67	1.43	0.47	0.80	0.71	trace	Cl 0.33	100.79	
A2. II	.925	.182	.017	.034	.062	.082	.066	.071			.010	.005	——			
83	55.23	19.61	4.33	2.97	2.25	5.32	3.98	6.25	0.24					Cl 0.74	100.49	
A3. III	.921	.192	.027	.042	.046	.095	.065	.067								

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 3. SODIPOTASSIC. MONZONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
69	II.5′′.2.3.	or 34.47, ab 17.82, an 12.23, ne 5.40, di 5.53, ol 15.93, mt 3.94, il 1.52, ap 1.01	Piz Tgietschen, Punteglia District, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Augite porphyrite.	
70	II.′′5.2.3(4).	Q 5.52, or 23.91, ab 35.63, an 13.07, di 7.59, hy 4.93, mt 5.10, il 2.43	Crap Grönd, Punteglia District, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Diorite porphyry.	Center of dike, Cf. No. 83, II.5.2.4.
71	II(III).5.2.3.	or 27.24, ab 25.68, an 8.34, ne 0.85, di 15.12, ol 10.01, il 1.67, hm 6.70, pf 1.22	Crap Grönd, Punteglia District, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Augite minette.	
72	II′′.5.2.3(4).	or 22.80, ab 31.96, an 10.01, di 15.04, hy 9.25, ol 1.22, mt 3.25, il 2.58, ap 1.68	Punteglia Glacier, Punteglia District, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Luciite?	Moraine block.
73	II′′.5.2(3).3(4).	or 21.13, ab 30.39, an 15.57, di 8.74, hy 5.28, ol 10.89, mt 3.02, il 2.43, ap 0.67	W. of Clavadi, Punteglia District, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Spessartite.	
74	II(III).5.′′2.3.	or 29.47, ab 28.82, an 5.00, di 21.45, hy 2.19, ol 2.08, mt 4.41, il 5.17	Val Roseg, Bernina District, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Monzonitic syenite.	
75	II(III).5.2.3(4).	Q 0.84, or 22.24, ab 33.54, an 6.67, di 20.68, hy 6.76, mt 5.57, il 2.43	Lucendro Lake, St. Gotthard, Switzerland.	P. Waindziok.	P. Waindziok, In. Diss. Zür., p. 37, 1906.	Spessartite.	
76	II.5.2.3.⊙	or 31.69, ab 29.87, an 10.56, ne 1.70, di 0.22, ol 16.03, mt 5.57, il 2.28	Lucendro Lake, St. Gotthard, Switzerland.	P. Waindziok.	P. Waindziok, In. Diss. Zür., p. 35, 1906.	Minette-kersantite.	
77	II.5.2.3′′.	Q 3.54, or 27.80, ab 34.58, an 10.56, di 14.76, hy 7.19, mt 0.93	Montecchio, n. Bagnaia, Cimino Volcano, Italy.	G. Aichino.	V. Sabatini, Vulc. Cim., p. 506, 1912.	"Oligolabradorite" (vulsinite).	
78	II.5.2′′.3.	or 30.02, ab 23.32, an 16.40, ne 4.40, di 16.84, ol 4.80, mt 3.71	Convento S. Angelo, Vico Volcano, n. Viterbo, Italy.	G. Aichino.	V. Sabatini, Vulc. Cim., p. 506, 1912.	Leucite tephrite.	
79	II.5(6).2.′′3.	or 45.04, ab 14.93, an 12.23, ne 7.81, di 11.37, ol 2.85, mt 3.02, il 1.67, ap 0.67	Poggio Cavaliere, Vico Volcano, n. Viterbo, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 75, 1906.	Vulsinite.	
80	′′II.5(6).2.3.	or 42.81, ab 22.01, an 10.29, ne 7.95, di 10.07, ol 1.63, mt 5.57	Concola, Fondo Riccio, Phlegrean Fields, Italy.	E. Manasse.	C. de Stefani, Pet. Mt. Ergh., No. 156, p. 162, 1907.	Trachyte.	Lapilli.
81	(I)II.5.2.′′3.	or 29.47, ab 39.30, an 15.29, di 5.40, hy 0.90, ol 0.14, mt 5.10, hm 2.24	Concola, Fondo Riccio, Phlegrean Fields, Italy.	E. Manasse.	C. de Stefani, Pet. Mt. Ergh., No. 156, p. 162, 1907.	Trachyte.	Pumice.
82	(I)II.5.2.3.	or 39.48, ab 27.77, an 12.51, ne 3.69, di 4.38, ol 3.59, mt 3.94, il 1.52, ap 1.68	Santa Teresa Volcano, Phlegrean Fields, Italy.	F. S. Starrabba.	F. S. Starrabba, Att. Ac. Sc. Nap. (2), XIV, No. 7, p. 7, 1910.	Andesite.	Scoria from tuff.
83	′′II.5.2.3.	or 37.25, ab 26.98, an 16.68, ne 0.99, hl 1.17, di 7.85, ol 2.01, mt 6.26	Mascaglione, Phlegrean Fields, Italy.	E. Manasse.	C. de Stefani, Pet. Mt. Ergh., No. 156, p. 162, 1907.	Trachyte.	Lapilli.

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. MONZONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
84	54.72	19.60	2.45	3.09	1.90	5.00	3.52	6.87	2.08		0.65	trace		Cl 0.05	99.93	
A2. II	.912	.192	.015	.043	.048	.089	.056	.073			.008	—				
85	56.75	18.03	2.22	3.04	2.02	4.68	4.85	5.92	0.18		1.24	0.34	trace	Cl 0.11	99.38	
A2. II	.946	.177	.014	.042	.051	.084	.078	.063			.016	.002	—			
86	58.40	17.94	5.02	1.42	0.95	6.23	3.64	4.68	1.89		0.41	trace	0.40		100.98	
A2. II	.973	.176	.031	.019	.024	.111	.059	.050			.008	—	.006			
87	52.35	19.34	8.39	2.57	1.26	2.12	3.07	7.72	1.76				0.13	S 0.20 Insol. 0.33	99.24	
B3. IV	.873	.190	.053	.036	.032	.038	.050	.082					.002			
88	52.80	19.99	3.63	3.40	3.20	4.22	3.10	7.74	1.18		1.00	0.70			100.96	
A2. II	.880	.196	.023	.047	.080	.075	.050	.082			.013	.005				
89	59.64	17.09	2.45	3.21	1.66	3.88	3.52	5.88	1.24	0.43	0.42	0.47	0.21	CO_2 0.47 ZrO_2 none SO_3 none Cl trace Cr_2O_3 none V_2O_3 0.01 NiO 0.04 BaO 0.10 SrO trace Li_2O trace CuO 0.01	100.73	2.698
A1. I	.994	.167	.015	.044	.041	.069	.057	.062			.005	.003	.003			
90	58.82	14.78	3.90	3.24	2.26	3.09	4.67	4.70	1.36	0.81	1.78	0.58	0.23	CO_2 0.05 ZrO_2 none SO_3 none Cl trace Cr_2O_3 none V_2O_3 0.02 NiO 0.02 BaO 0.12 SrO trace Li_2O none Cu trace	100.43	2.707
A1. I	.980	.145	.024	.044	.056	.055	.076	.050			.023	.004	.003			
91	58.95	17.04	2.80	4.66	0.57	2.49	4.51	6.39	1.28	0.59	0.76	none	0.05	CO_2 0.06 ZrO_2 0.17 SO_3 trace Cl trace F none NiO 0.01 BaO none SrO none	100.33	
A1. I	.983	.167	.018	.065	.014	.045	.073	.068			.010	—	—			
92	58.32	18.04	3.27	4.28	0.58	2.52	4.52	6.21	0.95	0.35	1.25		0.06	NiO trace BaO none SrO none	100.35	
A2. II	.972	.177	.020	.060	.015	.045	.073	.066			.016		.001			
93	51.07	17.52	4.10	5.40	2.27	5.44	3.31	5.53	2.50	1.02	0.80	0.88	0.03	CO_2 0.17 ZrO_2 none SO_3 none Cl trace Cr_2O_3 none V_2O_3 0.07 NiO trace BaO 0.14 SrO trace Li_2O trace	100.25	2.698
A1. I	.851	.172	.026	.075	.057	.097	.053	.059			.010	.006	—			
94	54.50	17.81	1.70	5.30	1.09	2.64	5.39	6.08	3.78	0.54	0.44	0.44	0.25	CO_2 0.30 ZrO_2 none SO_3 0.02 Cl trace S none Cr_2O_3 none V_2O_3 none NiO none BaO none SrO none Cu trace	100.28	2.595
A1. I	.908	.175	.011	.074	.027	.047	.087	.065			.011	.003	.004			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 3. SODIPOTASSIC. MONZONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
84	(I)II.5.2″.″3.	or 40.59 di 5.88 ab 21.48 ol 3.32 an 17.51 mt 3.48 ne 4.26 il 1.22	Astroni Volcano, Phlegrean Fields, Italy.	C. Riva.	De Lorenzo and Riva, Att. Ac. Sci. Nap., XI, p. 37, 1902.	Vulsinite.	
85	II″.5.2.3.	or 35.03 di 9.12 ab 32.49 ol 1.67 an 10.01 mt 3.25 ne 4.54 il 2.43 ap 0.81	L'Arso Flow, Ischia, n. Naples, Italy.	H. S. Washington.	H. S. Washington, A. J. S., VIII, p. 290, 1899.	Vulsinite.	Complete in R. C. R., p. 75, 1906.
86	(I)II.″5.2″.3.	Q 7.02 di 5.18 or 27.80 wo 2.32 ab 30.92 mt 4.64 an 18.63 il 0.76 hm 1.76	Canigha, n. Alghero, Sardinia.	F. Millosevitch.	F. Millosevitch, Mem. Ac. Linc., VI, 14, p. 408, 1908.	Trachy-andesite.	
87	(I)II.5.2.(2)3.	or 45.59 ol 2.24 ab 24.63 mt 8.82 an 10.56 hm 2.28 ne 0.85 C 2.04	Atatsch Mountain, Southern Ural Mountains, Russia.	J. Morozewicz.	J. Morozewicz, Mem. Com. G. Rus., XVIII, No. 1, p. 18, 1901.	Atatschite (sillimanite vitro-orthophyre)	Also in T. M. P. M., XXIII, p. 137, 1904.
88	″II.5.2.(2)3.	or 45.59 ol 6.72 ab 16.50 mt 5.34 an 16.12 il 1.98 ne 5.25 ap 1.68 C 0.61	Maros, Celebes.	Hinden.	C. Schmidt in Sarasin, Insel Celebes, IV, p. 25, 1901.	Monzonite-shonkinite.	
89	(I)II.(4)5.2.3.	Q 6.30 di 2.51 or 34.47 hy 6.44 ab 29.87 mt 3.48 an 13.34 il 0.76 ap 1.01	Berry Mountain, Cambewarra Flow, New South Wales.	Mingayè and White.	Card and Jaquet, Rec. G. S. N. S. W., VII, p. 111, 1902.	Augite trachyte.	
90	II.″5.(1)2.3(4).	Q 6.42 di 4.97 or 27.80 hy 3.35 ab 39.82 mt 4.87 an 5.28 il 3.50 hm 0.48 ap 1.34	Cambewarra Flow, n. Jamberoo, Kiama, New South Wales.	H. P. White.	Jaquet, Card and Harper, Rec. G. S. N. S. W., VIII, p. 18, 1905.	Augite trachyte.	
91	(I)II.5.(1)2.3.	Q 1.26 di 4.55 or 37.81 hy 3.94 ab 38.25 mt 4.18 an 7.23 il 1.52	Timor Ledges, Warrumbungle Mountains, New South Wales.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXII, p. 616, 1907.	Trachy-andesite.	
92	(I)II.5.2.3.	Q 0.90 di 1.64 or 36.70 hy 3.97 ab 38.25 mt 4.64 an 10.56 il 2.43	Forked Mountain, Warrumbungle Mountains, New South Wales.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXII, p. 616, 1907.	Trachy-andesite.	
93	II.5.2(3).3.	or 32.80 di 3.89 ab 25.68 ol 6.55 an 16.68 mt 6.03 ne 1.14 il 1.52 ap 2.02	Berkeley Flow, S. of Unanderra, Wollongong, New South Wales.	H. P. White.	G. W. Card, Rec. G. S. N. S. W., VIII, p. 262, 1907.	Orthoclase basalt.	
94	(I)II.5(6).(1)2.3″	or 36.14 di 3.10 ab 30.92 ol 6.40 an 6.39 mt 2.55 ne 7.95 il 1.67 ap 1.01	Yarrawa Parish, New South Wales.	W. A. Greig.	N. S. W. Dep. Min., A. R. (1912), p. 198, 1913.	Nephelite syenite.	

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. MONZONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
95	53.80	15.79	4.40	3.69	3.44	6.34	3.71	4.25	1.93	0.87	0.85	0.81	0.07	CO_2 0.10 SO_3 none Cl trace S none Cr_2O_3 none V_2O_3 0.02 NiO none BaO 0.02 SrO trace Cu none	100.09	2.715
A1. I	.897	.155	.028	.051	.086	.113	.060	.045			.011	.006	.001			
96	51.48	16.34	4.86	5.14	2.82	4.70	3.57	3.43	1.62	1.90	2.62	1.28	0.35	CO_2 trace SO_3 none Cl trace NiO none Li_2O none	100.11	2.760
A2. II	.858	.160	.031	.071	.071	.084	.057	.036			.033	.009	.005			
97	51.86	19.87	6.30	3.11	2.33	3.77	4.88	6.20	1.48			0.36		Cl 0.51	100.67	
A3. III	.864	.195	.039	.043	.058	.068	.079	.066				.003				
98	51.36	15.98	7.64	5.10	1.84	6.50	4.26	3.97	3.60			0.42			100.67	
A3. III	.856	.157	.048	.071	.046	.116	.069	.042				.003				
99	58.54	16.69	3.41	3.76	1.60	3.08	3.82	6.83	0.33		1.34	0.35			99.75	
A2. II	.976	.163	.021	.052	.040	.055	.061	.072			.017	.003				
100	57.33	18.14	0.26	7.77	3.05	5.61	3.11	3.61	0.39	0.12	0.96		trace	CO_2 0.02	100.37	
A3. III	.956	.178	.002	.108	.076	.100	.050	.038			.012		—		(100.17)	

RANG 2. DOMALKALIC. MONZONASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	53.15	17.64	3.10	4.65	2.94	5.66	5.00	3.10	1.10		1.52	0.65	0.46	CO_2 0.39 SO_3 0.28 Cl 0.07 BaO 0.13	99.84	
A1. I	.886	.173	.019	.065	.074	.101	.081	.033			.019	.005	.007			
2	52.54	15.14	0.85	10.73	5.22	6.92	5.46	1.43	1.76		1.00				101.05	
B3. IV	.876	.148	.005	.149	.131	.123	.086	.015			.013					
3	49.49	16.67	4.35	12.71	2.21	3.98	4.75	2.61	1.51		1.45		0.35		100.08	
A2. II	.825	.163	.028	.176	.055	.071	.077	.028			.018		.005			
4	52.75	14.96	2.44	7.03	3.86	6.76	4.95	1.64	0.55	0.09	3.90	0.76		ZrO_2 0.02 S 0.05 BaO none	100.16	
A1. I	.883	.147	.015	.097	.097	.121	.080	.016			.049	.005				
5	59.27	15.76	2.07	3.57	3.04	3.69	5.63	3.33	0.74	0.23	1.12	0.42	0.37	CO_2 0.30 ZrO_2 0.04 Cl 0.03 F 0.42 FeS_2 0.07 NiO trace	100.10	
A1. I	.988	.155	.013	.050	.076	.066	.091	.035			.014	.003	.005			
6	56.53	16.47	1.58	5.40	2.67	4.90	5.59	3.80	0.60	0.23	1.40	0.27	0.20	CO_2 0.05 ZrO_2 0.03 Cl 0.07 F 0.19 FeS_2 trace NiO trace BaO trace	99.99	
A1. I	.942	.161	.010	.075	.067	.088	.090	.040			.018	.002	.003			
7	56.51	16.59	1.35	6.59	2.52	4.96	5.15	3.05	0.71	0.21	1.20	0.41	0.24	CO_2 0.33 ZrO_2 0.04 Cl 0.07 F 0.06 FeS_2 0.06 BaO 0.03	100.26	
A1. I	.942	.163	.008	.092	.063	.089	.083	.032			.015	.003	.003			
8	56.01	15.19	2.34	4.89	4.67	4.85	5.66	2.16	0.90	0.36	1.13	0.53	0.40	FeS_2 0.09 NiO 0.03	99.21	
A2. II	.934	.149	.016	.068	.117	.087	.091	.023			.014	.004	.006			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 3. SODIPOTASSIC. MONZONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
95	II.5.2″.3″.	Q 1.50 di 9.48 or 25.02 hy 5.82 ab 31.44 mt 6.50 an 13.90 il 1.67 ap 2.02	Kiama, New South Wales.	H. P. White.	G. W. Card, pers. com.	Latite.	
96	II.5.2(3).3(4).	Q 6.54 hy 8.68 or 20.02 mt 7.19 ab 29.87 il 5.02 an 15.01 ap 3.02 C 1.33	Mount Macedon, Victoria.	A. G. Hall.	W. W. Skeats, Pr. Aust. A. A. S., 1910, p. 205.	Macedonite (orthoclase basalt).	Also in G. S. Vict. B. 24, p. 31, 1912.
97	(I)II.5(6).2.3.	or 36.70 di 0.22 ab 23.06 ol 4.40 an 15.85 mt 9.05 ne 7.95 ap 1.01 hl 0.82	Leith Valley, Dunedin, New Zealand.	P. Marshall.	P. Marshall, Pr. Aust. A. A. S., 1904, p. 186.	Trachydolerite.	Also in Q. J. G. S., LXII, p. 407, 1906.
98	II.5.2.3(4).	or 23.35 di 13.60 ab 32.49 ol 0.73 an 12.79 mt 11.14 ne 1.99 ap 1.01	Leith Valley, Dunedin, New Zealand.	P. Marshall.	P. Marshall, Q. J. G. S., LXII, p. 408, 1901.	Andesite.	
99	″II.5.2.3.	Q 2.94 di 3.37 or 40.03 hy 4.22 ab 31.96 mt 4.87 an 8.34 il 2.58 ap 1.01	Bras Rouge, Cilaos, Reunion Island.	Boiteau.	A. Lacroix, C. R., CLV, p. 543, 1912.	Monzonite.	
100	II.5.2.3″.	Q 2.88 di 2.35 or 21.13 hy 18.82 ab 26.20 mt 0.46 an 25.02 il 1.82	Cape Royds, Ross Region, S. Victoria Land, Antarctica.	Burrows and Walkom.	J. W. E. David, pers. com.	Not named.	Erratic block. Igneous?

SUBRANG 4. DOSODIC. AKEROSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.5.2″.4.	or 18.35 di 5.62 ab 41.39 ol 6.67 an 16.40 mt 4.41 ne 0.57 il 2.89 ap 1.68	Shefford Mountain, Quebec.	M. F. Connor.	J. A. Dresser, A. G., XXVIII, p. 207, 1901.	Essexite.	Also in Can. G. S., A. R. XIII (1900), p. 144, 1903.
2	II(III).5″.2″.4(5)	or 8.34 di 17.64 ab 36.15 ol 16.00 an 13.07 mt 1.16 ne 4.83 il 1.98	Cobalt, Ontario.	N. L. Bowen.	N. L. Bowen, J. Can. Min. Inst., XII, p. 519, 1910.	Diabase.	
3	II.5.2(3).4.	or 15.57 di 3.10 ab 35.11 ol 16.42 an 16.12 mt 6.50 ne 2.84 il 2.74	Munro Bay, Port Coldwell, Ontario.	E. L. C. Foster.	H. L. Kerr, Rep. Bur. Min. Ont., XIX (1), p. 228, 1910.	Diorite.	
4	II″.5.2(3).4″.	Q 1.32 di 11.90 or 8.90 hy 8.31 ab 41.92 mt 3.48 an 14.18 il 7.45 ap 1.68	Lockes Hill, Belknap Mountains, New Hampshire.	H. S. Washington.	Pirsson and Washington, A. J. S., XXII, p. 455, 1906.	Spessartite.	
5	II.5.2.4.⊙	Q 2.58 di 6.05 or 19.46 hy 8.37 ab 47.68 mt 3.02 an 8.06 il 2.13 ap 1.01	Mount Ascutney, Vermont.	W. F. Hillebrand.	R. A. Daly, U. S. G. S. B. 209, p. 84, 1903.	Akerite (segregation in granite).	In W. T., p. 261. Cf. No. 6, I.4.1.3.
6	II.5.2.4.⊙	or 22.24 di 11.47 ab 42.97 ol 5.03 an 8.62 mt 2.32 ne 2.27 il 2.74 ap 0.67	Mount Ascutney, Vermont.	W. F. Hillebrand.	R. A. Daly, U. S. G. S. B. 209, p. 66, 1903.	Monzonite (segregation in paisanite).	In W. T., p. 261. Cf. No. 4, I.4.1.3.
7	II.5.2.4.⊙	or 17.79 di 7.24 ab 43.49 hy 9.84 an 13.34 ol 1.72 mt 1.86 il 2.28 ap 1.01	Mount Ascutney, Vermont.	W. F. Hillebrand.	R. A. Daly, U. S. G. S. B. 209, p. 66, 1903.	Monzonite (segregation in nordmarkite).	In W. T., p. 261. Cf. No. 4, I.5.1.3.
8	II.5.2.4.⊙	or 12.79 di 8.77 ab 47.68 hy 8.90 an 9.73 ol 3.15 mt 3.71 il 2.13 ap 1.34	Mount Ascutney, Vermont.	W. F. Hillebrand.	R. A. Daly, U. S. G. S. B. 209, p. 84, 1903.	Akerite (segregation in granite).	In W. T., p. 261. Cf. No. 6, I,4.1.3.

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. MONZONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
9	55.28	17.23	1.54	6.23	2.69	5.60	5.42	2.10	0.71	0.20	1.64	0.73	0.24	CO_2 0.04 ZrO_2 trace Cl 0.07 F 0.28 FeS_2 0.07 BaO 0.06	100.15	
A1. I	.921	.169	.010	.086	.067	.100	.087	.022			.021	.005	.003			
10	52.83	16.30	9.60	2.48	3.98	2.98	6.54	2.49	2.76				trace		99.96	
A3. III	.881	.160	.060	.035	.100	.054	.105	.027					—			
11	61.87	17.26	2.35	2.43	1.82	3.23	5.18	3.83	1.07		0.87		0.03		99.94	2.67
A2. II	1.036	.169	.015	.034	.046	.058	.083	.041		0.11		—				
12	61.08	16.62	2.87	2.56	1.65	3.66	4.75	3.90	0.97	0.44	0.73	0.63	trace	BaO 0.32 SrO 0.08 Li_2O trace	100.26	
A1. I	1.018	.163	.018	.036	.041	.065	.077	.041			.009	.005	—			
13	58.28	17.89	3.20	1.73	1.51	3.69	5.89	5.34	0.98	0.17	0.68	0.26	0.06	BaO 0.36 SrO 0.05 Li_2O trace	100.05	
A1. I	.971	.175	.020	.024	.038	.066	.095	.057			.009	.002	—			
14	56.75	16.40	4.78	3.10	3.22	5.34	4.19	3.36	0.82	0.40	0.86	0.52	0.17	BaO 0.33 SrO 0.10 Li_2O trace	100.34	
A1. I	.946	.161	.030	.043	.081	.095	.068	.036			.010	.004	.002			
15	58.08	18.38	3.02	1.42	0.96	3.85	6.22	5.11	1.55	0.37	0.58	0.21	0.10	SO_3 0.07 Cl trace S none BaO none	99.92	
A1. I	.968	.180	.019	.019	.024	.069	.100	.054			.007	.001	.001			
16	60.44	16.65	2.31	3.09	2.18	4.22	5.18	2.71	1.07	0.36	0.60	0.29	0.13	CO_2 0.48 S trace V_2O_3 0.02 NiO none BaO 0.12 SrO 0.11	99.96	2.677
A1. I	1.007	.163	.014	.043	.055	.075	.084	.029			.008	.002	.002			24°
17	55.53	16.78	4.06	3.35	3.00	6.96	4.31	3.57	0.55	0.09	0.95	0.47	0.16	CO_2 0.09 FeS_2 0.04 V_2O_3 0.02 NiO trace BaO 0.13 SrO 0.11	100.17	2.79
A1. I	.926	.164	.025	.047	.075	.125	.069	.038			.012	.003	.002			21°
18	57.01	18.41	3.69	2.36	2.34	4.29	4.95	3.72	2.29		0.27	0.42	0.21		99.96	2.699
A2. II	.950	.180	.023	.033	.059	.077	.080	.040			.004	.003	.003			34°
19	53.80	20.13	3.57	2.63	2.26	5.60	5.20	4.49	0.90		0.43	0.56	0.29		99.86	2.768
A2. II	.897	.197	.022	.036	.047	.100	.084	.048			.005	.004	.004			34°
20	58.05	17.66	3.51	1.65	1.55	4.48	5.80	4.06	0.87	0.35	0.91	0.40	0.13	CO_2 none ZrO_2 0.02 SO_3 0.04 Cl trace Cr_2O_3 none BaO 0.19 SrO 0.08	99.75	
A1. I	.968	.173	.022	.023	.039	.080	.094	.043			.011	.003	.002			
21	56.01	17.92	4.22	2.52	2.04	4.80	4.92	4.21	1.10	0.31	1.20	0.55	0.13	CO_2 none ZrO_2 0.02 Cl trace S 0.02 Cr_2O_3 none BaO 0.16 SrO 0.06	100.19	
A1. I	.934	.176	.026	.035	.051	.086	.079	.045			.015	.004	.002			
22	51.89	17.94	3.85	3.37	2.88	5.62	4.63	4.50	2.09	0.72	1.34	0.67	0.08	ZrO_2 0.03 Cl trace FeS_2 0.41 BaO 0.19 SrO 0.11	100.32	
A1. I	.865	.176	.024	.047	.072	.100	.074	.048			.017	.005	.001			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. AKEROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
9	II.5.2(3).4.	or 12.79 ab 45.59 an 16.68 di 5.29 hy 10.41 ol 0.69 mt 2.32 il 3.19 ap 1.68	Mount Ascutney, Vermont.	W. F. Hillebrand.	R. A. Daly, U. S. G. S. B. 209, p. 44, 1903.	Diorite (segregation in diorite).	In W. T., p. 261.
10	II.5.″2.4.	or 15.01 ab 47.68 an 7.78 ne 3.98 di 5.62 ol 5.18 mt 8.12 hm 4.00	Little Montreal River, Keweenaw Point, Michigan.	F. P. Burrall.	L. L. Hubbard, Mich. G. S., VI, Pt. 2, p. 25, 1898.	Diabase porphyrite.	Not in W. T.
11	(I)II.(4)5.2.″4.	Q 8.10 or 22.80 ab 43.49 an 12.51 di 2.87 hy 4.29 mt 3.48 il 1.67	Cottonwood Creek, Castle Mountains, Montana.	L. V. Pirsson.	Weed and Pirsson, U. S. G. S. B. 139, p. 88, 1896.	Dioritic syenite.	Inclusion in granite, No. 67, I.4.1.3. In W. T., p. 261.
12	(I)II.(4)5.2.(3)4.	Q 10.02 or 22.80 ab 40.35 an 12.51 di 0.68 hy 4.66 mt 4.18 il 1.37 ap 1.68	Three Peaks, Crazy Mountains, Montana.	W. F. Hillebrand.	J. E. Wolff, U. S. G. S. B. 148, p. 142, 1897.	Porphyrite.	In W. T., p. 261.
13	(I)II.5.(1)2.(3)4.	or 31.69 ab 41.92 an 6.39 ne 4.26 di 7.78 ol 0.14 mt 3.71 il 1.37 hm 0.64 ap 0.67	Shields River Basin, Crazy Mountains, Montana.	W. F. Hillebrand.	J. E. Wolff, U. S. G. S. B. 148, p. 143, 1897.	Syenite.	In W. T., p. 261.
14	II.″5.2(3).(3)4.	Q 5.82 or 20.02 ab 35.63 an 15.85 di 5.43 hy 6.23 mt 6.96 il 1.52 ap 1.34	Shields River Basin, Crazy Mountains, Montana.	W. F. Hillebrand.	J. E. Wolff, U. S. G. S. B. 148, p. 143, 1897.	Porphyrite.	In W. T., p. 261.
15	(I)II.5.(1)2.(3)4.	or 30.02 ab 42.97 an 7.23 ne 5.11 di 5.18 wo 1.86 mt 3.02 il 1.06 hm 0.96 ap 0.34	Sundance quadrangle, Wyoming.	G. Steiger.	W. S. T. Smith, U. S. G. S. Fol. 127, p. 7, 1905.	Trachytoid phonolite.	
16	″II.(4)5.2.4.	Q 7.98 or 16.12 ab 44.02 an 13.90 di 4.05 hy 6.58 mt 3.25 il 1.22 ap 0.67	Deadwood Gulch, La Plata Mountains, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. Fol. 60, p. 7, 1899.	Diorite porphyry.	In W. T., p. 261.
17	II.5.2(3).(3)4.	Q 1.50 or 21.13 ab 36.16 an 15.85 di 12.79 hy 3.03 mt 5.80 il 1.82 ap 1.01	La Plata Mountains, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. Fol. 60, p. 6, 1899.	Monzonite.	Facies of diorite. In W. T., p. 263.
18	(I)II.5.2″.″4.	Q 2.04 or 22.24 ab 41.92 an 16.68 di 1.54 hy 6.49 mt 5.34 il 0.46 ap 1.01	Lookout Mountain, Silver Cliff, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. A. R. 17, II, p. 321, 1896.	Andesite.	In W. T., p. 261.
19	(I)II.5″.2″.(3)4.	or 26.69 ab 31.96 an 18.07 ne 6.53 di 4.91 ol 2.92 mt 5.10 il 0.76 ap 1.34	Mount Fairview, Rosita Hills, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. A. R. 17, II, p. 324, 1896.	Augite diorite.	In W. T., p. 261.
20	(I)II.5.2.″4.	or 23.91 ab 49.25 an 10.01 di 7.34 hy 0.70 mt 2.78 il 1.67 hm 1.60 ap 1.01	Anaconda Mine, Cripple Creek, Colorado.	W. T. Schaller.	Lindgren and Ransome, U. S. G. S. P. P. 54, p. 79, 1906.	Latite-phonolite.	
21	″II.5.2.(3)4.	Q 0.12 or 25.02 ab 41.39 an 14.46 di 6.70 hy 2.20 mt 4.64 il 2.28 hm 0.96 ap 1.34	Portland Mine, Cripple Creek, Colorado.	W. T. Schaller.	Lindgren and Ransome, U. S. G. S. P. P. 54, p. 79, 1906.	Latite-phonolite.	
22	II.5.2.(3)4.	or 26.69 ab 31.06 an 15.29 ne 4.12 di 6.36 ol 3.63 mt 5.57 il 2.58 ap 1.68 pr 0.41	Portland Mine, Cripple Creek, Colorado.	W. F. Hillebrand.	Lindgren and Ransome, U. S. G. S. P. P. 54, p. 87, 1906.	Syenite.	

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. MONZONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
23	49.84	17.78	5.86	2.62	3.02	7.35	5.20	3.04	2.02	0.34	1.43	0.76	0.21	CO_2 0.52 ZrO_2 0.03 SO_3 none Cl trace V_2O_3 0.03 BaO 0.22 SrO 0.18 Li_2O trace	100.42	
A1. I	.831	.174	.037	.036	.076	.131	.084	.032			.018	.005	.003			
24	48.76	17.04	5.04	3.52	4.57	8.64	4.27	3.39	1.84	0.69	1.34	0.79	0.08	CO_2 0.22 ZrO_2 trace Cl 0.01 S 0.06 BaO 0.15 SrO 0.07	100.48	
A1. I	.813	.167	.032	.049	.114	.154	.069	.036			.017	.005	.001			
25	57.35	16.29	3.15	4.36	2.41	5.66	4.50	3.39	0.70	0.15	1.07	0.70	0.12	CO_2 0.46 ZrO_2 trace FeS_2 0.09 Cr_2O_3 none V_2O_3 trace NiO none BaO 0.10 SrO 0.05 ZnO none Li_2O none	100.55	2.763
A1. I	.956	.160	.020	.061	.060	.101	.073	.036			.013	.005	.002			
26	55.44	14.95	4.37	5.18	3.58	6.12	4.44	2.83	0.84	0.12	1.22	0.49	0.22	CO_2 0.35 ZrO_2 none FeS_2 0.09 BaO 0.16 SrO 0.04 Li_2O none	100.44	2.827
A1. I	.924	.147	.028	.072	.090	.109	.072	.030			.015	.004	.003			
27	56.83	16.90	6.85	0.13	2.67	4.92	4.58	4.00	0.40	0.38	1.41	0.50	0.11	CO_2 none ZrO_2 none S none Cr_2O_3 trace V_2O_3 none BaO 0.12 SrO 0.06	99.86	
A1. I	.947	.166	.043	.002	.067	.088	.074	.042			.018	.004	.002			
28	54.72	16.60	3.81	4.11	2.88	6.31	4.04	3.49	0.49	0.68	1.52	0.77	0.09	CO_2 none ZrO_2 none S none Cr_2O_3 0.01 V_2O_3 none BaO 0.12 SrO 0.05	99.69	
A1. I	.912	.163	.024	.057	.072	.113	.065	.037			.019	.005	.001			
29	61.21	17.10	2.72	1.88	1.47	4.83	5.66	3.00	0.68	0.34	0.51	0.24	0.15	CO_2 none ZrO_2 0.02 Cl 0.04 S none BaO 0.13 SrO 0.07	100.05	
A1. I	1.020	.168	.017	.026	.037	.086	.091	.032			.006	.002	.002			
30	53.52	17.88	4.21	3.51	3.90	7.36	5.19	2.39	none	0.15	1.14	1.26	0.11	CO_2 none S none	100.62	
A2. II	.892	.175	.026	.049	.098	.131	.084	.026			.014	.009	002			
31	52.06	15.52	5.49	7.06	2.23	5.46	5.24	2.24	0.59	1.00	2.41	0.32	0.12	CO_2 none	99.74	
A2. II	.868	.152	.034	.098	.056	.097	.084	.023			.030	.002	.002			
32	62.08	17.91	1.08	3.08	1.77	4.54	5.12	2.96	0.20	0.05	0.54	0.17	0.11	BaO 0.14 SrO trace	99.75	
A2. II	1.035	.176	.007	.043	.044	.081	.082	.032			.007	.001	002			
33	58.67	15.67	2.85	3.28	3.86	5.33	4.77	3.08	0.54	0.02	1.00	0.16	0.11	BaO 0.11 SrO 0.09	99.54	2.751
A2. II	.978	.154	.018	.046	.097	.095	.077	.033			.013	.001	.002			
34	57.87	16.76	2.21	4.60	3.29	6.23	4.07	2.17	0.91	0.32	1.21	0.34	0.04	CO_2 none ZrO_2 0.02 FeS_2 0.23 BaO 0.02	100.34	
A2. II	.965	.164	.014	.064	.082	.111	.066	.023			.015	.002	—			
35	59.50	14.78	1.93	1.23	3.09	7.87	4.44	3.95	0.84	0.39	1.01	0.89	trace	CO_2 0.18 SrO 0.05	100.15	
A2. II	.992	.145	.012	.017	.077	.141	.072	.042			.013	.006	—			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. AKEROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
23	II.5(6).2.4.	or 17.79 ab 30.39 an 16.12 ne 7.38 di 12.10 ol 1.40 mt 4.87 il 2.74 hm 2.56 ap 1.68	Bull Cliff, Cripple Creek, Colorado.	W. F. Hillebrand.	Lindgren and Ransome, U. S. G. S. P. P. 54, p. 90, 1906.	Trachydolerite.	In W. T., p. 263.
24	II″.5(6).2(3).(3)4.	or 20.02 ab 20.96 an 17.24 ne 8.24 di 16.20 ol 2.80 mt 7.42 il 2.58 ap 1.68	Isabella Dike, Cripple Creek, Colorado.	W. T. Schaller.	Lindgren and Ransome, U. S. G. S. P. P. 54, p. 93, 1906.	Trachydolerite.	FeO corrected.
25	II.″5.2″.″4.	Q 5.22 or 20.02 ab 38.25 an 14.18 di 5.23 hy 7.40 mt 4.64 il 1.98 ap 1.68	Wellington Mine, Breckinridge District Colorado.	W. T. Schaller.	F. L. Ransome, U. S. G. S. P. P. 75, p. 55, 1911.	Diorite porphyry.	No rare earths.
26	II.5.2.4.⊙	Q 2.94 or 16.68 ab 37.73 an 12.51 di 11.44 hy 7.71 mt 6.50 il 2.28 ap 1.34	Wellington Mine, Breckinridge District, Colorado.	W. T. Schaller.	F. L. Ransome, U. S. G. S. P. P. 75, p. 55, 1911.	Diorite porphyry.	
27	II.5.2.(3)4.	Q 3.54 or 23.35 ab 38.77 an 13.90 di 2.38 hy 5.60 il 0.61 hm 6.85 tn 2.74 ap 1.34	Devils Lake, Uncompahgre quadrangle, Colorado.	G. Steiger.	E. S. Larsen, U. S. G. S. rec. lab.	Andesite.	
28	II.5.2(3).(3)4.	Q 3.36 or 20.57 ab 34.06 an 16.96 di 7.78 hy 5.46 mt 5.57 il 2.89 ap 1.68	Devils Lake, Uncompahgre quadrangle, Colorado.	G. Steiger.	E. S. Larsen, U. S. G. S. rec. lab.	Basalt.	
29	(I)II.″5.2.4.	Q 6.96 or 17.79 ab 47.68 an 12.51 di 7.47 hy 0.83 mt 3.94 il 0.91 ap 0.67	Near Mount Peale, La Sal Mountains, Utah.	W. F. Hillebrand.	L. M. Prindle, U. S. G. S. B. 228, p. 191, 1904.	Monzonite porphyry.	
30	II.5.2(3).4.	or 14.46 ab 42.97 an 18.07 ne 0.57 di 6.72 ol 5.44 mt 6.03 il 2.13 ap 3.02	Johnsons Park, Colfax County, New Mexico.	J. G. Fairchild.	J. B. Martie, U. S. G. S. rec. lab.	Andesite.	
31	II.5.2.4.⊙	or 12.79 ab 44.01 an 12.51 di 10.26 hy 5.31 mt 7.89 il 4.56 ap 0.67	Little Ash Creek, Bradshaw Mountains, Arizona.	G. Steiger.	Jaggar and Palache, U. S. G. S. Fol. 126, p. 7, 1905.	Trachydolerite.	
32	(I)II(4)5.2(3).4.	Q 8.16 or 17.79 ab 42.97 an 17.24 di 3.68 hy 6.67 mt 1.62 il 1.06 ap 0.34	Hedley District, British Columbia.	M. F. Connor.	C. Camsell, Can. G. S. Mem. 2, p. 96, 1910.	Granodiorite.	MgO corr. by C. C., pers. com.
33	II.5.2.″4.	Q 4.08 or 18.35 ab 40.35 an 12.23 di 10.59 hy 6.92 mt 4.18 il 1.98 ap 0.34	Record Mountain, Rossland Mountains, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38 (1), p. 328, 1912.	Latite.	
34	II.(4)5.2.4.	Q 8.10 or 12.79 ab 34.58 an 20.85 di 6.55 hy 9.63 mt 3.25 il 2.28 ap 0.67	Riddle quadrangle, Oregon.	R. C. Wells.	J. S. Diller, U. S. G. S. rec. lab.	Granodiorite?	
35	II.″5.2.(3)4.	Q 4.74 or 23.35 ab 37.73 an 8.62 di 16.63 wo 1.51 mt 0.93 il 1.98 hm 1.28 ap 2.02	Aranzazu, Concepcion del Oro, Zacatecas, Mexico.	M. Dittrich.	A. Bergeat, N. J. B. B., XXVIII p. 438, 1909.	Granodiorite.	Also in Inst. G. Mex. B. 27, p. 12, 1910.

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. MONZONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
36	52.55	14.96	5.80	6.19	3.22	7.05	5.37	2.83	2.48						100.45	2.87
A3. III	.876	.147	.036	.086	.081	.126	.087	.030								
37	61.26	16.15	4.39	2.66	2.91	5.75	4.93	2.65	0.15						100.85	
A3. III	1.021	.158	.027	.037	.073	.102	.079	.028								
38	62.98	15.50	2.88	2.85	3.17	2.95	5.90	2.77	0.70		0.68	0.25			100.63	2.582
A2. II	1.050	.152	.018	.040	.079	.053	.095	.030			.008	.002				
39	58.82	16.35	5.50	2.36	4.37	4.06	5.31	2.02	1.05		0.36	0.25			100.45	2.736
A2. II	.980	.160	.034	.033	.109	.073	.085	.021			.004	.002				
40	60.90	17.67	2.71	1.70	1.49	4.93	5.27	3.15	1.31		0.46	0.24	0.17	SrO trace	100.05	2.690
A2. II	1.015	.173	.017	.024	037	.088	.085	.034			.006	.002	.002			
41	59.06	16.79	3.47	4.81	3.00	5.22	4.60	2.79	0.95						100.69	
A3. III	.984	.164	.022	.067	.075	.093	.074	.030								
42	56.27	12.79	2.55	7.24	3.14	8.89	4.07	1.96	0.44	0.36	2.62	0.23	none	CO_2 none S trace	100.65	
A2. II	938	125	.016	.100	.079	.159	.066	.021			.033	.002	——			
43	54.89	16.54	1.85	12.30	1.52	1.08	5.39	2.35	2.29	0.11	0.38	0.07	0.84	CO_2 0.42 S 0.02 NiO 0.02 BaO none Li_2O trace	100.07	
A1. I	.915	.162	.012	.171	.038	.020	.087	.025			.005	——	.012			
44	49.24	15.84	6.09	7.18	3.02	5.26	5.21	2.10	1.61	1.08	1.84	1.47	0.17	F 0.18 S 0.03 Cr_2O_3 trace NiO trace BaO 0.09 SrO trace	100.53	2.79
A1. I	.821	.155	.038	.100	.076	.094	.084	.022			.023	.010	.002			
45	59.84	15.71	1.68	7.03	1.37	3.71	6.52	2.76	0.31	0.14	0.64	0.20	0.12	S 0.10	100.13	
A2. II	.997	.154	.011	.097	.034	.066	.105	.030			.008	.001	.002			
46	60.65	18.57	1.25	4.25	2.00	3.20	4.98	4.28	1.80				trace		100.99	
B3. IV	1.011	.182	.008	.059	.050	.057	.081	.045					——			
47	57.20	17.06	3.14	3.69	2.45	5.83	5.95	2.72	n. d.		1.28	0.45			99.77	
A2. II	.953	.167	.020	.051	.061	.104	.096	.029			.016	.003				
48	56.77	18.32	2.80	3.58	1.81	4.61	5.47	3.52	0.17		2.40	0.58	0.23	SO_3 0.04 BaO 0.03	100.33	
A2. II	.946	.180	.018	.050	.045	.082	.089	.037			.030	.004	.003			
49	54.69	18.16	5.71	1.79	1.99	5.68	5.25	3.28	0.19		2.31	0.71	0.17	SO_3 0.03 Cr_2O_3 none V_2O_3 0.03 BaO 0.13	100.12	
A1. I	.912	.178	.036	.025	.050	.101	.085	.035			.029	.005	.002			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. AKEROSE—Continued.

No.	Symbol.	Norm.		Locality.	Analyst.	Reference.	Rock name.	Remarks.
36	II″.5(6).2.4.	or 16.68 ab 32.49 an 8.34 hl 7.10	di 21.99 ol 3.41 mt 8.35	Culebra Island, West Indies.	T. Nordström.	P. T. Cleve, Sv. Vet. Ak. Hndl., IX, No. 12, p. 38, 1871.	Labrador porphyrite.	Also in A. G. Hogbom, B. G. Inst. Ups., VI, p. 230, 1905. Not in W. T.
37	II.(4)5.2″.4.	Q 8.58 or 15.57 ab 41.40 an 14.18	di 11.21 hy 3.33 mt 6.26	Lava of 1869, Pasto Volcano, Colombia.	R. Küch.	R. Küch, G. Stud. Col., I, p. 141, 1892.	Pyroxene andesite.	In W. T., p. 263.
38	″II.(4)5.″2.4.	Q 8.04 or 16.68 ab 49.78 an 7.51	di 4.20 hy 7.75 mt 3.67 il 1.22 ap 0.67	Toruno Caldera, Quilindana Volcano, Ecuador.	A. Young.	A. Young, Hochg. Rep. Ec., II (2), p. 252, 1902.	Andesite.	
39	II.″5.2″.4.	Q 6.90 or 11.68 ab 44.54 an 15.01	di 2.59 hy 9.70 mt 6.73 il 0.61 hm 0.80 ap 0.67	Ceballos-chupa, Sincholagua Volcano, Ecuador.	A. Young.	A. Young, Hochg. Rep. Ec., II (2), p. 248, 1902.	Pyroxene andesite.	
40	(I)II.″5.2″.4.	Q 7.14 or 18.90 ab 44.54 an 15.01	di 7.44 hy 0.60 mt 3.94 il 0.91	Cerro de Don Prajido, San Luis, Argentina.	P. Jannasch.	F. Tannhäuser, N. J. B. B., XXIII, p. 596, 1906.	Andesite.	
41	II.″5.2(3).4.	Q 5.02 or 16.68 ab 38.78 an 16.68	di 7.51 hy 9.76 mt 5.10	Cuesta del Cuzco, San Antonio Valley, Argentina.	B. Wetzig.	A. Stelzner, Btr. G. Arg. Rep., I, p. 212, 1885.	Andendiorite.	In W. T., p. 263.
42	II(III).″5.2″.4.	Q 5.76 or 11.68 ab 34.58 an 10.56	di 26.06 hy 1.79 mt 3.71 il 5.02 ap 0.67	North of Neochea, Argentina.	J. G. Fairchild.	Wright and Fenner, Bur. Am. Ethn. B. 52, p. 81, 1912.	Andesite scoria.	
43	II.5.″2.4.	or 13.90 ab 45.59 an 5.56 C 3.06	hy 25.71 mt 2.78 il 0.76	Carn Chuinneag, Scotland.	W. Pollard.	J. S. Flett, G. S. Scot., Mem. XCIII, p. 97, 1912.	Albite gneiss.	Igneous? MnO high?
44	II.5.2″.4.	or 12.23 ab 44.01 an 13.62	di 2.72 hy 2.32 ol 6.84 mt 8.82 il 3.50 ap 3.36	Druim na Criche, Portree, Skye, Scotland.	W. Pollard.	A. Harker, Rocks of Skye, p. 263, 1904.	Mugearite.	
45	II.5.(1)2.4.	or 16.68 ab 55.02 an 5.28	di 11.21 hy 2.81 ol 4.07 mt 2.55 il 1.22 ap 0.34	Gwavas Quarry, Newlyn, Cornwall.	W. Pollard.	Reid and Flett, G. S. Eng. Wal., Mem. Sh. 351, p. 35, 1907.	Diabase.	
46	(I)II.5.2.(3)4.	Q 2.52 or 25.02 ab 42.44 an 15.57	hy 11.73 mt 1.86	Cevins, Isere Valley, France.	E. Ritter.	E. Ritter, Sv. Ct. G. Fr. B., IX, No. 60, p. 32, 1897.	Inclusion in protogine.	Not in W. T.
47	II.5.2.4.⊙	or 16.12 ab 50.30 an 11.68	di 11.55 hy 0.63 ol 1.39 mt 4.64 il 3.71 ap 1.01	Volvic, Puy de Dome, Auvergne.	Pisani.	A. Lacroix, pers. com.	Andesite.	
48	″II.5.2.4.	Q 1.02 or 20.57 ab 46.63 an 15.01	di 3.30 hy 3.60 mt 4.18 il 4.56 ap 1.34	Volvic, Puy de Dome, Auvergne.	P. Holland.	Dickson and Holland, Pr. Liv. G. Soc., VIII, p. 412, 1899.	Andesite.	Not in W. T.
49	II.5.2″.4.	or 19.46 ab 44.54 an 16.12	di 5.62 hy 2.40 il 4.10 hm 5.71 pf 0.27 ap 1.68	Puy de Pariou, Puy de Dome, Auvergne.	P. Holland.	Dickson and Holland, Pr. Liv. G. Soc., VIII, p. 412, 1899.	"Lava" (andesite).	Not in W. T.

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. MONZONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
50	53.78	16.18	7.91	0.66	3.51	6.70	4.69	3.41	0.25		1.80	0.60	0.25	SO_3 0.06 BaO 0.04	99.84	
A2. II	.896	.159	.049	.009	.088	.120	.076	.036			.023	.004	.004			
51	57.99	19.47	3.60	4.12	2.07	4.40	6.01	2.23	(0.27)		1.04				100.93	2.546
B3. IV	.967	.191	.023	.057	.052	.079	.097	.023			.013					
52	57.60	16.83	0.84	4.16	1.90	5.21	4.45	3.82	1.50		2.28	0.37		FeS_2 1.93	100.89	
A2. II	.960	.165	.005	.057	.048	.093	.072	.040			.029	.003				
53	54.61	19.20	2.96	2.91	1.02	4.70	5.00	4.36	3.25		1.92	trace			99.93	
A2. II	.910	.188	.019	.040	.026	.084	.081	.047			.024	—				
54	62.28	17.32	4.00	0.94	3.96	2.08	6.04	2.98	1.02						100.62	
A3. III	1.038	.170	.025	.013	.099	.038	.097	.032								
55	61.12	17.06	3.20	2.96	1.17	2.91	7.25	2.04	0.74		1.35	0.02	0.23		100.04	
A2. II	1.019	.167	.020	.041	.029	.052	.117	.021			.017	—	.003			
56	60.97	15.39	3.29	1.19	3.39	5.04	5.65	2.88	0.60		1.65	0.11	0.36		100.52	
A2. II	1.016	.151	.021	.017	.085	.090	.091	.031			.021	.001	.005			
57	59.71	16.18	4.89	2.64	1.54	3.77	5.93	3.69	0.22	(0.07)	0.66	0.44	0.09	S trace	99.76	
A2. II	.995	.159	.031	.037	.039	.068	.095	.039			.008	.003	.001			
58	60.12	16.63	2.19	4.79	0.82	3.75	4.73	4.25	0.25		0.95	0.77	0.10	BaO 0.21	99.56	
A2. II	1.002	.163	.014	.067	.021	.067	.076	.045			.012	.005	.001			
59	53.96	15.98	2.76	6.16	1.58	5.82	4.18	3.72	0.27		2.45	1.85	0.27	FeS_2 0.35 BaO 0.19	99.54	
A2. II	.899	.157	.017	.086	.040	.104	.068	.039			.031	.013	.003			
60	57.21	16.03	1.65	7.38	3.36	5.18	4.12	3.50	0.56	0.30	0.69	0.20	0.18	S 0.10	100.46	
A2. II	.954	.157	.010	.103	.084	.093	.066	.037			.009	.001	.003			
61	53.20	14.30	3.93	8.58	3.91	5.51	5.58	2.70	2.22		0.70	0.43	trace		101.06	2.783
B2. III	.887	.140	.024	.119	.098	.098	.090	.029			.009	.003	—			
62	56.99	17.62	2.65	3.75	2.79	4.40	5.95	2.88	0.60		0.60	1.05	0.19		99.47	
A2. II	.950	.173	.017	.052	.070	.079	.096	.031			.008	.008	.003			
63	58.04	16.78	5.13	3.63	2.62	4.52	5.41	4.14	0.57				trace	Cl trace	100.84	
A3. III	.967	.164	.031	.050	.066	.080	.087	.044					—			
64	57.90	16.01	5.82	4.21	2.34	5.11	4.46	3.73	0.98				trace		100.56	
A3. III	.965	.157	.036	.058	.059	.091	.072	.039					—			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. AKEROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
50	II.5.2.″4.	or 20.02 di 9.94 ab 39.82 hy 3.40 an 13.07 ol 0.56 il 1.37 hm 7.91 pf 1.90 ap 1.34	Mont Dore, Auvergne.	P. Holland.	Dickson and Holland, Pr. Liv. G. Soc., VIII, p. 412, 1899.	Sanidine andesite.	Iron oxides? Not in W. T.
51	(I)II.5.2(3).4.	Q 1.44 di 1.79 or 12.79 hy 7.11 ab 50.83 mt 5.34 an 19.74 il 1.98	Plomb du Cantal, Auvergne.	F. Fouqué.	F. Fouqué, B. Soc. Fr. Min., XXV, p. 335, 1902.	Biotite andesite.	
52	II.5.2″.(3)4.	Q 4.86 di 6.80 or 22.24 hy 4.52 ab 37.73 mt 1.16 an 14.73 il 4.41 ap 1.01 pr 1.93	Fournol, Cantal, Auvergne.	Pisani.	A. Lacroix, C. R., CXLIX, p. 546, 1909.	Andesite.	
53	(I)II.5.2″.(3)4.	or 26.13 di 5.18 ab 41.39 ol 0.14 an 16.68 mt 3.71 ne 0.57 il 3.65 hm 0.48	Fournol, Cantal, Auvergne.	Pisani.	A. Lacroix, C. R., CXLIX, p. 546, 1909.	Monzonite.	
54	(I)II.5.2.4.	Q 5.34 hy 9.90 or 17.79 mt 3.02 ab 50.83 hm 1.92 an 10.56 C 0.31	Osani, Corsica.	J. Deprat.	J. Deprat, B. Sv. Ct. G. Fr., XVII, No. 117, p. 54, 1907.	Trachy-andesite.	
55	(I)II.5.″2.4(5).	Q 4.44 di 5.10 or 11.68 hy 1.40 ab 61.31 mt 4.64 an 8.06 il 2.58	Kiruna, Lapland, Sweden.	Lundbohm.	O. Stutzer, N. J. B. B., XXIV, p. 566, 1907.	Soda syenite porphyry.	
56	II.5.2.4.⊙	Q 4.98 di 12.53 or 17.24 hy 2.70 ab 47.68 mt 0.23 an 8.06 il 3.19 hm 3.20 ap 0.34	W. of Kapten, Kiruna, Lapland, Sweden.	Lundbohm.	O. Stutzer, N. J. B. B., XXIV, p. 566, 1907.	Soda syenite porphyry.	
57	″II.5.″2.4.	Q 4.14 di 7.13 or 21.68 hy 0.60 ab 49.78 mt 6.96 an 6.95 il 1.22 hm 0.16 ap 1.01	Kiirunavaara, Lapland, Sweden.	G. Nyblom.	P. Geijer, G. Kir. Dist., p. 33, 1910.	Syenite porphyry.	
58	(I)II.″5.2.(3)4.	Q 7.26 di 1.89 or 25.02 hy 6.68 ab 39.82 mt 3.25 an 11.68 il 1.82 ap 1.68	Warberg, Halland, Sweden.	R. Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 266, 1906.	Granite.	
59	II.5.2″.(3)4.	Q 3.90 di 2.57 or 21.68 hy 8.12 ab 35.63 mt 3.94 an 13.90 il 4.71 ap 4.37	Apelvik, Warberg, Halland, Sweden.	R. Mauzelius.	P. J. Holmquist, B. Un. Ups., VII, p. 266, 1906.	Grano-diorite.	
60	II.5.2″.(3)4.	Q 1.26 di 8.36 or 20.57 hy 15.71 ab 34.58 mt 2.32 an 15.01 il 1.37 ap 0.34	Svartsbergvik, N. Ulfön, Nordingra, Sweden.	N. Sahlbom.	J. E. Sobral, G. Nord. Reg., p. 129, 1913.	Monzonite.	
61	II″.5″.(1)2.4.	or 16.12 di 15.46 ab 39.30 ol 9.95 an 5.84 mt 5.57 ne 4.26 il 1.37 ap 1.01	Silfberg, Dalarne, Sweden.	O. Larsson.	M. Weibull, Lunds Aarsk., XXXIII, No. 4, p. 16, 1897.	Augite porphyrite.	Not in W. T.
62	II.5.2.4.⊙	or 17.24 di 1.36 ab 50.30 hy 8.37 an 12.79 ol 1.11 mt 3.94 il 1.22 ap 2.52	Autionsaari, Tavajärvi, Kuuosamo, Finland.	N. Sahlbom.	V. Hackman, B. C. G. Fin., 15, p. 52, 1905.	Soda minette.	
63	II.5.2.″4.	or 24.46 di 10.50 ab 45.59 hy 0.43 an 9.17 ol 2.58 mt 7.19	Bruderkunzberg, n. Honnef, Siebengebirge.	W. Bruhns.	W. Bruhns, Vh. Nh. Ver. Bonn., LIII, p. 48, 1896.	Trachyte.	Light. In W. T., p. 263.
64	″II.5.2.(3)4.	Q 4.86 di 10.10 or 21.68 hy 3.92 ab 37.73 mt 8.35 an 12.79	Bruderkunzberg, n. Honnef, Siebengebirge.	W. Bruhns.	W. Bruhns, Vh. Nh. Ver. Bonn., LIII, p. 48, 1896.	Trachyte.	Dark. In W. T., p. 263.

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. MONZONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
65	53.33	15.58	2.61	3.34	9.38	4.70	4.70	2.94	2.38		0.41	0.06	0.84	S 0.04	99.73	2.757
A2. II	.889	.153	.016	.046	.235	.084	.076	.031			.005	—	.012			
66	53.26	16.63	8.29	3.21	1.10	7.30	5.31	3.54	1.43		0.31				100.38	2.671
A3. III	.888	.163	.052	.044	.028	.130	.085	.037			.004					
67	59.69	18.16	3.01	2.47	1.99	4.15	5.03	3.34	1.18	0.27	0.09	0.64		SO_3 0.35	100.36	
A2. II	.995	.178	.019	.035	.050	.074	.081	.035			.001	005				
68	57.90	16.56	3.05	2.93	2.90	5.14	5.07	2.10	2.34		0.92	0.62			99.53	
A2. II	.965	.162	.019	.040	.073	.090	.082	.022			.011	004				
69	59.79	13.90	3.11	3.91	4.18	3.52	4.70	3.78	1.26		1.24	0.33	trace	CO_2 0.22	99.94	2.760
A2. II	.995	.136	.019	.054	.105	.063	.076	.040			.016	.002	—			
70	56.18	16.14	3.44	4.27	4.74	6.45	4.37	2.97	0.68		0.77	0.13	0.36	CO_2 0.03 SO_3 0.01 S 0.03	100.57	
A2. II	.936	.158	.022	.060	.119	.115	.071	.032			.010	.001	.005			
71	60.55	16.57	2.29	4.64	2.37	3.59	4.72	3.34	1.46		0.68	0.54			100.75	
A2. II	1.009	.162	.014	.064	.059	.064	.076	.035			.009	.004				
72	56.20	16.54	3.35	6.70	3.32	3.66	4.94	2.91	1.52		0.82	0.53			100.49	
A2. II	.937	.162	.021	.093	.083	.065	.080	.031			.010	.004				
73	56.37	16.65	5.67	0.43	1.54	4.32	4.65	4.54	3.39		1.56	1.07			100.19	
A2. II	.940	.163	.036	.006	.039	.077	.075	.048			.020	.008				
74	55.80	17.65	4.61	0.85	1.19	4.50	4.63	3.61	2.53	1.58	1.07	0.59	0.56	CO_2 0.14 Cl 0.12	99.43	2.434
A2. II	.930	.173	.029	.012	.030	.080	.074	.038			.013	.004	.007			
75	50.51	17.84	5.25	4.46	3.34	7.93	5.09	3.49	0.74		0.95	1.11		CO_2 0.43	101.14	2.855
B2. III	.842	.175	.033	.062	.084	.141	.082	.037			012	008				
76	52.67	13.66	7.33	1.44	4.01	7.94	3.79	2.51	1.51	1.07	2.58	0.52	0.78	F 0.17	99.98	2.755
A2. II	.878	.134	.046	.020	.100	.142	.061	.027			.032	.004	.011			
77	52.00	14.08	8.40	1.09	3.91	9.61	3.83	2.58	0.42	0.91	2.01	0.49	0.72	CO_2 trace F 0.18	100.23	2.729
A2. II	.867	.138	.053	.015	.098	.171	.061	.028			.025	.004	.010			
78	53.33	15.80	7.15	5.20	2.47	4.15	6.96	2.21	2.80	0.50					100.57	
A3. III	.889	.155	.045	.072	.062	.074	.112	.023								
79	61.63	17.71	1.12	4.34	0.80	3.40	5.38	3.96	0.68		0.68				99.70	
A?3. III	1.027	.174	.007	.060	.020	.061	.087	.043			.008					

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. AKEROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
65	II.5.2.4.⊙	or 17.24 ab 34.84 an 12.79 ne 2.70 di 8.37 ol 17.40 mt 3.71 il 0.76	Hutberg, n. Raiersdorf, Aachen, Rheinland.	Lindner.	E. Dathe, Jb. Pr. G. L.-A., XIX, p. cxxix, 1899.	Vogesite.	Not in W. T.
66	II.5.2.″4.	or 20.57 ab 38.78 an 11.40 ne 3.12 di 6.05 wo 7.08 mt 9.28 il 0.61 hm 1.92	Käuling-Beilstein, Kreuzberg, Rhöngebirge.	E. v. Seyfried.	E. v. Seyfried, Jb. Pr. G. L.-A., XVII, p. 33, 1897.	Tephrite.	In W. T., p. 263.
67	(I)II.″5.2(3).4.	Q 7.20 or 19.46 ab 42.44 an 15.85 C 0.51 hy 6.98 mt 4.41 il 0.15 ap 1.68	Birkenauer Thal, Hesse.	Surv. lab.	G. Klemm, Erl. G. Kt. Hes., Bl. Birkenau, p. 29, 1905.	Granite.	
68	″II.(4)5.2(3).4.	Q 7.98 or 12.23 ab 42.97 an 16.12 di 4.16 hy 6.66 mt 4.41 il 1.67 ap 1.34	Bergfeld, Westerwald, Hesse-Nassau.	H. Schneiderhöhn.	H. Schneiderhöhn, Jb. Pr. G. L.-A., XXX, (II), p. 306, 1910.	Trachyandesite.	
69	II.″5.(1)2.(3)4.	Q 5.94 or 22.24 ab 39.82 an 5.56 di 7.97 hy 9.22 mt 4.41 il 2.43 ap 0.67	Pyrna, Saxony.	C. Ambronn.	C. Ambronn, In. Diss. Leip., p. 53, 1907.	Pyroxene granite porphyry.	
70	II.5.2″.4.	or 17.79 ab 39.30 an 15.29 di 12.69 hy 4.82 ol 3.85 mt 5.10 il 1.52 ap 0.34	Stengert, Spessart, Bavaria.	A. Schwager.	H. Thürach, Geogn. Jhft., V (1892); p. 100, 1893.	Camptonite.	Aschaffite of Gümbel in G. von Bayern, II, p. 617, 1894. Not in W. T.
71	″II.(4)5.2″.″4.	Q 8.46 or 19.46 ab 39.82 an 14.18 hy 11.31 mt 3.25 il 1.37 ap 1.34	Striegau, Silesia.	F. Riegner.	F. Riegner, In. Diss. Bres., p. 34, 1909.	Border of schliere in granite.	Cf. No. 56, II.5.2.3 and No.182, I.4.1.3.
72	II.5.2.4.⊙	Q 2.04 or 17.24 ab 41.92 an 11.40 di 2.54 hy 15.22 mt 4.87 il 1.52 ap 1.34	Hohenberg, n. Reichenberg, Riesengebirge.	F. Riegner.	F. Riegner, In. Diss. Bres., p. 42, 1909.	Schliere in granite.	
73	″II.5.2.(3)4.	Q 4.38 or 26.69 ab 39.30 an 11.12 hy 3.90 il 0.91 hm 5.67 tn 1.96 ru 0.32 ap 2.69	Tscheboner Berg, Buchau, Bohemia.	A. Krehan.	A. Krehan, Jb. G. R.-A. Wien, LXII, p. 37, 1912.	Trachyandesite.	Iron oxides?
74	(I)II.″5.2(3).″4.	Q 6.60 or 21.13 ab 38.77 an 16.96 di 1.30 hy 2.40 mt 1.39 il 1.98 hm 3.68 ap 1.34	Ziegenberg, Nestersitz, Bohemia.	F. Hanusch.	J. E. Hibsch, T. M. P. M., XXIV, p. 303, 1905.	Bostonite.	
75	II.5(6).2″.″4.	or 20.57 ab 26.98 an 15.57 ne 8.66 di 12.82 ol 3.27 mt 7.66 il 1.82 ap 2.69	Rongstock, Bohemia.	R. Pfohl.	J. E. Hibsch, T. M. P. M., XIX, p. 55, 1900.	Essexite.	Mean of several analyses. Not in W. T.
76	II″.″5.2″.4	Q 4.50 or 15.01 ab 31.96 an 12.79 di 17.71 hy 1.80 il 4.71 hm 7.33 tn 0.14 ap 1.34	Alwernia, n. Cracow, Galicia.	Z. Rosen.	Z. Rosen, B. Ac. Sc. Crac., 1909, 1835	Melaphyre.	Iron oxides?
77	II(III).5.2(3).″4.	Q 1.68 or 15.57 ab 31.96 an 13.62 di 21.17 wo 1.28 il 3.30 hm 8.40 ap 1.34	Regulice, n. Cracow, Galicia.	Z. Rosen.	Z. Rosen, B. Ac. Sc. Crac., 1909, p. 837.	Melaphyre.	Iron oxides?
78	II.5″.(1)2.4″.	or 12.79 ab 47.16 an 5.56 ne 6.25 di 12.17 ol 2.80 mt 10.44	Rettenbachklamm, Schöckel, Styria.	L. Welisch.	L. Welisch, Mt. Nw. Ver. Steierm., XLVII, p. 76, 1911.	Diabase.	
79	(I)II.5.2.″4.	Q 4.62 or 23.91 ab 45.59 an 12.23 di 4.05 hy 5.86 mt 1.62 il 1.22	Monte Mulatto, Predazzo, Tyrol.	J. A. Ippen.	J. A. Ippen, Sb. Wien Ak., CXI, I, p. 260, 1902.	Cancrinite-nephelite syenite.	Norm and mode. Name correct?

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. MONZONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
80	52.73	16.85	5.23	4.43	2.64	5.86	5.44	3.86	3.14						100.18	
A3. III	.879	.165	.033	.061	.066	.105	.088	.041								
81	62.80	15.55	1.44	2.52	2.67	3.43	5.60	3.95	0.89	0.05	0.91				99.81	2.72
A3. III	1.047	.152	.009	.035	.067	.061	.090	.042			.011				(99.75)	
82	62.61	16.66	0.89	3.22	3.02	1.75	4.80	4.08	2.66	0.16	0.62				100.48	2.68
A3. III	1.044	.163	.006	.044	.076	.031	.077	.043			.008					
83	57.50	16.18	3.22	3.47	3.28	4.92	4.80	3.36	1.76	0.24	1.27				100.00	2.90
A3. III	.958	.159	.020	.049	.082	.088	.077	.036			.016					
84	60.99	15.93	1.80	3.82	1.92	3.91	5.11	3.75	1.88	0.09	0.65				99.85	2.78
A3. III	1.017	.156	.011	.053	.048	.070	.082	.040			.008					
85	55.18	17.12	6.97	1.47	4.01	3.79	4.85	3.10	1.25	0.06	1.84				99.65	2.82
A3. III	.920	.168	.044	.021	.100	.068	.078	.033			.023					
86	54.48	14.14	2.68	4.86	7.74	4.80	4.76	2.27	2.59	0.26	1.49				100.07	2.84
A3. III	.908	.139	.017	.068	.194	.086	.077	.024			.019					
87	53.65	14.29	1.01	6.01	6.00	6.90	4.33	3.48	1.65	0.09	1.78	0.86			100.05	2.82
A2. II	.894	.140	.006	.083	.150	.123	.069	.037			.022	.006				
88	52.87	15.44	6.15	4.86	4.59	5.55	4.93	1.75	1.47		2.32				99.93	2.86
A3. III	.881	.151	.039	.068	.115	.099	.079	.019			.029					
89	52.12	14.70	6.16	6.08	4.68	6.78	4.67	1.47	1.47	0.11	1.75	0.09			100.08	2.92
A2. II	.869	.144	.039	.085	.117	.121	.076	.016			.022	—				
90	55.78	16.98	4.07	3.43	3.61	2.52	5.05	3.33	3.04	0.17	1.54				99.52	2.77
A3. III	.930	.167	.025	.047	.090	.045	.082	.035			.019					
91	59.18	18.17	6.06	0.32	2.42	3.31	6.46	3.59	0.39		1.08				100.98	
B3. IV	.986	.178	.038	.004	.061	.059	.104	.038			.014					
92	56.14	20.20	4.53	1.27	1.26	4.99	6.39	2.80	1.51		0.82				99.91	
A3. III	.936	.198	.028	.018	.032	.089	.103	.030			.010					
93	52.67	15.35	3.82	5.42	4.40	5.91	4.50	2.68	0.37	0.14	4.04	0.75	trace	NiO none CuO none	100.05	
A2. II	.878	.150	.024	.075	.110	.105	.073	.029			.051	.005	—			
94	50.15	15.21	1.54	7.32	7.54	7.18	4.31	2.59	0.35	0.12	3.37	0.67			100.35	
A2. II	.836	.149	.010	.102	.189	.128	.070	.028			.042	.005				
95	53.58	19.78	3.91	2.76	3.01	7.55	5.33	3.61	0.65						100.18	
A3. III	.893	.194	.024	.039	.075	.135	.085	.038								
96	57.67	19.17	4.55	0.99	1.22	3.94	6.84	3.35	1.77		0.40	0.34		S 0.06	100.30	2.607
A2. II	.961	.188	.029	.014	.031	.070	.110	.036			.005	.002				

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. AKEROSE—Continued.

No.	Symbol.	Norm.		Locality.	Analyst.	Reference.	Rock name.	Remarks.
80	II.5(6).2.″4.	or 22.80 ab 30.65 an 10.01 ne 8.38	di 15.47 ol 2.04 mt 7.66	Pizmeda, Tyrol.	J. A. Ippen.	J. A. Ippen, N. J. Cb., 1904, p. 429.	Allochetite.	
81	″II.″5.(1)2.″4.	Q 5.52 or 23.35 ab 47.16 an 5.56	di 9.08 hy 4.36 mt 2.09 il 1.67	Piz Scantschallas, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Hornblende aplite.	
82	(I)II.(4)5.2.(3)4.	Q 9.36 or 23.91 ab 40.35 an 8.62 C 1.22	hy 11.56 mt 1.39 il 1.22	Crap Grond, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Diorite aplite.	
83	II.5.2.″4.	Q 3.06 or 20.02 ab 40.35 an 12.79	di 9.26 hy 5.52 mt 4.64 il 2.43	Crap Grond, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Diorite porphyrite.	Border of No. 70, II.5.2.3.
84	″II.″5.2.″4.	Q 5.94 or 22.24 ab 42.97 an 9.45	di 8.26 hy 5.21 mt 2.55 il 1.22	Piz Ner, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Syenite porphyry.	
85	II.5.2″.4.	Q 1.74 or 18.35 ab 40.87 an 15.85	di 1.94 hy 9.10 il 3.19 hm 6.87 tn 0.39	Brichplankenslock, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Kersantite.	
86	II″.5.2.4.	or 13.34 ab 40.35 an 10.56	di 10.59 hy 8.58 ol 7.14 mt 3.94 il 2.89	Piz Posta Bialla, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Spessartite.	
87	II″.5.2.(3)4.	or 20.57 ab 34.06 an 9.45 ne 1.14	di 15.48 ol 10.70 mt 1.39 il 3.34 ap 2.02	Gliemsstöckli, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Syenite.	
88	II.5.2(3).4.	Q 1.92 or 10.56 ab 41.39 an 14.73	di 9.94 hy 6.90 mt 9.05 il 4.41	Piz Dadens, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Luciite.	
89	II(III).5.2(3).4″.	Q 0.18 or 8.90 ab 39.82 an 14.46	di 15.28 hy 7.58 mt 9.05 il 3.34	Samvis, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Diorite.	
90	II.5.2.4.⊙	Q 2.70 or 19.46 ab 42.97 an 12.51 C 0.51	hy 9.40 mt 5.80 il 2.89	Sustenjoch, Aarmassif, Switzerland.	O. Fischer.	O. Fischer, T. M. P. M., XXIV, p. 92, 1905.	Diorite porphyrite.	
91	(I)II.5.2.4.	or 21.13 ab 54.49 an 10.01	di 2.81 hy 0.40 ol 3.08 il 0.61 hm 6.06 tn 1.96	Semaforo, Ustica, Aeolian Islands.	A. Martelli.	A. Martelli, Mem. Soc. It. Sc., XVII, p. 164, 1912.	Andesite.	Iron oxides?
92	(I)II.5.2″.4.	or 16.68 ab 48.21 an 18.07 ne 3.12	di 5.18 ol 0.56 mt 1.86 il 1.52 hm 3.20	Semaforo, Ustica, Aeolian Islands.	A. Martelli.	A. Martelli, Mem. Soc. It. Sc., XVII, p. 164, 1912.	Andesite.	
93	II.5.2″.4.	Q 1.20 or 16.12 ab 38.25 an 13.34	di 8.64 hy 7.00 mt 5.57 il 7.75 ap 1.68	Monte San Mateo, Ploaghe, Sardinia.	H. S. Washing- ton.	H. S. Washington, Q. J. G. S. LXIII, p. 74, 1907.	Basalt.	
94	II(III).5″.2″.4.	or 15.57 ab 28.30 an 14.18 ne 4.54	di 13.34 ol 13.75 mt 2.32 il 6.38 ap 1.68	Monte Lisiri, Itirreddu, Sardinia.	H. S. Washing- ton.	H. S. Washington, unpublished.	Basalt.	
95	II.5(6).2(3).4.	or 21.13 ab 27.77 an 19.74 ne 9.09	di 14.17 ol 1.95 mt 5.57	Beresowska, Perm, Russia.	Loewinson- Lessing.	F. Loewinson-Lessing, Jushno Saosk., p. 244, 1900.	Syenite- diorite.	In W. T., p. 265.
96	(I)II.5.2.4.	or 20.02 ab 51.61 an 11.68 ne 3.27	di 4.54 ol 0.70 mt 4.64 il 0.76 hm 1.44 ap 0.67	Gran Curral, Madeira.	Eyme.	C. Gagel, Z. D. G. G., LXIV, p. 415, 1912.	Gauteite.	

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. MONZONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
97	55.54	18.20	5.92	1.14	1.32	5.64	6.44	2.30	2.35		0.71	0.56		S 0.06	100.18	2.628
A2. II	.926	.178	.037	.016	.033	.101	.104	.024			.009	.004				
98	52.75	18.29	4.68	4.33	2.15	7.39	5.66	2.29	0.75		0.94	0.71		S 0.05	99.98	2.770
A2. II	.879	.179	.029	.060	.054	.132	.091	.024			.012	.005				
99	48.85	16.53	5.85	5.68	2.95	6.51	5.49	2.91	1.48		2.30	0.83	trace	SO_3 0.24	99.83	2.786
A2. II	.814	.162	.037	.079	.074	.116	.089	.031			.029	.006	—			
100	57.0	18.1	4.3	1.9	2.5	6.0	6.2	2.70	0.8		1.2				100.7	
B3. IV	.950	.177	.027	.026	.063	.107	.100	.029			.015					
101	60.96	16.24	2.50	3.52	2.69	5.77	5.13	2.48	1.10		0.45	0.09	trace	CO_2 trace	100.93	
B2. III	1.016	.159	.016	.049	.067	.103	.082	.027			.006	—	—			
102	58.67	17.68	2.21	3.85	3.28	4.82	5.86	3.27	0.49		trace	0.57			100.70	
A3. III	.978	.173	.014	.054	.082	.086	.095	.035			—	.004				
103	58.67	16.21	4.17	3.54	3.19	6.29	5.09	1.89	1.29		0.19	0.25	0.15	CO_2 trace	100.93	
A2. II	.978	.159	.026	.049	.080	.113	.082	.020			.002	.002	.002			
104	48.06	16.80	6.43	6.52	5.62	6.03	5.37	2.04	2.43		0.39	0.44	trace	CO_2 trace FeS_2 0.63	100.76	
A2. II	.801	.165	.040	.090	.141	.107	.087	.021			.005	.003	—			
105	58.39	18.11	2.55	2.65	1.11	3.90	6.24	3.74	0.94	0.57	1.18	0.30			99.68	
A2. II	.973	.177	.016	.037	.028	.070	.101	.039			.015	.020				
106	56.90	19.24	3.57	0.78	0.84	4.71	5.98	4.99	0.57	0.15	1.40	0.25	0.20		99.58	
A2. II	.948	.189	.022	.011	.021	.084	.097	.053			.018	.002	.003			
107	56.25	20.50	1.85	4.23	2.54	3.62	5.91	4.80	0.83		0.63				101.16	
B3. IV	.938	.201	.012	.058	.064	.064	.095	.051			.008					
108	55.95	18.60	2.60	5.22	3.17	3.97	5.15	4.00	0.50		0.45				99.61	
A3. III	.933	.182	.016	.072	.079	.071	.083	.043			.006					
109	51.80	17.90	3.10	4.36	3.72	6.59	4.74	3.65	2.87		1.41				100.14	
A3. III	.863	.175	.019	.061	.093	.118	.076	.039			.018					
110	59.95	17.47	2.59	3.15	1.18	3.25	6.38	2.98	1.04		1.57	0.02			99.58	
A2. II	.999	.171	.016	.044	.030	.058	.103	.032			.020	—			(99.88)	
111	53.04	17.34	2.12	6.96	2.49	5.86	5.61	3.00	0.37		2.12	0.83			99.74	
A2. II	.884	.170	.013	.097	.062	.105	.090	.032			.027	.006				
112	55.49	16.29	4.81	3.90	1.86	3.87	5.50	4.63	0.52		1.77	0.41	trace	ZrO_2 0.48 SO_3 0.34	99.87	2.680
A2. II	.925	.160	.030	.054	.047	.070	.089	.049			.022	.003	—			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. AKEROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
97	″II.5.2.4.	or 13.34 di 7.13 ab 52.92 wo 0.46 an 13.90 mt 1.62 ne 0.85 il 1.37 hm 4.80 ap 1.34	Serrado, Madeira.	Eyme.	C. Gagel, Z. D. G. G., LXIV, p. 428, 1912.	Trachy-dolerite.	
98	II.5.2(3).4.	or 13.34 di 11.44 ab 40.87 ol 1.73 an 17.79 mt 6.73 ne 3.68 il 1.82 ap 1.68	Ribeira de Massapez, Madeira.	Eyme.	C. Gagel, Z. D. G. G., LXIV, p. 428, 1912.	Trachy-dolerite.	
99	II.5(6).2.4.	or 17.24 di 11.92 ab 31.44 ol 2.47 an 11.68 mt 8.58 ne 8.24 il 4.41 ap 2.02	Barranco del Diablo, Caldera La Palma, Madeira.	Eyme.	C. Gagel, Z. D. G. G., LXIV, p. 399, 1912.	Essexite.	
100	II.5.2.4.⊙	or 16.12 di 12.74 ab 47.16 ol 0.28 an 13.34 mt 2.55 ne 2.84 il 2.28 hm 2.56	Gebel Doukhan, Egypt.	J. Couyat.	J. Couyat, C. R., CXLVII, p. 869, 1908.	Labradorite (basalt).	
101	II.″5.2″.4.	Q 6.90 di 11.93 or 15.01 hy 4.48 ab 42.97 mt 3.71 an 13.90 il 0.91	Piano di Gher, Molebso, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 102, 1909.	Malchite.	
102	II.5.2.4.⊙	or 19.46 di 6.80 ab 49.78 hy 1.33 an 11.95 ol 6.43 mt 3.25 ap 1.34	Hali Baret, Cheren, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 61, 1909.	Granite.	
103	II.″5.2(3).4.	Q 6.00 di 10.93 or 11.12 hy 5.78 ab 42.97 mt 6.03 an 15.85 il 0.30 ap 0.67	Digsa, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 68, 1909.	Quartz diorite.	
104	II″.5(6).2″.4.	or 11.68 di 8.96 ab 31.96 ol 11.34 an 15.85 mt 9.28 ne 7.38 il 0.76 ap 1.01	Valle Derré, Saganeiti, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 106, 1909.	Hornblende kersantite.	
105	(I)II.5.2.4.	or 21.68 di 5.78 ab 52.92 hy 0.83 an 10.29 mt 3.71 il 2.28 ap 0.67	Tsiafakafo, Ankaratra, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVI, p. 176, 1913.	Hornblende trachyte.	
106	(I)II.5″.2.(3)4.	or 29.47 di 4.54 ab 39.82 wo 1.51 an 10.84 il 2.13 ne 5.96 hm 3.57 pf 0.54 ap 0.67	Andranonatoa, Itasy, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVI, p. 179, 1913.	Trachyte.	
107	(I)II.5″.2.(3)4.	or 28.36 di 2.04 ab 35.11 ol 7.63 an 15.29 mt 2.78 ne 7.95 il 1.22	Ambodimadiro, Ampasindava, Madagascar.	A. Pisani.	A. Lacroix, Mat. Min. Mad., I, p. 110, 1902.	Micromonzonite (latite).	
108	″II.5.2.″4.	or 28.91 di 3.43 ab 41.13 ol 8.37 an 15.57 mt 3.71 ne 1.28 il 0.91	Ampangarinana, Nosy Komba, Madagascar.	A. Pisani.	A. Lacroix, Mat. Min. Mad., I, p. 19, 1902.	Ditroite.	
109	II.5″.2″.″4.	or 21.68 di 12.91 ab 27.77 ol 4.51 an 16.68 mt 4.41 ne 6.53 il 2.74	Bekinkina, Ambavatovy, Madagascar.	A. Pisani.	A. Lacroix, Mat. Min. Mad., II, p. 229, 1903.	Essexite-monchiquite.	Fresh?
110	(I)II.5.2.4.	Q 3.42 di 4.91 or 17.79 hy 1.70 ab 53.97 mt 3.71 an 10.01 il 3.04	Bras Rouge, Cilaos, Reunion Island.	Boiteau.	A. Lacroix, C. R., CLV, p. 541, 1912.	Akerite.	
111	II.5.2.4.⊙	or 17.79 di 8.57 ab 39.30 ol 6.99 an 13.34 mt 3.02 ne 4.26 il 4.10 ap 2.02	Bellouve, Reunion Island.	Boiteau.	A. Lacroix, C. R., CLV, p. 541, 1912.	Olivine trachy-andesite.	
112	II.5.(1)2.(3)4.	or 27.24 di 8.27 ab 42.97 ol 0.77 an 6.12 mt 6.96 ne 1.99 il 3.34 ap 1.01	East Mavenzi, Kilimanjaro, German East Africa.	C. Klüss.	L. Finckh, Z. D. G. G., LXV, p. 460, 1913.	Pulaskite.	"ZrO_2 by color with H_2O_2."

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. MONZONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
113	53.18	17.65	5.52	3.50	2.22	5.33	5.64	3.04	1.62		1.52	0.57	trace	SO_3 0.06 S 0.06	99.91	2.667
A2. II	.886	.173	.034	.049	.056	.095	.091	.032			.019	.004				
114	50.27	18.91	4.08	5.35	2.04	5.94	5.19	5.34	2.15		1.90	0.80		S 0.10	100.07	2.684
A2. II	.838	.185	.026	.075	.051	.106	.084	.035			.024	.006				
115	49.69	17.02	4.28	7.34	3.15	6.73	4.67	2.73	1.19		2.13	0.65		ZrO_2 0.36 SO_3 0.30	100.24	
A2. II	.828	.167	.027	.102	.079	.120	.076	.029			.027	.005				
116	56.80	17.81	1.40	4.84	1.34	5.21	6.15	2.81	1.60		1.61	0.45			100.02	
A2. II	.947	.175	.009	.067	.034	.093	.099	.030			.020	.003				
117	52.54	14.77	4.68	3.57	5.37	8.06	4.46	2.86	0.14	0.84	2.95	0.68	trace	F 0.34	101.26	2.794
B2. III	.876	.145	.029	.050	.134	.144	.072	.031			.037	.005	—			
118	59.30	16.61	1.51	5.02	1.55	3.16	5.63	4.41	0.95		1.11	0.44	0.21		99.90	
A2. II	.988	.163	.009	.069	.039	.056	.090	.047			.014	.003	.003			
119	57.14	18.05	2.80	2.59	1.42	4.03	5.27	4.71	2.06		1.82	0.59	trace		100.48	
A2. II	.952	.177	.018	.036	.036	.071	.085	.050			.023	.004	—			
120	49.70	13.24	8.60	4.05	3.21	6.31	5.28	1.90	4.00		3.35	0.26			99.90	
A2. II	.828	.130	.054	.057	.080	.113	.085	.020			.042	.002				
121	60.2	17.8	3.9	1.5	1.6	6.1	6.2	1.7	1.0						100.0	
B3. IV	1.003	.175	.024	.021	.040	.109	.100	.018								
122	53.94	19.25	4.16	2.70	1.83	10.70	5.55	2.49	0.27						100.89	2.732
A3. III	.899	.189	.026	.038	.046	.191	.090	.027								
123	52.95	15.56	2.62	7.29	2.89	4.92	4.46	2.94	2.18	0.75	1.84	1.15	0.14		99.69	2.74
A2. II	.883	.153	.016	.101	.072	.088	.072	.031			.023	.008	.002			
124	56.63	17.71	3.61	4.64	1.47	4.06	5.11	3.65	0.70	0.49	2.00	trace	0.03	CO_2 0.01 ZrO_2 0.06 NiO none BaO none SrO none	100.17	
A1. I	.944	.174	.023	.064	.037	.072	.082	.039			.025	—	—			
125	55.19	16.18	3.52	3.94	3.04	4.68	5.09	4.10	1.75	0.99	0.89	0.59	0.18	CO_2 0.28 ZrO_2 none SO_3 0.05 Cl 0.02 Cr_2O_3 none V_2O_3 0.03 NiO none CuO 0.01 BaO 0.07 SrO trace Li_2O trace	100.60	2.800
A1. I	.920	.159	.022	.054	.076	.084	.081	.044			.011	.004	.002			
126	51.88	14.20	3.72	6.87	4.62	6.36	3.93	3.27	1.44	0.58	3.54	trace	0.02	CO_2 0.29 SO_3 0.04 Cl trace NiO 0.04 BaO none SrO none	100.80	
A1. I	.865	.139	.023	.096	.116	.114	.063	.035			.044	—	—			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. AKEROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
113	II.5.2.4.⊙	or 17.79 di 6.91 ab 44.01 ol 1.68 an 13.90 mt 6.96 ne 1.99 il 2.89 hm 0.64 ap 1.34	Loo Malassin Volcano, German East Africa.	C. Klüss.	L. Finckh, Z. D. G. G., LXV, p. 500, 1913.	Basaltoid trachy-dolerite.	
114	II.5″.2(3).4.	or 19.44 di 4.51 ab 34.06 ol 4.53 an 18.35 mt 6.03 ne 5.40 il 3.65 ap 2.02	Kibo, Kilimanjaro, German East Africa.	C. Klüss.	L. Finckh, Z. D. G. G., LXV, p. 500, 1913.	Basaltoid trachy-dolerite.	
115	II.5.2(3).4.	or 16.12 di 9.37 ab 33.01 ol 7.04 an 17.24 mt 6.26 ne 3.69 il 4.10 ap 1.68	Mavenzi, Kilimanjaro, German East Africa.	C. Klüss.	L. Finckh, Z. D. G. G., LXV, p. 469, 1913.	Essexite.	"ZrO_2 by color with H_2O_2."
116	″II.5.2.4.	or 16.68 di 8.60 ab 50.30 ol 3.06 an 12.79 mt 2.09 ne 0.85 il 3.04 ap 1.01	Leeuwfontein, Pretoria, Transvaal.	F. Pisani.	H. A. Brouwer, Transv. Nephs., p. 81, 1910.	Leeuwfon-teinite (akerite).	
117	II(III).5.2.4.	or 17.24 di 18.36 ab 35.11 ol 3.43 an 11.68 mt 3.02 ne 1.42 il 5.62 hm 2.56 ap 1.68	Bering Island, Commander Islands, Bering Sea.	Z. Starzynki.	Z. Starzynki, B. Ac. Sci. Crac., 1912, p. 671.	Beringite (amphibole andesite).	
118	″II.5.″2.(3)4.	Q 0.36 di 4.67 or 26.13 hy 8.02 ab 47.16 mt 2.09 an 7.23 il 2.13 ap 1.01	Sulphur Island, Japan.	K. Yokoyama.	S. Kozu, pers. com.	Oligoclase andesite.	
119	(I)II.5.2.(3)4.	Q 0.36 di 3.46 or 27.80 hy 2.00 ab 44.54 mt 3.02 an 11.68 il 3.50 hm 0.80 ap 1.34	Miniura, Dozen, Oki Islands, Japan.	K. Yokoyama.	S. Kozu, pers. com.	Plagioclase trachyte.	
120	II(III).5.2.4.	or 11.12 di 17.28 ab 42.97 mt 3.48 an 6.95 il 6.38 ne 0.85 hm 6.24 ap 0.67	Won-low-si-chou, East Yunnan, China.	Pisani.	J. Deprat, Mem. Sv. G. Indo-Ch., I (1), p. 231, 1912.	Andesite.	
121	(I)II.5.2″.4(5).	Q 5.34 di 8.64 or 10.01 wo 1.39 ab 52.40 mt 4.87 an 15.85 hm 0.48	Sago Volcano, Sumatra.	H. Hoppe.	H. Hoppe, In. Diss. Bres., p. 23, 1903.	Andesite.	
122	II.5(6).2(3).4.	or 15.01 di 12.91 ab 30.92 wo 7.08 an 20.02 mt 6.03 ne 8.80	Rau Rau, Merapi Volcano, Sumatra.	A. Clausnizer.	R. D. M. Verbeek, Sum. Westk., p. 518, 1883.	Augite andesite.	Not in W. T.
123	II.5.2″.4.	Q 1.08 di 2.54 or 17.24 hy 14.39 ab 37.73 mt 3.71 an 13.90 il 3.50 ap 2.09	Spicers Peak, Queensland.	G. R. Patten.	A. R. Agric. Chem. Qld., 1914.	Oligoclase basalt.	H. C. Richards, pers. com.
124	″II.5.2.″4.	Q 2.40 di 4.29 or 21.68 hy 3.72 ab 42.97 mt 5.34 an 14.73 il 3.80	Oakey Creek, Nandewar Mountains, New South Wales.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXII, p. 904, 1908.	Akerite.	
125	II.5.2.″.4.	or 24.46 di 8.25 ab 42.44 ol 4.61 an 9.45 mt 5.10 il 1.67 ap 1.35	Jamberoo, Kiama, New South Wales.	J. C. H. Mingaye.	Jaquet, Card and Harper, Rec. G. S. N. S. W., VIII, p. 12, 1905.	Orthoclase basalt.	
126	II(III).5.2″.(3)4.	or 19.46 di 16.25 ab 33.01 hy 2.76 an 11.40 ol 3.51 mt 5.34 il 6.69	Tondurou, Warrumbungle Mountains, New South Wales.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXII, p. 616, 1908.	Orthoclase basalt.	

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. MONZONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
127	56.85	14.76	4.48	1.21	3.84	7.91	5.34	1.91	0.12	0.08	3.11	0.51	0.12	CO_2 none ZrO_2 trace SO_3 none Cl trace F 0.04 Cr_2O_3 none NiO 0.05 BaO none SrO 0.01 Li_2O none	100.34	
A1. I	.948	.145	.028	.017	.096	.141	.086	.020			.039	.004	.002			
128	49.39	14.86	7.35	5.42	5.62	7.08	4.71	2.54	2.52			0.20			99.69	
A3. III	.823	.146	.046	.075	.141	.127	.076	.027				.001				
129	58.06	18.21	4.87	2.01	1.59	3.29	6.12	2.75	(0.83)	(0.53)	1.88	0.65	0.36	SO_3 0.05 S 0.05 CuO 0.10	99.99	
A?1. I	.968	.178	.031	.028	.040	.059	.098	.030			.024	.005	.005			
130	51.26	16.74	2.92	7.11	2.80	6.61	5.86	2.25	0.42	0.26	2.57	0.81	0.23	ZrO_2 none Cr_2O_3 none NiO none BaO 0.10 SrO 0.09	100.03	
A1. I	.854	.164	.018	.099	.070	.118	.095	.023			.032	.006	.003			
131	49.55	17.78	4.65	5.89	2.49	7.01	6.12	2.29	0.34	0.29	2.09	1.10	0.28	CO_2 none ZrO_2 0.01 FeS_2 0.03 Cr_2O_3 none V_2O_3 0.02 NiO none BaO 0.05 SrO 0.08 Li_2O none	100.07	
A1. I	.826	.174	.029	.082	.062	.125	.098	.024			.026	.008	.004			
132	58.92	16.95	3.33	3.69	0.40	6.22	4.99	3.08	1.27	1.09					99.94	
A3. III	.982	.166	.021	.051	.010	.111	.081	.033								
133	52.36	14.20	5.80	6.68	3.09	7.40	5.42	2.06	1.57		2.40				100.98	
B3. IV	.873	.139	.036	.093	.077	.132	.087	.022			.030					
134	46.18	16.82	2.08	13.46	5.68	4.81	5.02	1.83	0.82	0.89	0.51	1.05	0.27	CO_2 0.31	99.73	2.88
A2. II	.770	.165	.013	.187	.142	.086	.081	.019			.006	.008	.004			

RANG 2. DOMALKALIC. MONZONASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	54.39	16.90	1.65	6.76	4.51	1.29	8.02	0.55	4.22	0.18	1.24	0.12			99.78	
A2. II	.906	.166	.010	.094	.113	.023	.129	.006			.016	.001				
2	60.44	16.26	0.07	3.52	1.75	7.86	7.13	0.44	0.38	0.29	1.33	0.58	0.06	CO_2 none ZrO_2 0.06 FeS_2 0.10 NiO trace Li_2O none	100.27	
A1. I	1.007	.159	——	.049	.044	.140	.115	.005			.016	.004	.001			
3	50.09	15.84	7.44	3.80	4.98	3.54	7.50	1.10	3.67		1.70	0.32	trace	CO_2 0.34	100.32	
A2. II	.835	.155	.047	.053	.125	.063	.121	.012			.021	.002				
4	52.59	15.03	6.12	3.96	5.04	5.55	5.79	0.67	2.16	0.16	1.36	0.15	0.25	CO_2 none	99.73	
A2. II	.877	.156	.038	.055	.126	.099	.093	.007			.016	.001	.004			
5	61.36	16.56	3.44	2.93	0.85	4.56	6.86	1.30	1.55					CO_2 trace	99.41	2.63
A?3. III	1.023	.162	.022	.040	.021	.081	.111	.014								
6	57.43	17.69	1.59	3.48	2.73	5.72	7.19	0.58	1.81	0.48	0.66	0.17	0.17	CO_2 0.10 ZrO_2 none S 0.02 BaO none SrO 0.02	99.84	
A1. I	.957	.173	.010	.049	.068	.102	.116	.006			.008	.001	.002			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. AKEROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
127	II.5.2.4.⊙	Q 2.94 di 14.90 or 11.12 hy 2.70 ab 45.06 il 2.89 an 10.84 hm 4.48 tn 3.92 ap 1.34	Houghton, Hundred of Yatala, South Australia.	W. N. Benson.	W. N. Benson, Pr. R. Soc. S. Aust., XXXIII, p. 122, 1909.	Diorite.	
128	II(III).5(6).2.4.	or 15.01 di 17.95 ab 28.30 ol 6.71 an 11.95 mt 10.67 ne 6.25 ap 0.34	Otago, New Zealand.	P. Marshall.	P. Marshall, Q. J. G. S., LXII, p. 409, 1906.	Nephelite basanite.	
129	(I)II.5.2.4.	Q 4.56 hy 4.00 or 16.68 mt 2.09 ab 51.35 il 3.65 an 11.68 hm 3.52 C 0.82 ap 1.68	Kohala Mountain, Waimea, Hawaii, Hawaiian Islands.	A. B. Lyons.	A. B. Lyons, A. J. S., II, p. 424, 1896.	Andesite.	Calculated to 100 after deducting H_2O. In W. T., p. 265.
130	II.5″.2.4.	or 12.79 di 11.93 ab 38.77 ol 5.86 an 12.79 mt 4.18 ne 5.96 il 4.86 ap 2.02	Ravine n. Vierira House, Maui, Hawaiian Islands.	G. Steiger.	W. Cross, U. S. G. S. P. P. 88, p. 31, 1915.	Essexitic andesite.	
131	II.5(6).2.4.	or 13.34 di 10.42 ab 34.84 ol 3.80 an 14.46 mt 6.73 ne 8.94 il 3.95 ap 2.69	Haleakala Crater, Maui, Hawaiian Islands.	W. F. Hillebrand.	W. Cross, U. S. G. S. P. P. 88, p. 31, 1915.	Esseritic andesite.	
132	″II.″5.2.4.	Q 5.76 di 9.60 or 18.35 wo 2.32 ab 42.44 mt 4.87 an 14.18	Namulowai, Fiji Islands.	Stoddard and Mawson.	W. G. Woolnough, Pr. Linn. Soc. N. S. W., XXVIII, p. 520, 1903.	Augite andesite.	
133	II(III).5.2.4.	or 12.23 di 22.86 ab 39.56 ol 0.17 an 8.34 mt 8.35 ne 3.26 il 4.56	Beeman Hill, Campbell Island.	P. Marshall.	P. Marshall, Subant. Islds., p. 696, 1909.	Basalt.	
134	II″.5(6).2(3).4.	or 10.56 ol 27.48 ab 28.82 mt 3.02 an 16.40 il 0.91 ne 7.38 ap 2.69 C 0.61	Adams Island, Auckland Islands.	A. M. Wright.	Speight and Finlayson, Subant. Islds., p. 733, 1909.	Basalt.	

SUBRANG 5. PERSODIC. GRENADOSE. (H. S. WASHINGTON, 1917.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.5.(1)2.5.	or 3.34 ol 14.85 ab 62.88 mt 2.32 an 5.56 il 2.43 ne 2.56 ap 0.34 C 1.12	Wapus Creek, Gowganda District, Ontario.	M. F. Connor.	W. H. Collins, Can. G. S. Mem. 33, p. 76, 1913.	Aplite.	
2	II.5.2.5.⊙	Q 2.58 di 17.94 or 2.78 wo 1.16 ab 60.26 il 2.43 an 10.84 ap 1.34	South Peru, Massachusetts.	W. T. Schaller.	U. S. G. S. B. 419, p. 24, 1910.	Pyroxene-titanite aplite.	
3	II.5(6).(1)2.″5.	or 6.67 di 7.34 ab 47.68 ol 6.30 an 6.12 mt 7.42 ne 8.52 il 3.19 hm 2.40 ap 0.67	Mattapan, Massachusetts.	W. T. Hall.	F. Bascom, pers. com.	Soda andesite.	
4	II.5.2(3).″5.	or 3.89 di 8.64 ab 48.73 hy 8.60 an 15.57 mt 8.82 il 2.43 ap 0.34	Crystal Falls, Michigan.	H. N. Stokes.	J. M. Clements, U. S. G. S. Mon., XXXVI, p. 106, 1899.	Metabasalt (diabase).	In W. T., p. 265.
5	(I)II.″5.2.(4)5.	Q 6.96 di 9.00 or 7.23 wo 0.58 ab 58.16 mt 5.10 an 10.29	Galena Mountain, Silverton, Colorado.	E. O. Cross.	F. R. Van Horn, B. G. S. A., XII, p. 8, 1901.	Hornblende andesite.	
6	II.5.2.5.⊙	or 3.34 di 10.88 ab 60.78 ol 4.25 an 14.18 mt 2.32 il 1.22 ap 0.34	Rogue River, Port Orford Quadrangle, Oregon.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. Fol. 89, p. 4, 1903.	Gabbro.	

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. MONZONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
7	60.80	16.34	0.68	5.14	1.47	6.92	6.71	1.12	0.37						99.55	2.71
A3. III	1.013	.160	.004	.071	.037	.123	.108	.012								
8	56.51	14.07	4.04	4.65	3.95	8.44	5.32	0.79	1.51		0.19	0.23	trace	CO_2 none S trace	99.70	
A2. II	.942	.138	.025	.065	.099	.150	.085	.008			.002	.002	—			
9	62.08	16.19	2.10	3.05	5.62	1.77	5.94	1.57	1.35						99.67	
A3. III	1.035	.159	.013	.043	.141	.032	.096	.017								
10	50.52	13.98	0.49	0.16	0.34	1.05	6.18	1.00	0.30	0.20	25.00	trace	none	CO_2 none S 0.12	99.34	
B2. III	.842	.137	.003	.002	.009	.019	.100	.011			.313	—	—		(99.33)	
11	52.04	16.28	6.18	5.69	4.14	5.33	6.41	1.19	0.39		1.67	0.40	0.03	S 0.08	99.83	
A2. II	.867	.160	.039	.079	.104	.095	.103	.013			.021	.003	—			
12	51.69	14.62	9.24	5.14	3.74	4.49	6.77	1.08	0.43	(0.08)	1.80	0.46	0.08	CO_2 0.38 S 0.02	99.94	
A2. II	.862	.143	.058	.071	.094	.080	.110	.012			.023	.003	.001			
13	58.28	16.42	6.02	2.75	1.94	4.26	7.90	0.14	1.72		0.58		0.12		100.13	
A2. II	.971	.161	.038	.039	.049	.076	.127	.001			.007		.002			
14	54.77	14.67	6.60	6.41	3.21	4.90	6.32	0.60	0.36	0.11	1.51		0.39	CO_2 0.10 SO_3 0.15	100.10	
A2. II	.913	.142	.041	.089	.080	.088	.102	.007			.019		.003			
15	52.82	15.98	2.07	6.88	4.20	6.74	6.44	1.23	0.69		2.82	0.10	0.31		100.28	2.87
A2. II	.880	.157	.013	.096	.105	.120	.104	.013			.035	.001	.004			
16	54.23	15.22	2.84	9.47	2.93	8.56	5.80	0.92	1.00						100.97	2.88
B3. IV	.904	.149	.017	.133	.072	.152	.093	.010								
17	60.62	16.22	1.76	5.67	1.62	4.18	6.67	0.78	0.56		1.54	0.24			99.86	
A2. II	1.010	.159	.011	.079	.041	.075	.108	.008			.019	.002				

RANG 3. ALKALICALCIC. ANDASE. (C. I. P. W., 1903.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	55.17	18.01	0.08	5.41	5.29	5.64	2.12	5.48	0.29	0.01	2.33	0.25		CO_2 none	100.08	
A2. II	.920	.176	.001	.075	.132	.101	.034	.059			.029	.002			(100.86)	
2	51.21	18.28	3.07	4.19	3.47	7.86	2.49	6.60	0.56	0.16	1.43	0.35	trace	CO_2 none ZrO_2 none SO_3 none BaO 0.10	99.77	
A1 I	.854	.179	.019	.058	.087	.140	.040	.070			.018	.003	—			
3	52.37	20.89	1.21	4.44	1.74	5.08	2.90	7.47	1.46	0.51	1.15	0.51	trace	CO_2 none ZrO_2 0.07 SO_3 none Cl none BaO 0.16	99.96	
A1. I	.873	.204	.008	.062	.044	.091	.047	.080			.014	.004	—			
4	50.86	18.48	4.03	3.45	2.55	7.77	2.23	7.15	1.51	0.16	1.00	0.46	trace	CO_2 none ZrO_2 0.02 SO_3 none BaO 0.17	99.84	
A1. I	.848	.181	.025	.048	.064	.139	.035	.077			.013	.003	—			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 5. PERSODIC. GRENADOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
7	II.5.2.(4)5.	Q 1.56 di 19.63 or 6.67 hy 2.55 ab 56.59 mt 0.93 an 11.12	Saba Island, West Indies.	T. Nordström.	P. T. Cleve, Sv. Vet. Ak. Hnrd., IX, No. 12, p. 39, 1871.	Andesite.	Cf. Högbom, B. G. Inst. Ups., VI, p. 230, 1905. Not in W. T.
8	II″.5.2″.″5.	Q 3.54 di 22.03 or 4.45 hy 4.25 ab 44.54 mt 5.80 an 12.51 il 0.30 ap 0.67	Grenada Island, West Indies.	J. B. Harrison.	J. B. Harrison, Rocks and Soils of Grenada, p. 10, 1896.	Andesite.	In W. T., p. 265.
9	II.″5.2.(4)5.	Q 7.32 hy 18.06 or 9.45 mt 3.02 ab 50.30 an 8.90 C 1.43	Northwestern Corsica.	J. Deprat.	J. Deprat, B. Sv. Ct. G. Fr., XVII, No. 117, p. 54, 1907.	Trachy-andesite.	
10	II.(4)5.(1)2.″5.	Q 7.74 hy 0.90 or 6.12 il 0.30 ab 52.40 hm 0.48 an 5.26 ru 24.88 C 0.82	Krageroe, Norway.	J. W. Watson.	T. L. Watson, A. J. S., XXXIV, p. 512, 1912.	Kragerite (rutile-albite rock).	
11	II.5.2.(4)5.	or 7.23 di 9.05 ab 48.73 ol 6.16 an 12.23 mt 9.05 ne 2.84 il 3.19 ap 1.01	Koskull Kulle Mine, Gellivare, Sweden.	G. Nyblom.	A. G. Högbom, G. F. F., XXXII, p. 569, 1910.	Metabasite.	
12	II″.5.(1)2.(4)5.	or 6.67 di 10.58 ab 53.45 ol 3.15 an 5.84 mt 11.37 ne 2.27 il 3.50 hm 1.44 ap 1.01	Sakaravaara, Lapland, Sweden.	R. Mauzelius.	P. Geijer, G. Kir. Dist., p. 198, 1910.	Syenite porphyry.	
13	II.5.2.5.⊙	Q 2.70 di 9.29 or 0.56 hy 0.00 ab 66.55 mt 7.89 an 9.17 il 1.06 hm 0.64	Niederkirchen, Rheinpfalz.	A. Schwager.	M. Schuster, Geog. Jhft., XIX (1906), p. 57, 1908.	Aplite.	
14	II.5.2.″5.	Q 2.34 di 10.14 or 3.89 hy 6.91 ab 53.45 mt 9.51 an 9.17 il 2.89 ap 1.01	Ludwigsteich, n. Rossdorf, Hesse.	Stadler.	G. Klemm, Erl. G. Kt. Hess., Bl. Rossdorf, p. 24, 1912.	Diabase.	
15	II″.5″.2.(4)5.	or 7.23 di 17.46 ab 43.23 ol 6.43 an 11.12 mt 3.02 ne 6.10 il 5.32 ap 0.34	San Antonio, Valtellina, Lombardy.	Dittrich.	W. Rasch, N. J. B. B., XXXII, p. 216, 1911.	Diorite.	
16	II″.5″.2.(4)5.	or 5.56 di 24.82 ab 40.87 ol 7.54 an 12.79 mt 3.94 ne 4.26	Victoria Range, Westland, New Zealand.	W. A. MacLeod.	W. A. MacLeod, Tr. N. Z. Inst., XXXI, p. 487, 1899.	Dolerite.	In W. T., p. 265.
17	II.″5.2.5.	Q 6.78 di 5.85 or 4.45 hy 7.62 ab 56.59 mt 2.55 an 11.95 il 2.89 ap 0.67	Deception Island, South Shetland Islands, Antarctica.	Lassieur.	G. Gourdon, pers. com.	Andesite.	

SUBRANG 2. DOPOTASSIC. AURUNCOSE. (H. S. WASHINGTON, 1906.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.5.3.2(3).	Q 0.54 di 2.48 or 32.80 hy 17.94 ab 17.82 mt 0.23 an 23.07 il 4.41 ap 0.67	Campbell Pond, Lincoln County, Maine.	M. W. Adams.	I. H. Ogilvie, Ann. N. Y. Ac. Sci., XVII, p. 542, 1907.	Monzonite.	
2	II.5″.3.2(3).	or 38.92 di 13.56 ab 9.17 ol 3.58 an 19.18 mt 4.41 ne 6.39 il 2.74 ap 1.01	Toscanella, n. Lake Bolsena, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 86, 1906.	Leucite tephrite.	
3	(I)II.5″.(2)3.2(3).	or 44.48 ol 7.16 ab 13.62 mt 1.86 an 21.41 il 2.13 ne 5.94 ap 1.34	Croce di San Martino, Monte Vico, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 80, 1906.	Leucite tephrite.	
4	II.5″.(2)3.2.	or 42.81 di 13.22 ab 6.81 ol 1.04 an 19.18 mt 5.80 ne 6.25 il 1.98 ap 1.01	Orchi, Rocca Monfina Volcano, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 83, 1906.	Leucite trachyte.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
5	50.20	18.80	1.79	4.62	5.55	8.77	1.71	6.07	1.37		1.19	0.31			100.38	
A2. II	.837	.184	.011	.064	.139	.157	.027	.065			.015	.002				
6	53.5	20.0	2.5	3.7	2.2	7.9	1.1	6.2	2.4						99.5	
B3. IV	.892	.196	.016	.051	.055	.141	.018	.066								

RANG 3. ALKALICALCIC. ANDASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	58.51	16.32	2.11	4.43	3.73	3.92	3.11	4.08	2.00	0.23	0.72	0.30	trace	CO_2 none Cr_2O_3 none NiO none	99.46	
A2. II	.975	.160	.013	.061	.093	.070	.050	.043			.009	.002	——			
2	57.97	15.65	0.73	2.80	4.96	10.93	3.03	3.16	0.38	0.22	0.60	0.15	trace	Cl trace F trace BaO 0.09 SrO 0.02 Li_2O trace	100.69	
A1. I	.966	.153	.005	.039	.124	.195	.049	.034			.008	.001	——			
3	52.07	15.99	4.77	5.59	4.54	7.50	2.97	2.79	1.60	0.34	1.08	0.40		CO_2 none	99.64	
A2. II	.868	.157	.030	.078	.114	.134	.048	.030			.014	.003				
4	51.00	17.21	4.23	2.41	6.19	9.15	2.88	4.93	0.63		0.13	0.33	trace	SO_3 0.03 Cl trace BaO 0.34 SrO 0.14	99.60	
A1. I	.850	.169	.026	.033	.155	.163	.047	.053			.002	.002	——			
5	56.05	19.70	3.74	2.32	2.51	4.34	3.29	4.44	1.86		0.98	0.66	trace	SO_3 0.19 Li_2O 0.06	100.14	
A2. II	.934	.193	.023	.032	.063	.078	.053	.047			.012	.005	——			
6	54.86	17.28	4.08	2.28	4.19	5.42	3.94	3.96	2.16		0.69	0.48	0.19	BaO 0.37	99.90	
A2. II	.914	.170	.025	.032	.105	.096	.063	.042			.009	.003	.003			
7	53.49	17.19	4.73	3.25	4.42	6.34	3.23	3.86	2.17		0.71	0.43	0.14	BaO 0.06	100.02	
A2. II	.892	.169	.029	.045	.111	.113	.052	.041			.009	.003	.002			
8	52.86	17.51	5.18	3.31	4.18	6.51	3.22	3.41	1.76		1.04	0.53	trace	SO_3 0.22 Cl 0.16 Li_2O 0.04	99.93	
A2. II	.881	.172	.032	.046	.105	.116	.051	.036			.013	.004	——			
9	52.49	17.89	5.76	2.08	3.49	7.01	3.18	3.73	2.63		0.81	0.55	0.09	BaO 0.30	100.01	
A2. II	.875	.175	.036	.030	.087	.125	.051	.039			.010	.004	.001			
10	52.93	19.67	3.07	3.50	2.88	4.69	4.20	4.75	2.73		0.72	0.59	0.15	BaO 0.21	100.09	
A2. II	.882	.193	.019	.049	.072	.084	.068	.051			.009	.004	.002			
11	51.56	21.00	5.17	2.76	2.52	4.83	4.37	4.13	2.27		0.65	0.69	trace	SO_3 0.21 Cl trace Li_2O 0.13	100.29	
A2. II	.859	.206	.032	.039	.063	.086	.071	.044			.008	.005	——			
12	52.11	16.58	3.66	4.99	6.87	6.43	3.25	3.20	1.99		0.53	0.63	0.23		100.47	
A2. II	.869	.163	.023	.070	.172	.115	.052	.034			.006	.004	.003			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 2. DOPOTASSIC. AURUNCOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
5	II.5″.3.2.	or 36.14 di 12.98 ab 4.19 ol 9.10 an 25.58 mt 2.55 ne 5.40 il 2.28 ap 0.67	Monte Somma, n. Naples, Italy.	A. Pisani.	A. Lacroix, C. R., CXLI, p. 1190, 1905.	Sommaite (leucite monzonite).	
6	″II.5.3″.2.	Q 2.70 di 6.61 or 36.70 hy 6.87 ab 9.43 mt 3.71 an 31.14	Gebel Aroudjaoud, n. Cherchel, Algeria.	Not stated.	Termier and de Lapparent, C. R., CL, p. 1486, 1910.	Monzonite.	

SUBRANG 3. SODIPOTASSIC. SHOSHONOSE. (C. I. P. W., 1903.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.(4)5.(2)3.3.	Q 9.54 hy 14.45 or 23.91 mt 3.02 ab 26.20 il 1.37 an 17.51 ap 0.67 C 0.41	Crystal Falls, Michigan.	H. N. Stokes.	J. M. Clements, J. G., VI, p. 378, 1898.	Mica diorite.	Also in U. S. G. S. Mon. 36, p. 231, 1899. In W. T., p. 267.
2	II″.5.3.3″.	Q 3.36 di 27.02 or 18.90 hy 2.96 ab 25.68 mt 1.16 an 19.46 il 1.22 ap 0.34	Rock Creek, Crazy Mountains, Montana.	W. F. Hillebrand.	J. E. Wolff, U. S. G. S. B. 148, p. 144, 1897.	Diorite.	In W. T., p. 267.
3	II″.5.3.3(4).	Q 2.94 di 10.04 or 16.68 hy 11.07 ab 25.15 mt 6.96 an 21.96 il 2.28 ap 1.01	Mount Belmont, Marysville District, Montana.	G. Steiger.	J. S. Barrell, U. S. G. S. P. P. 57, p. 45, 1907.	Diorite.	
4	II.5(6).3.3.	or 29.47 di 18.48 ab 12.05 ol 5.24 an 19.18 mt 6.03 ne 6.82 il 0.30 ap 0.67	Highwood Peak, Highwood Mountains, Montana.	E. B. Hurlbut.	L. V. Pirsson, U. S. G. S. B. 237, p. 79, 1905.	Monzonite.	In W. T., p. 267.
5	(I)II.(4)5.(2)3.3.	Q 9.06 hy 6.30 or 26.13 mt 4.64 ab 27.77 il 1.82 an 16.68 hm 0.48 C 3.37 ap 1.68	Two Ocean Pass, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, J. G., III, p. 944, 1895.	Shoshonite.	Also in U. S. G. S. Mon. 32 (II), p. 340, 1899. In W. T., p. 267.
6	II.5.(2)3.3(4).	Q 1.68 di 4.54 or 23.35 hy 8.40 ab 33.01 mt 5.34 an 18.07 il 1.37 hm 0.32 ap 1.01	Indian Peak, Yellowstone National Park.	L. G. Eakins.	J. P. Iddings, J. G., III, p. 944, 1895.	Shoshonite.	Also in U. S. G. S. Mon. 32 (II), p. 340, 1899. In W. T., p. 267.
7	II.5.3.3.⊙	Q 2.10 di 5.89 or 22.80 hy 9.52 ab 27.25 mt 6.73 an 21.13 il 1.37 ap 1.01	Beaverdam Creek, Yellowstone National Park.	L. G. Eakins.	J. P. Iddings, J. G., III, p. 944, 1895.	Shoshonite.	Also in U. S. G. S., Mon. 32(II), p. 340, 1899. In W. T., p. 267.
8	II.5.3.3″.	Q 3.78 di 4.41 or 20.02 hy 8.86 ab 26.72 mt 7.42 an 23.63 il 1.82 ap 1.34	Beaverdam Creek, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32 (II), p. 340, 1899.	Shoshonite.	In W. T., p. 267.
9	II.5.3.3.⊙	Q 3.06 di 5.83 or 21.68 hy 6.00 ab 26.72 mt 4.87 an 23.63 il 1.52 hm 2.40 ap 1.34	Near Pyramid Peak, Yellowstone National Park.	L. G. Eakins.	J. P. Iddings, J. G., III, p. 944, 1895.	Leucite? shoshonite.	Also in U. S. G. S. Mon. 32, (II), p. 340, 1899. In W. T., p. 267.
10	(I)II.5.(2)3.3″.	or 28.36 ol 7.39 ab 32.75 mt 4.41 an 19.74 il 1.37 ne 1.56 ap 1.34 C 0.31	Beaverdam Creek, Yellowstone National Park.	L. G. Eakins.	J. P. Iddings, J. G., III, p. 947, 1895.	Leucite banakite.	Also in U. S. G. S. Mon. 32, (II), p. 349, 1899. In W. T., p. 267.
11	(I)II.5.(2)3.3(4).	or 24.46 ol 4.41 ab 37.20 mt 7.42 an 19.18 il 1.22 C 2.24 ap 1.68	Beaverdam Creek, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 349, 1899.	Leucite banakite.	Same rock as No. 10 above. In W. T., p. 267.
12	II.″.5.3.3(4).	or 18.90 di 5.56 ab 27.25 hy 11.40 an 21.41 ol 6.42 mt 5.34 il 0.91 ap 1.34	Hurricane Ridge, Crandall Basin, Yellowstone National Park.	L. G. Eakins.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 260, 1899.	Orthoclase basalt.	In W. T., p. 267.

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
13	51.75	17.48	6.42	1.46	4.05	8.20	3.33	3.72	2.26		0.86	0.67	trace	SO_3 0.17 Cl trace	100.37	
A2. II	.863	.172	.040	.020	.101	.146	.054	.039			.011	.005	——			
14	51.17	16.14	4.11	4.48	4.82	7.72	2.99	3.54	2.24	0.63	1.01	0.48	0.21	ZrO_2 none FeS_2 0.05 Cr_2O_3 trace V_2O_3 0.04 NiO 0.01 BaO 0.20 SrO 0.10 Li_2O trace	99.94	
A1. I	.853	.158	.026	.062	.121	.137	.048	.037			.012	.003	.003			
15	50.29	15.85	8.22	1.43	4.65	7.71	2.98	3.53	1.98	1.77	0.96	0.51	0.15	CO_2 none Cl trace NiO trace BaO 0.15 SrO 0.09 Li_2O trace	100.27	
A1. I	.838	.155	.051	.020	.116	.137	.048	.037			.012	.004	.002			
16	57.67	18.07	1.09	4.23	2.69	6.24	3.14	4.02	0.17	0.22	1.04	0.11	0.80	ZrO_2 0.32 Cl 0.04	99.85	
A2. II	.961	.177	.007	.058	.067	.112	.051	.042			.013	.001	.011			
17	57.51	19.18	1.76	3.39	2.44	6.32	3.28	3.18	0.09	0.09	2.02	0.41	none	ZrO_2 none Cl 0.07 FeS_2 0.23	99.97	
A2. II	.959	.188	.011	.047	.061	.113	.053	.034			.025	.003	——			
18	57.39	18.26	1.58	5.10	1.51	6.52	2.78	4.59	0.11	0.20	1.11	0.11	0.88	ZrO_2 0.03 Cl 0.05	100.22	
A2. II	.967	.179	.010	.071	.038	.116	.045	.049			.014	.001	.013			
19	56.90	18.50	0.17	4.61	5.10	6.17	2.99	4.14	0.51		0.19	0.79	trace	Cl trace	100.07	
A2. II	.948	.181	.001	.064	.127	.110	.048	.044			.002	.006	——			
20	56.64	17.00	3.11	5.06	2.79	6.20	3.16	3.40	0.70	0.31	0.81	0.44	0.20	CO_2 none ZrO_2 none SO_3 none Cl none F none S 0.03 NiO none BaO 0.06 SrO trace	99.91	2.837
A1. I	.944	.167	.019	.070	.070	.111	.051	.036			.010	.003	.003			
21	53.95	18.56	3.86	4.23	2.35	6.58	3.36	3.88	0.68	0.30	0.76	0.60	0.17	CO_2 0.85 ZrO_2 none Cl none F none S 0.06 NiO none BaO 0.13 SrO 0.07	100.39	2.783
A1. I	.899	.182	.024	.058	.059	.118	.054	.041			.010	.004	.002			
22	52.10	19.35	4.63	4.16	3.19	7.15	3.39	3.77	0.13	0.06	0.94	0.71	0.10		99.68	
A2. II	.868	.190	.029	.058	.080	.128	.055	.040			.012	.005	.001			
23	51.43	19.35	5.32	4.70	3.05	7.09	3.54	3.52	0.35	0.08	0.85	0.60	trace		99.88	
A2. II	.857	.190	.033	.065	.076	.127	.057	.037			.011	.004	——			
24	48.25	16.73	3.99	6.28	5.77	8.32	3.24	4.08	1.72		0.89	0.68	trace	SO_3 0.12 Cl 0.08 BaO 0.01	100.16	
A1. I	.804	.164	.025	.088	.144	.148	.052	.043			.011	.005	——			
25	54.80	16.69	5.18	2.73	3.61	6.23	3.74	3.57	0.37	0.55	1.14	0.78	0.10	CO_2 none ZrO_2 0.07 F 0.02 S 0.01 Cr_2O_3 trace V_2O_3 0.03 BaO 0.17 SrO 0.04	99.83	
A1. I	.913	.164	.033	.038	.090	.111	.060	.038			.014	.005	.001			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 3. SODIPOTASSIC. SHOSHONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
13	II.5.3.3″.	or 21.68 di 10.80 ab 28.30 hy 4.30 an 21.96 ol 0.56 mt 2.09 il 1.67 hm 4.96 ap 1.68	Sepulcher Mountain, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32 (II), p. 340, 1899.	Shoshonite.	In W. T., p. 267.
14	II″.5.3.3″.	or 20.57 di 11.98 ab 25.15 hy 8.41 an 20.29 ol 1.18 mt 5.80 il 1.82 ap 1.01	Dike Mountain, Yellowstone National Park.	W. F. Hillebrand.	Hague and Jaggar, U. S. G. S. B. 168, p. 98, 1900.	Augite andesite.	In W. T., p. 267.
15	II.5.3.3.⊙	Q 1.08 di 11.66 or 20.57 hy 6.20 ab 25.15 mt 2.78 an 19.46 il 1.52 hm 6.24 ap 1.34	Deer Creek, Yellowstone National Park.	W. F. Hillebrand.	Hague and Jaggar, U. S. G. S. B. 168, p. 97, 1900.	Gabbro porphyry.	In W. T., p. 269.
16	II.″5.3.3.	Q 5.64 di 5.72 or 23.35 hy 10.35 ab 26.72 mt 1.62 an 23.35 il 1.98 ap 0.34	Monarch, Colorado.	R. M. Butters.	R. D. Crawford, Colo. G. S. B. 4, p. 133, 1913.	Quartz diorite.	
17	(I)II.(4)5.3.3(4).	Q 9.66 di 0.43 or 18.90 hy 7.35 ab 27.77 mt 2.55 an 28.08 il 3.80 ap 1.01	Jennings Gulch, Monarch District, Colorado.	R. M. Butters.	R. D. Crawford, Colo. G. S. B. 4, p. 162, 1913.	Andesite.	MnO?
18	″II.″5.3.3.	Q 7.02 di 5.80 or 27.24 hy 7.38 ab 23.58 mt 2.32 an 23.63 il 2.13 ap 0.34	Lost Mountain, Monarch District, Colorado.	R. M. Butters.	R. D. Crawford, Colo. G. S. B. 4, p. 133, 1913.	Quartz diorite.	MnO?
19	II.5.3.3.⊙	Q 1.80 hy 20.75 or 24.46 mt 0.23 ab 25.15 il 0.30 an 24.74 ap 2.02	Turkey Creek, Jefferson County, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. Mon. 27, p. 310, 1896.	Syenite.	In W. T., p. 269.
20	II.″5.3.3″.	Q 7.62 di 4.80 or 20.02 hy 10.45 ab 26.72 mt 4.41 an 22.24 il 1.52 ap 1.01	Caribou, Boulder County, Colorado.	G. Steiger.	E. S. Bastin, U. S. G. S. rec. lab.	Quartz monzonite.	
21	II.5.3.3.⊙	Q 3.18 di 4.29 or 22.80 hy 7.24 ab 28.30 mt 5.57 an 23.91 il 1.52 ap 1.34	Caribou, Boulder County, Colorado.	G. Steiger.	E. S. Bastin, U. S. G. S. rec. lab.	Monzonite.	
22	II.5.3.3″.	or 22.24 di 3.56 ab 28.82 hy 7.42 an 26.41 ol 0.90 mt 6.73 il 1.82 ap 1.68	Caribou, Boulder County, Colorado.	E. P. Jennings.	E. P. Jennings, Tr. Am. Inst. M. E., XLIV, p. 1047, 1913.	Gabbro.	Edge of stock.
23	II.5.3.3(4).	or 20.57 di 4.02 ab 29.87 hy 5.45 an 26.69 ol 2.15 mt 7.66 il 1.67 ap 1.34	Caribou, Boulder County, Colorado.	E. P. Jennings.	E. P. Jennings, Tr. Am. Inst. M. E., XLIV, p. 1047, 1913.	Gabbro.	Center of stock.
24	II″.5(6).3.3.	or 23.91 di 13.90 ab 14.67 ol 10.53 an 19.18 mt 5.80 ne 6.82 il 1.67 ap 1.68	Valmont, Boulder County, Colorado.	L. G. Eakins.	W. Cross. U. S. G. S. Mon. 27, p. 301, 1896.	Dolerite.	Also in U.S.G.S. B. 150, p. 264, 1898. In W. T., p. 269.
25	II.5.(2)3.3(4).	Q 4.50 di 6.05 or 21.13 hy 6.20 ab 31.44 mt 5.80 an 18.35 il 2.13 hm 1.28 ap 1.68	Lost Trail Creek, San Cristobal quadrangle, Colorado.	C. Palmer.	W. Cross. U. S. G. S. rec. lab.	Trachydolerite.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
26	54.06	19.07	4.69	4.40	1.15	6.78	3.20	2.98	0.57	1.19	1.38	0.62	0.15	CO_2 none ZrO_2 0.03 S 0.02 BaO 0.07 SrO 0.01	100.37	
A1. I	.901	.187	.029	.061	.029	.121	.052	.032			.017	.004	.002			
27	52.59	17.91	3.81	5.18	4.11	7.24	2.94	3.83	1.24		0.84	0.14	trace	Cl 0.05	99.88	2.83
A2. II	.877	.175	.024	.072	.103	.129	.047	.940			.011	.001	—			
28	49.69	18.06	2.64	6.19	5.73	8.24	2.99	3.90	0.91		0.85	0.81	0.13	Cl 0.13	100.27	
	.288	.177	.016	.086	.143	.147	.048	.041			.011	.006	.002			
29	55.90	15.52	1.22	5.22	4.70	5.79	2.89	4.45	1.40	0.60	0.90	0.46	0.08	CO_2 0.14 SrO 0.09	99.36	
B2. III	.932	.152	.008	.072	.118	.104	.047	.048			.011	.003	.001			
30	50.66	16.91	1.71	6.17	5.50	8.26	2.89	4.45	1.06	0.14	1.32	0.91	0.16	BaO 0.23 SrO 0.08	100.45	2.843
A2. II	.844	.166	.011	.086	.138	.147	.047	.048			.033	.006	.002			
31	56.78	16.86	3.56	2.93	3.41	6.57	3.19	3.48	1.21	0.15	1.15	0.42		CO_2 0.18	99.89	2.67
A2. II	.946	.165	.022	.040	.085	.118	.051	.037			.014	.003				
32	56.19	16.76	3.05	4.18	3.79	6.53	2.53	4.46	0.66	0.34	0.69	0.55	0.10	BaO 0.19 SrO trace Li_2O trace	100.02	
A2. II	.937	.164	.020	.058	.095	.117	.041	.048			.009	.004	.001			
33	57.26	17.79	3.39	3.45	2.02	6.58	3.06	4.15	0.55	0.53	0.71	0.21	0.29	CO_2 0.04 Cl trace F 0.04 FeS_2 0.13 BaO 0.07 Cu trace	100.27	
A1. I	.954	.174	.021	.048	.051	.118	.049	.045			.009	.002	.004			
34	56.32	17.30	3.88	4.32	2.61	4.78	2.91	4.37	1.49		0.72	0.47	0.13	FeS_2 0.13	99.35	2.740
B2. III	.939	.170	.024	.060	.065	.086	.047	.047			.009	.003	.002			
35	56.32	19.69	0.46	4.63	1.78	5.57	3.44	4.60	1.60	0.13	0.83	0.20	0.09	CO_2 0.54 ZrO_2 0.08 BaO 0.42	100.38	2.769
A1 I	.939	.193	.003	.064	.045	.100	.055	.049			.010	.001	.001			
36	47.6	17.6	4.8	5.8	5.0	8.6	2.3	4.3	2.2		1.6				99.8	
B3. IV	.792	.172	.030	.080	.125	.153	.037	.046			.020					
37	49.00	17.20	0.93	6.30	9.40	6.00	2.21	4.85	2.00		1.76	0.45			100.10	
A2. II	.817	.169	.006	.088	.235	.107	.035	.052			.022	.003				
38	59.41	17.92	1.71	2.40	2.99	4.65	2.63	5.60	1.30		0.01	0.87			99.49	
A2. II	.990	.175	.011	.033	.077	.083	.042	.060			—	.006				
39	47.50	17.57	7.24	5.08	3.31	7.09	3.60	3.28	1.70		3.02	0.48		CO_2 0.30	100.17	
A2. II	.792	.172	.045	.071	.083	.127	.058	.035			.038	.003				
40	55.19	16.42	5.20	4.28	2.31	8.23	2.82	3.79	2.26						100.50	2.748
A3. III	.920	.161	.032	.060	.058	.146	.045	.040								

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 3. SODIPOTASSIC. SHOSHONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
26	″II.(4)5.3.3(4).	Q 8.40 di 1.14 or 17.79 hy 4.58 ab 27.25 mt 6.73 an 28.63 il 2.58 ap 1.34	Huerto Peak, San Cristobal quadrangle, Colorado.	G. Steiger.	W. Cross, U. S. G. S. rec. lab.	Basalt.	
27	II.5.3.3.⊙	Q 0.06 di 8.53 or 22.24 hy 11.06 ab 24.63 mt 5.57 an 24.46 il 1.67 ap 0.34	Table Mountain, n. Denver, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. Mon. 27, p. 306, 1896.	Basalt.	In W. T., p. 269.
28	II.5.3.3.⊙	or 22.80 di 8.80 ab 19.39 ol 13.20 an 24.46 mt 3.71 ne 3.12 il 1.67 ap 2.02	Table Mountain, n. Denver, Colorado.	W. F. Hillebrand.	W. S. Cross, U. S. G. S. Mon. 27, p. 308, 1906.	Basalt.	In W. T., p. 269.
29	II.5.(2)3.3.	Q 2.34 di 8.37 or 26.69 hy 14.84 ab 24.10 mt 1.86 an 15.85 il 1.67 ap 1.01	Phoenix, British Columbia.	M. F. Connor.	O. E. LeRoy, Can. G. S. Mem. XXI, p. 49, 1912.	Augite porphyrite.	
30	II″.5.″3.3.	or 26.69 di 12.28 ab 17.29 ol 9.98 an 19.74 mt 2.55 ne 3.98 il 5.02 ap 2.02	Salmon River, Rossland Mountains, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38 (1), p. 305, 1912.	Monzonite.	
31	II.(4)5.3.3″.	Q 8.70 di 6.73 or 20.57 hy 5.80 ab 26.72 mt 5.10 an 21.41 il 2.13 ap 1.01	Clover Meadow, Tuolumne County, California.	G. Steiger.	F. L. Ransome, U. S. G. S. B. 89 p. 58, 1898.	Augite latite.	Also in A. J. S., V, p. 363, 1898. In W. T., p. 269.
32	II.″5.3.3.	Q 5.94 di 6.48 or 26.69 hy 10.34 ab 21.48 mt 4.64 an 20.85 il 1.37 ap 1.34	Table Mountain, Tuolumne County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 14 (II), p. 491, 1894.	Basalt.	In W. T., p. 269.
33	II.″5.3.3.	Q 7.68 di 6.99 or 25.02 hy 4.35 ab 25.68 mt 4.87 an 22.24 il 1.37 ap 0.67	Ely, Nevada.	R. C. Wells.	A. C. Spencer, U. S. G. S. rec. lab.	Monzonite porphyry.	
34	II.″5.3.3.	Q 7.20 hy 11.52 or 26.13 mt 5.57 ab 24.63 il 1.37 an 21.13 ap 1.01	Media Luna, n. Coyaima, Upper Magdalena, Colombia.	A. Lindner.	E. Lehmann, T. M. P. M., XXX, p. 249, 1911.	Quartz monzonite.	
35	(I)II.5.3.3.	Q 1.92 di 1.86 or 27.24 hy 10.44 ab 28.82 mt 0.70 an 24.74 il 1.52 ap 0.34	Olavarria, n. Buenos Aires, Argentina.	M. Dittrich.	H. Backlund, Minist. Agric. Arg. B. 2 B, p. 27, 1913.	Diorite.	
36	II″.5.3.3.	or 25.58 di 15.20 ab 12.05 ol 6.95 an 24.74 mt 6.96 ne 3.98 il 3.04	Malvern, England.	J. H. Player.	C. Callaway, Q. J. G. S., XLIX, p. 419, 1893.	Diorite.	In W. T., p. 269.
37	II.5.3.(2)3.	or 28.91 di 3.34 ab 13.10 ol 21.42 an 22.80 mt 1.39 ne 2.84 il 3.34 ap 1.01	Vaugneray, n. Lyon, France.	Pisani.	A. Lacroix, pers. com.	"Vaugnerite."	
38	(I)II.(4)5.(2)3.″3.	Q 9.18 hy 10.69 or 33.36 mt 2.55 ab 22.01 ap 2.02 an 17.51 C 1.02	Cabezo Felipe, n. Cartagena, Spain.	A. Osann.	A. Osann, Z. D. G. G., XLIII, p. 719, 1891.	Andesite.	TiO_2 low? In W. T., p. 269.
39	II.5.3.3(4).	or 19.46 di 8.21 ab 27.25 ol 3.15 an 21.96 mt 7.66 ne 1.70 il 5.78 hm 1.92 ap 1.01	Hukon, Christiania Fjord, Norway.	L. Schmelck.	W. C. Brögger, Q. J. G. S., L, p. 33, 1894.	Labradorite porphyrite.	In W. T., p. 269.
40	II.″5.3.3.	Q 6.12 di 15.96 or 22.24 hy 1.76 ab 23.58 mt 7.42 an 21.13	Gebweiler, Vosges Mountains.	V. Traumann.	A. Osann, Abh. G. Kte. Els. Lothr., III, p. 117, 1887.	Labrador-porphyrite.	In W. T., p. 269.

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
41	51.98	18.84	4.98	5.40	2.77	6.13	3.04	3.60	2.58						99.32	
B3. Iv	.866	.185	.031	.075	.069	.109	.049	.038								
42	50.08	18.87	3.47	3.49	2.14	6.70	4.10	4.58	4.17		1.39	0.39	0.29	CO_2 0.20 Cl 0.28 S 0.04	100.19	2.651
A2. II	.835	.185	.022	.049	.054	.120	.066	.049			.018	.003	.004			
43	50.08	21.68	3.88	4.00	2.85	7.78	4.21	3.96	0.55		1.24				100.23	2.607
A3. III	.835	.212	.024	.056	.071	.139	.068	.042			.016					
44	50.52	17.98	5.09	5.90	3.36	7.95	3.60	3.70	1.03		trace	1.31			100.44	
A3. III	.842	.176	.032	.082	.084	.142	.058	.039			——	.009				
45	49.75	16.72	5.70	4.99	3.89	9.69	3.08	3.02	2.18		0.18	0.72			99.92	2.857
A2. II	.829	.164	.036	.069	.097	.173	.050	.033			.003	.005				
46	57.32	17.35	3.23	4.04	2.63	5.87	3.53	4.06	0.55		1.08	0.17	0.08		99.91	
A2. II	.955	.170	.020	.056	.066	.105	.056	.044			.014	.001	.001			
47	53.59	15.09	1.57	7.47	4.66	7.26	2.86	3.48	2.70			1.20		S 0.28	100.34	
A3. III	.893	.148	.010	.104	.117	.130	.046	.037				.008				
48	58.00	16.68	2.28	3.79	3.89	5.09	2.61	4.67	1.71	0.15	1.43	0.23	0.13		100.66	2.87
A2. II	.967	.164	.014	.053	.097	.091	.042	.050			.018	.002	.002			
49	55.45	16.10	2.14	4.72	4.28	6.67	3.03	4.47	2.11	0.08	1.12	0.08			100.25	2.89
A2. II	.924	.158	.013	.065	.107	.120	.048	.048			.014	——				
50	51.29	15.68	2.75	6.40	6.37	7.06	1.94	3.74	2.49	0.11	1.77	0.62	0.16		100.38	2.96
A2. II	.855	.154	.017	.089	.159	.126	.031	.039			.022	.004	.002			
51	47.95	17.31	2.17	5.82	7.45	7.77	2.98	2.99	3.84	0.24	1.52	0.41	0.11		100.56	2.93
A2. II	.799	.170	.014	.081	.186	.139	.048	.032			.019	.003	.002			
52	55.25	15.65	3.80	2.67	5.94	6.42	2.98	3.83	1.94	0.16	0.91	0.49			100.04	2.84
A2. II	.921	.153	.024	.038	.149	.114	.048	.040			.011	.004				
53	53.30	17.25	2.98	5.24	3.72	7.41	2.98	2.80	2.70	0.05	1.37				100.00	2.92
A3. III	.888	.169	.019	.073	.093	.132	.048	.030			.017					
54	52.83	17.28	1.69	5.70	5.35	6.37	2.12	4.46	2.37	0.26	0.79			S 0.17	99.39	
B3. IV	.881	.169	.011	.079	.134	.114	.034	.048			.010					
55	51.92	16.19	1.08	9.08	4.42	5.81	2.43	3.40	3.14	0.30	1.97				99.74	2.91
A3. III	.865	.159	.007	.126	.111	.104	.039	.036			.025					
56	56.14	18.85	3.25	2.54	2.64	5.05	2.69	5.63	2.01		1.63		trace		100.43	
A3. III	.936	.185	.020	.035	.066	.090	.044	.060			.020		——			
57	54.56	16.49	1.02	5.65	8.57	7.95	2.07	3.35	0.15		1.10		trace		100.91	
B3. IV	.909	.162	.006	.078	.214	.142	.033	.036			.013		——			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 3. SODIPOTASSIC. SHOSHONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
41	II.5.3.3.⊙	Q 1.44 di 2.54 or 21.13 hy 11.45 ab 25.68 mt 7.19 an 27.24	Masmünster, Vosges Mountains.	A. Walther.	A. Osann, Abh. G. Kte. Els. Lothr., III, p. 125, 1887.	Labrador-porphyrite.	In W. T., p. 269.
42	II.5.″3.3″.	or 27.24 di 7.94 ab 25.15 ol 2.02 an 20.57 mt 5.10 ne 3.98 il 2.74 hl 0.47 ap 1.01	Mondhalde, Kaiserstuhl, Baden.	P. Jannasch.	F. Graeff, Ber. Oberrh. G. Ver., XXIII, 1889.	Tephrite.	Mondhaldeite in K. Grüss, Mt. Bad. G. L.-A., IV (2), p. 97, 1901. In W. T., p. 271.
43	II.5(6).3.3(4).	or 23.35 di 8.21 ab 18.86 ol 3.78 an 28.36 mt 5.57 ne 9.09 il 2.43	Schackau, Rhöngebirge.	H. Gachet.	H. Gachet, In. Diss. Strassb., p. 15, 1912.	Trachy-phonolite.	
44	II.5.3.3(4).	or 21.68 di 7.51 ab 28.30 ol 8.29 an 21.96 mt 7.42 ne 1.14 ap 3.02	Rongstock, Bohemia.	R. Pfohl.	J. E. Hibsch, T. M. P. M., XV, p. 487, 1895.	Dolerite (essexite).	In W. T., p. 271.
45	II″.5.3.3(4).	or 18.35 di 16.84 ab 24.89 ol 4.57 an 22.52 mt 8.35 ne 0.71 ap 1.68	Eichberg, n. Habendorf, Bohemia.	R. Pfohl.	J. E. Hibsch, T. M. P. M., XIV, p. 112, 1894.	Leucite tephrite.	In W. T., p. 271.
46	II.5.″3.3.	Q 5.58 di 6.96 or 24.46 hy 6.28 ab 29.34 mt 4.64 an 19.74 il 2.13 ap 0.34	Val delle Scandole, Monte Mulatto, Tyrol.	Dittrich and Pohl.	J. Romberg, Anh. Abh. Pr. Ak. Wiss., 1904, p. 49.	Hypersthene monzonite.	
47	II″.5.3.3.	Q 0.96 di 8.75 or 20.57 hy 19.76 ab 24.10 mt 2.32 an 18.07 ap 2.69	Eggenspitz, Netenthal, Tyrol.	C. v. John.	W. Hammer, Jb. G. R.-A., Wien, LIII, p. 83, 1904.	Kersantite.	
48	II.(4)5.3.3.	Q 8.34 di 2.65 or 27.80 hy 11.47 ab 22.01 mt 3.25 an 20.02 il 2.74 ap 0.67	Tschirva Road, Bernina District, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Mica diorite.	
49	II.5.(2)3.3.	Q 1.50 di 13.90 or 26.69 hy 9.00 ab 25.15 mt 3.02 an 16.12 il 2.13	Morteratsch Glacier, Bernina District, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Lamprophyre.	
50	II(III).5.3.3.	Q 0.84 di 9.42 or 21.68 hy 18.21 ab 16.24 mt 3.94 an 23.35 il 3.34 ap 1.34	Boval Road, Bernina District, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Lamprophyre.	
51	II″.5.3.3(4).	or 17.79 di 8.68 ab 20.44 ol 15.13 an 25.02 mt 3.25 ne 2.56 il 2.89 ap 1.01	Boval Road, Bernina District, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Gabbro-diorite.	
52	II.5.″3.3.	Q 4.50 di 7.81 or 22.24 hy 11.63 ab 25.15 mt 5.57 an 18.07 il 1.67 ap 1.34	Piz Posta Bialla, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Kersantite.	
53	II.5.3.3(4).	Q 4.02 di 9.14 or 16.68 hy 9.70 ab 25.15 mt 4.41 an 25.30 il 2.58	Haslital, Bernese Alps, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Hornblende diorite.	
54	II.5.3.″3.	or 26.69 di 6.09 ab 17.82 hy 17.24 an 24.19 ol 0.62 mt 2.55 il 1.52	Hospice, St. Gotthard, Switzerland.	K. M. Jene.	P. Waindziok, In. Diss. Zur., p. 33, 1906.	Kersantite.	Metamorphosed.
55	II″.5.3.3.	Q 1.32 di 4.61 or 20.02 hy 21.22 ab 20.44 mt 1.62 an 23.35 il 3.80	Bellezza, Lower Engadine, Switzerland.	L. Hezner.	U. Grubenmann, Btr. G. Kt. Schw., XXIII, p. 203, 1909.	Vogesite.	
56	(I)II.5.3.″3.	Q 4.50 di 1.94 or 33.36 hy 5.70 ab 23.06 mt 3.48 an 22.52 il 3.04 hm 0.80	Orciatico, Pisa Province, Tuscany.	A. Martelli.	A. Martelli, B. Soc. G. Ital., XXVIII, p. 436, 1909.	Trachyte.	
57	II(III).5.3″.3.	or 20.02 di 10.87 ab 17.29 hy 21.27 an 25.85 ol 1.25 mt 1.39 il 2.00	Radicofani, Tuscany.	H. S. Washington.	H. S. Washington, A. J. S., IX, p. 52, 1900.	Andesite.	Gray. In W. T., p. 271.

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
58	54.14	16.42	1.69	5.26	8.44	8.05	2.20	3.34	0.56		1.23		trace		101.33	
B3. IV	.902	.161	.011	.073	.211	.144	.035	.036			.015		—			
59	56.76	16.79	2.07	6.95	1.63	6.01	2.43	4.67	2.44			0.47			100.22	2.470
A?3. III	.946	.165	.013	.097	.041	.107	.039	.050				.003				
60	56.81	20.05	4.23	2.65	1.53	5.30	3.53	5.59	0.52						100.21	2.64
A3. III	.947	.196	.026	.037	.038	.095	.056	.060								
61	55.69	17.87	4.07	3.26	3.41	6.87	2.89	4.41	0.17		1.02	0.19			99.85	2.717
A2. II	.928	.175	.025	.045	.085	.123	.047	.047			.013	.001				
62	51.75	19.59	0.93	6.23	4.24	8.02	2.38	4.90	1.38		1.19	0.41			101.02	
A2. II	.863	.192	.006	.086	.106	.143	.039	.052			.015	.003			(100.82)	
63	50.10	18.93	2.65	4.65	6.60	9.75	2.03	4.21	0.75		0.97	0.57		Cl trace	101.21	
B2. III	.835	.185	.017	.065	.165	.174	.032	.045			.012	.004				
64	56.10	18.13	3.55	4.23	2.78	6.55	3.17	4.72	n. d.		0.80	0.37			100.40	
A3. III	.935	.178	.022	.058	.070	.117	.052	.050			.010	.003				
65	55.34	17.14	6.28	3.26	3.09	7.07	3.45	3.17	0.92				0.52		100.24	
A3. III	.922	.168	.039	.045	.077	.127	.056	.034					.007			
66	60.25	19.70	0.54	3.61	2.81	6.60	2.33	4.18	0.83		0.35				101.20	
B3. IV	1.004	.193	.003	.050	.070	.118	.037	.045			.004					
67	51.54	18.80	2.67	3.88	3.33	8.00	4.13	4.19	1.57	0.24	1.18	0.29			99.82	
A2. II	.859	.184	.017	.054	.083	.143	.066	.045			.015	.002				
68	50.67	15.31	4.58	6.67	5.25	7.48	2.84	2.72	0.13	0.32	2.83	0.88			99.68	
A2. II	.845	.150	.029	.093	.131	.134	.046	.029			.035	.006				
69	51.00	18.50	3.10	5.99	2.56	6.32	3.86	4.69	1.25		2.11	0.62		SO_3 0.16	100.16	2.745
A2. II	.850	.181	.019	.083	.064	.113	.062	.050			.026	.004				
70	47.51	16.87	4.41	7.99	4.27	8.07	3.26	3.16	0.99		2.65	0.55	trace	ZrO_2 0.18 SO_3 0.25	100.16	2.864
A2. II	.792	.166	.028	.111	.107	.145	.053	.034			.033	.004	—			
71	56.66	18.02	4.33	3.67	4.17	4.50	3.62	4.45	1.34		trace	trace			100.76	
A3. III	.944	.176	.027	.051	.104	.080	.058	.048			—	—				
72	51.38	14.80	1.76	7.67	6.48	8.15	2.35	4.45	1.15		1.54	0.63	0.08		100.44	
A2. II	.856	.145	.011	.107	.162	.140	.038	.048			.019	.004	.001			
73	54.10	19.01	4.32	2.45	3.02	8.90	3.08	2.98	2.04	0.52					100.42	
A3. III	.902	.186	.027	.034	.076	.159	.050	.032								

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 2. SODIOPOTASSIC. SHOSHONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
58	II(III).5.3.3.	or 20.02, ab 18.34, an 25.02, di 11.98, hy 18.19, ol 2.43, mt 2.55, il 2.28	Radicofani, Tuscany.	H. S. Washington.	H. S. Washington, A. J. S., IX, p. 52, 1900.	Andesite.	Black. In W. T., p. 271.
59	II.″5.3.3.	Q 6.72, or 27.80, ab 20.44, an 21.13, di 4.99, hy 12.90, mt 3.02, ap 1.01	Sassara, Lake Bolsena, Italy.	L. Ricciardi.	C. Klein, Sb. Pr. Ak. Wiss., p. 96, 1888.	Olivine trachyte.	Also in N. J. B. B., VI, p. 7, 1889. In W. T., p. 271.
60	(I)II.5 ″3.3.	Q 1.62, or 33.36, ab 29.34, an 22.24, di 3.34, hy 3.66, mt 6.03	Piano Cigliano, Cimino Volcano, n. Viterbo, Italy.	G. Aichino.	V. Sabatini, Vulc. Cim., p. 506, 1912.	Oligoclasite (vulsinite).	Al_2O_3 high?
61	II.5.3.3.⊙	Q 4.26, or 26.13, ab 24.63, an 22.52, di 8.52, hy 5.43, mt 5.80, il 1.98, ap 0.36	Monte Santa Croce, Rocca Monfina, Italy.	H. S. Washington.	H. S. Washington, J. G., V, p. 252, 1897.	Biotite vulsinite.	Complete in R. C. R., p. 88, 1906. In W. T., p. 271.
62	II.5.3.″3.	or 28.91, ab 17.82, an 28.08, ne 1.42, di 7.23, ol 11.49, mt 1.39, il 2.28, ap 1.01	Monte Somma, Italy.	Pisani.	A. Lacroix, Nouv. Arch. Mus., IX, p. 149, 1907.	Sommaite (leucite monzonite).	Cf. C. R., CXLI, p. 1190, 1905.
63	II.5.3″.″3.	or 25.02, ab 13.62, an 30.02, ne 1.70, di 11.74, ol 11.22, mt 3.94, il 1.82, ap 1.34	Monte Somma, Italy.	Pisani.	A. Lacroix, Mat. Min. Mad., p. 189, 1902.	Sommaite (leucite monzonite).	Inclusion in leucite tephrite.
64	II.5.″3.3.	Q 2.70, or 27.80, ab 27.25, an 21.13, di 7.09, hy 6.94, mt 5.10, il 1.52, ap 1.01	Eruption 1888–89, Vulcano, Aeolian Islands.	Pisani.	A. Lacroix, C. R., CXLVII, p. 1453, 1908.	Microsanidinite.	Inclusion in trachyte.
65	II.″5.3.3(4).	Q 5.22, or 18.90, ab 29.34, an 21.68, di 10.80, hy 4.29, mt 9.05	Atatsch, S. Ural Mountains, Russia.	J. Morozewicz.	J. Morozewicz, T. M. P. M., XXIII, p. 132, 1904.	Labradorite porphyry.	
66	(I)II.(4)5.3″.3.	Q 10.20, or 25.02, ab 19.39, an 30.86, di 1.61, hy 11.88, mt 0.70, il 0.61	Nosy Komba, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., p. 77, 1902.	Monzonite.	Metamorphic?
67	II.5(6).3.3″.	or 25.02, ab 20.96, an 23.07, ne 7.38, di 11.80, ol 3.99, mt 3.94, il 2.28, ap 0.67	Nosy Komba, Madagascar.	Not stated.	A. Lacroix, pers. com.	Gabbro dissolved in nephelite syenite.	Cf. No. 18, I. 6.2.4 and No. 123, II. 5.4.4.
68	II(III).5.3.3(4).	Q 2.76, or 16.12, ab 24.10, an 20.85, di 8.64, hy 12.80, mt 6.73, il 5.32, ap 2.02	N. of Amboutra, Madagascar.	Not stated.	A. Lacroix, pers. com.	Hypersthene gabbro.	
69	II.5.″3.3.	or 27.80, ab 24.10, an 21.96, ne 4.54, di 4.80, ol 6.63, mt 4.41, il 3.95, ap 1.34	Korissimbi, Lake Kivu District, German East Africa.	Eyme.	L. Finckh, D. Zent. Afr. Exp., I (1), p. 11, 1912.	Trachydolerite.	
70	II″.5.3.3(4).	or 18.90, ab 21.74, an 21.96, ne 3.26, di 11.99, ol 8.34, mt 6.50, il 5.02, ap 1.34	West Kibo, Kilimanjaro, German East Africa.	Eyme.	L. Finckh, Z. D. G. G., LXV, p. 495, 1913.	Trachytoid trachydolerite.	"ZrO_2 by color with H_2O_2."
71	II.5.(2)3.3.	Q 1.80, or 26.69, ab 30.39, an 19.46, di 2.22, hy 12.50, mt 6.26	Peishan Massif, Manchuria.	C. Pfeil.	C. Pfeil, in K. Futterer, Durch Asien, II (1), p. 351, 1905.	Porphyrite.	
72	II(III).5.″3.″3.	or 26.69, ab 18.86, an 16.40, ne 0.57, di 16.75, ol 13.35, mt 2.55, il 2.89, ap 1.34	Torigoe, Ninohe-gun, Mutsu Province, Japan.	K. Yokoyama.	S. Kozu, Sci. Rep. Toh. Un., II, p. 4, 1914.	Kentallenite.	
73	II.5.3.3(4).	Q 3.84, or 17.79, ab 26.20, an 28.91, di 12.04, hy 2.86, mt 6.26	Antamok River, Benguet, Luzon, Philippine Islands.	P. J. Fox.	A. J. Eveland, Philip. J. Sci. (A), II, p. 227, 1907.	Andesite.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
74	53.92	18.68	4.27	2.65	2.93	8.85	2.92	2.66	2.23	0.44					99.55	
A3. III	.899	.183	.027	.037	.073	.158	.047	.029								
75	55.42	17.39	1.56	6.82	3.28	7.57	2.41	2.67	0.17	none	1.07	0.58	0.71	ZrO_2 none Cl 0.11 F 0.03 S 0.03 Cr_2O_3 none BaO 0.13 SrO 0.03	99.98	
A1. I	.924	.170	.010	.094	.082	.136	.039	.029			.013	.004	.010			
76	48.32	17.81	4.65	4.62	3.37	9.15	3.14	4.79	0.82	0.17	0.88	0.82	0.41	ZrO_2 none Cl 0.10 F 0.04 S 0.23 Cr_2O_3 none BaO 0.11 SrO 0.21	99.64	
A1. I	.805	.174	.029	.064	.084	.164	.051	.051			.011	.006	.006			
77	49.32	18.11	2.51	4.86	8.05	8.90	1.90	3.30	1.80	0.28	0.60	0.27	0.47		100.37	2.89
A2. II	.822	.177	.016	.068	.201	.159	.039	.035			.008	.002	.007			
78	53.90	15.32	3.60	5.13	2.41	7.30	3.73	3.44	0.97	0.74	2.86	0.55	0.36	CO_2 0.03 ZrO_2 none Cl 0.02 FeS none Cr_2O_3 none V_2O_3 0.02 NiO 0.02 BaO 0.06 SrO trace CuO 0.01	100.47	2.779
A1. I	.898	.150	.023	.071	.060	.130	.060	.036			.036	.004	.005			
79	52.42	18.05	4.30	3.60	3.60	6.14	3.75	4.14	1.07	1.47	1.16	0.34	0.28	CO_2 0.04 Cl trace S none Cr_2O_3 none V_2O_3 0.05 NiO 0.03 BaO 0.11 SrO trace CuO 0.05	100.60	2.722
A1. I	.874	.177	.027	.050	.090	.109	.060	.044			.015	.002	.004			
80	52.12	18.47	3.40	4.77	5.11	8.71	3.07	3.29	0.46		trace	0.25	trace	SO_3 trace	99.65	
A3. III	.869	.181	.021	.067	.128	.155	.050	.035			——	.002	——			
81	52.65	17.79	3.01	5.46	5.34	6.50	3.04	4.06	0.95		0.89	0.18			99.87	
A2. II	.878	.174	.019	.076	.134	.116	.049	.044			.011	.001				
82	50.71	17.08	1.38	8.71	3.63	5.75	3.82	3.63	1.75	0.16	2.71	0.57	0.09		99.99	
A2. II	.845	.167	.009	.121	.091	.103	.061	.038			.034	.004	.001			

RANG 3. ALKALICALCIC. ANDASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	48.85	19.38	4.29	4.94	2.00	7.98	5.44	1.91	0.68		2.47	1.23	0.19		99.36	
B2. III	.814	.190	.027	.068	.050	.143	.088	.020			.031	.009	.003			
2	51.50	18.81	4.30	6.41	2.90	6.78	4.84	1.76	2.44		0.40				100.14	
A3. III	.858	.184	.027	.089	.073	.121	.078	.019			.005					
3	50.75	17.31	2.08	8.13	3.48	6.77	4.14	2.87	0.56		3.05	0.10	trace	CO_2 none	99.14	
B2. III	.846	.170	.013	.113	.087	.121	.067	.031			.038	.001	——			
4	50.59	17.74	3.54	7.45	3.92	6.85	4.25	2.79	0.55		2.60	0.27	trace		100.55	
A2. II	.843	.174	.022	.104	.098	.122	.068	.030			.033	.002	——			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 3. SODIOPOTASSIC. SHOSHONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
74	II.″5.3″.3(4).	Q 6.00 di 11.21 or 16.12 hy 2.83 ab 24.63 mt 6.26 an 29.75	Antamok River, Benguet, Luzon, Philippine Islands.	P. J. Fox.	A. J. Eveland, Philip. J. Sci. (A), II, p. 251, 1907.	Andesite.	
75	II.(4)5.3(4).″3.	Q 8.94 di 4.86 or 16.12 hy 14.02 ab 20.44 mt 2.32 an 28.36 il 1.98 ap 1.34	Bromo Volcano, Java.	E. W. Morley.	J. P. Iddings, Ign. Rocks, II, p. 622, 1913.	Shoshonite.	Also in Iddings and Morley, J. G., XXIII, p. 233, 1915.
76	II.5(6).″3.3.	or 28.36 di 16.16 ab 11.53 ol 3.29 an 20.02 mt 6.73 ne 8.24 il 1.67 ap 2.02	Near Ragou, Mount Moeriah, Java.	E. W. Morley.	J. P. Iddings, Ign. Rocks, II, p. 622, 1913.	Leucite tephrite.	Also in Iddings and Morley, J. G., XXIII, p. 233, 1915.
77	II″.5.3″.3.	or 19.46 di 10.90 ab 16.77 ol 15.52 an 28.63 mt 3.71 ne 1.99 il 1.22 ap 0.67	Red Hill, Ipswich, Queensland.	G. R. Patten.	A. R. Agric. Chem. Qld., 1912.	Basalt.	H. C. Richards. pers. com.
78	II.″5.(2)3.3(4).	Q 4.44 di 14.09 or 20.02 hy 1.50 ab 31.44 mt 5.34 an 15.01 il 5.47 ap 1.34	Nowra, Milton, New South Wales.	H. P. White.	G. W. Card, Rec. G. S. N. S. W., VIII (2), p. 85, 1905.	Orthoclase basalt.	
79	II.5.″3.3″.	or 24.46 di 6.39 ab 31.44 hy 1.96 an 20.29 mt 3.97 il 2.28 ap 0.67	Bumbo, Kiama, New South Wales.	H. P. White.	Jaquet, Card, and Harper, Rec. G. S. N. S. W., VIII (1), p. 12, 1905.	Orthoclase basalt.	
80	II.5.3.3″.	or 19.46 di 11.68 ab 25.15 hy 0.43 an 26.69 ol 9.25 mt 4.87 ap 0.67	Tilba Tilba Lake, New South Wales.	J. C. H. Mingaye.	W. Anderson, Rec. G. S. N. S. W., II, p. 153, 1892.	Hornblende andesite.	In W. T., p. 271.
81	II.5.3.3.⊙	or 24.46 di 7.17 ab 25.68 hy 4.32 an 22.52 ol 8.46 mt 4.41 il 1.67 ap 0.34	Petermann Island, Weddell Quadrant, Antarctica.	Boiteau.	E. Gourdon, pers. com.	Diabase.	
82	II.5.″3.3(4).	or 21.13 di 5.07 ab 31.44 ol 12.57 an 18.90 mt 2.09 ne 0.28 il 5.17 ap 1.34	North Foothills, S. Victoria Land, Antarctica.	G. T. Prior.	G. T. Prior, Nat. Ant. Exp., I, p. 130, 1907.	Kersantite.	

SUBRANG 4. DOSODIC. ANDOSE. (C. I. P. W., 1903.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.5″.3.4″.	or 11.12 di 6.92 ab 36.41 ol 2.43 an 22.80 mt 6.26 ne 4.97 il 4.71 ap 3.02	Mount Johnson, Quebec.	N. N. Evans.	F. D. Adams, J. G., XI, p. 265, 1903.	Essexite.	
2	II.5.3.4.⊙	or 10.56 di 7.82 ab 39.03 ol 8.06 an 24.19 mt 6.26 ne 0.99 il 0.76	Nighthawk Lake, Abitibi region, Ontario.	A. G. Burrows.	G. F. Kay, Rep. Bur. Min. Ont., XIII, p. 117, 1904.	Dolerite.	
3	II.5.3″.4.	or 17.24 di 10.58 ab 31.18 ol 8.55 an 20.02 mt 3.02 ne 2.13 il 5.78 ap 0.34	Tripyramid Mountain, Waterville, New Hampshire.	R. W. Langley.	L. V. Pirsson, A. J. S., XXXI, p. 424, 1911.	Essexite.	
4	II.5.″3.4.	or 16.68 di 9.06 ab 31.44 ol 8.64 an 20.85 mt 5.10 ne 2.56 il 5.02 ap 0.67	Tripyramid Mountain, Waterville, New Hampshire.	C. J. Monahan.	L. V. Pirsson, A. J. S., XXXI, p. 424, 1911.	Camptonite.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
5	48.67	16.88	4.98	6.37	4.62	8.63	3.85	1.26	0.32	0.02	2.12	1.85			99.57	
A2. II	.811	.166	.031	.089	.115	.154	.062	.018			.026	.013				
6	52.12	16.35	3.68	6.02	4.14	7.25	3.65	2.34	0.88	0.25	2.10	0.89	0.17	CO_2 0.07 ZrO_2 0.02 Cl 0.09 F 0.03 FeS_2 0.24 NiO trace BaO 0.04	100.30	
A1. I	.869	.160	.023	.084	.104	.129	.059	.025			.026	.006	.002			
7	55.51	16.51	1.68	4.57	6.73	6.73	3.19	2.46	1.53		0.91	0.17	0.11	BaO 0.02	100.12	
A2. II	.925	.162	.011	.064	.168	.120	.052	.027			.012	.001	.002			
8	51.82	17.06	1.97	8.60	4.87	8.59	3.44	1.77	0.20	0.11	2.15				100.58	
A3. III	.864	.167	.012	.120	.122	.153	.056	.019			.027					
9	49.84	17.45	1.64	9.43	4.77	8.34	3.90	1.35	0.54	0.26	1.56	0.10	0.15	CO_2 none S 0.12 BaO trace SrO trace	99.45	3.090
A2. II	.831	.171	.010	.131	.119	.149	.063	.015			.020	.001	.002			
10	45.27	18.30	3.30	10.13	4.08	7.32	3.64	1.07	2.08		2.77	1.27	0.86	S 0.08 NiO trace	100.17	2.958
A2. II	.755	.179	.021	.140	.102	.130	.059	.011			.035	.009	.012			
11	54.38	20.53	2.78	5.50	1.99	5.39	5.20	3.40	0.50		0.09	0.15	0.01	Cl 0.03 S 0.03 BaO 0.16	100.14	2.70
A1. I	.906	.201	.018	.076	.050	.096	.084	.036			.001	.001	—		(100.03)	
12	54.10	17.45	4.52	6.47	2.33	6.17	3.81	3.06	0.48	0.09	0.19	0.88	0.35	ZrO_2 none Cl none F 0.05 S 0.14 Cr_2O_3 none BaO 0.10	100.19	
A1. I	.902	.171	.028	.090	.058	.111	.061	.033			.002	.006	.005			
13	55.34	16.37	0.77	7.54	5.05	7.51	4.06	2.03	0.58				0.40	CO_2 trace	99.65	
A3. III	.922	.160	.005	.105	.126	.134	.065	.022					.006			
14	51.49	20.72	1.80	7.28	3.82	6.71	3.70	2.14	0.31	0.10	2.26	0.15	0.13	S 0.11 BaO trace	100.72	
A2. II	.858	.203	.011	.101	.096	.120	.060	.022			.028	.001	.002			
15	50.74	20.30	1.23	7.27	3.78	7.28	3.82	2.21	0.31	0.10	2.31	0.15	0.13	S 0.12	99.75	
A2. II	.846	.199	.008	.101	.095	.130	.061	.023			.029	.001	.002			
16	47.42	17.34	4.91	10.22	5.21	8.09	3.48	1.89	1.13		0.36	0.06	0.06	Cl 0.21 BaO 0.04	100.42	
A2. II	.790	.170	.031	.142	.130	.145	.056	.020			.005	—	.001			
17	46.73	16.66	3.56	8.45	8.12	8.03	3.73	1.64	2.39		0.03	0.39	trace	Cl 0.18 F 0.26 Cr_2O_3 0.06 BaO 0.04	100.27	
A1. I	.779	.163	.023	.118	.203	.143	.060	.017			—	.003	—		(100.20)	
18	57.74	18.90	1.42	3.87	3.52	6.42	3.74	1.72	1.11	0.06	1.24	0.28	0.02	S 0.20	100.19	
A2. II	.962	.185	.009	.054	.088	.114	.060	.018			.016	.002	—			
19	53.20	15.83	3.39	6.79	5.44	6.95	3.73	1.34	1.44	0.63	1.35		0.15		100.24	
A2. II	.887	.155	.021	.094	.136	.124	.060	.014			.017		.002			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. ANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
5	II″.5.3.4.	or 10.01, ab 32.49, an 23.91, di 5.56, hy 10.27, ol 2.01, mt 7.19, il 3.95, ap 4.37	Tripyramid Mountain, Waterville, New Hampshire.	C. J. Monahan.	L. V. Pirsson, A. J. S., XXXI, p. 414, 1911.	Norite.	
6	II.5.3.4.⊙	Q 2.34, or 13.90, ab 30.92, an 21.13, di 7.42, hy 11.70, mt 5.34, il 3.95, ap 2.02	Mount Ascutney, Vermont.	W. F. Hillebrand.	R. A. Daly, U. S. G. S. B. 203, p. 41, 1903.	Diorite.	In W. T., p. 273.
7	II″.5.3.4″.	Q 2.40, or 15.01, ab 27.25, an 23.07, di 7.56, hy 18.85, mt 2.55, il 1.82, ap 0.34	South Leverett, Massachusetts.	L. G. Eakins.	B. K. Emerson, U. S. G. S. Mon. 29, p. 336, 1898.	Tonalite.	In W. T., p. 273.
8	II(III).5.3.4.	or 10.56, ab 29.34, an 25.58, di 13.98, hy 8.36, ol 5.59, mt 2.78, il 4.10	Peach's neck, Essex County, Massachusetts.	H. S. Washington.	H. S. Washington, J. G., VII, p. 60, 1899.	Diorite.	In W. T., p. 273.
9	II″.5.3.4.	or 8.34, ab 31.44, an 25.85, ne 0.85, di 12.25, ol 14.69, mt 2.32, il 3.04, ap 0.34	Montrose, Lynnfield, Essex County, Massachusetts.	M. F. Connor.	C. H. Clapp, pers. com.	Gabbro diorite.	
10	II″.5.3″.4″.	or 6.12, ab 30.92, an 27.80, C 0.92, hy 8.32, ol 10.77, mt 4.87, il 5.32, ap 3.02	Iron Mine Hill, Cumberland, Rhode Island.	C. H. Warren.	C. H. Warren, A. J. S., XXVI, p. 470, 1908.	Gabbro.	
11	″II.5.(2)3.″4.	or 20.02, ab 37.73, an 22.52, ne 3.41, di 2.78, ol 8.38, mt 4.18, il 0.15, ap 0.34	Altamont, Franklin County, New York.	E. W. Morley.	H. P. Cushing, N. Y. St. Mus. A. R. LIV (1), (1900), p. R 68, 1902.	Anorthosite.	
12	II.5.3.(3)4.	Q 2.82, or 18.35, ab 31.96, an 21.41, di 3.25, hy 12.76, mt 6.50, il 0.30, ap 2.02	Raquette Falls, Long Lake, Adirondack Mountains, New York.	E. W. Morley.	H. P. Cushing, N. Y. St. Mus. A. R. LX (2), p. 513, 1907.	Syenite.	
13	II″.5.3.4.	or 12.23, ab 34.06, an 20.29, di 14.04, hy 10.88, ol 6.47, mt 1.16	Montrose Point, Cortlandt, New York.	M. D. Munn.	J. D. Dana, A. J. S., XXII, p. 104, 1881.	Norite.	Cf. G. H. Williams, A. J. S., XXXIII, p. 193, 1887. In W. T., p. 273.
14	II.5.3″.4.	or 12.23, ab 31.44, an 32.53, C 0.41, hy 11.74, ol 4.62, mt 2.55, il 4.26, ap 0.34	Near Peekskill, Cortlandt, New York.	G. S. Rogers.	G. S. Rogers, Ann. N. Y. Ac. Sci., XXI, p. 61, 1911.	Norite.	Also in A. J. S., XXXI, p. 127, 1911.
15	II.5.3″.4.	or 12.79, ab 31.96, an 31.97, di 2.75, hy 3.05, ol 10.14, mt 1.86, il 4.41, ap 0.34	Near Peekskill, Cortlandt, New York.	G. S. Rogers.	G. S. Rogers, Ann. N. Y. Ac. Sci., XXI, p. 62, 1911.	Norite.	
16	II(III).5.3.4.	or 11.12, ab 23.06, an 26.13, ne 3.41, di 11.76, ol 15.81, mt 7.19, il 0.61	Hopkinton, St. Lawrence County, New York.	E. W. Morley.	H. P. Cushing, N. Y. St. Mus. A. R. LIII (1899), p. R 58, 1901.	Hyperite-gabbro.	TiO_2 corrected, H. P. C., pers. com.
17	II(III).5.3.4.	or 9.45, ab 25.68, an 23.91, ne 3.12, di 6.12, ol 21.93, mt 5.34, ap 1.01	Belmont Township, Franklin County, New York.	E. W. Morley.	H. P. Cushing, N. Y. St. Mus. A. R. LIV (1900), p. R 78, 1902.	Olivine diabase.	
18	″II.(4)5.3″.4.	Q 9.78, or 10.01, ab 31.44, an 29.75, hy 12.63, mt 2.09, il 2.43, ap 0.67	Tye River, Nelson County, Virginia.	W. M. Thornton.	Watson and Taber, Va. G. S. B. III A, p. 95, 1913.	Gabbro.	
19	II′.5.3.4.	Q 2.64, or 7.78, ab 31.44, an 22.52, di 9.67, hy 16.57, mt 4.87, il 2.58	Crooked Creek, Pine County, Minnesota.	C. Tronson.	F. F. Grout, J. G., XVIII, p. 647, 1910.	Diabase.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
20	52.48	15.47	5.14	9.25	2.55	7.27	3.26	1.75	1.24		1.26	0.29	0.51	BaO none SrO none	100.47	2.83
A2. II	.875	.151	.032	.129	.064	.129	.052	.019			.016	.002	.007			
21	56.88	15.61	2.95	2.34	6.35	5.23	3.59	2.39	3.03	0.67	0.49	0.13		CO_2 none	99.66	
A2. II	.948	.153	.019	.032	.159	.093	.058	.026			.006	.001				
22	56.80	18.30	1.64	5.58	3.63	5.31	4.35	3.28	0.53		0.46	trace	trace	BaO 0.05 Li_2O trace	99.93	2.83
A2. II	.947	.179	.010	.078	.091	.095	.070	.035			.006	—				
23	56.41	17.62	1.24	3.55	3.97	8.66	3.35	2.61	0.76	0.14	0.68	0.49	0.08	Cl 0.07 BaO 0.09 SrO 0.08	99.70	
A1. I	.940	.174	.007	.050	.099	.154	.054	.027			.009	.003	.001			
24	55.13	20.27	1.52	4.29	1.80	7.05	4.31	2.84	0.95	0.14	0.74	0.40	0.13	CO_2 0.26 BaO 0.06 SrO 0.11 Li_2O trace	100.00	
A1. I	.919	.198	.009	.060	.045	.126	.069	.030			.009	.003	.002			
25	54.84	16.41	3.63	4.54	4.71	6.64	3.27	2.83	0.93	0.34	0.99	0.35	none	CO_2 none ZrO_2 none S none NiO none BaO 0.12 SrO 0.05	99.65	
A1. I	.914	.160	.023	.063	.118	.119	.053	.030			.013	.003	—			
26	54.09	16.00	2.92	5.54	5.19	7.37	3.38	2.67	0.77	0.20	0.99	0.35	0.15	CO_2 none ZrO_2 none S none NiO none BaO 0.10 SrO 0.06	99.78	
A1. I	.902	.157	.018	.077	.130	.132	.055	.029			.013	.003	.002			
27	54.56	17.58	4.30	4.98	2.86	6.00	4.43	2.70	0.38	0.02	1.34	0.60	0.06	BaO 0.27 SrO 0.08 Li_2O trace	100.16	
A1. I	.909	.172	.027	.069	.072	.107	.071	.029			.017	.004	.001			
28	50.73	19.99	3.20	4.66	3.48	8.55	4.03	1.89	0.66	0.11	1.59	0.81	0.05	BaO 0.27 SrO 0.11 Li_2O trace	100.13	
A1. I	.846	.196	.020	.065	.087	.153	.065	.020			.020	.006	—			
29	53.48	19.35	2.37	4.90	3.67	7.55	4.07	1.41	0.80	0.16	1.07	0.62	0.06	BaO 0.19 SrO 0.11 CO_2 0.08	99.89	
A1. I	.891	.190	.015	.068	.092	.135	.066	.015			.013	.004	.001			
30	58.05	18.00	2.49	4.56	3.55	6.17	3.64	2.18	0.86		1.05	0.17	none	SO_3 0.07 Cl trace Li_2O none	100.79	
A2. II	.968	.176	.016	.064	.089	.111	.059	.023			.013	.001	—			
31	57.38	16.86	2.49	5.17	5.51	7.32	3.33	1.45	0.42		trace	trace	trace	SO_3 0.21 Cl 0.17 Li_2O 0.39	100.70	
A2. II	.956	.165	.016	.072	.138	.131	.054	.015			—	—	—			
32	57.17	17.25	2.48	4.31	4.83	6.61	3.44	2.03	1.20		1.03	0.05	none	SO_3 trace Cl trace	100.40	
A2. II	.953	.169	.015	.060	.121	.118	.055	.022			.013	—	—			
33	55.92	17.70	3.16	4.48	4.34	5.90	4.08	2.24	1.42		0.94	0.18	trace	SO_3 trace Cl none Li_2O 0.09	100.45	
A2. II	.932	.174	.020	.062	.109	.105	.066	.025			.012	.001	—			
34	57.64	18.43	3.63	2.84	3.32	5.49	4.03	3.33	0.51		0.77	0.34	0.10	Cl trace	100.43	
A2. II	.961	.181	.023	.040	.083	.098	.065	.035			.010	.002	.001			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. ANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
20	II″.″5.3.4.	Q 5.82, or 10.56, ab 27.25, an 22.52, di 9.63, hy 12.85, mt 7.42, il 2.43, ap 0.67	Duluth, Minnesota.	A. N. Winchell.	A. N. Winchell, A. G., XXVI, p. 293, 1900.	Orthoclase gabbro.	In W. T., p. 273.
21	II.(4)5.3.″4.	Q 7.14, or 15.57, ab 29.34, an 19.18, di 4.57, hy 14.69, mt 4.41, il 0.91, ap 0.34	Bald Butte, Marysville District, Montana.	G. Steiger.	J. S. Barrell, U. S. G. S. P. P. 57, p. 45, 1907.	Hornblende porphyrite.	
22	II.5.″3.″4.	or 19.46, ab 36.68, an 20.57, di 4.80, hy 13.80, ol 0.83, mt 2.32, il 0.91	Robinson, Castle Mountains, Montana.	L. V. Pirsson.	Weed and Pirsson, U. S. G. S. B. 139, p. 90, 1896.	Diorite.	In W. T., p. 273.
23	II.″5.3.4″.	Q 4.98, or 15.01, ab 28.30, an 25.85, di 11.44, hy 9.00, mt 1.62, il 1.37, ap 1.01	Red Mountain, n. Butte, Montana.	H. N. Stokes.	W. H. Weed, J. G., VII, p. 739, 1899.	Diorite.	Also in U. S. G. S. P. P. 74, p. 33, 1912. In W. T., p. 273.
24	″II.5.3.4.	Q 1.26, or 16.68, ab 36.16, an 27.52, di 3.93, hy 8.35, mt 2.09, il 1.37, ap 1.01	Near Neihart, Little Belt Mountains, Montana.	W. F. Hillebrand.	L. V. Pirsson, U. S. G. S. A. R. 20, III, p. 490, 1900.	Diorite.	In W. T., p. 273.
25	II.″5.3.(3)4.	Q 5.10, or 16.68, ab 27.77, an 21.41, di 7.10, hy 11.97, mt 5.34, il 1.98, ap 1.01	Haystack Mountain, Park County, Montana.	G. Steiger.	W. H. Emmons, J. G., XVI, p. 214, 1908.	Quartz-orthoclase gabbro.	
26	II″.5.3.(3)4.	Q 0.96, or 16.12, ab 28.82, an 20.29, di 11.06, hy 15.14, mt 4.18, il 1.98, ap 1.01	Haystack Mountain, Park County, Montana.	G. Steiger.	W. H. Emmons, J. G., XVI, p. 216, 1908.	Orthoclase gabbro.	
27	II.5.″3.4.	Q 2.70, or 16.12, ab 37.20, an 20.02, di 4.94, hy 8.24, mt 6.26, il 2.58, ap 1.34	Big Timber Creek, Crazy Mountains, Montana.	W. F. Hillebrand.	J. E. Wolff, U. S. G. S. B. 148, p. 143, 1897.	Diorite porphyrite.	In W. T., p. 273.
28	II.5.3″.4.	or 11.12, ab 34.06, an 30.86, di 4.91, hy 5.35, ol 3.09, mt 4.64, il 3.04, ap 2.02	Big Timber Creek, Crazy Mountains, Montana.	W. F. Hillebrand.	J. E. Wolff, U. S. G. S. B. 148, p. 144, 1897.	Diorite.	In W. T., p. 273.
29	II.5.3″.4″.	Q 2.46, or 8.34, ab 34.58, an 30.30, di 2.94, hy 13.18, mt 3.48, il 1.98, ap 1.34	Sweet Grass Creek, Crazy Mountains, Montana.	W. F. Hillebrand.	J. E. Wolff, U. S. G. S. B. 148, p. 143, 1897.	Quartz diorite.	In W. T., p. 273.
30	II.(4)5.3.4.	Q 9.06, or 12.79, ab 30.92, an 26.13, di 3.16, hy 11.86, mt 3.71, il 1.98, ap 0.34	Electric Peak, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. A. R. 12, p. 627, 1891.	Diorite.	In W. T., p. 273.
31	II.(4)5.3″.4.	Q 7.26, or 8.34, ab 28.30, an 26.69, di 7.88, hy 17.37, mt 3.71	Electric Peak, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. A. R. 12, p. 627, 1891.	Porphyrite.	In W. T., p. 273.
32	II.(4)5.3.4.	Q 7.68, or 12.23, ab 28.82, an 25.58, di 5.78, hy 13.56, mt 3.48, il 1.98	Sepulcher Mountain, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. A. R. 12, p. 648, 1891.	Pyroxene andesite.	In W. T., p. 275.
33	II.5.3.4.⊙	Q 3.62, or 13.90, ab 34.58, an 23.07, di 4.23, hy 12.83, mt 4.64, il 1.82, ap 0.34	Sepulcher Mountain, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. A. R. 12, p. 648, 1891.	Hornblende andesite.	In W. T., p. 275.
34	″II.″5.3.(3)4.	Q 6.00, or 19.46, ab 34.06, an 22.52, di 2.19, hy 8.12, mt 5.34, il 1.52, ap 0.67	Hurricane Ridge, Crandall Basin, Yellowstone National Park.	L. G. Eakins.	J. P. Iddings, U. S. G. S. Mon. 32 (II), p. 261, 1899.	Andesite porphyry.	In W. T., p. 273.

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
35	57.32	17.29	3.89	3.03	3.56	5.81	3.89	3.04	0.30	0.33	0.62	0.50	0.06	NiO 0.10	99.74	
A2. II	.955	.170	.024	.042	.089	.104	.063	.032			.008	.004	.001			
36	57.26	19.40	2.49	3.29	2.57	5.68	4.21	2.95	0.86		0.76	0.51	0.16		100.14	
A2. II	.954	.190	.016	.046	.064	.101	.068	.039			.010	.003	.002			
37	56.21	18.24	3.26	3.69	3.38	5.91	4.15	3.02	0.78		0.88	0.64	0.17		100.33	
A2. II	.937	.179	.020	.051	.085	.106	.067	.032			.011	.005	.002			
38	55.93	18.32	2.39	4.91	3.97	6.17	4.29	2.62	0.22		0.81	0.56	0.14		100.33	
A2. II	.932	.180	.015	.068	.099	.110	.069	.028			.010	.004	.002			
39	53.71	18.00	3.99	4.05	5.19	6.88	3.50	3.10	0.55		0.74	0.38	0.24		100.33	
A2. II	.895	.176	.025	.056	.130	.123	.056	.033			.009	.003	.003			
40	53.89	18.81	4.92	2.81	3.29	5.42	3.65	2.98	2.99		0.49	0.52	0.17		99.94	
A2. II	.898	.184	.031	.039	.082	.097	.059	.032			.006	.004	.002			
41	52.09	17.84	4.27	4.56	5.33	8.03	3.39	1.98	1.77		0.39	0.27	0.14		100.06	
A2. II	.868	.175	.027	.064	.133	.143	.055	.021			.005	.002	.002			
42	56.47	15.33	2.54	4.53	5.08	6.93	3.81	1.66	1.65		0.99	0.54	0.18		99.71	
A2. II	.941	.150	.015	.062	.127	.123	.061	.018			.012	.004	.003			
43	53.75	20.75	4.50	3.53	3.76	7.18	4.16	1.37	1.55		none	0.15	trace	CO_2 none SO_3 trace Cl none Li_2O trace	100.70	
A2. II	.896	.203	.028	.049	.094	.128	.067	.015			——	.001	——			
44	53.57	17.78	3.19	4.93	4.36	6.22	4.04	3.04	0.80	0.27	0.89	0.44	0.07	CO_2 none Cr_2O_3 none NiO none BaO 0.21 SrO 0.13	99.94	
A1. I	.893	.174	.020	.068	.109	.110	.064	.032			.011	.003	.001			
45	52.37	16.57	6.34	2.35	5.27	8.54	2.99	2.45	1.04	1.18	0.73	0.31	0.07	NiO 0.12	100.33	
A2. II	.873	.162	.039	.033	.132	.152	.048	.026			.009	.002	.001			
46	52.18	18.19	3.31	4.36	4.69	6.51	4.58	1.88	2.00	0.75	0.99	0.29	0.14	CO_2 none Cl trace S none NiO trace BaO 0.11 SrO 0.06 LiO_2 trace	100.04	
A1. I	.870	.178	.021	.061	.117	.116	.074	.020			.012	.002	.002			
47	51.70	17.90	7.24	1.00	2.77	6.94	4.17	1.62	1.15		3.17	0.41	trace	SO_3 0.32 Li_2O 0.03 Iron 1.81	100.23	
A2. II	.862	.175	.045	.014	.069	.124	.068	.017			.039	.003	——			
48	57.42	18.48	3.74	2.10	1.71	6.84	4.52	3.71	0.28	0.08	0.86	0.36	0.09	CO_2 none SO_3 none Cl 0.03 BaO 0.15 SrO 0.08 Li_2O trace	100.45	2.767
A1. I	.957	.181	.023	.030	.043	.122	.072	.039			.011	.003	.001			
49	56.62	16.74	4.94	3.27	4.08	7.39	3.50	1.97	0.92	1.15		trace	0.15		100.73	2.768
A3. III	.944	.164	.031	.046	.102	.132	.056	.021				——	.002			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. ANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
35	II.″5.3.″4.	Q 7.14 di 3.52 or 17.79 hy 8.69 ab 33.01 mt 5.57 an 20.95 il 1.22 ap 1.34	Hurricane Ridge, Crandall Basin, Yellowstone National Park.	W. H. Melville.	J. P. Iddings, U. S. G. S. Mon. 32 (II), p. 261, 1899.	Monzonite.	In W. T., p. 275.
36	″II.5.3.(3)4.	Q 1.92 di 1.79 or 21.68 hy 8.44 ab 35.63 mt 3.71 an 23.07 il 1.52 ap 1.01	Hurricane Ridge, Crandall Basin, Yellowstone National Park.	L. G. Eakins.	J. P. Iddings, U. S. G. S. Mon. 32 (II), p. 261, 1899.	Diorite.	Facies of gabbro. In W. T., p. 275.
37	II.5.3.″4.	Q 3.96 di 1.79 or 17.79 hy 10.54 ab 35.11 mt 4.64 an 22.52 il 1.67 ap 1.68	Hurricane Ridge, Crandall Basin, Yellowstone National Park.	L. G. Eakins.	J. P. Iddings, U. S. G. S. Mon. 32 (II), p. 260, 1899.	Orthoclase gabbro-diorite.	In W. T., p. 275.
38	II.5.3.4.⊙	Q 1.56 di 3.16 or 15.57 hy 14.31 ab 36.16 mt 3.48 an 23.07 il 1.52 ap 1.34	Hurricane Ridge, Crandall Basin, Yellowstone National Park.	L. G. Eakins.	J. P. Iddings, U. S. G. S. Mon. 32 (II), p. 260, 1899.	Orthoclase gabbro-diorite.	In W. T., p. 275.
39	II.5.3.(3)4.	Q 0.36 di 5.75 or 18.35 hy 13.57 ab 29.34 mt 5.80 an 24.19 il 1.37 ap 1.01	Hurricane Ridge, Crandall Basin, Yellowstone National Park.	L. G. Eakins.	J. P. Iddings, U. S. G. S. Mon. 32 (II), p. 260, 1899.	Orthoclase basalt.	In W. T., p. 275.
40	II.″5.3.″4.	Q 6.00 hy 8.46 or 17.79 mt 7.19 ab 30.92 il 0.91 an 23.35 ap 1.34 C 0.92	Indian Peak, Crandall Basin, Yellowstone National Park.	L. G. Eakins.	J. P. Iddings, U. S. G. S. Mon. 32 (II), p. 260, 1899.	Basalt-glass breccia.	In W. T., p. 275.
41	II.5.3″.4.	Q 0.60 di 8.31 or 11.68 hy 13.77 ab 28.82 mt 6.26 an 27.52 il 0.76 ap 0.67	Timber Creek, Crandall Basin, Yellowstone National Park.	L. G. Eakins.	J. P. Iddings, U. S. G. S. Mon. 32 (II), p. 260, 1899.	Basalt.	In W. T., p. 275.
42	II.(4)5.3.4.	Q 6.66 di 6.48 or 10.01 hy 14.59 ab 31.96 mt 3.48 an 22.52 il 1.82 ap 1.34	Dunraven Peak, Yellowstone National Park.	F. A. Gooch.	J. P. Iddings, U. S. G. S. B. 148, p. 135, 1897.	Pyroxene andesite.	In W. T., p. 275.
43	II.5.3(4).4″.	Q 2.58 di 0.89 or 8.34 hy 11.74 ab 35.11 mt 6.50 an 33.64 ap 0.34	Mount Washburn, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. B. 148, p. 136, 1897.	Basalt.	No TiO_2? In W. T., p. 275.
44	II.5.3.″4.	or 17.79 di 4.94 ab 33.54 hy 12.49 an 21.68 ol 0.31 mt 4.64 il 1.67 ap 1.01	Beams Hill, Sunlight Valley, Yellowstone National Park.	H. N. Stokes.	T. A. Jaggar, U. S. G. S. B. 168, p. 95, 1900.	Gabbro.	In W. T., p. 275.
45	II.5.3.(3)4.	Q 3.84 di 12.31 or 14.46 hy 7.50 ab 25.15 mt 5.80 an 24.46 il 1.37 hm 2.24 ap 0.67	Stinkingwater Canyon, Yellowstone National Park.	W. H. Melville.	J. P. Iddings, U. S. G. S. B. 148, p. 135, 1897.	Basalt.	In W. T., p. 275.
46	II.5.3.4.⊙	or 11.12 di 5.56 ab 38.78 hy 5.75 an 23.35 ol 5.21 mt 4.87 il 1.82 ap 0.67	Shoshone Canyon, Yellowstone National Park.	W. F. Hillebrand.	T. A. Jaggar, U. S. G. S. B. 168, p. 96, 1900.	Diabase.	In W. T., p. 275.
47	II.5.3″.4.	Q 4.14 hy 6.90 or 9.45 il 2.13 ab 35.63 hm 7.24 an 27.80 tn 2.74 ap 1.01	Yellowstone Canyon, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. B. 148, p. 135, 1897.	Basalt.	Iron bearing. In W. T., p. 275.
48	″II.5.(2)3.(3)4.	Q 3.96 di 9.07 or 21.68 hy 0.10 ab 37.73 mt 4.64 an 19.46 il 1.67 hm 0.48 ap 1.01	Babcock Peak, La Plata Mountains, Colorado.	H. N. Stokes.	W. Cross, U. S. G. S. Fol. 60, p. 6, 1899.	Monzonite.	In W. T., p. 277.
49	II.(4)5.3.4.	Q 8.64 di 9.91 or 11.68 hy 7.75 ab 29.34 mt 7.19 an 24.19	Buckskin Gulch, Alma District, Colorado.	W. F. Hillebrand.	H. B. Patton, Col. G. S. B. 3, p. 81, 1912.	Hornblende porphyrite.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
50	55.65	17.04	2.81	5.17	3.42	6.82	3.27	2.29	1.49	0.46	0.90	0.37	0.20	SO_3 none NiO none BaO 0.08 SrO 0.05 Li_2O trace	100.02	2.783
A1. I	.928	.167	.017	.072	.086	.121	.053	.024			.011	.003	.003			
51	47.32	16.71	6.92	5.94	5.69	8.51	2.70	2.02	1.04	0.24	1.50	0.96	0.08	CO_2 none SO_3 0.19 Cl trace BaO 0.07 SrO 0.06 Li_2O trace	99.95	2.949
A1. I	.789	.164	.043	.082	.142	.151	.043	.021			.019	.007	.001			
52	53.60	17.89	4.20	5.45	3.77	7.53	2.91	1.98	0.64	0.55	0.74	0.30	0.18	CO_2 0.25 ZrO_2 0.03 F 0.02 S 0.05 Cr_2O_3 trace V_2O_3 0.03 NiO none BaO 0.08 SrO 0.07	100.27	
A1. I	.893	.175	.026	.076	.094	.134	.047	.021			.009	.002	.003			
53	52.97	18.31	1.86	6.73	3.04	6.51	3.74	3.35	0.31	0.44	1.04	0.81	0.09	ZrO_2 0.05 BaO 0.18 SrO 0.14	99.57	
A1. I	.883	.179	.012	.093	.076	.116	.060	.035			.013	.006	.001			
54	48.76	15.89	6.04	4.56	5.98	8.15	3.43	2.93	1.48	0.40	1.65	0.60	0.13	ZrO_2 none BaO 0.17 SrO 0.06 Li_2O none	100.23	
A1. I	.813	.155	.037	.063	.150	.145	.055	.031			.021	.004	.002			
55	55.46	18.15	3.93	3.42	3.19	7.37	3.44	2.14	0.38	0.24	1.20	0.38	0.21	CO_2 none ZrO_2 none S 0.04 BaO 0.07	99.62	
A1. I	.924	.178	.024	.047	.080	.132	.055	.022			.015	.003	.003			
56	55.04	20.45	2.09	2.71	1.63	5.82	4.92	4.29	0.69	0.10	1.17	0.37	0.26	CO_2 none ZrO_2 none S 0.04 BaO 0.19	99.77	
A1. I	.917	.200	.013	.038	.041	.104	.079	.046			.015	.003	.004			
57	54.86	19.33	3.35	2.59	3.05	7.69	4.38	2.33	0.80	0.16	1.32	0.41	0.22	CO_2 none ZrO_2 none S 0.06 BaO 0.17	100.72	
A1. I	.914	.190	.021	.036	.076	.138	.071	.024			.016	.003	.003			
58	52.38	18.79	2.88	4.90	4.91	7.70	3.99	1.76	0.53		1.22	0.56	0.18	BaO 0.11	99.91	
A2. II	.873	.174	.018	.068	.123	.137	.064	.019			.015	.004	.003			
59	52.37	17.01	1.44	5.89	6.86	7.59	3.51	1.59	1.29		1.60		0.32	CO_2 0.37 Cl trace BaO 0.06	99.90	
A2. II	.873	.167	.009	.082	.172	.135	.056	.017			.020		.005			
60	52.27	17.68	2.51	5.00	6.05	8.39	4.19	1.58	0.82		1.49		0.23	CO_2 trace Cl trace BaO 0.06	100.27	
A2. II	.871	.173	.016	.069	.151	.150	.068	.017			.019		.003			
61	51.57	17.72	6.24	1.78	4.91	8.82	3.59	1.99	0.64		1.43		0.45	CO_2 0.58 BaO 0.16	99.88	
A2. II	.860	.174	.039	.025	.123	.157	.058	.021			.018		.006			
62	51.68	15.05	5.22	5.64	5.63	8.30	3.75	1.39	0.62	0.72	1.54	0.45	0.12	CO_2 none	100.11	
A2. II	.861	.148	.033	.078	.141	.148	.061	.015			.019	.003	.002			
63	48.21	17.96	5.18	4.47	4.11	9.72	3.68	2.99	1.41	0.21	0.84	0.58	0.31	CO_2 none ZrO_2 none SO_3 none BaO 0.07 SrO trace	99.74	
A1. I	.804	.176	.033	.063	.103	.173	.060	.032			.010	.004	.004			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. ANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
50	II.(4)5.3.″4.	Q 7.92 di 4.76 or 13.34 hy 12.48 ab 27.77 mt 3.94 an 25.02 il 1.67 ap 1.01	Black Face, Telluride, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 168, p. 163, 1900.	Camptonitic lamprophyre.	In W. T., p. 277.
51	II(III).5.3(4).″4.	Q 0.84 di 6.18 or 11.68 hy 14.04 ab 22.53 mt 9.98 an 27.80 il 2.89 ap 2.35	Near Mount Sneffels, Telluride, Colorado.	H. N. Stokes.	W. Cross, U. S. G. S. Fol. 57, p. 7, 1899.	Gabbro porphyry.	In W. T., p. 277.
52	II.(4)5.3(4).4.	Q 6.78 di 4.51 or 11.68 hy 13.02 ab 24.63 mt 6.03 an 29.75 il 1.37 ap 0.67	Lost Trail Creek, San Cristobal quadrangle, Colorado.	C. Palmer.	W. Cross, U. S. G. S. rec. lab.	Diorite.	
53	II.5.3.(3)4.	or 19.46 di 2.78 ab 31.44 hy 12.56 an 23.35 ol 2.03 mt 2.78 il 1.98 ap 2.02	Saddle Mountain, Pikes Peak, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 148, p. 163, 1897.	Basalt.	In W. T., p. 277.
54	II″.5.3.″4.	or 17.24 di 13.71 ab 26.96 ol 6.71 an 19.18 mt 8.58 ne 0.99 il 3.19 ap 1.34	Saddle Mountain, Pikes Peak, Colorado.	W. F. Hillebrand.	W. Cross, J. G., V, p. 689, 1897.	Basalt.	In W. T., p. 277.
55	II.(4)5.3″.4.	Q 8.88 di 4.60 or 12.23 hy 7.29 ab 28.82 mt 5.57 an 28.08 il 2.28 ap 1.01	Ortiz Mountains, n. Albuquerque. New Mexico.	M. W. Adams.	I. H. Ogilvie, J. G., XVI, p. 234, 1908.	Diorite.	
56	(I)II.5.(2)3.(3)4.	or 25.58 di 4.26 ab 36.15 ol 2.81 an 20.85 mt 3.02 ne 2.84 il 2.28 ap 1.01	Ortiz Mountains, n. Albuquerque, New Mexico.	M. W. Adams.	I. H. Ogilvie, J. G., XVI, p. 233, 1908.	Diorite.	
57	II.5.3.4.⊙	Q 2.58 di 7.13 or 13.34 hy 4.44 ab 37.20 mt 4.87 an 26.41 il 2.43 a 1.01	Ortiz Mountains, n. Albuquerque, New Mexico.	M. W. Adams.	I. H. Ogilvie, J. G., XVI, p. 234, 1908.	Diorite.	
58	II.5.3.4.⊙	or 10.56 di 5.13 ab 33.54 hy 12.46 an 28.08 ol 1.73 mt 4.18 il 2.28 ap 1.34	Rio Grande Canyon, New Mexico.	L. G. Eakins.	J. P. Iddings, A. J. S., XXXVI, p. 220, 1888.	Basalt.	Also in U.S.G.S. B. 66, p. 30, 1890. In W. T., p. 277.
59	II″.5.3.4.	or 9.45 di 9.18 ab 29.34 hy 15.25 an 26.13 ol 3.74 mt 2.09 il 3.04	Rio Grande Canyon, New Mexico.	L. G. Eakins.	J. P. Iddings, A. J. S., XXXVI, p. 220, 1888.	Quartz basalt.	Also in U.S.G.S. B. 66, p. 30, 1890. In W. T., p. 277.
60	II.5.3.4.⊙	or 9.45 di 13.81 ab 35.37 ol 9.59 an 24.46 mt 3.71 ne 0.14 il 2.89	Rio Grande Canyon, New Mexico.	L. G. Eakins.	J. P. Iddings, A. J. S., XXXVI, p. 220, 1888.	Quartz basalt.	Also in U.S.G.S. B. 66, p. 30, 1890. In W. T., p. 277.
61	II.5.3.4.⊙	Q 0.66 di 13.39 or 11.68 hy 6.10 ab 30.39 mt 3.02 an 26.41 il 2.74 hm 4.16	Rio Grande Canyon, New Mexico.	L. G. Eakins.	J. P. Iddings, A. J. S., XXXVI, p. 220, 1888.	Quartz basalt.	Also in U.S.G.S. B. 66, p. 30, 1890. In W. T., p. 277.
62	II(III).5.3.4.	Q 1.56 di 14.71 or 8.34 hy 10.84 ab 31.96 mt 7.66 an 20.02 il 2.89 ap 1.01	Barilla Mesa, Colfax County, New Mexico.	G. Steiger.	J. B. Mertie, U. S. G. S. rec. lab.	Basalt.	
63	II″.5(6).3.″4.	or 17.79 di 16.90 ab 19.39 ol 3.86 an 23.35 mt 7.66 ne 6.53 il 1.52 ap 1.34	Mount McKensie, Cerillos Hills, New Mexico.	G. Steiger.	D. W. Johnston, Sch. Min. Q., XXV, p. 82, 1904.	Gabbro porphyry.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
64	61.60	17.34	2.22	2.73	2.46	4.92	5.10	2.16	0.51	0.12	0.73	0.24		SO_3 none Cl trace	100.13	2.63
A2. II	1.027	.170	.014	.038	.062	.088	.082	.024			.009	.002				
65	57.64	17.07	3.07	5.15	2.80	5.55	4.20	2.14	0.05	0.09	1.57	0.37	0.08	CO_2 none SO_3 none Cl trace BaO 0.05 SrO none	99.83	2.74
A1. I	.961	.167	.019	.072	.070	.099	.068	.023			.020	.003	.001		(99.85)	
66	56.51	16.28	2.93	5.13	4.12	6.10	3.94	2.18	0.40	0.10	1.50	0.30	0.08	CO_2 none SO_3 none Cl trace	99.57	2.77
A2. II	.942	.160	.018	.071	.103	.109	.064	.023			.019	.002	.001			
67	53.97	16.00	4.56	3.63	6.36	7.47	4.38	1.23	1.31	0.03	1.46	0.10		CO_2 none SO_3 none Cl trace	100.50	
A2. II	.900	.157	.029	.050	.159	.134	.071	.013			.018	.001				
68	51.53	18.21	4.59	5.46	4.99	8.05	3.45	1.67	0.31	0.20	1.50	0.36	0.10	CO_2 none SO_3 none Cl trace	100.42	2.82
A2. II	.859	.179	.029	.076	.125	.144	.056	.018			.019	.003	.001			
69	59.44	17.40	3.30	2.77	1.81	6.51	4.22	3.12	0.56	0.06	0.66	0.28	0.17	CO_2 none F trace S 0.02 BaO 0.07 SrO 0.05	100.44	
A1. I	.991	.171	.021	.039	.045	.116	.068	.033			.008	.002	.002			
70	56.63	16.81	3.62	3.44	4.23	7.53	3.08	2.24	0.51	0.80	0.67	0.16	0.23	CO_2 none FeS_2 0.06 V_2O_3 0.04 BaO 0.09 SrO trace	100.14	
A1. I	.944	.165	.023	.048	.106	.134	.050	.024			.008	.001	.003			
71	56.07	19.06	5.39	0.92	2.12	7.70	4.52	1.24	0.99		1.24	0.16	0.23		99.64	
A2. II	.935	.187	.034	.011	.053	.138	.073	.013			.016	.001	.003			
72	51.54	20.31	4.65	3.56	3.16	9.55	4.29	2.47	0.34		0.32	0.57	0.32		101.07	
B2. III	.859	.199	.029	.049	.079	.171	.069	.026			.004	.004	.005			
73	56.03	18.31	3.47	4.42	3.64	7.43	3.60	1.18	0.31	0.12	1.24	0.13	0.11	CO_2 none S trace BaO trace SrO trace Li_2O trace	99.99	
A2. II	.934	.180	.022	.061	.091	.133	.058	.013			.016	.001	.002			
74	49.64	19.78	1.89	4.76	3.33	6.77	4.83	1.95	2.65	0.02	3.53	0.67	0.17	CO_2 none	99.99	
A2. II	.827	.194	.012	.066	.083	.121	.077	.021			.044	.005	.002			
75	56.90	18.17	1.23	5.88	4.36	6.51	3.23	1.57	0.77	0.12	0.84	0.10	0.21	CO_2 0.08 SrO 0.18	100.15	2.793
A2. II	.948	.178	.008	.082	.109	.116	.052	.017			.011	.001	.003			
76	54.06	18.75	4.64	3.10	2.75	7.35	4.60	3.00	0.41	0.10	0.80	0.55	trace	CO_2 0.11	100.22	2.819
A2. II	.901	.182	.029	.043	.069	.131	.074	.032			.010	.004	—			
77	50.89	17.00	0.97	7.60	5.41	9.82	3.35	1.31	1.14	0.06	0.80	0.19	0.14	CO_2 0.28 S 0.43	99.39	
B2. III	.848	.167	.006	.106	.135	.175	.054	.014			.010	.001	.002			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. ANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
64	(I)II.(4)5.(2)3.4.	Q 10.20 or 13.34 ab 42.97 an 17.79 di 3.56 hy 6.48 mt 3.25 il 1.37 ap 0.67	Mormon Mountain, San Francisco Mountains, Arizona.	H. H. Robinson.	H. H. Robinson, U. S. G. S. P. P. 76, p. 136, 1913.	Pyroxene latite.	
65	II.(4)5.3.4.	Q 8.76 or 12.79 ab 35.63 an 21.13 di 2.94 hy 10.06 mt 4.41 il 3.04 ap 1.01	San Francisco Peak, San Francisco Mountains, Arizona.	H. H. Robinson.	H. H. Robinson, U. S. G. S. P. P. 76, p. 142, 1913.	Augite andesite.	
66	II."5.3.4.	Q 6.42 or 12.79 ab 33.54 an 20.29 di 6.52 hy 11.56 mt 4.18 il 2.89 ap 0.67	Kendrick Peak, San Francisco Mountains, Arizona.	H. H. Robinson.	H. H. Robinson, U. S. G. S. P. P. 76, p. 144, 1913.	Augite andesite.	
67	II".5.3.4".	Q 1.80 or 7.23 ab 37.20 an 20.29 di 12.56 hy 10.46 mt 6.73 il 2.74 ap 0.34	Bill Williams Mountain, San Francisco Mountains, Arizona.	H. H. Robinson.	H. H. Robinson, U. S. G. S. P. P. 76, p. 147, 1913.	Andesite-basalt.	
68	II.5.3".4.	Q 1.32 or 10.01 ab 29.34 an 29.19 di 6.42 hy 13.27 mt 6.73 il 2.89 ap 1.01	Bill Williams Mountain, San Francisco Mountains, Arizona.	H. H. Robinson.	H. H. Robinson, U. S. G. S. P. P. 76, p. 145, 1913.	Andesite-basalt.	
69	II.(4)5."3."4.	Q 8.94 or 18.35 ab 35.63 an 19.46 di 8.68 hy 1.93 mt 4.87 il 1.22 ap 0.67	Jumbo Mine, Prince of Wales Island, Alaska.	G. Steiger.	C. W. Wright, U. S. G. S. P. P. 87, p. 34, 1915.	Granodiorite.	
70	II.(4)5.3."4.	Q 9.12 or 13.34 ab 26.20 an 25.30 di 8.83 hy 9.05 mt 5.34 il 1.22 ap 0.34	Delarof Harbor, Unga Island, Alaska.	W. F. Hillebrand.	G. F. Becker, U. S. G. S. A. R. 18, (III), p. 55, 1898.	Augite-bronzite andesite.	In W. T., p. 277.
71	"II.(4)5.3.4(5).	Q 7.80 or 7.23 ab 38.25 an 28.08 di 6.91 hy 2.10 il 2.13 hm 5.39 tn 0.39 ap 0.34	Bogoslof Island, Alaska.	T. M. Chatard.	G. P. Merrill, Pr. U. S. Nat. Mus., VIII, p. 33, 1885.	Hornblende andesite.	Also G. S. Becker, U. S. G. S. A. R. 18 (III), p. 58, 1898. In W. T., p. 277.
72	II.5.3.4.⊙	or 14.46 ab 29.60 an 28.91 ne 3.55 di 12.01 ol 3.54 mt 6.73 il 0.61 ap 1.34	Bogoslof Island, Alaska.	T. M. Chatard.	G. P. Merrill, Pr. U. S. Nat. Mus., VIII, p. 33, 1885.	Hornblende andesite.	Also G. F. Becker, U. S. G. S. A. R. 18 (III), p. 58, 1898. In W. T., p. 277.
73	II.(4)5.3(4).4".	Q 9.18 or 7.23 ab 30.39 an 30.30 di 4.70 hy 10.14 mt 5.10 il 2.43 ap 0.34	Kalinai Pass, Aleutian Peninsula, Alaska.	H. N. Stokes.	J. E. Spurr, A. G., XXV, p. 233, 1900.	Augite aleutite.	In W. T., p. 277.
74	II.5.3.4.⊙	or 11.68 ab 38.77 an 26.69 ne 0.85 di 1.76 ol 6.44 mt 2.78 il 6.69 ap 1.68	Boston Mine, Juneau, Alaska.	J. G. Fairchild.	A. Knopf, U. S. G. S. B. 502, p. 28, 1912.	Albite diorite.	
75	II.(4)5.3(4).4.	Q 8.22 or 9.45 ab 27.25 an 30.30 di 0.92 hy 19.15 mt 1.86 il 1.67 ap 0.34	Slesse Mountain, Skagit Range, British Columbia.	M. Dittrich.	R. A. Daly, Can. G. S. Mem. 38, (1), p. 533, 1912.	Diorite.	
76	II.5."3.4.	or 17.79 ab 38.77 an 21.13 di 9.33 hy 2.76 ol 0.28 mt 6.73 il 1.52 ap 1.34	Similkameen Laccolith, Okanagan Range, British Columbia.	M. Dittrich.	R. A. Daly, Can. G. S. Mem. 38 (1), p. 457, 1912.	Monzonite.	Contact. Cf. No. 30, I.4.3.4.
77	II(III).5.3(4).4.	or 7.78 ab 28.30 an 27.52 di 16.73 hy 4.28 ol 9.62 mt 1.39 il 1.52 ap 0.34	War Eagle mine, Trail Creek District, British Columbia.	M. F. Connor.	R. W. Brock, Can. G. S. rec. lab.	Porp yrite.	Pers. com.

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
78	50.60	18.61	1.51	7.45	6.05	8.30	3.80	0.80	2.89	0.16	0.34	0.07	0.11	Cl trace S 0.02	100.71	
A2. II	.843	.182	.009	.104	.151	.148	.061	.009			.004	—	.002			
79	49.41	18.08	5.93	4.08	4.61	10.10	3.48	1.01	1.59	0.04	0.95		0.09		99.37	
B2. III	.824	.177	.037	.057	.115	.180	.056	.011			.012		.001			
80	48.68	18.05	3.41	6.44	2.82	10.00	3.18	1.60	2.40		0.80	2.01	0.20		99.59	2.91
A2. II	.811	.177	.021	.089	.071	.179	.051	.017			.010	.014	.003			
81	54.50	14.43	2.17	8.80	4.24	8.01	3.05	1.29	1.09	0.29	1.69	0.21	0.10	SO_3 0.11 NiO none BaO 0.06 SrO 0.09	100.13	
A1. I	.908	.141	.014	.122	.106	.143	.049	.014			.021	.001	.001			
82	56.85	18.31	2.88	3.15	3.92	7.20	3.89	1.23	0.95	0.16	1.08	0.22	trace	CO_2 none S none Cr_2O_3 none BaO 0.04 SrO trace	99.88	
A1. I	.948	.179	.018	.044	.098	.129	.063	.013			.014	.002	—			
83	52.99	16.71	3.80	3.55	6.95	8.49	3.56	1.29	0.59	0.18	1.18	0.42	trace	CO_2 none Cl trace S none Cr_2O_3 none NiO 0.02 BaO 0.07 SrO 0.12 Li_2O none	99.92	
A1. I	.883	.164	.024	.050	.174	.151	.057	.014			.015	.003	—			
84	57.59	16.49	1.22	4.89	7.72	7.40	3.62	0.99	0.86						100.78	
A3. III	.960	.161	.007	.068	.193	.132	.058	.011								
85	57.37	15.66	2.06	4.46	8.84	4.94	3.05	1.54	0.61	0.12	0.60	0.02	0.27	NiO 0.41	99.92	2.830
A2. II	.956	.153	.013	.062	.221	.088	.049	.016			.008	—	.004			
86	57.25	16.45	1.67	4.72	6.74	7.65	3.00	1.57	0.40		0.60	0.20	0.10	BaO none SrO trace Li_2O none	100.35	
A2. II	.954	.161	.010	.065	.169	.136	.048	.017			.008	.001	.001			
87	56.70	15.75	1.29	5.32	7.16	7.67	3.36	1.56	0.30		0.65	0.20	0.19	Cr_2O_3 trace BaO 0.03 SrO trace Li_2O trace	100.18	
A2. II	.945	.154	.008	.074	.179	.137	.054	.017			.008	.001	.003			
88	56.53	17.50	1.35	5.03	5.94	8.07	3.51	1.55	0.27		0.54	0.15	0.12	BaO trace Li_2O trace	100.56	
A2. II	.942	.171	.009	.070	.149	.144	.056	.017			.007	.001	.002			
89	56.18	16.59	1.51	5.51	7.26	7.64	3.58	1.47	0.42						100.16	
A3. III	.936	.162	.009	.076	.182	.136	.058	.016								
90	55.93	17.34	1.50	5.20	7.29	8.04	3.32	1.35	0.26						100.23	
A3. III	.932	.170	.009	.072	.182	.143	.053	.015								
91	57.11	17.78	3.54	2.74	3.41	7.21	3.81	1.86	0.98		0.95	0.26	0.33	BaO 0.03 SrO trace	100.01	
A2. II	.952	.174	.022	.038	.085	.128	.061	.020			.012	.002	.005			
92	52.63	17.62	6.49	3.10	5.64	8.62	3.38	1.73	0.79		0.07	0.47	trace	SO_3 trace BaO 0.04 SrO trace Li_2O trace	100.58	
A2. II	.877	.173	.041	.043	.141	.153	.055	.019			.001	.003	—			
93	55.40	15.32	2.70	5.49	5.75	9.90	2.89	1.52	0.38	0.03	0.60	0.22	0.11	BaO 0.07 SrO none Li_2O trace	100.38	
A2. II	.923	.150	.017	.076	.144	.177	.047	.016			.008	.002	.002			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. ANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
78	II.5.3(4).4(5).	or 5.00 di 8.23 ab 31.96 hy 7.40 an 31.14 ol 11.67 mt 2.09 il 0.61	Lillooet, British Columbia.	M. F. Connor.	A. M. Bateman, Can. G. S. rec. lab.	Diorite.	
79	II″.5.3(4).4″.	Q 0.48 di 15.28 or 6.12 hy 5.53 ab 29.34 mt 8.58 an 30.58 il 1.82	Olivine Ridge, Tulameen District, British Columbia.	M. F. Connor.	C. Camsell, Can. G. S. Mem. 26. p. 71, 1913.	Augite syenite.	Pers. com.
80	II.5.3(4).4.	Q 1.80 di 5.32 or 9.45 hy 12.50 ab 26.72 mt 4.87 an 30.30 il 1.52 ap 4.70	Mount Tolmie, Victoria District, Vancouver Island, British Columbia.	M. F. Connor.	C. H. Clapp, Can. G. S. Mem. 36, p. 59, 1913.	Gabbro-diorite gneiss.	
81	II(III).(4)5.3.4.	Q 7.08 di 14.29 or 7.78 hy 15.12 ab 25.68 mt 3.25 an 21.68 il 3.19 ap 0.34	Clalum Ridge, Kittitas County, Washington.	G. Steiger.	G. O. Smith, U. S. G. S. Fol. 106, p. 8, 1904.	Basalt.	
82	II.(4)5.3″.4″.	Q 9.36 di 4.16 or 7.23 hy 9.52 ab 33.01 mt 4.18 an 28.63 il 2.13 ap 0.67	Llao Rock, Crater Lake, Oregon.	H. N. Stokes.	H. B. Patton, U. S. G. S. P. P. 3, p. 140, 1902.	Secretion in dacite.	
83	II″.5.3.4.	Q 2.28 di 10.47 or 7.78 hy 13.96 ab 29.87 mt 5.57 an 25.85 il 2.28 ap 1.01	Red Cone, Crater Lake, Oregon.	H. N. Stokes.	H. B. Patton, U. S. G. S. P. P. 3, p. 161, 1902.	Basalt.	
84	II″.5.3″.4″.	Q 4.08 di 8.96 or 6.12 hy 23.03 ab 30.39 mt 1.62 an 25.38	Silver Lake, n. Lassen Peak, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 79, p. 29, 1891.	Quartz basalt.	In W. T., p. 279.
85	II″.(4)5.3″.4.	Q 7.44 hy 28.04 or 8.90 mt 3.02 ab 25.68 il 1.22 an 24.46	South of Burns Valley, California.	W. H. Melville.	G. F. Becker, U. S. G. S. Mon. 13, p. 159, 1888.	Basalt.	In W. T., p. 277.
86	II″.(4)5.3(4).4.	Q 7.08 di 8.31 or 9.45 hy 19.25 ab 25.15 mt 2.32 an 26.69 il 1.22 ap 0.34	Snag Lake, Cinder Cone, California.	W. F. Hillebrand.	J. S. Diller, A. J. S., XXXIII, p. 49, 1887.	Quartz basalt.	Also in U. S. G. S. B. 79, p. 29, 1891. In W. T., p. 279.
87	II(III).5.3.4.	Q 3.90 di 11.44 or 9.45 hy 20.04 ab 28.30 mt 1.86 an 23.07 il 1.22 ap 0.34	Cinder Cone, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 79, p. 29, 1891.	Quartz basalt.	Bomb. In W. T., p. 279.
88	II.5.3″.4.	Q 3.72 di 9.67 or 9.45 hy 17.41 ab 29.34 mt 2.09 an 27.24 il 1.06 ap 0.34	Cinder Cone, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 79, p. 29, 1891.	Quartz basalt.	In W. T., p. 279.
89	II″.5.3.4.	Q 1.14 di 10.75 or 8.90 hy 21.86 ab 30.39 mt 2.09 an 24.46	Lake Bidwell, Cinder Cone, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 79, p. 29, 1891.	Quartz basalt.	In W. T., p. 279.
90	II″.5.3(4).4.	Q 2.04 di 9.21 or 8.34 hy 22.06 ab 27.77 mt 2.09 an 28.36	Cinder Cone, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 79, p. 29, 1891.	Quartz basalt.	In W. T., p. 279.
91	II.(4)5.3.4.	Q 9.48 di 6.15 or 11.12 hy 6.79 ab 31.96 mt 5.10 an 25.85 il 1.82 ap 0.67	Mill Creek, Shasta County, California.	T. M. Chatard.	J. S. Diller, U. S. G. S. B. 148, p. 196, 1887.	Hypersthene andesite.	In W. T., p. 279.
92	II.5.3″.4.	Q 3.12 di 8.86 or 10.56 hy 10.13 ab 28.82 mt 9.51 an 27.52 il 0.15 ap 1.34	Burney Butte, Shasta County, California.	R. B. Riggs.	J. S. Diller, U. S. G. S. B. 148, p. 200, 1887.	Basalt.	In W. T., p. 279.
93	II(III).″5.3″.4.	Q 5.46 di 18.63 or 8.90 hy 12.39 ab 24.63 mt 3.94 an 24.19 il 1.22 ap 0.67	Near Emigrant Gap, Placer County, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 148, p. 212, 1887.	Gabbro.	In W. T., p. 279.

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
94	55.20	18.68	3.14	4.42	4.59	8.02	3.66	1.01	0.51		0.92	0.24	0.14	BaO 0.03 SrO 0.02 Li_2O none	100.58	
A2. II	.920	.183	.020	.061	.115	.143	.059	.011			.012	.002	.002			
95	56.88	18.25	2.35	4.45	4.07	7.53	3.29	1.42	0.50	0.24	0.45	0.30	0.18	BaO 0.11 SrO 0.04 Li_2O trace	100.06	
A2. II	.948	.179	.015	.062	.102	.134	.053	.015			.006	.002	.003			
96	50.56	14.71	3.54	8.90	4.07	7.58	2.94	2.10	1.12	1.06	1.71	1.14	0.13	BaO 0.25 SrO trace	99.81	
A2. II	.843	.144	.022	.122	.102	.135	.047	.022			.021	.008	.002			
97	55.86	19.30	0.91	4.78	2.94	7.31	3.52	1.52	1.23	0.19	1.20	0.38	0.16	CO_2 none NiO trace FeS_2 0.39 BaO 0.13 SrO 0.04	99.86	
A1. I	.931	.189	.006	.067	.074	.130	.056	.016			.015	.003	.002			
98	55.18	17.35	2.77	3.90	4.80	7.98	3.42	1.42	1.52	0.16	0.83	0.20	0.15	CO_2 none FeS_2 0.28 NiO 0.03 BaO 0.04 SrO 0.06	100.09	
A1. I	.920	.170	.017	.054	.120	.143	.055	.015			.010	.001	.002			
99	56.81	18.36	2.48	3.94	4.75	6.43	4.18	1.36	1.17		trace	0.25			99.73	2.74
A3. III	.947	.180	.016	.055	.119	.114	.068	.015			——	.002				
100	53.98	17.86	4.61	2.27	3.30	7.55	4.19	2.59	0.50	0.56	1.10	0.61	0.13	CO_2 0.21 SO_3 0.17 S 0.01 BaO 0.28 SrO 0.14	100.06	
A1. I	.900	.175	.029	.032	.083	.135	.068	.028			.014	.004	.002			
101	52.55	17.61	4.24	4.98	4.17	8.02	3.41	1.49	2.13	0.25	0.86	0.36	0.23	CO_2 none S 0.02 BaO 0.04 SrO 0.02 Li_2O none	100.38	
A1. I	.876	.173	.026	.069	.104	.143	.055	.016			.011	.003	.003			
102	51.89	15.28	3.10	3.60	8.68	7.38	3.27	2.56	1.37	1.17	0.91	0.61	0.12	CO_2 none ZrO_2 trace NiO 0.02 BaO 0.15 SrO 0.09	100.21	
A1. I	.865	.150	.019	.050	.217	.132	.053	.028			.011	.004	.002			
103	50.12	18.52	2.47	4.11	2.68	8.99	5.22	1.46	3.09	1.64	1.33	0.18	trace	SO_3 0.08 Cr_2O_3 trace NiO none BaO 0.02	99.91	2.732
A1. I	.835	.182	.016	.057	.067	.161	.084	.016			.016	.001	——			
104	49.60	16.56	4.28	4.44	5.38	9.22	3.31	1.25	2.58	1.44	1.86	0.30	0.08	SO_3 0.17 Cr_2O_3 0.03 NiO none BaO 0.05	100.55	2.825
A1. I	.827	.162	.027	.062	.135	.164	.053	.013			.024	.002	.001			
105	56.40	15.99	3.26	3.82	3.54	6.98	3.83	1.91	2.47		1.14	0.32	0.12		99.78	2.797
A2. II	.940	.157	.020	.053	.089	.125	.062	.020			.014	.002	.002			
106	58.07	15.83	2.97	3.89	5.56	6.70	3.89	1.73	0.23	0.18	1.27	0.29	0.06	Cr_2O_3 0.01 BaO 0.07 SrO 0.04 Li_2O trace	100.79	
A1. I	.968	.155	.019	.054	.139	.120	.063	.018			.016	.002	.001			
107	51.98	17.20	8.22	2.00	5.41	8.17	3.84	0.90	0.62		0.36	0.99			99.69	2.72
A2. II	.866	.169	.051	.028	.135	.146	.062	.010			.005	.007				
108	51.82	18.13	0.75	6.88	7.81	8.60	3.74	0.91	0.62	0.21	1.06	0.01		S. 0.02	100.46	
A2. II	.864	.178	.005	.096	.195	.154	.060	.010			.013	——				

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. ANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
94	II.″5.3(4).4″.	Q 6.30, or 6.12, ab 30.92, an 31.41; di 5.13, hy 13.13, mt 4.64, il 1.82, ap 0.67	Bidwell's road, Butte County, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 148, p. 196, 1887.	Hypersthene andesite.	In W. T., p. 279.
95	II.(4)5.3(4).4.	Q 9.36, or 8.34, ab 27.77, an 30.86; di 3.62, hy 14.25, mt 3.48, il 0.91, ap 0.67	Franklin Hill, Plumas County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 17 (I), p. 731, 1896.	Hypersthene andesite.	In W. T., p. 289.
96	II(III).5.3.″4.	Q 3.78, or 12.23, ab 24.63, an 20.85; di 7.61, hy 17.11, mt 5.10, il 3.19, ap 2.69	Near Mount Ingalls, Plumas County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 14 (II), p. 491, 1894.	Basalt.	Also in A. J. S. XLIV, p. 458, 1892. In W. T., p. 279.
97	II.(4)5.3(4).4.	Q 8.40, or 8.90, ab 29.34, an 32.53; di 0.68, hy 13.40, mt 1.39, il 2.28, ap 1.01	Tuolumne River, Amador County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 17 (I), p. 702, 1896.	Diorite.	In W. T., p. 279.
98	II.(4)5.3″.4.	Q 6.66, or 8.34, ab 28.82, an 27.80; di 8.90, hy 11.57, mt 3.94, il 1.52, ap 0.34	Tuolumne River, Amador County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 17 (I), p. 702, 1896.	Diorite porphyry.	In W. T., p. 279.
99	II.″5.3.4″.	Q 5.28, or 8.34, ab 35.63, an 26.97; di 2.00, hy 16.08, mt 3.71, ap 0.67	Telegraph Canyon, Berkeley Hills, California.	C. Palache.	Lawson and Palache, Un. Cal., Dep. G., B. II, p. 426, 1901.	Andesite.	
100	II.5.3.4.⊙	Q 2.40, or 15.57, ab 35.63, an 21.96; di 9.29, hy 4.00, mt 4.18, il 2.13, hm 1.76, ap 1.34	Panamint Range, California.	W. F. Hillebrand.	J. E. Spurr, U. S. G. S. B. 228, p. 253, 1904.	Aleutite.	
101	II.″5.3″.4.	Q 4.56, or 8.90, ab 28.82, an 28.36; di 6.96, hy 11.66, mt 6.03, il 1.67, ap 1.01	Fremont Peak, Mojave Desert, California.	W. F. Hillebrand.	J. E. Spurr, U. S. G. S. B. 228, p. 253, 1904.	Quartz diorite.	
102	II(III).5.3.(3)4.	or 15.57, ab 27.77, an 19.18; di 10.96, hy 9.59, ol 6.98, mt 4.41, il 1.67, ap 1.34	San Joaquin River, Madera County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. B. 168, p. 218, 1900.	Basalt.	In W. T., p. 279.
103	II.5″.3.4.	or 8.90, ab 32.49, an 22.80, ne 6.25; di 17.09, ol 1.25, mt 3.71, il 2.43, ap 0.34	Bella Vista Ranch, San Mateo County, California.	E. T. Allen.	Haehl and Arnold, Pr. Am. Phil. Soc., XLIII, p. 50, 1904.	Diabase.	
104	II″.5.3″.4.	Q 1.86, or 7.23, ab 27.77, an 26.69; di 13.34, hy 8.82, mt 6.26, il 3.65, ap 0.67	Mindego Hill, San Mateo County, California.	E. T. Allen.	Haehl and Arnold, Pr. Am. Phil. Soc., XLIII, p. 50, 1904.	Diabase.	
105	II.(4)5.3.4.	Q 8.28, or 11.12, ab 32.49, an 20.85; di 11.09, hy 6.38, mt 4.64, il 2.13	Sutro Tunnel, Washoe, Nevada.	G. E. Moore.	G. F. Becker, U. S. G. S. Mon. 3, Table I, 1882.	Diabase (pyroxene andesite).	Also in Hague and Iddings, U. S. G. S. B. 17, p. 33. 1885. In W. T., p. 279.
106	II.(4)5.3.4.	Q 8.16, or 10.01, ab 33.01, an 20.57; di 8.58, hy 12.48, mt 4.41, il 2.43, ap 0.67	Tlamacas, Popocatepetl, Mexico.	F. N. Guild.	F. N. Guild, A. J. S., XXII, p. 164, 1906.	Hypersthene andesite.	
107	II.″5.3″.4(5).	Q 4.74, or 5.56, ab 32.49, an 26.97; di 5.62, hy 10.90, mt 5.34, il 0.76, hm 4.48, ap 2.35	Cerro de Guadelupe, Puebla, Mexico.	A. Röhrig.	A. Hoppe in Felix and Lenk, Btr. G. Mex., II, p. 211, 1899.	Basalt.	In W. T., p. 279.
108	II″.5.3(4).4″	or 5.56, ab 31.44, an 30.02; di 10.36, hy 4.02, ol 14.40, mt 1.16, il 1.98	Higuera Plateau, n. Jorullo, Mexico.	F. Roel.	E. Ordonez, Cong. G. Int., X, Guide XI, p. 55, 1906.	Basalt.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
109	50.83	18.90	2.95	6.86	3.06	7.92	3.20	2.44	0.70	1.06	1.08	0.66	0.19		99.85	
A2. II	.847	.185	.019	.095	.077	.141	.052	.026			.014	.005	.003			
110	54.36	14.27	6.28	3.04	5.87	7.50	3.35	2.22	1.21		0.30	0.33	1.19	CO_2 trace ZrO_2 trace Cl 0.02 FeS_2 0.02 CaO none BaO 0.02 Cu 0.06 Pb none	100.04	
A1. I	.906	.140	.039	.042	.147	.134	.054	.023			.004	.002	.017			
111	52.19	15.47	8.30	3.65	4.59	8.26	2.77	1.48	0.90		1.24	0.10	0.13	CO_2 0.15 ZrO_2 none Cl 0.13 FeS_2 0.26 CoO none BaO 0.08 Cu trace Pb none	99.70	
A1. I	.870	.151	.052	.051	.115	.147	.061	.016			.016	.001	.002			
112	56.91	18.18	4.65	3.61	3.49	7.11	4.02	1.61	0.36			0.25			100.19	
A3. III	.949	.178	.029	.050	.087	.127	.064	.017				.002				
113	59.61	18.66	3.03	4.00	2.50	6.60	4.27	1.56	n. d.			0.11			100.34	2.678
A3. III	.994	.183	.019	.056	.063	.118	.069	.017	——			.001				
114	56.23	15.25	6.13	3.60	5.38	7.35	4.18	1.50	0.23		0.48				100.33	2.77
A3. III	.937	.150	.038	.050	.134	.131	.068	.016			.006					
115	50.97	15.56	4.43	7.62	4.28	7.05	5.04	1.26	1.58		1.98	0.43	0.38	S 0.16	100.74	2.919
A2. II	.850	.153	.027	.106	.107	.126	.081	.014			.025	.003	.005			
116	54.15	19.30	3.61	3.54	2.75	8.00	3.75	3.19	1.24		0.69	0.45	0.12		100.79	
A2. II	.903	.189	.023	.049	.069	.143	.060	.034			.009	.003	.002			
117	49.30	17.31	3.84	5.73	5.12	8.67	4.05	1.73	2.18		2.16	0.26	0.14	CO_2 0.16 S 0.01	100.66	
A2. II	.823	.170	.024	.079	.128	.155	.066	.018			.027	.002	.002			
118	54.92	17.46	4.40	3.09	2.66	7.42	4.53	3.03	1.12		0.51	0.24	0.07	X 0.13	99.58	2.773
A2. II	.915	.171	.028	.043	.067	.132	.073	.032			.006	.002	.001			
119	47.85	16.59	4.32	6.16	4.79	9.84	3.72	2.08	2.61		1.18	0.23		X 0.18 S 0.10	99.65	2.905
A2. II	.798	.163	.027	.086	.120	.176	.060	.022			.015	.002				
120	56.22	16.33	3.11	7.94	2.99	5.63	3.84	1.65	1.63	0.88			0.11		100.33	
A2. II	.937	.160	.019	.110	.075	.101	.062	.018					.002			
121	50.70	14.60	5.23	7.68	4.15	7.20	3.71	1.33	1.15	2.08	1.89	0.49	0.42	NiO trace BaO 0.08 SrO trace	100.71	
A2. II.	.845	.143	.033	.107	.104	.129	.060	.014			.024	.003	.006			
122	50.33	19.97	2.81	6.23	3.24	8.03	4.30	1.19	0.99	0.87	1.81	0.17	0.17	S none Cr_2O_3 trace NiO trace BaO 0.06 SrO trace	100.17	2.81
A1. I	.839	.196	.018	.086	.081	.143	.069	.013			.023	.001	.002			
123	46.13	17.07	6.61	8.20	4.38	7.15	3.58	1.19	1.71	0.59	3.60	0.09	0.28	Cr_2O_3 trace V_2O_3 0.03	100.61	2.91
A2. II	.769	.167	.041	.114	.110	.128	.058	.013			.045	——	.004			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. ANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
109	II.5.3″.″4.	Q 0.36 di 3.93 or 14.46 hy 14.37 ab 27.25 mt 4.41 an 29.75 il 2.13 ap 1.68	Chorcha Mountain, Chiriqui Province, Panama.	W. C. Wheeler.	D. F. McDonald, U. S. G. S. rec. lab.	Andesite.	
110	II(III).″5.3.4.	Q 5.46 di 14.01 or 12.79 hy 10.22 ab 28.30 mt 9.05 an 17.51 il 0.61 ap 0.67	Mazaruni District, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Brit. Gui., p. 40, 1908.	Diorite gneiss.	MnO high? In W. T., p. 279.
111	II″.″5.3.4.	Q 4.50 di 15.12 or 8.90 hy 4.50 ab 31.96 mt 8.58 an 20.57 il 2.43 hm 2.40 ap 0.34	Mazaruni District, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Brit. Gui., p. 96, 1908.	Proterobase.	In W. T., p. 281.
112	II.(4)5.3.4.	Q 8.28 di 5.13 or 9.45 hy 9.01 ab 33.54 mt 6.73 an 26.97 ap 0.67	Purgatorio, Pasto Volcano, Colombia.	R. Küch.	R. Küch, G. Stud. Colomb., I, p. 139, 1892.	Pyroxene andesite.	In W. T., p. 281.
113	″II.(4)5.3.4.	Q 9.96 di 4.11 or 9.45 hy 9.16 ab 36.15 mt 4.41 an 26.97 ap 0.34	Yana-sacha, Cotopaxi Volcano, Ecuador.	A. Young.	A. Young, Hochgeb. Rep. Ec., II (2), p. 264, 1902.	Andesite.	
114	II″.″5.3.4.	Q 5.64 di 14.14 or 8.90 hy 7.80 ab 35.63 mt 8.82 an 18.35 il 0.91	Tunguragua Volcano, Ecuador.	A. Lindner.	F. Tannhäuser in W. Reiss, Ecuador, II, p. 144, 1904.	Dacite.	
115	II″.5.(2)3.4(5).	or 7.78 di 13.20 ab 41.65 ol 8.74 an 16.12 mt 6.26 ne 0.42 il 3.80 ap 1.01	Cordillera de Dona Ana, Coquimbo, Chile.	F. Soenderop.	F. Wolff, Z. D. G. G., LI, p. 529, 1899.	Augite kersantite.	In W. T., p. 281.
116	II.5.3.(3)4.	Q 1.38 di 8.47 or 18.90 hy 5.35 ab 31.44 mt 5.34 an 26.41 il 1.37 ap 1.01	Cerro Pinto, Skyring Water, Patagonia, Chile.	G. Nyblom.	P. D. Quensel, B. G. Inst. Ups., XI, p. 100, 1911.	Shoshonite.	
117	II″.5.3.4.	or 10.01 di 13.77 ab 31.44 ol 7.30 an 23.91 mt 5.57 ne 1.70 il 4.10 ap 0.67	Cerro Cogual, Patagonia, Chile.	G. Nyblom.	P. D. Quensel, B. G. Inst. Ups., XI, p. 80, 1911.	Essexite.	
118	II.5.(2)3.4.	Q 1.14 di 13.00 or 17.79 hy 1.86 ab 38.25 mt 6.50 an 18.35 il 0.91 ap 0.67	Cerro de Poca, Cordoba, Argentina.	P. Jannasch.	F. Tannhäuser, N. J. B. B., XXII, p. 602, 1906.	Pyroxene andesite.	
119	II(III).5″.3.4.	or 12.23 di 19.78 ab 22.27 ol 5.96 an 22.52 mt 6.26 ne 4.97 il 2.28 ap 0.67	Alemania, Salta, Argentina.	P. Jannasch.	F. Tannhäuser, N. J. B. B., XXII, p. 626, 1906.	Essexite.	
120	II.(4)5.3.4.	Q 8.28 di 4.92 or 10.01 hy 17.29 ab 32.49 mt 4.41 an 22.24	Caribber, Linlithgow, Scotland.	G. S. Blake.	J. D. Falconer, Tr. R. Soc. Ed., XLV, p. 147, 1908.	Diabase.	
121	II(III).5.3.4.	Q 3.18 di 11.34 or 7.78 hy 12.25 ab 31.44 mt 7.66 an 19.18 il 3.65 ap 1.01	Fiomm-chro, Rum Island, Scotland.	E. G. Radley.	A. Harker, G. S. Scot. Mem., G. Sm. Islands, p. 130, 1908.	Mugearite.	
122	II.5.3.4″.	or 7.23 di 5.94 ab 36.15 hy 3.58 an 31.69 ol 5.70 mt 4.18 il 3.50 ap 0.34	Druim na Criche, Portree, Skye, Scotland.	W. Pollard.	A. Harker, Rocks of Skye, p. 263, 1904.	Olivine dolerite.	
123	II″.5.3″.4″.	or 7.23 di 7.13 ab 30.39 hy 7.25 an 26.69 ol 2.88 mt 9.51 il 6.84	Broc Bheinn, Sligachan, Skye, Scotland.	W. Pollard.	A. Harker, Rocks of Skye, p. 248, 1904.	Olivine dolerite.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
124	49.86	16.33	3.62	4.34	7.80	6.47	3.42	2.10	2.77	1.25	1.06	0.54	0.40	CO_2 0.23 S none Cr_2O_3 trace NiO none BaO 0.10	100.29	
A1. I	.831	.160	.023	.060	.195	.116	.055	.022			.013	.004	.006			
125	46.45	16.98	3.94	8.57	5.94	7.64	3.50	1.43	1.68	0.24	3.11	0.51	0.48	CO_2 0.41 Fe_7S_8 0.06 NiO none BaO none	100.94	
A1. I	.774	.167	.025	.119	.149	.137	.056	.015			.039	.004	.007			
126	50.23	17.16	2.44	5.46	6.23	8.10	4.23	1.94	2.13		1.20	0.15		CO_2 0.03 ZrO_2 0.02 FeS_2 0.09 Cr_2O_3 0.07 BaO 0.06	99.73	2.890
A1. I	.837	.168	.015	.076	.156	.145	.068	.021			.015	.001				
127	54.42	15.34	0.67	5.17	6.69	8.30	4.21	1.01	2.60	0.47	0.72	0.57	trace	CO_2 trace	100.[illegible]7	
A2. II	.907	.150	.004	.072	.167	.148	.068	.011			.009	.004	—			
128	53.82	14.70	2.39	6.74	4.84	9.03	2.75	1.85	1.59	0.37	1.66	0.10	0.39	CO_2 0.10 NiO 0.03 BaO 0.02	100.38	
A1. I	.897	.144	.015	.093	.121	.161	.045	.020			.021	.001	.006			
129	52.37	18.05	3.40	4.27	5.53	6.18	4.36	1.97	1.83	0.32	1.16	0.18	0.28	CO_2 0.17 NiO none BaO 0.02 Li_2O trace	100.09	
A1. I	.873	.177	.021	.060	.138	.111	.070	.021			.015	.001	.004			
130	50.19	14.57	4.39	8.96	2.79	7.60	4.24	1.53	1.54	0.32	2.72	1.12	0.32	CO_2 0.02 Cl 0.05 NiO none BaO 0.03 Li_2O trace	100.42	
A1. I	.837	.143	.028	.125	.070	.136	.068	.016			.034	.008	.005			
131	54.10	14.70	2.21	11.50	1.56	6.94	3.47	1.52	1.00		2.65	0.37			100.02	
A2. II	.902	.144	.014	.160	.039	.124	.056	.016			.033	.003				
132	53.85	16.21	4.11	4.70	3.35	7.81	3.75	2.22	1.25		2.60	0.64			100.49	
A2. II	.898	.159	.026	.065	.084	.139	.061	.023			.033	.005			(100.48)	
133	53.21	18.40	1.22	4.69	2.50	6.72	4.32	2.54	1.76		2.33	0.32		FeS_2 2.95	100.96	
A2. II	.887	.180	.008	.065	.063	.120	.069	.027			.029	.002				
134	51.25	16.97	2.95	5.85	3.98	7.45	4.36	2.56	1.25		3.25	0.43			100.30	
A2. II	.854	.166	.019	.082	.100	.133	.070	.028			.041	.003				
135	48.51	16.08	2.48	7.66	5.32	8.57	4.02	2.60	1.25		3.07	0.23			99.79	
A2. II	.809	.158	.016	.107	.133	.154	.065	.028			.038	.002				
136	47.15	17.41	4.63	4.62	4.96	10.10	3.40	2.60	2.50		3.13	0.39			100.89	
A2. II	.786	.171	.029	.064	.124	.180	.055	.028			.039	.003				
137	52.25	17.60	5.90	3.51	3.15	7.70	5.15	2.25	n. d.		1.86	0.70			100.07	
A2. II	.871	.172	.037	.049	.079	.138	.083	.024			.023	.005				

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. ANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
124	II″.5.3.4.	or 12.23 di 4.42 ab 28.82 hy 12.61 an 23.07 ol 6.23 mt 5.34 il 1.98 ap 1.34	Cruach Arddhuine, Taynuilt, Argyll, Scotland.	E. G. Radley.	J. J. H. Teall, G. S. G. Br., Sum. Prog. (1913), p. 82, 1914.	Orthoclase-olivine basalt.	
125	II(III).5.3″.4.	or 8.34 di 6.31 ab 29.34 hy 1.86 an 26.69 ol 13.19 mt 5.80 il 5.93 ap 1.34	Little Galdon Neck, Kilpatrick Hills, Glasgow, Scotland.	E. G. Radley.	G. W. Tyrrell, G. S. Scot. Mem., G. Glasg. Dist., p. 142, 1911.	Olivine basalt.	
126	II″.5.3.4.	or 11.68 di 14.06 ab 28.82 ol 10.75 an 21.96 mt 3.48 ne 3.69 il 2.28 ap 0.34	Clec Hill, Ludlow, Shropshire, England.	P. Holland.	Reade and Holland, Pr. Liverp. G. Soc., X, p. 208, 1907.	Basalt.	
127	II(III)5.3.4(5).	Q 0.06 di 14.36 or 6.12 hy 17.54 ab 35.63 mt 0.93 an 19.74 il 1.37 ap 1.34	Penberry Head, Pembrokeshire, Wales.	J. V. Elsden.	J. V. Elsden, Q. J. G. S., LXI, p. 588, 1905.	Quartz norite.	
128	II(III).″5.3.4.	Q 5.16 di 17.92 or 11.12 hy 11.65 ab 23.58 mt 3.48 an 21.96 il 3.19 ap 0.34	Skomer Island, Pembrokeshire, Wales.	E. G. Radley.	H. H. Thomas, Q. J. G. S., LXVII, p. 205, 1911.	Basalt.	
129	II.5.3.4.⊙	or 11.68 di 4.88 ab 36.68 hy 8.22 an 23.91 ol 4.97 mt 4.87 il 2.28 ap 0.34	Grassholme Island, Pembrokeshire, Wales.	E. G. Radley.	H. H. Thomas, Q. J. G. S., LXVII, p. 200, 1911.	Marloesite.	
130	II(III).5.″3.4.	Q 1.62 di 11.60 or 8.90 hy 10.18 ab 35.63 mt 6.50 an 16.40 il 5.17 ap 2.69	Skomer Island, Pembrokeshire, Wales.	E. G. Radley.	H. H. Thomas, Q. J. G. S., LXVII, p. 202, 1911.	Mugearite.	
131	II″.(4)5.3.4.	Q 7.92 di 10.06 or 8.90 hy 13.62 ab 29.34 mt 3.25 an 20.02 il 5.02 ap 1.01	Brée, Brittany, France.	Pisani.	L. Vandernotte, Mass. Armor., p. 161, 1913.	Microgabbro.	
132	II.″5.3.4.	Q 6.42 di 10.25 or 12.79 hy 4.40 ab 31.96 mt 6.03 an 20.85 il 5.02 ap 1.68	Griou, Fournol, Cantal, France.	Pisani.	A. Lacroix, C. R., CXLIX, p. 546, 1909.	Andesite.	
133	II.5.3.4.⊙	Q 1.14 di 7.45 or 15.01 hy 6.38 ab 36.15 mt 1.86 an 23.35 il 4.41 ap 0.34 pr 2.95	Fournol, Cantal, France.	Pisani.	A. Lacroix, C. R., CXLIX, p. 546, 1909.	Micromonzonite.	
134	II.5.″3.4.	or 15.57 di 12.17 ab 34.84 ol 5.11 an 18.90 mt 4.41 ne 0.99 il 6.23 ap 1.01	Fournol, Cantal, France.	Pisani.	A. Lacroix, C. R., CXLIX, p. 546, 1909.	Monzonite.	
135	II(III).5(6).(2)3.4	or 15.57 di 18.45 ab 21.48 ol 8.24 an 18.07 mt 3.71 ne 6.82 il 5.78 ap 0.67	Fournol, Cantal, France.	Pisani.	A. Lacroix, C. R., CXLIX, p. 546, 1909.	Essexitic gabbro.	
136	II(III).5″.3.″4.	or 15.57 di 17.71 ab 19.39 ol 2.94 an 24.46 mt 5.80 ne 5.11 il 5.93 hm 0.64 ap 1.01	Fournal, Cantal, France.	Pisani.	A. Lacroix, C. R., CXLIX, p 546, 1909	Essexitic gabbro.	
137	II.5.(2)3.4.	or 13.34 di 12.10 ab 40.35 ol 1.61 an 18.07 mt 6.03 ne 1.70 il 3.50 hm 1.76 ap 1.68	Fontfroide, Puy de Dome, Auvergne.	Pisani.	A. Lacroix, pers. com.	Labradorite (basalt).	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
138	52.20	17.57	1.81	7.20	3.68	7.76	4.86	1.90	n. d.		2.08	0.58			99.64	
A2. II	.870	.172	.011	.100	.092	.139	.078	.020			.026	.004				
139	59.1	18.5	1.3	3.8	3.1	5.3	4.1	2.6	2.8						100.6	
B3. IV	.985	.181	.008	.053	.078	.095	.066	.028								
140	54.60	18.45	4.45	2.88	2.73	8.05	4.11	1.53	2.10		0.88				99.78	
A3. III	.910	.181	.028	.040	.068	.144	.066	.016			.011					
141	48.11	16.75	1.60	9.54	5.15	8.70	3.75	1.16	2.65		2.10	0.45			99.96	
A2. II	.802	.164	.010	.132	.129	.155	.061	.013			.026	.003				
142	47.41	16.88	2.51	9.91	5.51	8.50	3.61	0.81	1.20		2.65	0.44			99.43	
A2. II	.790	.166	.016	.138	.138	.152	.058	.009			.033	.003				
143	56.09	16.03	3.12	4.77	8.03	6.73	3.49	1.87	0.16		0.37				100.66	2.892
A3. III	.935	.157	.020	.062	.201	.120	.056	.020			.005					
144	48.06	16.95	4.78	7.60	5.51	7.79	3.37	1.42	0.80		2.57	0.63	trace		99.48	
A2. II	.801	.166	.030	.106	.138	.139	.054	.015			.032	.004	——			
145	52.29	14.99	6.77	3.70	5.95	7.62	4.16	2.26	1.65		0.24		0.50		100.13	
A2. II	.872	.147	.043	.051	.149	.136	.067	.024			.003		.007			
146	50.92	16.62	3.27	9.10	4.89	8.23	3.57	1.58	1.06		0.77	0.51	trace		100.52	2.957
A2. II	.849	.163	.020	.126	.122	.146	.058	.017			.010	.004	——			
147	50.72	16.32	5.68	5.40	6.24	6.14	3.50	1.48	3.36		0.70	0.51	trace		100.05	2.804
A2. II	.845	.160	.036	.075	.156	.110	.056	.016			.009	.004	——			
148	53.75	16.10	6.36	6.38	4.53	6.53	3.81	1.67	1.18				0.27	SO_3 0.09	100.62	
A3. III	.896	.158	.040	.089	.113	.116	.061	.018					.004			
149	55.05	16.26	3.83	3.31	5.34	7.61	3.37	1.49	1.93		1.01	0.20		SO_3 0.05 Org 0.08	99.53	2.796
A2. II	.918	.159	.024	.046	.134	.135	.055	.016			.013	.001				
150	53.58	15.84	2.98	4.90	7.16	7.86	2.99	1.63	2.54		.098	0.19		SO_3 0.16	100.75	2.760
A2. II	.893	.155	.019	.068	.179	.140	.048	.017			.012	.001				
151	53.31	20.05	2.18	3.37	3.33	8.65	4.17	1.30	2.02		1.16	0.18		CO_2 0.06 SO_3 0.20	99.98	2.746
A?2. II	.889	.196	.014	.048	.083	.154	.068	.014			.015	.001				
152	50.30	18.67	6.06	4.27	4.66	9.37	4.05	1.42	n. d.		1.84				100.64	
A3. III	.838	.183	.038	.060	.117	.168	.066	.015			.022					

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. ANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
138	II.5.''3.4.	or 11.12 di 11.90 ab 37.99 ol 8.55 an 20.57 mt 2.55 ne 1.56 il 3.95 ap 1.34	Puy de Come, Puy de Dome, Auvergne.	Pisani.	A. Lacroix, pers. com.	Labradorite (basalt).	
139	''II.''5.3.4.	Q 6.96 di 1.83 or 15.57 hy 12.84 ab 34.58 mt 1.86 an 24.19	Pic du Midi d'Ossan, Pyrennes, France.	Not stated.	J. de Lapparent, B. Soc. Min. Fr., XXXIV, p. 287, 1911.	Hypersthene dacite.	
140	II.''5.3.4.	Q 6.36 di 9.75 or 8.90 hy 2.40 ab 34.58 mt 6.50 an 27.52 il 1.67	Cap d'Ail, Esterel, France.	Pisani.	A. Michel-Levy, B. Ser. Ct. G. Fr., XXI, No. 130, p. 41, 1912.	Labradorite (basalt).	
141	II(III).5.3.4''.	or 7.23 di 12.62 ab 29.87 ol 14.24 an 25.02 mt 2.32 ne 1.14 il 3.95 ap 1.01	Les Adrets, Esterel, France.	Pisani.	A. Michel-Levy. B. Ser. Ct. G. Fr., XXI, No. 130, p. 41, 1912.	Melaphyre.	
142	II(III).5.3(4).4(5).	or 5.00 di 9.83 ab 30.39 hy 2.69 an 27.52 ol 13.22 mt 3.71 il 5.02 ap 1.01	Les Adrets, Esterel, France.	Pisani.	A. Michel-Levy, B. Ser. Ct. G. Fr., XXI, No. 130, p. 41, 1912.	Melaphyre.	
143	II(III).5.3.4.	Q 2.40 di 8.61 or 11.12 hy 20.89 ab 29.34 mt 4.64 an 22.52 il 0.76	Campo Maior, Alemtejo, Portugal.	A. Merian.	A. Merian, N. J. B. B., III, p. 296, 1885.	Mica diorite.	In W. T., p. 281.
144	II(III).5.3''.4.	or 8.34 di 6.48 ab 28.30 hy 12.63 an 26.97 ol 2.78 mt 6.96 il 4.86 ap 1.34	Hovland, n. Laurvik, Lougendal, Norway.	V. Schmelck.	W. C. Brögger, Eg. Kg., III, p. 75, 1899.	Bronzite kersantite.	In W. T., p. 281.
145	II(III).5.(2)3.4.	or 13.34 di 17.47 ab 35.11 hy 2.76 an 15.57 ol 3.91 mt 9.98 il 0.46	Prestberg, Ragunda, Jemtland, Sweden.	H. Santesson.	A. G. Högbom, Afh. Sv. G. Und., 182, p. 45, 1899.	Diabase.	Not in W. T.
146	II(III).5.3.4.	or 9.45 di 9.90 ab 30.39 hy 11.31 an 24.46 ol 6.38 mt 4.64 il 1.52 ap 1.34	Silfberg, Dalarne, Sweden.	O. Larsson.	M. Weibull, Lunds Un. Aars-Sk., XXXIII, No. 4, p. 28, 1897.	Enstatite porphyrite.	Not in W. T.
147	II''.5.3.4.	Q 2.34 di 2.65 or 8.90 hy 18.30 ab 29.34 mt 8.35 an 24.46 il 1.37 ap 1.01	Lustigkulla Mine, Silfberg, Dalarne, Sweden.	O. Larsson.	M. Weibull, Lunds. Un. Aars-Sk., XXXIII, No. 4, p. 24, 1897.	Diabase.	Not in W. T.
148	II''.5.3.4.	Q 3.66 di 8.37 or 10.01 hy 14.21 ab 31.96 mt 9.28 an 21.96	Ostergard, n. Lammala, Kimito Island, Finland.	N. M. Slawsky.	P. P. Sustchinsky, Trav. Soc. Imp. St. P., XXXVI, p. 64, 1912.	Metabasite.	SO_3 given as 3.09.
149	II.(4)5.3.4.	Q 7.74 di 9.60 or 8.90 hy 10.09 ab 28.82 mt 5.57 an 24.46 il 1.98 ap 0.34	Martinstein, Nahe District, Rheinland.	Jacobs.	K. Lossen, Jb. Pr. G. L.-A. (1889), p. 309, 1892.	Bronzite tholeyite.	In W. T., p. 281.
150	II(III).5.3''.4.	Q 3.60 di 10.34 or 9.45 hy 17.89 ab 25.15 mt 4.41 an 25.02 il 1.82 ap 0.34	Mittweiler, Nahe District, Rheinland.	A. Hesse.	A. Leppla, Erl. Bl. Friessen, G. Kte. Pr., XLVI, p. 35, 1894.	Melaphyre.	In W. T., p. 281.
151	II.5.3.4''.	Q 1.80 di 8.21 or 7.78 hy 6.88 ab 35.63 mt 3.25 an 31.69 il 2.28 ap 0.34	Sattel, Niederkirchen, Nahe District, Rheinland.	Gremse.	K. Lossen, Jb. Pr. G. L.-A. (1889), p. 309, 1892.	Dolerite.	Al_3O_2 and MgO? In W. T., p. 281.
152	II.5.3.4''.	or 6.34 di 14.26 ab 33.54 ol 3.57 an 28.36 mt 8.82 ne 0.57 il 3.34	Ermensbach, Vosges, Alsace.	Loscher.	W. Deecke, Z. D. G. G., XLIII, p. 873, 1891.	Diabase.	In W. T., p. 281.

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
153	54.13	16.17	3.36	4.76	6.76	7.48	2.89	1.63	2.72		trace	0.19		SO_3 0.16	100.25	2.625
A3. III	.902	.158	.021	.066	.169	.134	.047	.017			—	.001				
154	56.22	17.59	2.78	5.05	3.96	6.47	3.68	1.33	0.83	0.12	1.19	0.11		CO_2 0.19 FeS_2 0.24	99.76	
A2. II	.937	.172	.018	.070	.097	.115	.060	.014			.015	.001				
155	54.28	19.27	0.64	6.27	3.29	5.01	5.73	2.23	1.30	0.33	0.80	0.37		CO_2 0.35 SO_3 0.25	100.12	
A2. II	.905	.189	.004	.088	.082	.089	.092	.023			.010	.003				
156	50.45	18.90	7.73	2.61	5.41	9.00	3.92	1.05	0.10	0.18	0.27	0.52			100.14	
A2. II	.841	.185	.048	.036	.135	161	.063	.011			.003	.004				
157	58.34	18.08	3.23	3.87	2.07	5.76	5.65	1.30	0.55	0.05	1.07	0.22		CO_2 0.12 SO_3 0.07	100.36	
A2. II	.972	.177	.020	.054	.052	.103	.091	.014			.013	.002				
158	51.22	17.48	3.42	6.09	5.40	8.00	3.65	1.59	1.06	0.10	1.36	0.18		CO_2 0.27 SO_3 0.39	100.20	
A2. II	.854	.171	.021	.085	.135	.143	.059	.017			.017	.001				
159	51.14	19.65	2.29	5.62	4.26	7.96	3.94	1.37	1.02	0.35	1.54	0.49		CO_2 0.18 SO_3 trace	99.81	
A2. II	.852	.193	.014	.078	.107	.142	.064	.015			.019	.004				
160	52.73	14.35	4.37	7.60	5.13	7.26	3.57	0.82	1.33		2.34	0.46	trace	CO_2 0.22 Cl trace F trace Cr_2O_3 trace BaO trace	100.18	2.872
A2. II	.879	.141	.027	.106	.128	.130	.058	.009			.028	.003	—			
161	50.92	17.92	1.72	5.96	6.53	8.32	3.24	2.12	2.09	0.23	0.90			FeS_2 0.21	100.21	
A3. III	.849	.176	.011	.083	.163	.148	.052	.022			.011					
162	49.97	16.38	3.62	6.76	7.50	8.95	3.22	1.55	2.18					Cl 0.06	100.19	2.84
A3. III	.833	.160	.022	.094	.188	.160	.052	.017								
163	54.08	16.62	3.38	9.18	1.22	4.80	3.71	1.79	2.10		1.69	0.42	0.63	CO_2 0.07 S 0.12	99.81	
A2. II	.901	.163	.021	.128	.031	.086	.060	.019			.021	.003	.009			
164	49.56	16.32	3.69	6.97	7.50	8.83	2.91	1.87	2.36					Cl. 0.07	100.08	2.88
A3. III	.826	.160	.023	.097	.188	.157	.047	.020								
165	53.78	16.02	1.27	6.84	6.49	8.45	2.47	1.81	1.45		0.81	0.17		SO_3 0.23 FeS_2 0.19	99.98	2.897
A2. II	.896	.157	.008	.095	.162	.151	.040	.019			.010	.001				
166	49.93	16.12	5.01	6.28	6.40	8.93	3.87	1.41	0.44		0.72	0.21		CO_2 0.20 SO_3 0.19	99.71	2.928
A2. II	.832	.158	.031	.088	.160	.159	.063	.015			.009	.002				
167	49.84	17.06	3.26	7.64	5.44	9.80	3.27	1.43	0.96		1.42	0.03		SO_3 0.04	100.19	2.964
A2. II	.831	.167	.020	.106	.136	.175	.053	.015			.018	—				

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. ANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
153	II''.''5.3''.4.	Q 4.74 di 8.25 or 9.45 hy 18.88 ab 24.63 mt 4.87 an 26.13 ap 0.34	Die Wacht, n. Eulenbis, Rheinpfalz.	H. Haefeke.	A. Leppla, Jb. Pr. G. L.-A. XIV (1893), p. 146, 1894.	Melaphyre.	In W. T., p. 281.
154	II.(4)5.3''.4.	Q 8.82 di 3.16 or 7.78 hy 13.26 ab 31.44 mt 4.18 an 27.24 il 2.28 ap 0.34	Near Ober Ramstadt, Odenwald, Hesse.	K. M. Jene.	G. Klemm, Nb. Ver. Erdk. (4), XXVIII, p. 30, 1907.	Malchite.	
155	''II.5.(2)3.4.	or 12.79 di 1.14 ab 45.85 ol 12.87 an 20.57 mt 0.93 ne 1.28 il 1.52 ap 1.01	Kirschhäuser Thal, Odenwald, Hesse.	Stadler.	G. Klemm, Nb. Ver. Erdk. (4), XXVIII, p. 30, 1907.	Malchite.	
156	II.5.3(4).4(5).	Q 0.18 di 7.99 or 6.12 hy 9.80 ab 33.01 mt 7.66 an 30.86 il 0.46 hm 2.40 ap 1.34	Lichtenberg, Odenwald, Hesse.	Surv. lab.	C. Chelius, Nb. Ver. Erdk. (4), XIV, p. 2, 1893.	Hypersthene diorite.	In W. T., p. 281
157	II.(4)5.''3.4(5).	Q 6.06 di 5.40 or 7.78 hy 5.35 ab 47.68 mt 4.64 an 20.02 il 1.98 ap 0.67	Ludwigsbrunnen, Eberstadt, Hesse.	Stadler.	G. Klemm, Erl. G. Kt. Hes., Bl. Rossdorf, p. 34, 1912.	Diorite.	
158	II.5.3''.4.	or 9.45 di 7.85 ab 30.92 hy 9.64 an 29.19 ol 4.54 mt 4.87 il 2.58 ap 0.34	Biegelsberg, n. Eberstadt, Hesse.	Stadler.	G. Klemm, Erl. G. Kt. Hes., Bl. Rossdorf, p. 34, 1912.	Diorite.	
159	II.5.3''.4.	or 8.34 di 3.37 ab 33.54 hy 11.26 an 31.69 ol 2.73 mt 3.25 il 2.89 ap 1.34	Kohlberg, n. Darmstadt, Hesse.	K. M. Jene.	G. Klemm, Erl. G. Kt. Hes., Bl. Rossdorf, p. 24, 1912.	Diabase.	
160	II(III).(4)5.3.4(5).	Q 6.88 di 10.36 or 5.00 hy 13.99 ab 30.39 mt 6.26 an 20.57 il 4.26 ap 1.01	Rüdigheim, n. Hanau, Hesse.	T. Petersen.	T. Petersen, Ref. N. J., 1894, I, p. 460.	Basalt.	In W. T., p. 327.
161	II.5.3''.4.	or 12.23 di 10.39 ab 27.25 hy 4.35 an 28.36 ol 10.81 mt 2.55 il 1.67	Teufelstrappen, Hesse.	Surv. Lab.	G. Klemm, Erl. G. Kt. Hes., Bl. Birkenau, p. 26, 1905.	Diorite.	
162	II(III).5.3''.4.	or 9.45 di 15.51 ab 27.25 hy 0.76 an 25.30 ol 14.51 mt 5.10	Krötenkopf, Hesse.	H. Wolff.	K. Oebbeke, Jb. Pr. G. L.-A. (1888), p. 393, 1889.	Basalt	In W. T., p. 323.
163	II.(4)5.3.4.	Q 8.94 hy 15.64 or 10.56 mt 4.87 ab 31.44 il 3.19 an 21.13 ap 1.01 C 0.82	Near Silberberg, Brocken, Harz.	Jacobs.	O. H. Erdmannsdoerfer, Jb. Pr. G. L.-A., XXVII, (1906), p. 357, 1908.	Quartz diorite.	
164	II(III).5.3.''4.	or 11.12 di 14.40 ab 24.63 hy 2.39 an 25.85 ol 13.92 mt 5.34	Eisenberg, Hesse.	H. Wolff.	K. Oebbeke, Jb. Pr. G. L.-A., (1888), p. 394, 1889.	Basalt	In W. T., p. 323.
165	II(III)5.3(4).''4.	Q 3.42 di 11.31 or 10.56 hy 20.85 ab 20.96 mt 1.86 an 27.24 il 1.52 ap 0.34	Elfenstein, Brocken, Harz.	Haefke.	O. H. Erdmannsdoerfer, Jb. Pr. G. L.-A., XXVII (1906), p. 359, 1908.	Biotite gabbro.	
166	II(III).5.3.4.	or 8.34 di 16.16 ab 31.96 ol 10.45 an 22.24 mt 7.19 ne 0.57 il 1.37 ap 0.67	Bleichethal, n. Harzburg, Harz.	Winter.	O. H. Erdmannsdoerfer, Jb. Pr. G. L.-A., XXV (1904) p. 38, 1907.	Diabase.	
167	II(III).5.3''.4.	or 8.34 di 17.22 ab 27.77 hy 1.99 an 27.52 ol 8.88 mt 4.64 il 2.74	Steinerne Rennen, Harz.	Heuseler.	O. H. Erdmannsdoerfer, Jb. Pr. G. L.-A., XXXII, (II), p. 365, 1912.	Diabase hornfels.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
168	51.93	17.90	6.12	3.19	3.99	7.29	4.11	3.42	0.53	0.09	1.22				99.79	2.867
A3. III	.866	.175	.038	.044	.100	.130	.066	.036			.015					
169	56.2	19.7	3.9	1.1	3.7	7.2	3.7	2.0	2.1						99.6	
B3. IV	.937	.193	.024	.015	.093	.129	.060	.021								
170	55.24	15.90	4.68	3.85	5.25	8.40	3.52	2.16	1.36						100.36	
A3. III	.921	.156	.029	.054	.131	.150	.056	.023								
171	54.13	16.17	3.36	4.76	6.76	7.48	2.89	1.63	2.72		trace	0.19		SO_3 0.16	100.25	
A3. III	.902	.159	.021	.066	.169	.134	.047	.017			—	.001				
172	52.78	16.08	0.74	8.33	3.50	10.72	2.87	1.33	2.54		2.08		trace	Cr_2O_3 trace	100.97	
B3. IV	.880	.158	.005	.115	.085	.191	.047	.014			.026		—			
173	50.44	17.03	1.50	11.02	5.01	8.28	3.02	2.53	0.32		0.72		0.18		100.05	3.011
A2. II	.841	.167	.009	.153	.125	.148	.048	.027			.009		.003			
174	55.54	17.80	5.20	3.07	2.59	5.69	4.22	2.90	1.75		trace	0.52		SO_3 0.64	99.92	
A3. III	.926	.175	.033	.043	.065	.102	.068	.031			—	.004				
175	44.85	18.08	7.71	3.23	4.16	9.97	3.19	2.82	2.56	0.46	1.78	1.55			100.36	2.839
A2. II	.748	.177	.048	.045	.104	.178	.051	.030			.022	.011				
176	54.42	14.11	3.65	6.13	3.94	6.59	3.95	2.03	0.60	0.80	1.95	0.98	0.93	F 0.47	100.55	
A2. II	.907	.138	.023	.085	.099	.118	.064	.021			.024	.007	.013			
177	56.89	16.95	4.85	3.72	3.12	4.92	4.09	2.41	2.23		0.28	0.15		SrO trace	99.61	
A2. II	.948	.166	.031	.051	.078	.088	.066	.025			.004	.001				
178	51.65	16.33	4.68	5.73	4.75	8.02	3.97	1.57	2.16		0.54	0.10	0.20	SrO 0.05	100.15	
A2. II	.861	.160	.029	.079	.119	.143	.065	.017			.007	.001	.003			
179	58.20	19.20	2.01	4.42	3.25	5.60	4.53	1.81	1.28		0.21	0.33			100.84	
A2. II	.970	.188	.013	.061	.081	.100	.073	.020			.003	.002				
180	45.75	15.85	7.40	5.82	6.90	7.20	3.44	1.33	3.20		1.68	0.55	0.31	S 0.18	99.61	
A2. II	.763	.155	.046	.080	.173	.128	.055	.014			.020	.004	.004			
181	51.39	17.65	3.43	7.14	5.01	7.76	2.93	2.56	1.18			1.09		S 0.17	100.31	
A3. III	.857	.173	.021	.099	.125	.139	.047	.028				.008				
182	50.35	17.07	4.58	6.49	3.50	7.70	3.58	3.12	1.45		1.23	0.64	trace	CO_2 0.47	100.18	
A2. II	.839	.168	.029	.090	.088	.138	.058	.033			.015	.005	—			
183	48.88	16.99	4.73	6.88	4.37	10.02	3.56	2.17	0.63		1.17	0.35	0.39		100.14	
A2. II	.815	.167	.029	.096	.109	.179	.058	.023			.015	.002	.005			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. ANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
168	II.5.″3.(3)4.	or 20.02 di 12.31 ab 30.92 ol 3.01 an 20.29 mt 6.73 ne 1.99 il 2.28 hm 1.44	Gröba, n. Riesa, Saxony.	H. Hirschi.	H. Hirschi, In Diss. Zür., p. 23, 1901.	Syenite.	
169	″II.5″.3″.4.	Q 7.02 di 3.67 or 11.68 hy 7.60 ab 31.44 mt 3.48 an 31.14 hm 1.44	Ober-Buchwald, Riesengebirge.	W. Herz.	L. Milch, N. J. Cb., 1902, p. 677.	Malchite.	
170	II″.5.3.4.	Q 3.84 di 16.15 or 12.79 hy 8.72 ab 29.34 mt 6.73 an 21.41	Königreicher Hof, Blatt Kusel, Bavaria.	A. Schwager.	M. Schuster, Erl. G. Kt. Bay., XX, p. 25, 1910.	Basaltic melaphyre.	
171	II″.″5.3(4).4.	Q 4.68 di 8.04 or 9.45 hy 18.98 ab 24.63 mt 4.87 an 26.41 ap 0.34	Eulenbis, Blatt Kusel, Bavaria.	A. Schwager.	M. Schuster, Erl. G. Kt. Bay., XX, p. 39, 1910.	Melaphyre.	
172	II(III).5.3(4).4.	Q 3.42 di 21.80 or 7.78 hy 8.68 ab 24.63 mt 1.16 an 26.97 il 3.95	Relsberg, Blatt Kusel, Bavaria.	A. Schwager.	M. Schuster, Erl. G. Kt. Bay., XX, p. 23, 1910.	Tholeyitic diabase.	
173	II(III).5.3.(3)4.	or 15.01 di 13.03 ab 22.53 ol 17.98 an 25.58 mt 2.09 ne 1.42 il 1.37	Hutberg, Neurode, Silesia.	O. Hauser.	F. Tannhäuser, Sb. Pr. Ak. W., 1908, II, p. 1074.	Spessartite.	
174	″II.5.″3.4.	Q 5.52 di 2.87 or 17.24 hy 6.46 ab 35.63 mt 7.66 an 21.13 ap 1.34	Reimswaldau, Sudetische Mulde, Bohemia.	Böhm.	G. Berg, Jb. Pr. G. L.-A., XXVIII (1907), p. 239, 1910.	Melaphyre.	
175	II.5.3.(3)4.	or 16.68 di 9.72 ab 20.44 ol 4.13 an 26.69 mt 5.34 ne 3.41 il 3.34 hm 4.00 ap 3.70	Birkigt, Dobrankathal, Bohemia.	R. Pfohl.	J. E. Hibsch, T. M. P. M., XIV, p. 109, 1894.	Nephelite-tephrite.	In W. T., p. 283.
176	II″.″5.(2)3.4.	Q 5.94 di 9.52 or 11.68 hy 11.98 ab 33.54 mt 5.34 an 14.73 il 3.65 ap 2.35	Niedzwiedzia Gora, n. Cracow, Galicia.	Z. Rozen.	Z. Rozen, B. Ac. Sci. Crac., 1909, p. 801.	Hypersthene diabase.	
177	II.(4)5.3.4.	Q 8.88 di 2.22 or 13.90 hy 8.85 ab 34.58 mt 7.19 an 20.85 il 0.61 ap 0.34	Cziklovabanya, Krasso-Szöreny, Hungary.	K. Emszt.	Rozlozsnit and Emszt, Mt. Ung. G. A., XVI, p. 196, 1908.	Syenite-diorite.	
178	II″.5.3.4.	or 9.45 di 13.93 ab 34.06 hy 8.17 an 21.68 ol 2.22 mt 6.73 il 1.06 ap 0.34	Oraviçzabanya, Krasso-Szöreny, Hungary.	K. Emszt.	Rozlozsnit and Emszt, Mt. Ung. G. A., XVI, p. 193, 1908.	Gabbro-diorite.	
179	″II.″5.3.4.	Q 6.60 hy 12.72 or 11.12 mt 3.02 ab 38.25 il 0.46 an 25.85 ap 0.67 C 0.20	Pöllagraben, Salzkammergut, Tyrol.	C. v. John.	C. v. John, Jb. G. R.-A., Wien, XLIX, p. 250, 1899.	Tonalite.	In W. T., p. 283.
180	II(III).5.3.4.	or 7.78 di 6.36 ab 28.82 hy 7.82 an 23.81 ol 6.28 mt 10.67 il 3.04 ap 1.34	Steinberg, Salzkammergut, Tyrol.	C. v. John.	C. v. John, Jb. G. R.-A., Wien, XLIX, p. 252, 1899.	Gabbro.	In W. T., p. 283.
181	II″.5.3″.(3)4.	or 15.57 di 3.19 ab 24.63 hy 19.88 an 27.24 ol 1.00 mt 4.87 ap 2.69	Weissbachtbal, Ultental, Tyrol.	C. v. John.	W. Hammer, Jb. G. R.-A., Wien, LIII, p. 83, 1904.	Kersantite.	
182	II.5.3.(3)4.	or 18.35 di 9.98 ab 30.39 hy 1.33 an 21.41 ol 6.32 mt 6.73 il 2.28 ap 1.68	Traversella Thal, Monzoni, Tyrol.	Dittrich and Pohl.	J. Romberg, Anh. Abh. Pr. Ak., 1904, p. 64.	Kersantite.	
183	II(III).5″.3.4.	or 12.79 di 19.34 ab 23.06 ol 6.46 an 23.91 mt 6.73 ne 3.98 il 2.28 ap 0.67	Riccoletta, Monzoni, Tyrol.	Dittrich and Pohl.	J. Romberg, Anh. Abh. Pr. Ak., 1904, p. 61.	Olivine monzonite.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
184	59.65	17.14	1.24	2.17	4.41	5.51	4.43	3.04	0.94	0.17	1.04				99.74	2.83
A3. III	.994	.168	.008	.031	.110	.098	.071	.032			.013					
185	53.96	15.90	1.58	5.56	7.63	6.31	2.99	2.07	3.46	0.17	0.60				100.23	2.87
A3. III	.899	.156	.010	.077	.191	.113	.048	.022			.008					
186	51.43	15.08	4.29	3.92	8.05	7.12	2.98	2.64	3.68	0.25	0.82				100.26	2.90
A3. III	.857	.148	.027	.054	.201	.127	.048	.028			.010					
187	48.02	20.26	3.49	2.76	7.23	8.87	3.88	1.85	1.82	0.17	1.54				99.83	2.95
A3. III	.800	.198	.022	.039	.181	.159	.063	.020			.019					
188	58.25	19.30	0.70	3.29	3.88	3.87	4.15	3.22	2.21	0.05	1.29				100.21	2.75
A3. III	.971	.189	.004	.046	.097	.070	.067	.034			.016					
189	55.15	15.82	0.43	6.64	4.36	6.53	3.75	2.56	3.36	0.09	1.14				99.83	2.82
A3. III	.919	.155	.003	.092	.109	.116	.061	.028			.014					
190	55.01	20.57	1.75	2.92	3.45	6.35	3.68	1.87	2.50	none	1.73				99.63	2.88
A3. III	.917	.202	.011	.040	.086	.114	.060	.020			.022					
191	51.54	15.99	2.87	6.89	6.53	5.84	3.36	1.50	4.11	0.14	1.05				99.82	2.859
A3. III	.859	.157	.018	.096	.163	.104	.054	.016			.013					
192	48.74	17.80	6.21	4.30	5.30	7.36	2.87	2.03	3.76	0.27	1.44				100.08	2.94
A3. III	.812	.174	.039	.060	.133	.131	.047	.021			.018					
193	58.25	18.54	0.92	4.00	2.01	5.38	4.10	3.58	1.55	0.11	0.96				99.00	2.83
B3. IV	.971	.182	.006	.056	.050	.096	.066	.038			.012					
194	49.54	16.89	2.42	6.43	7.58	7.92	3.58	1.42	2.25	0.05	1.73				99.81	2.96
A3. III	.826	.166	.015	.089	.190	.141	.058	.015			.022					
195	54.55	16.87	6.61	1.43	2.47	6.95	4.85	2.28	1.41	0.25	1.98	0.38			100.03	2.85
A2. II	.909	.165	.041	.019	.062	.124	.078	.024			.025	.003				
196	58.00	18.87	4.81	1.01	3.84	7.92	3.50	2.40	0.60						100.95	2.96
B3. IV	.967	.185	.030	.014	.096	.141	.056	.025								
197	50.70	16.85	1.22	7.95	6.78	9.57	3.27	1.13	0.48	0.19	1.76				99.90	2.98
A3. III	.845	.165	.008	.111	.170	.171	.053	.012			.022					
198	54.57	15.29	4.01	4.01	6.05	5.44	4.16	2.33	3.20	0.42	1.05				100.53	2.80
A3. III	.910	.150	.025	.056	.151	.097	.067	.024			.013					
199	51.30	19.05	3.17	6.49	5.47	8.04	4.01	1.22	1.13	0.18	0.35				100.41	
A3. III	.855	.187	.020	.092	.137	.144	.065	.013			.004					
200	56.82	16.68	3.84	4.57	3.93	6.36	3.39	2.81	1.48			trace		Cl trace	99.88	2.657
A3. III	.947	.163	.024	.064	.098	.113	.055	.030				—				

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. ANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
184	II.″5.(2)3.″4.	Q 5.58 di 7.23 or 17.79 hy 8.92 ab 37.20 mt 1.86 an 18.07 il 1.98	Ponteglia Glacier, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Basic portion of dike.	Cf. No. 287, I.4.2.3.
185	II(III).5.3.″4.	Q 1.80 di 5.99 or 12.23 hy 24.03 ab 25.15 mt 2.32 an 23.91 il 1.22	Piz Avat, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Spessartite.	Fresh?
186	II.5.3.(3).4.	or 15.57 di 12.01 ab 25.15 hy 13.45 an 20.02 mt 6.26 il 1.52	Piz Tgietschen, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Augite porphyrite.	Fresh?
187	II.5″.3.4.	or 11.12 di 9.50 ab 23.01 ol 9.59 an 31.97 mt 4.64 ne 5.96 il 2.89 hm 0.32	Piz Tumbif, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Gabbro diorite.	
188	″II.″5.″3.″4.	Q 6.12 hy 13.13 or 18.90 mt 0.93 ab 35.11 il 2.43 an 19.46 C 1.84	Griankopf, Lower Engadine, Switzerland.	L. Hezner?	U. Grubenmann, Btr. G. Kt. Schw., XXIII, p. 185, 1909.	Hornblende vogesite.	
189	II.5.″3.″4.	Q 1.14 di 11.44 or 15.57 hy 15.16 ab 31.96 mt 0.70 an 18.35 il 2.13	Griankopf, Lower Engadine, Switzerland.	L. Hezner?	U. Grubenmann, Btr. G. Kt. Schw., XXIII, p. 183, 1909.	Labradorite porphyrite.	
190	″II.″5.3″.4.	Q 6.96 hy 9.52 or 11.12 mt 2.55 ab 31.44 il 3.34 an 31.69 C 0.82	Craist Alta, Lower Engadine, Switzerland.	L. Hezner?	U. Grubenmann, Btr. G. Kt. Schw., XXIII, p. 182, 1909.	Labradorite porphyrite.	
191	II″.5.3.4.	Q 1.20 di 3.83 or 8.90 hy 23.02 ab 28.30 mt 4.18 an 24.19 il 1.98	Ardez, Lower Engadine, Switzerland.	M. Dittrich.	U. Grubenmann, Btr. G. Kt. Schw., XXIII, p. 239, 1909.	Hornblende diabase.	
192	II.5.3(4).4.	Q 1.86 di 5.40 or 11.68 hy 11.20 ab 24.63 mt 9.05 an 29.47 il 2.74	Vulpera, Lower Engadine, Switzerland.	L. Hezner.	U. Grubenmann, Ecl. G. Helv., VIII, p. 205, 1903.	Gabbro.	
193	″II.5.3.(3)4.	Q 5.10 di 4.15 or 21.13 hy 7.96 ab 34.58 mt 1.39 an 21.68 il 1.82	Val Roseg, Bernina District, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Monzonite.	
194	II″.5.3.4.	or 8.34 di 10.69 ab 30.39 hy 1.93 an 25.85 ol 13.54 mt 3.48 il 3.34	Platzers, Bernina District, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Gabbro-diorite.	
195	II.5.(2)3.4.	Q 3.48 di 9.72 or 13.34 hy 1.70 ab 40.87 il 2.89 an 17.51 hm 6.61 tn 1.18 ap 1.00	Maasplankstock, Aarmassif, Switzerland.	O. Fischer.	O. Fischer, T. M. P. M., XXIV, p. 104, 1905.	Augite porphyrite.	
196	II.(4)5.3.4.	Q 8.40 di 7.99 or 13.90 hy 5.90 ab 29.34 mt 3.25 an 28.91 hm 2.56	Val Ufirn, St. Gotthard, Switzerland.	Grubenmann and Anderwert.	U. Grubenmann, Mt. Thurg. Nf. Ges., X, p. 120, 1892.	Diorite.	In W. T., p. 283.
197	II(III).5.3(4).4″.	or 6.67 di 16.08 ab 27.77 hy 5.08 an 27.80 ol 10.75 mt 1.86 il 3.34	Tremola, St. Gotthard, Switzerland.	P. Waindziok.	P. Waindziok, In. Diss. Zür., p. 41, 1906.	Kersantite.	
198	II.5.(2)3.4.	Q 2.34 di 8.34 or 13.34 hy 13.55 ab 35.11 mt 5.80 an 16.40 il 1.98	Berglihorn, Verrucano, Switzerland.	L. Hezner.	R. Beder, In. Diss. Zür., p. 23, 1909.	Augite porphyrite.	
199	II.5.3″.4″.	or 7.23 di 7.94 ab 34.06 hy 3.09 an 30.30 ol 11.44 mt 4.64 il 0.61	Val Scala, Valtellina, Lombardy.	O. Hecker.	O. Hecker, N. J. B. B., XVII, p. 346, 1903.	Diorite-gabbro.	
200	II.″5.3.(3)4.	Q 6.48 di 7.88 or 16.68 hy 11.26 ab 28.82 mt 5.57 an 21.68	Monte Scopa, Capraia Island. Italy.	A. Röhrig.	H. Emmons, Q. J. G. S., XLIX, p. 141, 1893.	Andesite.	In W. T., p. 283.

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
201	53.73	17.00	3.81	3.25	6.24	7.65	3.30	2.45	2.61						100.04	2.64
A3. III	.894	.167	.024	.045	.156	.137	.053	.027								
202	52.46	17.84	2.39	7.11	5.64	9.06	3.81	1.11	1.22		0.29	0.16			101.09	
B2. III	.874	.175	.015	.099	.141	.162	.061	.012			.004	.001				
203	50.30	19.82	5.46	2.91	3.73	9.66	3.75	1.99	0.12		1.99	0.15	0.12		100.00	
A2. II	.838	.194	.034	.040	.093	.172	.061	.021			.025	.001	.002			
204	49.25	17.47	3.33	6.77	3.75	11.09	4.45	1.42	0.18		1.74	0.81			100.26	
A2. II	.821	.171	.021	.094	.094	.198	.072	.015			.022	.006				
205	54.82	20.80	2.40	4.66	3.22	5.02	4.82	2.90	0.85		1.07				100.56	
A3. III	.914	.204	.015	.065	.081	.089	.077	.031			.013					
206	52.79	16.45	2.74	6.44	5.56	6.51	3.64	1.21	1.02	0.21	2.64	0.39	0.06	NiO 0.18	99.84	
A2. II	.880	.161	.017	.089	.139	.116	.059	.013			.033	.003	——			
207	48.97	16.37	1.33	8.56	6.22	7.49	4.09	1.72	0.38	0.08	3.95	1.04	0.06	NiO 0.08	100.34	
A2. II	.816	.160	.008	.119	.156	.134	.066	.018			.049	.007	.001			
208	62.37	18.10	0.48	3.15	3.28	4.94	4.32	3.10	0.32						100.06	
A3. III	1.040	.177	.003	.044	.082	.088	.069	.033								
209	52.20	14.67	1.83	11.51	3.48	6.69	3.04	2.49	0.11		2.55	0.83	trace	Cl 0.08 S 0.23	100.23	
A2. II	.870	.144	.011	.160	.087	.120	.049	.026			.031	.006	——			
210	52.27	16.07	2.25	14.48	1.68	6.67	3.29	1.50	2.05						100.26	
A3. III	.871	.157	.014	.201	.042	.120	.053	.016								
211	52.76	20.28	5.87	1.49	4.26	7.08	3.94	3.47	1.06	0.32					100.53	
A3. III	.879	.199	.037	.021	.107	.127	.064	.037								
212	52.14	19.71	6.12	1.50	3.99	7.89	4.64	3.00	0.67	0.15					99.81	
A3. III	.869	.193	.038	.021	.100	.141	.075	.032								
213	53.61	16.11	3.05	4.45	6.80	7.00	3.95	3.08	1.65		0.34		0.14		100.18	2.75
A2. II	.894	.158	.019	.062	.170	.125	.064	.033			.004		.002			
214	52.40	19.27	4.56	3.57	2.03	6.68	5.50	2.03	1.82		1.60	0.52	trace	S 0.10	100.12	2.798
A2. II	.873	.189	.029	.050	.051	.120	.089	.021			.020	.004	——			
215	51.78	18.68	6.42	2.77	1.86	6.04	5.53	2.34	2.78		1.05	0.71		S 0.04	100.00	2.698
A2. II	.863	.183	.040	.039	.047	.108	.089	.024			.013	.005				

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. ANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
201	II.5.3.″4.	Q 0.78 di 10.99 or 15.01 hy 13.18 ab 27.77 mt 5.57 an 24.19	Piano Cigliano, Monte Cimino, n. Viterbo, Italy.	G. Aichino.	V. Sabatini, Vulc. Cim., p. 506, 1912.	Oligoclasite (ciminite).	
202	II″.5.3″.4″.	or 6.67 di 12.98 ab 31.96 hy 8.03 an 28.36 ol 7.50 mt 3.48 il 0.61 ap 0.34	Santo Pablo, Ustica Island, Aeolian Islands.	M. Stark.	M. Stark, T. M. P. M., XXIII, p. 512, 1904.	Basalt.	
203	II.5.″3.4.	or 11.68 di 12.31 ab 30.65 ol 2.52 an 31.14 mt 3.94 ne 0.71 il 2.72 hm 3.94 ap 0.34	Eruption of 1911, Mount Etna, Sicily.	G. Ponte.	G. Ponte, Rend. Ac. Linc., XXI (2), p. 215, 1912.	Basalt ash.	3 decimals.
204	II(III).5″.3.4″.	or 8.34 di 21.36 ab 26.72 ol 4.15 an 23.35 mt 4.87 ne 5.96 il 3.34 ap 2.02	Valle del Petrolo, Mount Etna, Sicily.	S. di Franco.	S. di Franco, Att. Ac. Gioen., (5): V, Mem. 21, p. 5, 1912.	Basalt.	
205	″II.5.3.4.	or 17.24 di 6.38 ab 40.35 ol 4.81 an 24.74 mt 3.48 C 0.71 il 1.98	Tempio Pausania, Sardinia.	C. Riva.	C. Riva, Att. Ac. Sci. Nap., (2), XII, No. 9, p. 27, 1905.	Segregation in granite.	Cf. No. 317, I.4.2.3.
206	II″.″5.3.4″.	Q 4.50 di 3.80 or 7.23 hy 17.22 ab 30.92 mt 3.92 an 24.74 il 5.02 ap 1.00	Uras, Monte Arci, Sardinia.	H. S. Washington.	H. S. Washington, A. J. S., XXXVI, p. 589, 1913.	Basalt.	
207	II″.5.3.4	or 10.01 di 7.91 ab 34.58 ol 14.44 an 21.13 mt 1.86 il 7.45 ap 2.35	Graham Island, (1831), Near Sicily.	H. S. Washington.	H. S. Washington, A. J. S., XXVII, p. 138, 1909.	Basalt.	
208	″II.(4)5.″3.″4.	Q 8.52 di 2.94 or 18.35 hy 12.18 ab 36.15 mt 0.70 an 20.85	Tschcheri, Kasbek, Caucasus.	Not stated.	L.-Lessing and Sewastjanow, Mat. G. Rus., XXI, p. 107, 1901.	Andesite-dacite.	
209	II(III).5.3.(3)4.	Q 2.76 di 7.24 or 14.46 hy 20.63 ab 25.68 mt 2.55 an 19.18 il 4.71 ap 2.02	Goroschki, Volhynia, Russia.	W. Tarassenko.	W. Tarassenko, Ref. N. J., 1899, I, p. 463.	Gabbro-syenite.	In W. T., p. 283.
210	II(III).5.3.4.	Q 1.20 di 7.74 or 8.90 hy 24.85 ab 27.77 mt 3.25 an 24.46	Assa, Caucasus.	Krikmeyer.	Loewinson-Lessing, Ref. N. J., 1899, II, p. 234.	Albite diorite.	In W. T., p. 283.
211	II.5.3.(3)4.	or 20.57 di 6.26 ab 30.92 ol 5.46 an 27.24 mt 4.87 ne 1.42 hm 2.56	Lake Karagol, Karabagh, Armenia.	(?)	A. S. Ginsberg, An. Inst. Polyt. St. Pet., XX, p. 52, 1913.	Shoshonite.	
212	II.5″.3.4.	or 17.79 di 11.88 ab 29.08 ol 3.15 an 23.91 mt 4.87 ne 5.54 hm 2.72	Near Gerussy, Karabagh, Armenia.	(?)	A. S. Ginsberg, An. Inst. Polyt. St. Pet., XX, p. 51, 1913.	Shoshonite.	
213	II.5.(2)3.″4.	or 18.35 di 14.20 ab 31.96 ol 11.01 an 16.96 mt 4.41 ne 0.85 il 0.61	Persufli, Thessaly, Greece.	R. Lepsius.	R. Lepsius, Geol. Attika, p. 169, 1883.	Basalt.	In W. T., p. 283.
214	II.5.″3.4.	or 11.68 di 6.08 ab 45.06 ol 1.68 an 21.96 mt 6.73 ne 0.85 il 3.04 ap 1.34	Achada, n. Porto da Cruz Madeira Island.	Klüss.	C. Gagel, Z. D. G. G., LXIV, p. 428, 1912.	Trachy-dolerite.	
215	II.5.(2)3.4.	or 13.34 di 8.21 ab 41.92 ol 0.63 an 19.46 mt 6.03 ne 2.56 il 1.98 hm 2.24 ap 1.68	Ilheo, n. Porto do Cruz, Madeira Island.	Eyme.	C. Gagel, Z. D. G. G., LXIV, p. 428, 1912.	Trachy-dolerite.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
216	47.70	17.32	5.43	4.71	3.62	7.98	4.21	2.45	3.08		2.54	0.99		S 0.04	100.05	2.673
A2. II	.795	.170	.034	.065	.091	.143	.068	.026			.032	.007				
217	46.08	17.39	10.95	2.56	2.66	8.87	3.72	1.38	2.37		2.73	1.11		S 0.02	99.84	2.809
A2. II	.768	.170	.069	.036	.067	.159	.060	.015			.034	.008				
218	51.59	18.90	4.61	6.10	3.20	7.23	3.81	2.33	1.36		1.03	0.36			100.52	
A2. II	.860	.185	.029	.085	.080	.129	.061	.024			.013	.003				
219	53.50	15.20	5.40	6.93	4.95	5.60	4.35	0.95	0.50		2.25	0.09			99.72	
A2. II	.892	.149	.034	.096	.124	.100	.070	.010			.028	.001				
220	48.88	20.56	3.34	5.29	3.09	8.34	4.75	2.56	0.32		1.69	0.73			99.55	
A2. II	.815	.202	.021	.074	.077	.149	.077	.028			.021	.005				
221	48.40	21.47	0.65	2.12	2.65	8.21	5.67	1.45	2.68		2.00	0.36		FeS_2 3.78	99.44	
A? 2. II	.807	.210	.004	.029	.066	.146	.092	.016			.025	.003			(99.94)	
222	46.76	14.80	8.71	8.32	1.70	9.46	2.75	2.48	1.45	0.19	2.05	0.63	0.34	SO_3 0.35	99.99	
A2. II	.779	.145	.054	.115	.043	.169	.045	.027			.026	.004	.005			
223	53.87	15.25	3.95	5.16	6.16	5.67	3.59	2.53	1.92		1.53	0.32	0.13	CO_2 0.52	100.60	
A2. II	.898	.150	.025	.072	.154	.101	.058	.027			.019	.002	.002			
224	58.3	18.0	4.5	2.0	2.3	5.5	5.4	1.7			1.0				100.5	
B3. IV	.972	.176	.028	.028	.058	.098	.087	.018			.013					
225	51.97	16.21	3.37	9.51	3.68	7.67	3.41	1.75	1.97		0.22				99.76	
A3. III	.866	.159	.021	.132	.092	.138	.055	.019			.003					
226	57.51	15.88	3.50	3.71	4.48	9.16	3.70	1.27	1.21		trace	0.29	0.17		100.88	
A3. III	.959	.156	.022	.051	.112	.164	.060	.014			——	.002	.002			
227	56.82	18.85	5.05	2.90	2.76	5.45	4.80	2.07	1.62		trace	0.38	0.16		100.86	
A3. III	.947	185	.032	.040	.069	.097	.077	.022			——	.003	.002			
228	54.21	15.11	3.94	5.25	6.42	8.19	3.96	1.91	1.28		0.52	0.14			100.93	
B2. III	.904	.148	.025	.073	.161	.146	.064	.020			.007	.001				
229	54.18	15.33	5.65	6.30	3.28	7.77	3.96	2.32	0.47		0.76	0.72			100.74	
A2. II	.903	.150	.036	.088	.082	.139	.064	.024			.010	.005				
230	51.02	17.81	3.75	6.17	5.30	8.98	3.81	1.01	1.48		0.72	0.72	0.18		100.95	
B2. III	.850	.175	.024	.086	.133	.161	.061	.011			.009	.005	.003			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. ANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
216	II.5.3.4.⊙	or 14.46, ab 31.44, an 21.13, ne 2.27; di 9.50, ol 3.29, mt 7.66, il 4.86, hm 0.16, ap 2.35	Ribeiro Frio, Madeira Island.	Eyme.	C. Gagel, Z. D. G. G., LXIV, p. 428, 1912.	Trachy-dolerite.	
217	II.5.3.4.⊙	Q 1.44, or 8.34, ab 31.44, an 26.41; di 7.99, hy 3.00, mt 0.46, il 5.17, hm 10.72, ap 2.69	Pico Serrado, Madeira Island.	Eyme.	C. Gagel, Z. D. G. G., LXIV, p. 428, 1912.	Trachy-dolerite.	Iron oxides?
218	II.5.3.4.⊙	Q 0.48, or 13.34, ab 31.96, an 27.80; di 4.32, hy 11.55, mt 6.73, il 1.98, ap 1.01	Sao Vicente, Cape Verde Islands.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (7), p. 655, 1912.	Basalt.	
219	II″.″5.3.4(5).	Q 5.28, or 5.56, ab 36.68, an 19.18; di 6.24, hy 13.90, mt 7.89, il 4.26, ap 0.34	Grotto Mountain, Mony, Ivory Coast.	Pisani.	A. Lacroix, Nouv. Arch. Mus., III, p. 118, 1911.	Norite.	
220	II.5(6).3.4.	or 15.57, ab 25.15, an 26.97, ne 8.24; di 7.88, ol 5.88, mt 4.87, il 3.19, ap 1.68	Topsail Point, Tamara Island, Los Islands, French Guinea.	Lassieur.	A. Lacroix, Nouv. Arch. Mus., III, p. 80, 1911.	Topsailite (mica-basalt).	
221	II.5(6).3.4(5).	or 8.90, ab 31.44, an 28.36, ne 9.09; di 7.34, ol 2.24, mt 0.93, il 3.80, ap 1.01, pr 3.78	Topsail Point, Tamara Island, Los Islands, French Guinea.	Lassieur.	A. Lacroix, Nouv. Arch. Mus., III, p. 78, 1911.	Micromonzonite.	Inclusion in nephelite syenite. Sum?
222	II(III).5.3.(3)4.	Q 2.10, or 15.01, ab 23.58, an 20.29; di 19.21, mt 12.53, il 3.95, ap 1.34	Mont Caffé, Sao Thomé Island, Guinea Coast.	A. Lindner.	W. Boese, N. J. B. B., XXXIV, p. 273, 1912.	Basalt.	Three decimals.
223	II″.5.″3.″4.	Q 2.70, or 15.01, ab 30.39, an 18.07; di 6.42, hy 16.30, mt 5.80, il 2.89, ap 0.67	Mount Duli, Adamawa, Kamerun.	M. Dittrich.	W. Edlinger, In. Diss. Erl., p. 64, 1908.	Diorite.	
224	″II.″5.(2)3.4″.	Q 6.90, or 10.01, ab 45.59, an 19.74; di 5.83, hy 3.10, mt 3.48, il 1.98, hm 2.08	Gebel Doukhan, Egypt.	Not stated.	J. Couyat, C. R., CXLVII, p. 868, 1908.	Microdiorite.	
225	II(III).5.3.4.	or 10.56, ab 28.82, an 23.63; di 12.31, hy 17.29, mt 4.87, il 0.46	Delen, Kordofan.	Sprockhoff.	G. Linck, N. J. B. B., XVII, p. 428, 1903.	Diorite porphyry.	
226	II.(4)5.3.4.	Q 7.98, or 7.78, ab 31.44, an 22.80; di 16.71, hy 7.28, mt 5.10, ap 0.67	Galaba Well, Molebso, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 76, 1909.	Quartz diorite.	
227	″II.″5.3.4.	Q 6.12, or 12.23, ab 40.35, an 23.91; hy 8.06, mt 7.42, ap 1.01	Coatit, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 68, 1909.	Quartz diorite.	
228	II(III).5.3.4.	or 11.12, ab 33.54, an 18.90; di 16.68, hy 10.77, ol 1.98, mt 5.80, il 1.06, ap 0.34	Azeo, Digsa, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 90, 1909.	Diorite porphyry.	
229	II″.5.″3.4.	Q 4.02, or 13.34, ab 33.54, an 17.24; di 13.60, hy 7.10, mt 8.35, il 1.52, ap 1.68	Elos, Mai Adarete, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 92, 1909.	Diorite porphyry.	
230	II″.5.3″.4(5).	or 6.12, ab 31.96, an 28.63; di 9.05, hy 12.26, ol 2.87, mt 5.57, il 1.37, ap 1.68	Brigantia, Cheren, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 82, 1909.	Hornblende diorite.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
231	53.39	17.96	2.49	4.91	3.13	6.41	4.37	3.43	0.80	0.39	1.81	0.62			99.71	
A2. II	.890	.176	.016	.068	.078	.114	.071	.036			.023	.004				
232	53.10	21.80	1.15	5.75	3.05	5.84	5.65	2.56	0.62		1.41				100.93	
B3. IV	.885	.214	.007	.080	.076	.104	.091	.028			.018					
233	51.38	16.07	3.93	6.19	4.98	6.34	4.60	2.20	0.69	0.22	2.83	0.78			100.21	
A2. II	.856	.158	.025	.086	.125	.113	.074	.023			.035	.005				
234	48.76	19.57	4.23	4.69	3.06	7.70	3.95	2.69	1.75	0.78	2.36	0.15			99.69	
A2. II	.813	.192	.026	.065	.077	.138	.064	.029			.030	.001				
235	46.62	19.02	5.36	5.12	3.66	8.68	3.78	2.08	1.55	0.85	2.70	0.22			99.64	
A2. II	.777	.186	.034	.071	.092	.155	.061	.022			.034	.002				
236	46.38	16.49	3.29	8.83	5.39	8.97	2.81	2.01	0.80	0.33	3.77	0.75			99.82	
A2. II	.773	.162	.021	.122	.135	.161	.045	.021			.047	.005				
237	51.24	16.39	3.09	6.30	3.55	6.27	3.78	3.17	2.36		3.54	0.16			99.85	
A2. II	.854	.161	.019	.088	.099	.113	.061	.034			.044	.001				
238	47.49	17.11	4.83	6.63	4.95	9.90	2.80	1.77	0.31	0.35	2.83	0.77			99.74	
A2. II	.792	.168	.030	.092	.124	.177	.045	.019			.035	.005				
239	47.04	17.70	2.59	7.56	5.53	9.90	3.05	1.81	1.02	0.17	2.71	0.50		CO_2 0.29	99.87	
A2. II	.784	.174	.016	.105	.138	.177	.049	.019			.034	.004			(99.95)	
240	48.47	15.31	6.69	6.36	3.60	8.14	4.49	1.67	1.65		2.23	0.52		CO_2 0.26 SO_3 trace S 0.14	99.53	2.886
A2. II	.808	.150	.042	.089	.090	.145	.073	.018			.028	.004				
241	48.63	17.01	2.92	8.85	3.87	7.90	3.98	1.76	0.22		4.02	0.77			99.93	
A2. II	.811	.164	.018	.123	.097	.141	.065	.019			.050	.005				
242	47.79	19.76	0.93	4.96	5.93	7.57	5.01	1.24	3.34	0.35	1.18	1.44	0.28	CO_2 trace Cl trace S 0.02 Cr_2O_3 trace BaO none	99.80	2.732
A2. II	.797	.194	.006	.069	.148	.136	.081	.013			.015	.010	.004			
243	54.90	20.23	3.42	5.26	3.11	6.24	4.86	1.44	0.54				0.18		100.18	2.89
A3. III	.915	.198	.021	.073	.078	.112	.078	.015					.003			
244	49.37	17.67	6.28	4.81	5.02	9.12	3.27	1.41	2.15		0.28				99.38	2.522
B3. IV	.823	.173	.039	.067	.126	.163	.053	.015			.004					
245	48.43	15.54	7.95	5.09	6.08	8.13	4.03	1.21	2.07		0.91				99.44	2.758
B3. IV	.807	.152	.050	.071	.152	.145	.065	.013			.011					

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. ANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
231	II.5.(2)3.″4.	or 20.02 di 7.20 ab 37.20 hy 1.86 an 19.18 ol 4.54 mt 3.71 il 3.50 ap 1.34	Ankify, Madagascar.	Not stated.	A. Lacroix, pers. com.	Monzonite.	
232	″II.5″.3.4.	or 15.57 di 2.04 ab 34.84 ol 10.20 an 26.41 mt 1.62 ne 6.96 il 2.74	Nosy Komba, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., I, p. 32, 1902.	Covite.	
233	II.5.(2)3.4.	or 12.79 di 7.75 ab 38.77 hy 5.06 an 16.96 ol 5.14 mt 5.80 il 5.32 ap 1.68	Taniankatsaka, Ankaratra, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVI, p. 177, 1913.	Basalt.	
234	II.5.3.″4.	or 16.12 di 7.91 ab 28.30 ol 3.65 an 27.52 mt 6.03 ne 2.84 il 4.56 ap 0.34	Ambohibaho, Ankaratra, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVI, p. 177, 1913.	Labradorite (basalt).	
235	II.5.3.4.⊙	or 12.23 di 9.75 ab 26.46 ol 3.56 an 28.63 mt 7.89 ne 2.98 il 5.17 ap 0.67	Ambodinapahitra, Ankaratra, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVI, p. 177, 1913.	Labradorite (basalt).	
236	II(III).5.3″.″4.	or 11.68 di 10.82 ab 23.58 hy 4.05 an 26.69 ol 8.21 mt 4.87 il 7.14 ap 1.68	Mont Inanobé, Ankaratra, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVI, p. 177, 1913.	Basalt.	
237	II.5.(2)3.(3)4.	or 18.90 di 9.79 ab 31.96 hy 5.12 an 18.35 ol 2.43 mt 4.41 il 6.69 ap 0.34	Madagascar.	Not stated.	A. Lacroix, pers. com.	Akerite.	
238	II(III).5.3(4).4.	or 10.56 di 12.42 ab 23.58 hy 8.55 an 28.91 ol 1.08 mt 6.96 il 5.32 ap 1.68	Ivong, Madagascar.	Not stated.	A. Lacroix, pers. com.	Hypersthene gabbro.	
239	II(III).5.3(4).4.	or 10.56 di 13.04 ab 23.06 ol 10.70 an 29.47 mt 3.71 ne 1.42 il 5.17 ap 1.34	Mana Kanala, Madagascar.	Boiteau.	A. Lacroix, pers. com.	Basalt.	
240	II(III).5.(2)3.4.	or 10.01 di 16.19 ab 35.63 ol 2.71 an 16.40 mt 9.74 ne 1.42 il 4.26 ap 1.34	Oldonyo Sambu, German East Africa.	A. Eyme.	L. Finckh, Z. D. G. G., LXV, p. 501, 1913.	Basaltic trachy-dolerite.	
241	II″.5.3.4.	or 10.56 di 10.01 ab 34.06 hy 1.10 an 23.24 ol 8.01 mt 4.18 il 7.60 ap 1.68	Avirons, Reunion Island.	Boiteau.	A. Lacroix, C. R., CLV, p. 541, 1912.	Basalt.	
242	II.5″.3.4(5).	or 7.23 di 0.68 ab 33.01 ol 15.42 an 27.80 mt 1.39 ne 5.11 il 2.28 ap 3.36	Kugensk, Jenissei District, Siberia.	M. Dittrich.	J. Rakovsky, Trav. Mus. G. Pet. Grt., V, p. 237, 1911.	Essexite-diabase.	
243	II.5.3.4″.	Q 0.42 di 1.61 or 8.34 hy 14.26 ab 40.87 mt 4.87 an 29.19	Choa-schen Volcano, Kamchatka.	Not stated.	K. Bogdanovitsch, Pet. Mt., L, p. 99, 1904.	Andesite.	
244	II″.5.3(4).4.	or 8.34 di 12.85 ab 27.77 hy 8.78 an 29.19 ol 0.90 mt 9.05 il 0.61	Kyry Nor, Manchuria.	Not stated.	P. Venukoff, B. Soc. Belg. G., II, p. 446, 1888.	Trachylyte.	Not in W. T.
245	II(III).5.3.4″.	or 7.23 di 15.47 ab 34.06 hy 0.73 an 20.57 ol 6.04 mt 11.60 il 1.67	Abtzikh, Kairkhan Mountains, Manchuria.	Not stated.	P. Venukoff, B. Soc. Belg. G., II, p. 446, 1888.	Basalt.	Not in W. T.

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
246	48.82	14.10	2.75	8.73	4.25	5.50	4.00	1.76	4.50		5.12				99.53	
A3. III	.814	.138	.017	.121	.106	.098	.065	.019			.064					
247	52.40	17.59	3.51	7.07	3.73	9.36	2.93	1.77	0.57		1.06	0.14	0.16		100.29	
A2. II	.873	.172	.022	.099	093	.167	.047	.019			013	.001	.002			
248	49.29	18.49	2.38	6.77	6.09	8.14	3.93	1.79	0.88		2.22	trace	0.22		100.20	
A2. II	.822	.181	.015	.094	.152	.145	.063	.019			.028	——	.003			
249	53.91	15.65	3.75	2.82	4.81	7.09	4.12	2.47	2.05		2.00	1.28	trace		99.95	
A2. II	.899	.153	.024	.039	.120	.127	.066	.027			.025	.009	——			
250	52.19	19.74	4.72	6.28	2.24	6.99	3.48	2.04	1.25				0.06		98.99	
B?3. IV?	.870	.194	.029	.088	.056	.125	.056	.021					.001		(99.99)	
251	48.33	16.29	3.24	8.73	5.70	8.50	3.59	1.49	0.82		2.40	0.79	0.11		99.99	2.562
A2. II	.806	.160	.020	.121	.143	.152	.058	.016			.030	.006	.002			
252	55.7	19.5	6.8	0.8	3.7	8.2	3.8	1.9	0.2						100.6	2.689
B3. IV	.928	.191	.043	.011	.093	.146	.061	.020								
253	54.9	19.2	4.9	3.4	2.6	9.2	4.0	1.8	0.8						100.8	
B3. IV	.902	.188	.031	.047	.065	.164	.065	.019								
254	53.75	17.06	4.18	5.50	4.07	7.72	3.33	1.37	0.50	0.39	0.88	0.25	0.50	ZrO_2 none Cl 0.11 F 0.06 S 0.06 BaO 0.02 SrO 0.12	99.87	
A1. I	.896	.167	.026	.076	.102	.138	.053	.015			.011	.002	.007			
255	53.2	19.2	4.0	2.9	3.7	9.2	5.5	1.9	0.4						100.0	
B3. IV	.887	.188	.025	.040	.093	.164	.089	.020								
256	53.01	18.49	3.90	5.37	4.24	7.28	4.63	1.98	1.16				0.27		100.33	2.799
A? III	.884	.181	.024	.075	.106	.130	.074	.021					.004			
257	55.06	17.92	4.39	5.24	3.26	8.29	3.09	2.01	0.07	0.23	0.36		0.50		100.42	2.61
A2. II	.918	.176	.028	.073	.082	.148	.050	.021			.005		.007			
258	52.89	18.93	4.06	4.80	3.72	8.56	3.98	0.94	0.58	0.84	0.96	0.22	0.43	CO_2 0.10 SO_3 none Cl trace S 0.04	101.05	2.772
B2. III	.882	.186	.026	.067	.093	.153	.065	.010			.012	.002	.006			
259	53.74	18.26	6.21	3.00	2.69	8.06	3.58	2.52	0.60	0.16	0.97	0.33	0.08		100.19	2.67
A2. II	.896	.179	.039	.042	.067	.144	.058	.027			.012	.002	.001			
260	57.66	21.17	0.05	5.11	1.70	6.57	3.81	1.73	1.00	0.05	0.88	trace	0.11	CO_2 0.11 ZrO_2 none Cl trace S 0.05 Cr_2O_3 none NiO 0.04 BaO none SrO none Li_2O none	100.04	2.78
A1. I	.961	.208	——	.071	.043	.118	.061	.018			.011	——	.002			
261	56.52	17.55	3.14	4.86	2.51	5.50	4.82	1.90	2.45	0.25	trace	0.22	0.13		99.85	2.75
A2. II	.942	.172	.020	.068	.063	.098	.077	.020			——	.002	.002			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. ANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
246	II(III).5.(2)3.4.	Q 0.48 di 10.79 or 10.56 hy 10.66 ab 34.06 mt 3.94 an 15.01 il 9.73	Liou-chou-ko, East Yunnan, China.	Pisani.	J. Deprat, Mem. Ser. G. Indo-Ch., I (1), p. 234, 1912.	Basalt.	Fresh?
247	II″.5.3(4).4.	Q 2.88 di 13.30 or 10.56 hy 11.44 ab 24.63 mt 5.10 an 29.47 il 1.98 ap 0.34	Uso Volcano, Hokkaido, Japan.	Sakaonura.	D. Sato, Jap. G. S. B., XXIII, 1913.	Andesite.	Cited in Zs. Vulk., I, p. 281, 1915.
248	II.5.3.4.⊙	or 10.56 di 10.30 ab 27.77 ol 12.51 an 27.52 mt 3.48 ne 2.84 il 4.26	Genbudo, Tajima, Japan.	C. Sugiura.	S. Kozu, pers. com.	Basalt.	
249	II.5.″3.4.	Q 3.84 di 7.99 or 15.01 hy 8.30 ab 34.58 mt 3.25 an 16.68 il 3.80 hm 1.60 ap 3.02	Otsurumizu, Bungo, Kiu Shiu, Japan.	K. Yokoyama.	S. Kozu, Sc. Rep. Toh. Un., I, p. 78, 1913.	Trachy-andesite.	
250	II.5.3(4).4.	Q 3.00 di 1.86 or 11.68 hy 12.59 ab 29.34 mt 6.73 an 32.53	Madara Shina, Hizen, Japan.	T. Ono.	S. Kozu, J. G., XIX, p. 574, 1911.	Trachy-dolerite.	Sum uncertain.
251	II(III).5.3.4.	or 8.90 di 10.45 ab 30.39 hy 2.89 an 23.91 ol 11.62 mt 4.64 il 4.56 ap 2.02	Ondake Volcano, Fukae, Goto Islands, Japan.	K. Yokoyama.	S. Kozu, J. G., XIX, p. 574, 1911.	Trachy-dolerite.	
252	II.″5.3″.4.	Q 5.58 di 7.78 or 11.12 hy 5.70 ab 31.96 mt 2.55 an 30.58 hm 5.12	Kaba Volcano, Sumatra.	H. Hoppe.	H. Hoppe, In. Diss. Bres., p. 57, 1903.	Pyroxene andesite.	
253	II.5.3.4.⊙	Q 2.94 di 13.34 or 10.56 hy 2.23 ab 34.06 mt 7.19 an 28.91	Sago Volcano, Sumatra.	H. Hoppe.	H. Hoppe, In. Diss. Bres., p. 27, 1903.	Andesite.	
254	II.(4)5.3(4).4.	Q 6.60 di 7.23 or 8.34 hy 12.75 ab 27.77 mt 6.03 an 27.52 il 1.67 ap 0.67	Rau Rau, Merapi Volcano, Sumatra.	E. W. Morley.	J. P. Iddings, Ign. Rocks, II, p. 625, 1913.	Pyroxene andesite.	Also in Iddings and Morley, J. G., XXIII, p. 233, 1915.
255	II.5(6).″3.4″.	or 11.12 di 18.74 ab 32.49 ol 1.71 an 21.96 mt 5.80 ne 7.67	Merapi Volcano, Sumatra.	H. Hoppe.	H. Hoppe, In. Diss. Bres, p. 40, 1903.	Pyroxene andesite.	
256	II.5.3.4.⊙	or 11.68 di 9.98 ab 38.25 ol 9.47 an 23.91 mt 5.57 ne 0.28	Soengei Lassie, Sumatra.	L. Serrurier.	R. D. M. Verbeek, Sum. Westk., p. 232, 1883.	Quartz diorite.	Not in W. T.
257	II.″5.3(4).4.	Q 6.60 di 9.80 or 11.68 hy 9.59 ab 26.20 mt 6.50 an 29.19 il 0.76	Watoe belah, Loh-oelo, Java.	N. Sahlbom.	G. Niethammer, T. M. P. M., XXVIII, p. 227, 1909.	Pyroxene andesite.	
258	II.5.3(4).4(5).	Q 2.82 di 7.88 or 5.56 hy 10.10 ab 34.06 mt 6.03 an 30.86 il 1.82 ap 0.67	Burangerang, Preanger Province, Java.	E. C. J. Mohr.	E. C. J. Mohr, B. Dep. Agr. Ind. Neer., XXVIII, p. 10, 1909.	Andesite.	
259	II.″5.3.″4.	Q 5.28 di 9.29 or 15.01 hy 2.40 ab 30.39 mt 7.19 an 26.13 il 1.82 hm 1.28 ap 0.67	Ndano, Sumbawa Island, Sunda Islands.	A. Lindner.	G. Rack, N. J. B. B., XXXIV, p. 54, 1912.	Andesite.	
260	(I)II.(4)5.3(4).4.	Q 8.76 hy 12.48 or 10.01 il 1.67 ab 31.96 an 32.80 C 1.12	Noosa Head, Queensland.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXI, p. 169, 1906.	Quartz diorite.	
261	II.″5.″3.4.	Q 4.86 di 3.45 or 11.12 hy 11.08 ab 40.35 mt 4.64 an 20.85 ap 0.67	Ottaba, Esk, Queensland.	G. R. Patten.	A. R. Agric. Chem. Qld., 1914.	Augite andesite.	H. C. Richards, pers. com.

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
262	52.24	16.52	4.52	6.61	3.55	8.20	3.28	1.48	0.65	0.58	1.44	0.80	trace		99.87	2.87
A2. II	.871	.162	.028	.092	.089	.146	.053	.016			.018	.006	—			
263	49.90	15.79	4.52	6.25	5.77	9.12	3.24	0.89	1.36	1.28	1.98	0.43	0.12		100.65	2.76
A2. II	.832	.155	.028	.087	.144	.163	.052	.009			.025	.003	.002			
264	57.64	18.28	2.57	3.68	2.73	6.40	4.08	2.03	1.10	0.28	0.64	0.31	0.25	CO_2 0.03 ZrO_2 none SO_3 0.08 Cl 0.02 Cr_2O_3 trace V_2O_3 0.02 NiO 0.04 BaO 0.09 SrO trace Li_2O none	100.27	2.744
A1. I	.961	.179	.016	.051	.068	.114	.066	.022			.008	.002	.003			
265	51.02	16.98	5.52	4.13	4.13	6.37	3.61	2.98	1.95	1.01	1.44	0.30	0.29	CO_2 0.35 ZrO_2 none SO_3 0.19 Cl 0.03 F none Cr_2O_3 none V_2O_3 0.02 NiO 0.04 BaO 0.25 SrO trace Li_2O none CuO trace	100.61	2.788
A1. I	.850	.166	.034	.057	.103	.114	.058	.032			.018	.002	.004			
266	54.76	16.49	0.80	10.71	3.57	7.89	2.67	2.03	0.59	0.11		0.32			99.94	
A3. III	.913	.162	.005	.149	.089	.141	.044	.023				.002				
267	53.86	15.41	1.50	11.51	3.60	7.18	3.04	1.24	1.10	0.44	0.36	0.35	0.16	CO_2 none ZrO_2 none SO_3 none Cl 0.06 Cr_2O_3 none V_2O_3 0.04 NiO none BaO none SrO trace	99.85	2.853
A1.I	.898	.151	.009	.160	.090	.129	.049	.003			.005	.002	.002			
268	53.21	17.84	3.80	5.22	2.96	6.48	3.36	3.03	1.27	0.65	1.01	0.44	0.32	CO_2 0.02 ZrO_2 none SO_3 0.09 Cl 0.11 F none Cr_2O_3 none V_2O_3 0.01 NiO 0.04 BaO 0.02 SrO trace Li_2O trace CuO trace	99.88	2.768
A1. I	.887	.175	.024	.072	.074	.116	.055	.032			.013	.003	.004			
269	51.16	19.16	3.98	4.64	3.73	6.80	4.05	2.89	1.48	0.72	0.84	0.56	0.26	CO_2 0.03 ZrO_2 none SO_3 0.06 Cl 0.04 F trace Cr_2O_3 none V_2O_3 0.05 NiO 0.02 BaO 0.08 SrO trace Li_2O none CuO 0.01	100.56	2.760
A1. I	.853	.188	.025	.064	.093	.121	.065	.031			.010	.004	.004			
270	51.11	17.70	3.99	5.13	3.43	6.51	3.97	3.25	2.41	0.52	1.34	0.65	0.32	CO_2 0.01 ZrO_2 none SO_3 none Cl 0.01 F none Cr_2O_3 trace V_2O_3 0.05 NiO 0.02 BaO 0.07 SrO trace Li_2O trace	100.49	2.788
A1. I	.852	.173	.025	.071	.086	.116	.065	.035			.017	.002	.005			
271	52.86	17.23	4.10	4.59	3.34	7.62	3.29	2.75	1.48	0.91	1.10	0.43	none	CO_2 0.04 ZrO_2 none Cl trace F none S none Cr_2O_3 none V_2O_3 0.03 NiO none BaO 0.01 SrO trace Li_2O trace	99.78	2.757
A1. I	.861	.169	.026	.064	.084	.136	.053	.030			.014	.003	—			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. ANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
262	II.″5.3″.4.	Q 6.18 di 7.48 or 8.90 hy 11.32 ab 27.77 mt 6.50 an 25.85 il 2.74 ap 2.02	Burleigh Heads, Queensland.	N. H. Christensen.	A. R. Agric. Chem. Qld., 1914.	Andesitic basalt.	H. C. Richards, pers. com.
263	II(III).5.3(4).4(5).	Q 2.34 di 12.12 or 5.00 hy 12.87 ab 27.25 mt 6.50 an 26.13 il 3.80 ap 1.01	Chinghee Creek, Queensland.	A. T. Jefferis.	A. R. Agric. Chem. Qld., 1913.	Basalt.	H. C. Richards. pers. com.
264	″II.(4)5.3.4.	Q 9.00 di 3.56 or 12.23 hy 7.35 ab 34.58 mt 3.71 an 25.30 il 1.22 ap 0.67	Good Dog Mountains, Cambewarra Range, New South Wales.	H. P. White.	Card and Jaquet, Rec. G. S. N. S. W., VII, p. 120, 1902.	Quartz diorite.	
265	II.5.3.(3)4.	Q 1.26 di 6.76 or 17.79 hy 7.80 ab 30.39 mt 7.89 an 21.13 il 2.74 ap 0.67	Nowra, Cambewarra Range, New South Wales.	J. C. H. Mingaye.	Card and Jaquet, Rec. G. S. N. S. W., VII, p. 127, 1902.	Hornblende lamprophyre.	
266	II(III).5.3″.″4.	Q 2.94 di 9.19 or 12.79 hy 23.24 ab 23.06 mt 1.16 an 26.41 ap 0.67	Mother's paddock, Inverell, New South Wales.	Not stated.	A. R. Dep. Min.,, N. S. W. (1898), p. 187, 1899.	Tachylyte.	Not in W. T.
267	II(III).″5.3″.4.	Q 4.50 di 8.26 or 3.23 hy 24.33 ab 25.68 mt 2.09 an 24..74 il 0.76 ap 0.67	Inverell, New South Wales.	W. A. Greig.	A. R. Dep. Min. N. S. W. (1912). p. 198, 1913.	Tachylyte.	
268	II.5.3.(3)4.	Q 3.72 di 4.08 or 17.79 hy 10.03 ab 28.82 mt 5.57 an 24.46 il 1.98 ap 1.01	Croobyar Creek, Milton, Nowra, New South Wales.	A. H. Greig.	G. W. Card, Rec. G. S. N. S. W., VIII, p. 85, 1905.	Orthoclase basalt.	
269	II.5.3.″4.	Q 0.66 di 3.59 or 17.24 hy 11.93 ab 34.06 mt 5.80 an 25.58 il 1.52 ap 1.34	Milton, Nowra, New South Wales.	H. P. White.	G. W. Card, Rec. G. S. N. S. W., VIII, p. 85, 1905.	Orthoclase basalt.	
270	II.5.″3.(3)4.	or 19.46 di 5.84 ab 34.06 hy 1.53 an 20.29 ol 6.34 mt 5.80 il 2.58 ap 1.68	Milton, Nowra, New South Wales.	H. P. White.	G. W. Card, Rec. G. S. N. S. W., VIII, p. 83, 1905.	Diorite.	
271	II.5.3.(3)4.	Q 2.58 di 8.93 or 16.68 hy 7.28 ab 27.77 mt 6.03 an 23.91 il 2.13 ap 1.01	Dapto Flow, Calderwood, Camden County, New South Wales.	H. P. White.	G. W. Card, Rec. G. S. N. S. W., VIII, p. 263, 1907.	Dolerite.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
272	52.72	16.19	4.80	4.14	4.12	8.10	3.31	2.45	1.56	0.92	1.20	0.48	0.07	CO_2 0.07 ZrO_2 none SO_3 none Cl trace Cr_2O_3 none V_2O_3 0.02 NiO trace BaO 0.05 SrO trace	100.20	
Al. I	.879	.159	.030	.057	.103	.145	.053	.027			.015	.003	.001			
273	52.48	17.32	4.30	5.04	3.65	7.66	3.43	2.53	1.61	0.59	0.74	0.42	0.31	CO_2 0.17 ZrO_2 none SO_3 0.09 Cl trace Cr_2O_3 trace V_2O_3 0.03 NiO 0.01 BaO 0.06 SrO trace Li_2O none CuO trace	100.44	2.789
Al. I	.875	.170	.027	.069	.091	.124	.055	.027			.009	.003	.004			
274	51.92	15.58	5.00	4.68	4.09	7.72	3.38	2.56	1.35	1.19	1.20	0.54	0.24	CO_2 0.02 ZrO_2 none SO_3 none Cl 0.05 Cr_2O_3 none V_2O_3 0.04 NiO 0.02 BaO 0.07 SrO trace Li_2O none CuO 0.01	99.66	2.758
Al. I	.865	.153	.031	.065	.102	.138	.055	.028			.015	.004	.003			
275	51.32	18.82	4.50	2.97	3.58	6.42	3.97	3.31	2.89	0.87	0.56	0.42	0.23	CO_2 0.10 ZrO_2 none SO_3 none Cl trace Cr_2O_3 none V_2O_3 0.04 NiO 0.01 BaO 0.22 SrO trace Li_2O trace CuO 0.02	100.25	2.664
Al. I	.855	.184	.028	.042	.090	.114	.065	.035			.007	.003	.003			
276	51.19	14.03	4.95	6.48	4.27	8.18	3.53	1.10	1.52	1.06	2.72	0.99	0.09	CO_2 0.04 ZrO_2 0.02 SO_3 none Cl 0.01 Cr_2O_3 trace V_2O_3 0.01 BaO 0.04 SrO trace CuO 0.01	100.24	2.814
Al. I	.853	.137	.031	.090	.107	.146	.056	.012			.034	.007	.001			
277	50.24	15.42	5.59	6.75	3.73	7.86	3.60	1.47	1.16	0.89	3.08	0.37	0.12	CO_2 0.03 ZrO_2 none SO_3 0.07 Cl 0.01 Cr_2O_3 trace V_2O_3 0.06 NiO 0.04 BaO 0.03 SrO trace Li_2O none CuO 0.01	100.53	2.866
Al. I	.837	.151	.035	.093	.093	.140	.058	.016			.039	.003	.002			
278	50.78	15.16	2.36	10.01	4.43	6.46	3.54	2.20	1.32	0.75	2.60	0.34	0.14	CO_2 0.01 ZrO_2 none SO_3 0.15 Cl 0.02 F none Cr_2O_3 none V_2O_3 0.02 NiO 0.05 BaO 0.05 SrO trace Li_2O trace CuO 0.01	100.40	2.795
Al. I	.846	.149	.015	.139	.111	.115	.057	.023			.033	.002	.002			
279	49.80	15.43	4.70	5.39	5.95	9.52	3.01	2.48	2.27	0.39	0.40	0.30	0.17	CO_2 0.04 ZrO_2 none SO_3 trace Cl 0.02 S none Cr_2O_3 trace V_2O_3 0.05 NiO none BaO 0.03 SrO trace Cu trace	99.95	2.857
Al. I	.830	.151	.029	.075	.149	.170	.048	.027			.005	.002	.002			
280	49.56	17.54	1.20	7.83	5.72	8.46	2.73	2.08	1.98	0.40	1.30	0.50	0.22	CO_2 0.12 ZrO_2 none SO_3 none Cl 0.09 S 0.03 Cr_2O_3 none V_2O_3 0.04 NiO none BaO 0.03 SrO trace	99.83	2.910
Al. I	.826	.172	.008	.108	143	.151	.044	.022			.016	.004	.003			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. ANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
272	II.5.3."4.	Q 4.26 di 11.85 or 15.01 hy 6.42 ab 27.77 mt 6.96 an 21.96 il 2.28 ap 1.34	Dapto Flow, Port Kemble, New South Wales.	H. P. White.	A. R. Dep. Min. N. S. W. (1911), p. 198, 1912.	Dolerite.	
273	II.5.3."4.	Q 3.42 di 5.84 or 15.01 hy 10.63 ab 28.82 mt 6.26 an 24.46 il 1.37 ap 1.01	Saddleback Flow, Kiama, New South Wales.	H. P. White.	Jaquet, Card, and Harper, Rec. G. S. N. S. W., VIII, p. 16, 1905.	Dolerite.	
274	II.5.3."4.	Q 3.06 di 12.17 or 15.57 hy 6.92 ab 28.82 mt 7.19 an 19.46 il 2.28 ap 1.35	Blow Hole Flow, Kiama, New South Wales.	J. C. H. Mingaye.	Jaquet, Card, and White, Rec. G. S. N. S. W., VIII, p. 7, 1905.	Basalt.	
275	II.5.3.(3)4.	or 19.46 di 4.38 ab 34.06 hy 1.73 an 23.35 ol 4.33 mt 6.50 il 1.06 ap 1.01	Minumurra Flow, Kiama, New South Wales.	H. P. White.	Jaquet, Card, and Harper, Rec. G. S. N. S. W., VIII, p. 21, 1905.	Dolerite.	
276	II(III).(4)5.3.4".	Q 7.26 di 12.20 or 6.67 hy 8.08 ab 29.34 mt 7.19 an 19.18 il 5.17 ap 2.35	Bong Bong Flow, Kiama, New South Wales.	J. C. H. Mingaye.	Jaquet, Card, and Harper, Rec. G. S. N. S. W., VIII, p. 23, 1905.	Basalt.	
277	II"."5.3.4.	Q 4.44 di 11.74 or 8.90 hy 6.22 ab 30.39 mt 8.12 an 21.41 il 5.93 ap 1.00	Bong Bong Flow, Kiama, New South Wales.	J. C. H. Mingaye.	Jaquet, Card, and Harper, Rec. G. S. N. S. W., VIII, p. 23, 1905.	Basalt.	
278	II(III).5.3.4.	or 12.79 di 9.03 ab 29.87 hy 15.68 an 19.18 ol 2.14 mt 3.48 il 5.02 ap 0.67	Tweed River Heads, New South Wales.	J. C. H. Mingaye.	Mingaye and White, Rec. G. S. N. S. W., VII, p. 304, 1904.	Basalt.	
279	II(III).5.3.(3)4.	or 15.01 di 19.43 ab 25.15 hy 0.33 an 21.13 ol 7.84 mt 6.73 il 0.76 ap 0.67	O'Haras Head, Kioloa, New South Wales.	W. A. Greig.	N. S. W. Dep. Min. A. R. (1912), p. 198, 1913.	Dolerite.	
280	"II.5.3(4)."4.	or 12.23 di 7.29 ab 23.06 hy 12.31 an 29.47 ol 7.25 mt 1.86 il 2.43 ap 1.34	Durras Mountain, New South Wales.	J. C. H. Mingaye.	N. S. W. Dep. Min. A. R. (1912), p. 198, 1913.	Olivine dolerite.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
281	49.26	18.56	3.80	6.12	3.71	7.40	3.61	2.21	1.64	0.95	1.85	0.78	0.21	CO_2 0.20 ZrO_2 none SO_3 trace Cr_2O_3 trace V_2O_3 0.01 NiO none BaO 0.02 SrO trace Cu trace	100.33	
A1. I	.821	.182	.024	.085	.093	.132	.058	.023			.023	.005	.003			
282	48.98	16.88	3.30	7.29	5.27	8.86	3.39	2.11	1.78	0.52	1.28	0.30	0.31	CO_2 0.06 ZrO_2 none SO_3 none Cl 0.02 F none Cr_2O_3 none V_2O_3 0.02 NiO 0.04 BaO trace SrO trace Li_2O trace CuO none	100.41	2.869
A1. I	.816	.166	.021	.101	.132	.159	.055	.022			.016	.002	.004			
283	48.48	16.71	5.93	5.96	4.19	7.02	3.38	1.78	1.44	2.07	2.50	0.59	0.12	CO_2 0.04 ZrO_2 none SO_3 0.10 Cl 0.07 Cr_2O_3 trace V_2O_3 0.02 NiO 0.03 BaO 0.05 SrO trace Li_2O trace CuO 0.01	100.49	2.761
A1. I	.808	.164	.037	.083	.105	.125	.055	.020			.031	.004	.002			
284	48.27	18.02	12.06	0.90	1.17	6.06	3.73	3.33	0.52	0.85	4.87	trace	0.03	CO_2 0.30 ZrO_2 0.04 SO_3 none Cl trace F 0.11 NiO 0.04 BaO none SrO none Li_2O none	100.30	
A1. I	.805	.176	.076	.013	.029	.108	.060	.035			.061	—	—			
285	46.42	17.42	3.70	7.45	6.61	8.56	3.61	1.80	1.52	0.34	1.88	0.87	0.02	CO_2 0.04 ZrO_2 none SO_3 none Cl 0.05 Cr_2O_3 trace V_2O_3 0.01 NiO 0.02 BaO 0.03 SrO trace Li_2O none	100.35	2.905
A1. I	.774	.171	.023	.104	.165	.153	.058	.019			.024	.006	—			
286	47.80	18.02	1.77	9.46	3.96	8.54	3.74	1.12	1.15		3.53	0.27	0.30		99.66	
A2. II	.797	.176	.011	.132	.099	.153	.060	.012			.044	.002	.004			
287	46.43	17.60	8.51	2.44	8.03	8.12	3.56	0.92	1.20	0.81	2.25	0.37	0.22	CO_2 trace NiO 0.07	100.53	2.94
A2. II	.774	.173	.053	.034	.201	.145	.057	.010			.028	.003	.003			
288	54.06	17.13	6.10	3.55	3.05	4.88	3.97	3.29	1.00	0.80	1.95	0.48	0.20	CO_2 none SO_3 none Cl trace NiO 0.03	100.71	2.722
A2. II	.901	.168	.038	.049	.076	.088	.065	.035			.024	.003	.003			
289	51.52	16.58	2.35	7.68	4.03	6.10	4.11	2.99	0.22	1.39	2.15	0.82	0.13	CO_2 trace Cl 0.05 NiO 0.06	100.18	2.787
A2. II	.859	.163	.015	.107	.101	.109	.066	.032			.027	.006	.002			
290	50.14	16.91	3.26	9.15	2.62	5.18	3.80	2.78	2.16	0.14	1.90	1.19	0.38	CO_2 trace SO_3 none Cl trace Li_2O none	99.61	2.786
A2. II	.836	.166	.020	.127	.066	.093	.061	.030			.024	.008	.005			
291	48.83	16.69	2.66	8.40	5.56	7.95	2.92	2.10	0.66	1.34	2.85	0.74	0.25	CO_2 trace SO_3 none Cl 0.04 Li_2O none	100.99	2.870
B2. III	.814	.164	.017	.117	.139	.142	.047	.022			.036	.005	.004			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. ANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
281	II.5.3.4.⊙	or 12.79 ab 30.39 an 28.08 di 3.16 hy 9.90 ol 2.39 mt 5.57 il 3.50 ap 1.68	The Canoblas, New South Wales.	W. G. Stone.	G. W. Card, pers. com.	Olivine basalt.	
282	II''.5.3.4.	or 12.23 ab 27.25 an 24.74 ne 0.85 di 14.28 ol 10.68 mt 4.87 il 2.43 ap 0.68	St. Georges Head, Nowra District, New South Wales.	H. P. White.	G. W. Card, Rec. G. S. N. S. W., VIII, p. 91, 1905.	Basalt.	
283	II.5.3.4⊙	Q 2.22 or 11.12 ab 28.82 an 24.74 di 5.07 hy 10.08 mt 8.58 il 4.71 ap 1.34	Ballina, Richmond River, New South Wales.	J. C. H. Mingaye.	Mingaye and White, Rec. G. S. N. S. W., VII, p. 304, 1904.	Basalt.	
284	II.5.3.(3)4.	Q 1.02 or 19.46 ab 31.44 an 22.52 hy 2.90 il 1.98 hm 12.06 tn 5.29 ru 1.68	Billy Kings Creek, Coonabarabran, Warrumbungle Mountains, New South Wales.	H. I. Jensan.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXII, p. 616, 1907.	Corundum basalt.	
285	II(III).5.3.4.	or 10.56 ab 24.63 an 26.13 ne 3.12 di 8.74 ol 14.31 mt 5.34 il 3.65 ap 2.02	Mount Tomah, New South Wales.	J.C.H.Mingaye.	Mingaye and White, Rec. G. S. N. S. W., VII, p. 304, 1904.	Basalt.	
286	II''.5.3''.4''.	or 6.67 ab 31.44 an 28.91 di 9.68 hy 0.93 ol 10.96 mt 2.55 il 6.69 ap 0.67	Clifton Hill, Victoria.	H. C. Richards.	H. C. Richards, pers. com.	Basalt.	
287	''II.5.3(4).4(5).	or 5.56 ab 29.87 an 29.47 di 3.26 hy 3.20 ol 9.80 mt 2.09 il 4.26 ap 7.04	Greensborough, Nillumbik Parish, Victoria.	N. R. Jenner.	N. R. Jenner, Pr. R. Soc. Vict., XXV (2), p. 335, 1913.	Basalt.	
288	II.5.(2)3.(3)4.	Q 4.74 or 19.46 ab 34.06 an 18.90 di 2.16 hy 6.60 mt 6.50 il 3.65 hm 1.60 ap 1.01	Sugarloaf Hill, Macedon, Victoria.	A. G. Hall.	Skeats and Summers, Vict. G. S. B. 24, p. 25, 1912.	Olivine trachyte.	
289	II.5.(2)3.''4.	or 17.79 ab 34.58 an 18.07 di 5.40 hy 4.41 ol 9.06 mt 3.48 il 4.10 ap 2.02	Cobaw, Macedon, Victoria.	A. A. Topp.	Skeats and Summers, Vict. G. S. B. 24, p. 25, 1912.	Olivine trachyte.	
290	II.5.''3.''4.	or 16.68 ab 31.96 an 18.90 C 0.71 hy 18.22 mt 4.64 il 3.65 ap 2.69	Emu Creek, Macedon, Victoria.	A. G. Hall.	Skeats and Summers, Vict. G. S. B. 24, p. 31, 1912.	Macedonite (orthoclase basalt).	
291	II(III).5.3''.''4.	or 12.23 ab 24.63 an 26.41 di 6.77 hy 13.98 ol 3.70 mt 3.94 il 5.47 ap 1.68	Sugarloaf Hill, Macedon, Victoria.	P. G.W. Bayley.	Skeats and Summers, Vict. G. S. B. 24, p. 33, 1912.	Anorthoclase basalt.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
292	50.69	15.64	9.64	2.04	5.51	7.52	3.25	1.05	0.87	1.06	2.05	0.36	0.12	CO_2 none SO_3 trace Cl trace Cr_2O_3 0.06 NiO 0.06 Li_2O trace	99.92	2.797
A1. I	.845	.153	.060	.028	.138	.134	.053	.012			.026	.003	.002			
293	49.93	15.99	1.56	7.32	6.83	9.12	3.54	1.54	1.55	0.36	1.95	0.40	0.07	CO_2 none SO_3 trace Cl trace NiO 0.03 Li_2O trace	100.19	2.865
A2. II	.832	.157	.010	.102	.171	.163	.057	.016			.024	.003	.001			
294	48.84	14.95	2.79	8.53	4.73	7.47	3.90	2.01	1.53	0.67	4.00	0.52	0.13	CO_2 none SO_3 trace Cl trace F 0.08 NiO 0.03 Li_2O trace	100.18	2.908
A1. I	.814	.147	.018	.118	.118	.134	.063	.021			.050	.004	.002			
295	49.35	17.61	1.50	9.72	3.17	7.71	3.10	1.56	2.56	0.65	2.83	trace	0.07	FeS_2 0.34	100.17	2.918
A2. II	.823	.173	.009	.135	.079	.138	.050	.017			.035	——	.001			
296	47.46	16.12	2.96	9.39	5.70	7.27	3.51	1.74	0.57	0.72	3.10	0.78	0.25	CO_2 none Cl trace Cr_2O_3 0.02 NiO 0.05	99.64	2.824
A1. I	.791	.158	.019	.131	.143	.130	.056	.019			.039	.006	.004			
297	50.63	16.30	5.34	6.46	6.62	7.65	3.22	1.69	0.89	0.14	0.80			CO_2 none SrO trace	99.74	
A3. III	.844	.160	.033	.090	.166	.137	.052	.018			.010					
298	49.29	18.81	3.57	7.78	3.28	9.25	3.07	2.10	1.07	0.20	2.17			CO_2 trace	100.59	
A3. III	.822	.184	.022	.108	.082	.165	.050	.022			.027					
299	59.04	15.74	0.60	3.66	4.48	7.59	4.90	1.47	0.39	0.04	0.61	0.68	0.18	CO_2 0.14 ZrO_2 0.03 FeS_2 0.15 Cr_2O_3 0.02 V_2O_3 0.13 BaO 0.05	99.80	2.80
A1. I	.984	.154	.004	.051	.112	.136	.079	.016			.008	.005	.003			
300	57.32	17.69	2.24	5.62	3.66	6.50	4.04	1.25	0.13		0.85		0.21	CO_2 0.67	100.18	
A2. II	.955	.173	.014	.078	.092	.116	.065	.014			.011		.003			
301	52.46	18.58	4.76	4.03	4.72	8.56	3.86	1.14	0.47	0.10	0.60	0.51	0.14	CO_2 none	99.93	
A2. II	.874	.182	.030	.056	.118	.153	.062	.012			.008	.004	.002			
302	58.35	20.44	2.51	2.44	1.63	7.45	4.22	2.53	0.20		0.43		0.07		100.27	
A2. II	.973	.200	.016	.034	.041	.133	.068	.027			.005		.001			
303	56.28	18.81	5.15	1.85	2.27	7.72	3.66	2.10	1.55		0.95		0.06		100.40	
A2. II	.938	.184	.032	.026	.057	.138	.059	.022			.012		.001			
304	55.77	17.36	4.36	3.64	2.73	8.45	3.72	2.27	0.70		0.74		0.07		99.81	
A2. II	.930	.170	.028	.050	.068	.151	.060	.024			.009		.001			
305	53.95	19.63	3.17	4.06	3.33	9.05	3.38	1.84	0.35		0.97	0.39		CO_2 none	100.32	
A2. II	.899	.192	.020	.057	.083	.162	.055	.020			.012	.003				
306	52.21	19.33	4.12	4.81	3.25	9.01	3.37	1.92	0.88		1.05		0.20		100.15	
A2. II	.870	.190	.026	.067	.081	.161	.055	.020			.013		.003			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. ANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
292	II''.(4)5.3''.4.	Q 6.30 di 7.78 or 6.67 hy 10.20 ab 27.77 mt 0.93 an 24.46 il 9.35 hm 8.96 ap 1.01	Lake Terang, Camperdown District, Victoria.	A. A. Topp.	H. J. Grayson, Vict. G. S. Mem. 9, p. 22, 1910.	Basalt.	
293	II(III).5.3.4.	or 8.90 di 15.54 ab 29.87 hy 0.53 an 23.35 ol 13.16 mt 2.32 il 3.65 ap 1.01	Lake Bullenmeri, Camperdown District, Victoria.	A. G. Hall.	H. J. Grayson, Vict. G. S. Mem. 9, p. 22, 1910.	Essexite.	
294	II(III).5.''3.4.	or 11.68 di 13.07 ab 33.01 hy 2.86 an 17.51 ol 6.68 mt 4.18 il 7.60 ap 1.34	Lake Bullenmeri, Camperdown District, Victoria.	A. G. Hall.	H. J. Grayson, Vict. G. S. Mem. 9, p. 22, 1910.	Essexite.	
295	II''.5.3(4).4.	Q 0.36 di 7.45 or 9.45 hy 16.30 ab 26.20 mt 2.09 an 29.47 il 5.32	Mount Wellington, North Gippsland, Victoria.	Ampt.	E. V. Thiele, Pr. R. Soc. Vict., XXI (1), p. 267, 1908.	Basalt.	
296	II(III).5.3.4.	or 10.56 di 6.12 ab 29.34 hy 5.44 an 23.07 ol 11.71 mt 4.41 il 5.93 ap 2.02	Newlyn, Victoria.	D. J. Maloney.	A. R. Sec. Min. Vict. (1911), p. 62, 1912.	Basalt.	
297	II(III).5.3.4.	or 10.01 di 10.44 ab 27.25 hy 14.23 an 25.02 ol 2.61 mt 7.66 il 1.52	Blinman, Flinders Ranges, South Australia.	W. N. Benson.	W. N. Benson, Pr. R. Soc. S. Aust., XXXIII, p. 234, 1909.	Gabbro diabase.	
298	II.5.3(4).4.	or 12.23 di 12.15 ab 26.20 hy 3.85 an 31.14 ol 4.31 mt 5.10 il 4.10	Blinman, Flinders Ranges, South Australia.	W. N. Benson.	W. N. Benson, Pr. R. Soc. S. Aust., XXXIII, p. 234, 1909.	Olivine diabase.	
299	II.''5.(2)3.4''.	Q 4.92 di 13.47 or 8.90 hy 10.23 ab 41.39 mt 0.93 an 16.40 il 1.22 ap 1.68	Kalgoorlie, West Australia.	H. Bowley.	Simpson and Gibson, W. Aust. G. S. B. 42, p. 61, 1912.	Porphyrite.	
300	II.(4)5.3.4''.	Q 7.38 di 5.01 or 7.78 hy 14.14 ab 34.06 mt 3.25 an 26.13 il 1.67	Te Moehan Mountain, Coromandel, Hauraki, New Zealand.	J. S. Maclaurin.	Fraser and Adams, N. Z. G. S. B. 4, p. 90, 1907.	Quartz diorite.	Fresh?
301	II.5.3''.4''.	Q 2.64 di 7.07 or 6.67 hy 11.08 ab 32.49 mt 6.96 an 30.02 il 1.22 ap 1.34	Hollyford River, Otago, New Zealand.	J. S. Maclaurin.	P. G. Morgan, pers. com.	Norite.	
302	(I)II.''5.3.4.	Q 6.60 di 6.27 or 15.01 hy 2.92 ab 35.63 mt 3.71 an 29.19 il 0.76	New Plymouth, Taranaki, New Zealand.	J. S. Maclaurin.	E. D. Clarke, N. Z. G. S. B. 14, p. 23, 1912.	Andesite.	
303	''II.(4)5.3.4.	Q 9.24 di 7.56 or 12.23 hy 2.20 ab 30.92 mt 3.48 an 28.63 il 1.82 hm 2.72	New Plymouth, Taranaki, New Zealand.	J. S. Maclaurin.	E. D. Clarke, N. Z. G. S. B. 14, p. 23, 1912.	Andesite.	
304	II.''5.3.4.	Q 6.42 di 14.39 or 13.34 hy 1.80 ab 31.44 mt 6.50 an 23.91 il 1.37	Mount Egmont, Taranaki, New Zealand.	J. S. Maclaurin.	E. D. Clarke, N. Z. G. S. B. 14, p. 23, 1912.	Andesite.	
305	II.5.3(4).4.	Q 4.32 di 7.82 or 11.12 hy 7.84 ab 28.82 mt 4.64 an 32.53 il 1.82 ap 1.01	New Plymouth, Taranaki, New Zealand.	J. S. Maclaurin.	E. D. Clarke, N. Z. G. S. B. 14, p. 23, 1912.	Andesite.	
306	II.5.3(4).4.	Q 1.92 di 10.36 or 11.12 hy 7.18 ab 28.82 mt 6.03 an 31.97 il 1.98	Sentry Hill, Taranaki, New Zealand.	J. S. Maclaurin.	E. D. Clarke, N. Z. G. S. B. 14, p. 23, 1912.	Andesite.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
307	50.89	17.75	2.32	7.20	3.30	7.70	3.83	2.43	2.35		1.97		0.21		100.00	
A2. II	.848	.174	.014	.100	.083	.138	.062	.026			.025		.003			
308	51.97	15.37	6.76	7.89	2.42	7.96	3.31	1.26	2.39			0.33		FeS_2 0.53	100.19	2.843
A3. III	.866	.151	.043	.110	.061	.142	.053	.013				.002				
309	50.92	17.59	3.80	6.69	3.90	6.97	4.28	1.86	0.79	0.35	2.55	0.40	0.20	CO_2 none Cr_2O_3 none NiO none	100.30	2.761
A2. II	.849	.172	.024	.093	.098	.124	.069	.020			.032	.003	.003			
310	49.73	16.39	7.58	3.98	4.06	7.17	4.12	1.93	0.54	0.81	3.05	0.84	0.23	CO_2 none ZrO_2 0.03 SO_3 none Cr_2O_3 none NiO 0.04 BaO 0.03 SrO none	100.53	2.911
A1. I	.829	.161	.048	.055	.102	.128	.066	.020			.038	.006	.003			
311	49.01	16.29	7.61	4.89	3.62	9.79	3.82	0.80			3.93	0.49	0.27	SO_3 0.20 S 0.02 CuO 0.10	100.84	
A2. II	.817	.160	.048	.068	.091	.175	.061	.009			.047	.003	.004			
312	48.71	18.87	3.18	8.00	4.85	9.87	4.15	1.52	none		1.81	trace	trace		100.96	2.99
B3. IV	.812	.185	.020	.111	.121	.177	.067	.016			.023	—	—			
313	45.61	15.98	8.25	11.60	3.75	6.42	3.50	1.82	0.27		1.15	0.72	1.20		100.27	
A2. II	.760	.157	.052	.161	.094	.114	.056	.019			.014	.005	.017			
314	46.30	17.95	6.21	6.79	3.67	8.17	3.92	0.89			5.35	0.53	0.26	SO_3 0.06 S 0.05 CuO 0.17	100.32	
A2. II	.772	.176	.039	.094	.092	.146	.063	.010			.067	.004	.004			
315	54.04	19.58	5.09	3.75	1.99	5.54	4.70	3.48	1.16		0.94	0.31			100.58	
A2. II	.901	.192	.032	.052	.050	.099	.076	.037			.012	.002				
316	51.18	21.41	4.61	3.32	1.75	6.56	4.72	3.53	1.08		1.34	0.48			99.98	
A2. II	.853	.210	.029	.046	.044	.117	.076	.037			.017	.003				
317	52.81	16.11	7.16	7.48	3.55	6.62	3.52	1.20	0.85						99.30	
B3. IV	.880	.158	.045	.104	.089	.118	.056	.013								
318	49.95	15.21	7.45	8.02	3.32	8.16	3.31	1.55	1.10		0.60	0.68			99.35	
B2. III	.833	.149	.047	.111	.083	.146	.053	.017			.008	.005				
319	49.71	16.74	8.89	6.69	3.63	7.82	3.90	1.05	1.21						99.64	
A3. III	.829	.164	.056	.093	.091	.139	.063	.012								
320	45.99	15.91	11.80	5.62	5.43	7.94	3.89	1.06	1.48		0.49	0.21			99.82	
A2. II	.767	.156	.074	.078	.136	.142	.063	.012			.006	.002				
321	45.67	16.61	12.42	5.30	5.26	8.44	4.02	1.20	0.76						99.68	
A3. III	.761	.163	.078	.074	.132	.151	.065	.013								

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. ANDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
307	II.5.3.4.⊙	or 14.46, ab 31.96, an 23.91, ne 0.28; di 11.97, ol 7.96, mt 3.25, il 3.80	Te Ahuahu Hill, Whangaroa, New Zealand.	J. S. Maclaurin.	Bell and Clarke, N. Z. G. S. B. 8, p. 75, 1909.	Basalt.	
308	II″.(4)5.3″.4.	Q 7.32, or 7.23, ab 27.77, an 23.63; di 11.63, hy 9.11, mt 9.98, ap 0.67, pr 0.53	Baining Mountains, Neupommern Island, Bismarck Archipelago.	A. Lindner.	E. Lehmann, T. M. P. M., XXVII, p. 200, 1908.	Monzonite.	
309	II.5.3.4.⊙	or 11.12, ab 36.15, an 23.07; di 6.99, hy 7.31, ol 3.18, mt 5.57, il 4.86, ap 1.01	Mauna Kea, Hawaii, Hawaiian Islands.	G. Steiger.	R. A. Daly, Pr. Am. Ac., XLVII, p. 104, 1911.	Trachy-dolerite.	Also in J. G., XIX, p. 301, 1911.
310	II.5.3.4.⊙	Q 1.68, or 11.12, ab 34.58, an 20.85; di 7.13, hy 6.90, mt 4.64, il 5.78, hm 4.48, ap 2.02	Mauna Kea, Hawaii, Hawaiian Islands.	G. Steiger.	R. A. Daly, Pr. Am. Ac., XLVII, p. 104, 1911.	Basalt.	Also in J. G., XIX, p. 298, 1911.
311	II(III).5.3″.4(5).	Q 3.06, or 5.00, ab 31.96, an 25.02; di 16.20, hy 1.60, mt 5.80, il 7.14, hm 3.68, ap 1.01	Mount Kohala, Hawaii, Hawaiian Islands.	A. B. Lyons.	A. B. Lyons, A. J. S., II, p. 424, 1896.	Basalt.	Ignited. $H_2O+=1.00$. $H_2O-=0.98$. In W. T., p. 285.
312	II″.5(6).3.4.	or 8.90, ab 22.53, an 28.36, ne 6.82; di 16.97, ol 9.39, mt 4.64, il 3.50	Crater Wall, Kilauea, Hawaii, Hawaiian Islands.	O. Silvestri.	O. Silvestri, B. Com. G. It., XIX. p. 187, 1888.	Basalt.	In W. T., p. 283.
313	II(III).5.3.4.	or 10.56, ab 29.34, an 22.80; di 3.50, hy 4.80, ol 13.12, mt 12.06, il 2.13, ap 1.68	Crater Wall, Kilauea, Hawaii, Hawaiian Islands.	O. Silvestri.	O. Silvestri, B. Com. G. It., XIX, p. 173, 1888.	Basalt.	In W. T., p. 283.
314	II″.5.3″.4(5).	Q 0.36, or 5.56, ab 33.01, an 28.63; di 6.48, hy 6.20, mt 7.19, il 10.18, hm 1.28, ap 1.34	Waianae, Oahu, Hawaiian Islands.	A. B. Lyons.	A. B. Lyons, A. J. S., II, p. 424, 1896.	Basalt.	Ignited. $H_2O+=2.00$. $H_2O-=1.75$. In W. T., p. 285.
315	″II.5.″3.″4.	or 20.57, ab 39.82, an 21.96; di 2.87, hy 3.43, ol 0.90, mt 7.42, il 1.82, ap 0.67	Fortress Hill, Ascension Island.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (7), p. 652, 1912.	Trachy-dolerite.	Al_2O_3 and MgO?
316	(I)II.5.3.″4.	or 20.57, ab 32.49, an 26.97, ne 3.41; di 2.16, ol 2.38, mt 6.73, il 2.58, ap 1.01	Near Pier, Ascension Island.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (7), p. 652, 1912.	Trachy-dolerite.	Al_2O_3 and MgO?
317	II.(4)5.3″.4.	Q 6.66, or 7.23, ab 29.34, an 24.74; di 6.64, hy 13.40, mt 10.44	Bouvet Island.	R. Reinisch.	R. Reinisch, D. Tiefs. Exp., X (3), p. 54, 1908.	Basalt.	
318	II(III).″5.3.4.	Q 3.96, or 9.45, ab 27.77, an 21.96; di 11.44, hy 10.05, mt 10.90, il 1.22, ap 1.68	Bouvet Island.	R. Reinisch.	R. Reinisch, D. Tiefs. Exp., X (3), p. 54, 1908.	Basalt.	
319	II″.5.3.4″.	Q 1.38, or 6.67, ab 33.01, an 24.74; di 11.25, hy 8.54, mt 12.99	Bouvet Island.	R. Reinisch.	R. Reinisch, D. Tiefs. Exp., X (3), p. 54, 1908.	Basalt.	
320	II(III).5.3.4″.	or 6.67, ab 33.01, an 22.52; di 11.66, hy 1.20, ol 4.90, mt 16.70, il 0.91, hm 0.32, ap 0.67	Stationsberg, Kerguelen Island.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (2), p. 218, 1908.	Basalt.	
321	II(III).5.3.4″.	or 7.23, ab 28.56, an 23.63, ne 2.98; di 14.26, ol 4.62, mt 17.17, hm 0.64	Philippi Lake, Kerguelen Island.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (2), p. 218, 1908.	Basalt.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
322	51.76	17.54	5.40	6.94	2.89	7.85	3.51	0.87	2.41		0.96				100.13	
A3. III	.863	.172	.034	.096	.072	.140	.056	.009			.012					
323	56.30	15.91	3.15	6.38	3.64	8.10	3.41	1.17	1.74		0.06	0.16	trace		100.02	
A2. II	.938	.156	.020	.089	.091	.145	.055	.013			——	.001	——			
324	54.61	19.10	3.65	3.73	3.06	6.51	4.34	1.27	2.63		1.66	0.32			100.56	
A2. II	.910	.187	.023	.051	.077	.116	.070	.014			.021	.002				
325	53.06	18.65	1.44	7.58	3.78	8.22	3.20	1.55	0.94	0.16	1.60	0.38	0.05		100.61	
A2. II	.884	.183	.009	.106	.095	.146	.052	.017			.020	.003	——			
326	54.27	19.23	0.73	8.29	3.74	6.41	3.05	2.49	0.77	0.18	1.33			CO_2 0.05	100.54	
A3. III	.905	.188	.004	.115	.094	.114	.050	.027			.017				(100.55)	
327	51.91	20.75	1.08	7.32	3.05	7.07	3.04	2.44	0.58	0.04	2.34	0.52	trace	CO_2 0.11	100.25	
A2. II	.865	.203	.007	.102	.076	.127	.049	.026			.027	.004	——			
328	51.35	18.90	2.03	7.87	3.30	8.81	3.73	1.48	0.97	0.09	0.79	0.57	trace	CO_2 0.01	99.90	
A2. II	.856	.185	.013	.109	.083	.157	.060	.016			.010	.004	——			
329	51.56	17.95	3.46	6.93	5.54	7.05	3.56	1.28	1.58		1.34	0.10			100.35	
A2. II	.859	.176	.022	.096	.139	.126	.057	.014			.017	.001				

RANG 3. ALKALICALCIC. ANDASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	57.47	18.86	2.21	4.08	4.27	7.42	3.85	0.73	0.22		0.75	0.24	0.10	BaO 0.03 SrO 0.11	100.34	
A2. II	.958	.185	.014	.057	.107	.132	.062	.008			.009	.002	.001			
2	56.95	18.84	2.06	4.28	4.37	7.45	3.89	0.82	0.31	0.19	0.79	0.19	trace	CO_2 none S trace Cr_2O_3 none BaO 0.04 SrO trace Li_2O none	100.18	
A1. I	.949	.185	.013	.060	.109	.133	.063	.009			.010	.001	——			
3	57.87	16.30	1.71	3.86	5.50	5.53	5.01	0.75	2.40	0.26	0.53	0.27	0.08	BaO 0.05 SrO trace	100.12	
A2. II	.964	.161	.011	.054	.138	.099	.080	.008			.007	.002	.001			
4	55.08	18.93	2.02	5.56	5.17	8.40	4.23	0.74	0.29		trace				100.42	
A3. III	.918	.185	.013	.077	.129	.150	.068	.008			——					
5	49.26	16.88	6.49	6.94	4.80	7.58	3.41	0.72	2.90	0.41	trace	0.34	0.61	ZrO_2 none S trace NiO 0.05 BaO none SrO trace	100.39	2.95
A2. II	.821	.164	.041	.096	.120	.136	.055	.007			——	.002	.008			
6	51.72	15.38	3.35	7.91	4.38	7.84	4.37	0.47	2.00	0.56	1.67	0.49	0.16	CO_2 none SO_3 0.03 Cl 0.12 F none Cr_2O_3 none	100.45	
A1. I	.862	.151	.021	.110	.110	.140	.071	.005			.021	.003	.002			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4. DOSODIC. ANDASE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
322	II."5.3(4).4(5).	Q 6.24, or 5.00, ab 29.34, an 29.75; di 7.55, hy 10.08, mt 7.89, il 1.82	Mount Menhir, Campbell Island.	P. Marshall.	P. Marshall, Subant. Islands, p. 690, 1909.	Gabbro.	
323	II.(4)5.3".4.	Q 8.40, or 7.23, ab 28.82, an 24.46; di 12.40, hy 12.07, mt 4.64, ap 0.34	Two Hammocks Island, 64° 6′ S., 61° 41′ W., Antarctica.	E. Zdarek.	A. Pelikan, Voy. Belgica, V, Pet. Unt., I, p. 13, 1909.	Quartz diorite.	
324	II."5.3.4".	Q 6.60, or 7.78, ab 36.68, an 28.63; di 1.33, hy 7.99, mt 5.34, il 3.19, ap 0.67	Port Locroy, Graham Land, Antarctica.	Pisani.	E. Gourdon, Exp. Ant. Fr., Petr., p. 175, 1908.	Hornblende andesite.	
325	II.5.3(4).4.	Q 2.88, or 9.45, ab 27.25, an 31.69; di 5.07, hy 17.14, mt 2.09, il 3.04, ap 1.01	Cathedral Rocks, South Victoria Land, Antarctica.	G. T. Prior.	G. T. Prior, Nat. Ant. Exp., I, p. 127, 1907.	Hornblende diorite.	
326	II.5.3".(3)4.	Q 1.80, or 15.01, ab 26.20, an 30.86; di 0.71, hy 21.44, mt 0.93, il 2.58	Cape Irizar? Ross Region, South Victoria Land, Antarctica.	Burrows and Walkom.	J. W. E. David, pers. com.	Not named.	Dike in granite.
327	II.5.3(4).(3)4.	Q 2.58, or 14.46, ab 25.68, an 31.69, C 1.43; hy 16.58, mt 1.62, il 4.10, ap 1.34	Mount Larsen, Ross Region, South Victoria Land, Antarctica.	Burrows and Walkom.	J. W. E. David, pers. com.	Sphene diorite.	Erratic block.
328	II.5.3".4.	or 8.90, ab 31.44, an 30.30; di 8.14, hy 10.47, ol 3.78, mt 3.02, il 1.52, ap 1.34	Mount Larsen, Ross Region, South Victoria Land, Antarctica.	Burrows and Walkom.	J. W. E. David, pers. com.	Not named.	Erratic block.
329	II.5.3(4).4.	Q 1.14, or 7.78, ab 29.87, an 29.19; di 4.05, hy 18.14, mt 5.10, il 2.58, ap 0.34	Jenny Island, Weddell quadrant, Antarctica.	Lassieur.	E. Gourdon. pers. com.	Gabbro.	

SUBRANG 5. PERSODIC. BEERBACHOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.(4)5.3(4).(4)5.	Q 9.12, or 4.45, ab 32.49, an 31.97; di 3.16, hy 13.79, mt 3.75, il 1.37, ap 0.34	Near Crater Lake, Oregon.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 148, p. 231, 1897.	Basalt.	In W. T., p. 285.
2	II.(4)5.3(4).(4)5.	Q 7.68, or 5.00, ab 33.01, an 31.41; di 3.83, hy 13.92, mt 3.02, il 1.52, ap 0.34	Anna Creek, Crater Lake, Oregon.	H. N. Stokes.	H. B. Patton, U. S. G. S. P. P. 3, p. 161, 1902.	Hypersthene basalt.	
3	II."5.3."5.	Q 5.76, or 4.48, ab 41.92, an 20.29; di 4.23, hy 16.66, mt 2.55, il 1.06, ap 0.67	South Husent Creek, Butte County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 17 (I), p. 731, 1896.	Diorite.	Also in J. G., III, p. 403, 1895. In W. T., p. 285.
4	II.5.3".(4)5.	Q 0.60, or 4.45, ab 35.63, an 30.30; di 9.31, hy 16.80, mt 3.02	Delta, Shasta County, California.	W. H. Melville.	J. S. Diller, U. S. G. S. B. 148, p. 190, 1897.	Andesite-basalt.	In W. T., p. 285.
5	II(III).5.3(4).(4)5.	Q 1.50, or 3.89, ab 28.82, an 28.36; di 8.41, hy 16.20, mt 9.51, ap 0.67	Pajaro, San Benito County, California.	J. E. Reid.	J. E. Reid, Un. Cal. Dep. G. B., III, p. 185, 1902.	Diorite.	
6	II(III).5.3."5.	Q 1.26, or 2.78, ab 37.20, an 20.85; di 12.55, hy 14.07, mt 4.87, il 3.19, ap 1.01	Point Farfan, Panama.	W. C. Wheeler.	D. F. MacDonald, U. S. G. S. rec. lab.	Diorite.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. ANDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
7	57.25	18.00	2.17	4.25	4.52	7.68	3.67	0.77	0.50		0.43	trace			99.24	
B3. IV	.954	.176	.014	.059	.113	.138	.059	.008			.005	——				
8	52.55	14.20	9.43	6.50	4.03	6.68	4.51	0.20	1.62						99.72	2.905
A3. III	.876	.139	.059	.090	.101	.120	.073	.002								
9	48.42	17.49	6.79	4.34	5.35	9.83	3.98	0.55	2.68						99.43	2.902
A3. III	.807	.171	.043	.060	.134	.175	.065	.006								
10	52.31	17.38	2.99	5.21	3.76	9.95	3.96	0.75	2.05	0.30	1.45	0.20	0.22	CO_2 trace Cl 0.02	100.55	2.87
A2. II	.872	.170	.019	.072	.094	.178	.064	.008			.018	.001	.003			
11	52.82	16.39	2.31	10.92	3.43	7.87	4.83	0.92	0.48				trace		99.97	
A3. III	.880	.160	.014	.151	.086	.141	.077	.010					——			
12	51.70	19.39	2.54	6.44	4.64	8.95	4.07	0.83	0.92	0.15	0.14	0.37		FeS_2 0.48	100.62	
A2. II	.862	.190	.016	.089	.116	.160	.066	.009			.002	.003				
13	47.21	20.52	7.48	5.32	4.16	8.63	5.17	0.33	0.34	0.10		0.46		FeS_2 0.19	99.91	
A3. III	.787	.201	.047	.074	.104	.153	.084	.003				.003				
14	53.34	15.95	2.43	4.93	5.23	7.96	5.42	0.63	2.75	0.09	1.21	0.63			100.57	2.84
A2. II	.889	.156	.015	.068	.131	.142	.087	.007			.015	.004				
15	44.37	16.69	8.03	7.64	4.07	7.44	3.99	0.65	3.23		3.07	0.42	trace		99.60	2.93
A2. II	.740	.163	.050	.106	.102	.133	.065	.007			.036	.003	——			
16	51.00	18.01	0.23	9.31	6.53	8.89	4.42	0.46	1.38	0.28					100.51	
A3. III	.850	.176	.001	.129	.163	.159	.071	.005								
17	50.13	16.90	2.19	7.55	5.71	6.83	4.95	0.95	2.45	0.77	1.26	0.24	0.12		100.06	2.60
A2. II	.836	.166	.014	.105	.143	.121	.080	.010			.016	.002	.002			
18	51.80	16.63	2.72	7.91	5.34	8.38	3.89	0.29	0.88	1.10	0.82	0.26	0.23		100.25	
A2. II	.863	.163	.017	.110	.134	.150	.063	.003			.010	.002	.003			
19	53.50	17.62	2.58	6.07	4.39	9.22	4.57	0.33	none		1.65	0.36			100.29	
A2. II	.892	.173	.016	.085	.110	.164	.074	.004			.021	.003				
20	52.32	18.16	2.82	5.81	5.62	8.88	4.01	0.42	1.00		0.90	0.10			100.04	
A2. II	.872	.178	.018	.081	.141	.159	.065	.004			.011	.001				

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 5. PERSODIC. BEERBACHOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
7	II.(4)5.3(4).(4)5.	Q 9.12 di 6.52 or 4.45 hy 13.42 ab 30.92 mt 3.25 an 30.30 il 0.76	Vallée de Ceron, Martinique, West Indies.	Pisani.	A. Lacroix, Mont Pelée, p. 573, 1904.	Andesilabradorite (andesite).	
8	II(III).(4)5.3.5.	Q 6.60 di 12.52 or 1.11 hy 8.18 ab 38.25 mt 13.69 an 17.79	Red Point, St. Thomas, West Indies.	P. T. Cleve.	P. T. Cleve, Sv. Vet. Ak. Hnd., IX, No. 12, p. 37, 1871.	Diabase.	Cf. A. Högbom, B. G. Inst. Ups., VI, p. 230, 1905. Not in W. T.
9	II″.5.3″.″5.	or 3.34 di 16.46 ab 33.01 ol 5.61 an 27.80 mt 9.98 ne 0.57	Coki Point, St. Thomas, West Indies.	E. Ecklund.	P. T. Cleve, Sv. Vet. Ak. Hnd., IX, No. 12, p. 37, 1871.	Diabase.	Cf. A. Högbom, B. G. Inst. Ups., VI, p. 230, 1905. Not in W. T.
10	II″.5.3″.(4)5.	Q 2.10 di 17.33 or 4.45 hy 6.01 ab 33.54 mt 4.41 an 27.24 il 2.74 ap 0.34	Trwyn Llwyd, St. Davids Head, Pembrokeshire, Wales.	J. V. Elsden.	J. V. Elsden, Q. J. G. S., LXIV, p. 280, 1908.	Quartz gabbro.	
11	II″.5.3.″5.	or 5.56 di 16.03 ab 40.35 ol 13.89 an 20.29 mt 3.25	Wiborg, Finland.	H. Berghell.	H. Berghell, Fin. G. Und., Bl. 33, p. 26, 1898.	Diabase.	In W. T., p. 285.
12	II.5.3(4).(4)5.	or 5.00 di 7.98 ab 34.58 hy 8.06 an 31.97 ol 6.59 mt 3.71 il 0.30 ap 1.01	Ernsthofen, Odenwald, Hesse.	W. Sonne.	C. Chelius, Nbl. Ver. Erdk. (IV), XVIII, p. 15, 1897.	Luciite porphyry.	In W. T., p. 285.
13	II.5″.3.5.	or 1.67 di 6.45 ab 34.58 ol 7.81 an 31.69 mt 10.90 ne 5.11 ap 1.01	Frankenstein, Odenwald, Hesse.	R. Marzahn.	Chelius and Klemm, Erl. G. Kt. Hes., X, p. 39, 1896.	Beerbachite.	In W. T., p. 285.
14	II″.5.(2)3.″5.	or 3.89 di 14.95 ab 45.59 hy 3.42 an 17.24 ol 5.41 mt 3.48 il 2.28 ap 1.34	Alp Rusein, Graubunden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Kersantite.	
15	II″.5.3.(4)5.	or 3.89 di 7.07 ab 34.06 hy 3.59 an 25.30 ol 4.21 mt 11.60 il 5.47 ap 1.01	Nurra, Sardinia.	C. Viola.	C. Viola, B. Com. G. It., XXXVI, p. 107, 1905.	Hornblende diabase.	
16	II″.5.3″.″5.	or 2.78 di 13.57 ab 31.96 ol 19.50 an 27.80 mt 0.23 ne 2.84	Mancayan, Lepanto Province, Luzon Island, Philippine Islands.	L. S. Salinger.	A. J. Eveland, Min. Bur. Manila, B. 4, p. 39, 1905.	Diorite.	
17	II.5.3.(4)5.	or 5.56 di 8.63 ab 38.77 ol 14.79 an 21.13 mt 3.25 ne 1.70 il 2.43 ap 0.67	Karang Samboen, Loh-oels, Java.	N. Sahlbom.	G. Niethammer, T. M. P. M., XXVIII, p. 233, 1909.	Theralite-diabase.	
18	II(III).5.3(4).5.	Q 0.42 di 10.52 or 1.67 hy 19.58 ab 33.01 mt 3.94 an 26.97 il 1.52 ap 0.67	Ipswich, Purga Parish, Queensland.	G. R. Patten.	A. R. Agric, Chem. Qld., 1912.	Basalt.	H. C. Richards, pers. com.
19	II″.5.3.5.	Q 1.02 di 13.32 or 2.22 hy 10.86 ab 38.77 mt 3.71 an 26.41 il 3.19 ap 1.01	Deception Island, South Shetland Islands, Antarctica.	Lassieur.	E. Gourdon, pers. com.	Labradorite (diabase?).	
20	II″.5.3(4).5.	or 2.22 di 10.57 ab 34.06 hy 15.85 an 30.30 mt 4.18 il 1.67 ap 0.34	Berthelot Island, Weddell quadrant, Antarctica.	Lassieur.	E. Gourdon, pers. com.	Labradorite (basalt).	

CLASS II. DOSALANE—Continued.

RANG 4. DOCALCIC. HESSASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	43.42	22.37	0.81	9.25	5.75	13.34	1.24	1.13	1.54	0.09	1.25	0.10	0.06	Cr_2O_3 trace Li_2O trace	100.35	
A2. II	.724	.219	.005	.129	.144	.238	.020	.012			.016	.001	.001			
2	53.54	16.36	1.31	7.07	6.23	9.35	2.13	2.02	1.92		trace	0.12		SO_3 0.17	100.22	
A3. III	.892	.160	.008	.099	.156	.167	.034	.021			—	—	.001			
3	51.29	17.50	4.52	4.93	3.75	13.10	2.19	2.44	1.11		0.11				100.94	
B3. IV	.855	.171	.028	.068	.094	.234	.035	.025			.001					
4	53.57	16.96	2.08	7.29	3.70	9.55	2.15	2.03	1.17		1.15		0.35	CO_2 none	100.00	
A2. II	.893	.166	.013	.101	.093	.171	.035	.021			.013		.005			
5	50.10	17.96	2.40	6.48	5.14	8.25	1.31	3.26	3.34		1.84			CO_2 none Cr_2O_3 none NiO none CuO none	100.08	
A2. II	.835	.176	.015	.090	.129	.147	.021	.035			.023					
6	44.17	18.91	8.34	5.62	4.87	10.64	1.61	1.50	0.55		2.84	0.24		CO_2 0.32 Cl 0.09	99.70	
A2. II	.736	.185	.052	.078	.122	.190	.026	.016			.036	.002				

RANG 4. DOCALCIC. HESSASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	44.00	27.73	2.36	3.90	2.30	13.94	2.36	0.45	0.80		1.90	0.20	0.08		100.02	
A2. II	.733	.272	.015	.054	.058	.249	.038	.005			.024	.001	.001			
2	56.89	19.39	0.38	7.11	2.11	8.11	3.31	1.04	1.35		0.43	0.11	0.30		100.53	2.834
A2. II	.948	.190	.002	.099	.053	.145	.053	.011			.005	.001	.004			
3	51.52	19.77	0.47	6.77	6.49	8.16	2.66	0.70	1.68		1.39	0.10	trace		99.71	2.832
A2. II	.859	.194	.003	.094	.162	.146	.043	.008			.017	.001	—			
4	50.80	19.42	0.97	6.67	5.78	12.68	1.60	0.37	0.86	0.25	0.43			NiO 0.01	99.84	
A3. III	.847	.190	.006	.093	.145	.227	.026	.004			.005					
5	44.92	18.88	2.73	13.76	5.38	9.07	2.94	0.53	1.62	0.20			0.26		100.29	
A3. III	.749	.185	.017	.191	.135	.161	.047	.005					.004			
6	52.60	18.45	2.47	6.11	4.22	7.55	3.24	1.12	2.53		1.11	0.20	0.23		99.83	
A2. II	.877	.181	.015	.085	.106	.135	.052	.011			.014	.001	.003			
7	47.82	19.99	2.10	6.48	4.94	11.65	3.51	0.67	0.21	0.07	2.00	0.56	trace	CO_2 none BaO trace	100.00	
A2. II	.797	.196	.013	.090	.124	.208	.056	.007			.025	.004	—			
8	43.73	20.17	4.32	6.93	3.91	10.99	2.42	1.45	1.02	0.08	4.23	0.15	trace		99.40	3.058
B2. III	.729	.198	.027	.097	.098	.196	.039	.015			.053	.001	—			
9	50.46	19.65	1.66	5.15	5.31	9.66	3.15	1.57	1.14	0.74	1.18	0.18	0.15	CO_2 none BaO 0.09 SrO 0.03	100.12	
A2. II	.841	.193	.010	.072	.133	.172	.051	.017			.015	.001	.002			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 3. SODIPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II″.5.4(5).3(4).	or 6.67 di 11.04 ab 5.24 ol 17.17 an 51.99 mt 1.16 ne 2.84 il 2.43 ap 0.34	Ilchester, Howard County, Maryland.	W. F. Hillebrand.	G. H. Williams, U. S. G. S. A. R. 15, p. 673, 1895.	Gabbro-diorite.	In W. T., p. 287.
2	II(III).5.″4.3(4).	Q 2.76 di 13.44 or 11.68 hy 21.01 ab 17.84 mt 1.86 an 29.19 ap 0.34	Hippeln, Brocken, Harz.	Klüss.	O. H. Erdmannsdoerfer, Jb. Pr. G. L.-A., XXVII, p. 360, 1906.	Gabbro.	
3	II(III).5.(3)4.3″.	Q 0.96 di 27.25 or 13.90 ol 1.20 ab 18.34 mt 6.50 an 30.86	Mal Inverno, Monzoni, Tyrol.	C. Doelter.	C. Doelter, T. M. P. M., XXI, p. 73, 1902.	Monzonite.	
4	II″.″5.″4.3(4).	Q 6.18 di 14.08 or 11.68 hy 12.86 ab 18.34 mt 3.02 an 30.58 il 1.98	Flat Islands, Whangaroa, New Zealand.	J. S. Maclaurin.	Bell and Clarke, N. Z. G. S. B. 8, p. 71, 1909.	Dolerite.	
5	II.5.″4.(2)3.	Q 3.06 di 6.09 or 19.46 hy 16.81 ab 11.00 mt 3.48 an 33.36 il 3.50	Champion Mine, Dun Mountains, Nelson, New Zealand.	J. S. Maclaurin.	J. M. Bell, N. Z. G. S. B. 12, p. 36, 1911.	Diabase.	
6	II(III).5.4.3(4).	Q 2.16 di 8.64 or 8.90 hy 8.20 ab 13.62 mt 9.74 an 39.75 il 5.47 hm 1.60 ap 0.67	Sepia Temple, Vaisigan Valley, Upolu Island, Samoa.	A. Dieseldorff.	F. M. Möhle, N. J. B. B., XV, p. 99, 1902.	Basalt.	

SUBRANG 4-5. PRESODIC. HESSOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(1)II.5″.4″.(4)5.	or 2.78 di 3.80 ab 13.62 ol 4.37 an 63.66 mt 3.48 ne 6.25 il 3.65 ap 0.34	Brome Mountain, Quebec.	M. F. Connor.	J. A. Dresser, Can. G. S. A. R. XVI (1904), p. 10 G, 1906.	Essexite.	Also in A. J. S., XVII, p. 352, 1904.
2	II.(4)5.″4.4″.	Q 8.82 di 3.78 or 6.12 hy 16.05 ab 27.77 mt 0.46 an 35.03 il 0.76 ap 0.34	Onaping, Sudbury, Ontario.	E. G. R. Ardagh.	A. P. Coleman, J. G., XV, p. 770, 1907.	Norite?	
3	II.5.4.4″.	Q 1.86 hy 25.97 or 4.45 mt 0.70 ab 22.53 il 2.58 an 39.75 ap 0.34	Blezard Mine, Sudbury, Ontario.	T. L. Walker.	T. L. Walker, Q. J. G. S., LIII, p. 56, 1897.	Diabase.	In W. T., p. 287.
4	II(III).5.4″.4(5).	Q 3.18 di 15.24 or 2.22 hy 17.86 ab 13.62 mt 1.39 an 44.48 il 0.76	Kerr Lake Mine, Cobalt, Ontario.	R. E. Hore.	R. E. Hore, J. G., XVIII, p. 275, 1910.	Quartz diabase.	
5	II(III).5.4.(4)5.	or 2.78 di 6.56 ab 20.96 ol 25.13 an 36.97 mt 3.94 ne 1.99	Ottertail Creek, Nipissing District, Ontario.	F. G. Wait.	G. C. Hoffman, Can. G. S. A. R. IX (1896), p. 20 R, 1898.	Quartz diorite gneiss.	In W. T., p. 287.
6	II.″5.(3)4.4″.	Q 5.04 di 3.19 or 6.12 hy 16.83 ab 27.25 mt 3.48 an 32.80 il 2.13 ap 0.34	East Clarendon, Vermont.	H. N. Stokes.	C. L. Whittle, U. S. G. S. B. 148, p. 71, 1897.	Hornblende granite.	In W. T., p. 287.
7	II″.5.′4.(4)5.	or 3.89 di 13.97 ab 25.68 ol 9.07 an 36.97 mt 3.02 ne 1.99 il 3.80 ap 1.34	Tripyramid Mountain, Waterville, New Hampshire.	C. J. Monahan.	L. V. Pirsson, A. J. S., XXXI, p. 418, 1911.	Ossipite (gabbro).	
8	II.5.4.4.⊙	or 8.34 di 10.80 ab 18.60 ol 4.94 an 40.03 mt 6.26 il 8.06 ap 0.34	Nahant, Essex County, Massachusetts.	H. S. Washington.	H. S. Washington, J. G., VII, p. 63, 1899.	Gabbro.	In W. T., p. 287.
9	II.5.(3)4.4.	or 9.45 di 9.88 ab 26.72 hy 5.85 an 34.75 ol 6.41 mt 2.32 il 2.28 ap 0.34	Prospect Hill, Litchfield, Connecticut.	W. F. Hillebrand.	W. H. Hobbs, Fests. Rosenb., p. 30, 1906.	Hornblende gabbro.	

CLASS II. DOSALANE—Continued.

RANG 4. DOCALCIC. HESSASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
10	47.97	17.41	2.06	9.09	5.93	9.12	3.08	0.85	1.11	0.30	2.10	0.37	0.10	CO_2 0.43	99.92	
A2. II	.800	.171	.013	.126	.148	.163	.050	.009			.026	.003	.001			
11	56.94	20.82	0.83	3.02	2.36	9.41	3.36	1.58	0.59	0.21	0.44	0.07	0.11	CO_2 0.45 S trace Cr_2O_3 trace NiO trace BaO 0.05 SrO trace	100.24	
A2. II	.949	.204	.005	.042	.059	.168	.054	.017			.006	——	.002			
12	53.18	23.25	1.53	1.82	2.60	11.18	3.97	0.86	0.98	0.15	0.45	0.09	0.11	CO_2 0.34 S trace BaO trace	100.51	
A2. II	.886	.228	.009	.025	.065	.200	.064	.009			.006	——	.002			
13	47.88	18.90	1.39	10.45	7.10	8.36	2.75	0.81	0.43	0.18	1.20	0.20	0.16	CO_2 0.12 S 0.07 Cr_2O_3 trace V_2O_3 trace NiO 0.02 BaO trace SrO trace	100.02	3.090
A1. I	.798	.185	.009	.145	.178	.149	.044	.008			.015	.001	.002			
14	46.10	18.66	3.00	9.58	6.71	8.26	2.57	1.59	0.18	0.10	2.88	0.70		Cl 0.02 S 0.18 BaO trace SrO trace	100.53	
A2. II	.768	.183	.019	.133	.168	.147	.042	.017			.036	.005			(100.52)	
15	45.91	19.83	2.91	8.09	5.13	9.32	2.78	1.23	0.40	0.14	2.71	1.03	0.07	CO_2 0.04 Cl 0.08 S 0.35 Cr_2O_3 0.01	100.03	
A1. I	.765	.195	.018	.113	.128	.166	.045	.013			.034	.007	.001			
16	52.97	23.27	1.31	3.31	2.20	10.08	4.09	0.62	0.69	0.53	0.38	0.22	0.19	CO_2 0.12	100.12	
A2. II	.883	.228	.008	.046	.055	.180	.066	.007			.005	.002	.003			
17	54.03	16.71	1.37	7.70	5.66	8.84	2.99	0.67	0.53	0.14	0.84	0.13	0.13	CO_2 0.40 S 0.09 Cr_2O_3 trace NiO trace BaO trace SrO trace	100.23	
A2. II	.901	.164	.009	.107	.142	.158	.048	.007			.011	.001	.002			
18	49.67	18.19	0.33	12.84	2.12	9.70	2.74	0.34	0.74	0.15	2.01	0.58	0.37	CO_2 none ZrO_2 trace S 0.32 BaO trace	100.10	
A2. II	.828	.178	.002	.178	.053	.173	.044	.004			.025	.004	.005			
19	44.04	20.01	4.22	8.61	5.01	11.68	1.24	0.15	1.90	0.11	2.24	0.52	0.28	CO_2 none ZrO_2 0.10 FeS_2 0.25 Cr_2O_3 none V_2O_3 0.05 NiO 0.01 BaO none SrO none	100.42	
A1. I	.736	.196	.026	.119	.125	.209	.024	.002			.028	.004	.004			
20	44.54	20.72	5.84	7.30	5.56	12.67	1.49	0.24	0.54	0.38	0.40		0.17	S 0.19 BaO 0.09	100.13	
A2. II	.742	.203	.037	.101	.139	.227	.024	.003			.005		.002			
21	49.80	19.96	6.32	0.49	7.05	11.33	2.22	0.61	1.71	0.13	0.79	0.07		CO_2 0.15	100.63	
A2. II	.830	.195	.039	.007	.176	.201	.035	.006			.010					
22	49.88	18.55	2.06	8.37	5.77	9.72	2.59	0.68	1.04		1.19	0.16	0.09	Cl trace BaO 0.02 SrO trace	100.12	2.923
A1. I	.831	.182	.013	.117	.144	.173	.042	.007			.015	.001	.001			
23	48.29	20.87	1.13	4.93	7.54	14.32	1.77	0.38	0.89						100.12	
A3. III	.805	.204	.007	.068	.189	.255	.029	.004								

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4-5. PRESODIC. HESSOSE—Continued.

No.	Symbol.	Norm.		Locality.	Analyst.	Reference.	Rock name.	Remarks.
10	II(III).5.(3)4.4(5).	or 5.00 ab 26.20 an 31.14	di 9.40 hy 9.62 ol 8.85 mt 3.02 il 3.95 ap 1.01	Prospect Hill, Litchfield, Connecticut.	W. F. Hillebrand.	W. H. Hobbs, Ros. Fests, p. 37, 1906.	Hornblende diorite.	
11	″II.(4)5.(3)4.4.	Q 7.80 or 9.45 ab 28.30 an 36.97	di 7.98 hy 6.34 mt 1.16 il 0.91	Elizabethtown, Essex County, New York.	W. F. Hillebrand.	J. F. Kemp, U. S. G. S. B. 168, p. 37, 1900.	Pyroxenic anorthosite.	In W. T., p. 287.
12	″II.5.″4.(4)5.	Q 0.60 or 5.00 ab 33.54 an 43.09	di 9.94 hy 3.36 mt 2.09 il 0.91	Whiteface Mountain, Adirondacks, New York,	G. Steiger.	J. F. Kemp, U. S. G. S. B. 168, p. 36, 1900.	Gabbro.	In W. T., p. 287.
13	II(III).5.4.4″.	or 4.45 ab 23.06 an 36.77	di 2.97 hy 11.31 ol 15.62 mt 2.09 il 2.28 ap 0.34	Westport, Essex County, New York.	W. F. Hillebrand.	J. F. Kemp, U. S. G. S. A. R. 19, (III), p. 402, 1899.	Gabbro.	In W. T., p. 287.
14	II″.5.″4.4.	or 9.45 ab 22.01 an 34.47	di 1.36 hy 7.50 ol 13.77 mt 4.41 il 5.47 ap 1.68	Montrose Point, n. Peekskill, New York.	G. S. Rogers.	G. S. Rogers, Ann. N. Y. Ac. Sci., XXI, p. 61, 1911.	Biotite norite.	Also in A. J. S., XXXI, p. 127, 1911.
15	II.5.4.4.⊙	or 7.23 ab 23.58 an 38.09	di 1.36 hy 8.36 ol 8.51 mt 4.18 il 5.17 ap 2.35	Montrose, n. Peekskill, New York.	G. S. Rogers.	G. S. Rogers, Ann. N. Y. Ac. Sci., XXI, p. 62, 1911.	Hornblende norite.	
16	(I)II.5.″4.(4)5.	Q 1.56 or 3.89 ab 34.58 an 43.09	di 4.11 hy 8.23 mt 1.86 il 0.76 ap 0.67	Lake Hopatcong quadrangle, New Jersey.	W. T. Schaller.	W. S. Bayley, U. S. G. S. B. 419, p. 29, 1910.	Augitic granite.	
17	II(III).″5.″4.4(5).	Q 4.56 or 3.89 ab 25.15 an 30.30	di 10.52 hy 20.77 mt 2.09 il 1.67 ap 0.34	Bryn Mawr, n. Philadelphia, Pennsylvania.	W. F. Hillebrand.	F. Bascom, U. S. G. S. Fol. 162, p. 6, 1909.	Hypersthene gabbro.	
18	II(III).5.4.″5.	Q 2.46 or 2.25 ab 23.06 an 36.14	di 7.18 hy 22.19 mt 0.46 il 3.80 ap 1.34	Fontaine, Pennsylvania.	W. T. Schaller.	F. Bascom, U. S. G. S. rec. lab.	Gabbro gneiss.	Igneous?
19	II(III).5.4(5).″5.	Q 1.20 or 1.11 ab 12.58 an 47.26	di 5.91 hy 18.72 mt 6.03 il 4.26 ap 1.34	Rising Sun, Cecil County, Maryland.	W. F. Hillebrand.	A. G. Leonard, A. G., XXVIII, p. 146, 1901.	Hornblende diorite.	In W. T., p. 293.
20	II(III).5.4(5).(4)5.	or 1.67 ab 12.58 an 48.03	di 11.53 hy 11.29 ol 3.67 mt 8.58 il 0.76	Gold Hill District, Rowan County, North Carolina.	F. B. Lanery.	F. B. Lanery, N. C. G. S. B. 21, p. 60, 1910.	Hornblende gabbro.	
21	II″.5.4.4(5).	Q 3.18 or 3.34 ab 18.34 an 42.81	di 9.50 hy 13.20 il 1.06 hm 6.32 tn 0.59	Crystal Falls, Michigan.	G. Steiger.	J. M. Clements, J. G., VI, p. 381, 1898.	Hornblende gabbro.	Also in U. S. G. S. Mon. 36, p. 242, 1899. In W. T., p. 287.
22	II(III).5.4.4(5).	or 3.89 ab 22.01 an 36.97	di 8.44 hy 22.13 mt 3.02 il 2.28 ap 0.34	Pigeon Point, Minnesota.	W. F. Hillebrand.	W. S. Bayley, A. J. S., XXXVII, p. 61, 1889.	Olivine gabbro.	Also in U. S. G. S. B. 109, p. 37, 1893. In W. T., p. 287.
23	II(III).5.4″.(4)5.	or 2.22 ab 15.20 an 47.54	di 18.81 hy 3.02 ol 10.72 mt 1.62	Minnesota Falls, Yellow Medicine County, Minnesota.	H. N. Stokes.	W. S. Bayley, U. S. G. S. B. 150, p. 372, 1898.	Gabbro gneiss.	In W. T., p. 287.

CLASS II. DOSALANE—Continued.

RANG 4. DOCALCIC. HESSASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
24	46.45	21.30	0.81	9.57	7.90	9.83	2.14	0.34	1.02	0.14	1.19	0.02	trace	NiO 0.04	100.75	
A2. II	.774	.209	.005	.134	.195	.175	.034	.003			.015	—	—			
25	47.90	19.92	4.92	9.78	4.55	8.56	2.75	0.56	0.76		0.57			BaO none SrO none	100.39	2.93
A3. III	.798	.195	.031	.137	.114	.153	.045	.006			.007					
26	47.70	19.04	0.87	8.84	8.65	8.96	2.53	0.53	1.38		1.80		trace	BaO none SrO none	100.30	2.89
A3. III	.795	.186	.006	.123	.216	.160	.040	.005			.023		—			
27	48.68	19.29	4.07	8.31	5.52	7.78	3.49	1.16	0.16	0.10	1.70	0.05			100.31	
A2. II	.811	.189	.025	.115	.136	.139	.056	.013			.021	—				
28	47.82	18.52	6.39	3.15	8.20	11.09	1.67	0.17	1.53	0.66	0.78	0.05	0.12	CO_2 0.17 S 0.04 Cr_2O_3 0.03 BaO 0.02 SrO none CuO trace	100.41	2.898
A1. I	.797	.182	.040	.040	.205	.198	.027	.002			.010	—	.002			
29	49.30	19.53	3.18	6.36	5.02	7.53	2.81	2.39	2.38	0.20	1.18	0.25	0.11		100.24	
A2. II	.823	.191	.020	.089	.126	.134	.045	.026			.015	.002	.002			
30	47.44	18.21	5.37	6.05	5.53	9.98	2.58	1.17	1.08	0.13	1.38	0.68	0.06	CO_2 none S 0.03 Cr_2O_3 none NiO none BaO 0.08 SrO 0.08	99.85	
A1. I	.791	.179	.034	.084	.138	.179	.042	.013			.018	.005	.001			
31	48.49	18.35	7.63	1.21	6.72	10.40	3.02	0.57	0.67		2.19	0.20	none	SO_3 0.52 Li_2O 0.02	99.99	
A2. II	.808	.180	.048	.015	.168	.185	.048	.006			.027	.001	—			
32	47.17	17.85	7.42	1.18	6.54	10.12	2.94	0.56	0.65		2.13	0.20	none	SO_3 0.51 Li_2O 0.02 Iron 3.26	100.55	
A2. II	.786	.175	.046	.015	.166	.180	.047	.006			.025	.001	—			
33	52.09	21.35	2.26	5.82	2.57	8.17	3.28	1.81	0.53	0.57	1.47	0.61	0.18	CO_2 trace ZrO_2 0.02 BaO 0.06 SrO 0.02	100.83	
A1. I	.868	.209	.014	.081	.064	.146	.053	.019			.017	.004	.003			
34	52.05	17.96	4.09	6.33	5.03	8.64	2.99	1.61	0.97			0.31	0.43		100.41	2.891
A2. II	.868	.176	.025	.088	.126	.154	.048	.017				.002	.006			
35	47.94	22.56	2.02	4.77	2.08	12.08	4.02	0.84	1.30	0.24	1.12	0.25	0.11	CO_2 0.16 ZrO_2 0.02 F 0.14 S 0.03 BaO 0.39 SrO 0.31	100.38	
A1. II	.799	.221	.013	.067	.052	.216	.065	.009			.014	.002	.002			
36	50.23	19.46	4.21	4.20	3.59	10.39	3.08	1.32	1.01	0.16	1.30	0.41	0.07	CO_2 0.25 S 0.02 BaO 0.04 SrO trace Li_2O trace	99.74	
A1. I	.837	.191	.026	.058	.090	.185	.050	.014			.016	.003	.001			
37	51.08	19.77	trace	3.60	4.57	16.03	2.56	0.28	0.65	0.15	0.45	0.14	0.09	CO_2 0.32 BaO trace SrO trace	99.69	
A2. II	.851	.194	—	.050	.114	.286	.041	.003			.006	.001	.001			
38	49.41	18.08	5.93	4.08	4.61	10.10	3.48	1.01	1.59	0.04	0.95		0.09		99.37	
A2. II	.824	.187	.037	.057	.115	.180	.056	.011			.012		.001		(99.77)	

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4-5. PRESODIC. HESSOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
24	II″.5.4″.″5.	or 1.67, ab 17.82, an 47.82, di 0.68, hy 10.62, ol 17.51, mt 1.16, il 2.28	St. Louis County, Minnesota.	H. N. Stokes.	W. S. Bayley, J. G., I, p. 712, 1893.	Gabbro.	In W. T., p. 287.
25	II″.5.4.(4)5.	or 3.34, ab 23.58, an 40.03, di 2.07, hy 19.30, ol 3.06, mt 7.19, il 1.06	Birch Lake, Minnesota.	A. N. Winchell.	A. N. Winchell, A. G., XXVI, p. 374, 1900.	Diabase.	Incorrect on p. 184, op. cit. In W. T., p. 287.
26	II(III).5.4.(4)5.	or 2.78, ab 20.96, an 39.20, di 4.29, hy 13.05, ol 13.70, mt 1.39, il 3.50	Birch Lake, Minnesota.	A. N. Winchell.	A. N. Winchell, A. G., XXVI, p. 181, 1900.	Olivine gabbro.	In W T., p. 289.
27	II.5.(3)4.4.	or 7.23, ab 29.34, an 32.36, di 4.32, hy 7.97, ol 9.20, mt 5.80, il 3.19	Taylors Falls, Minnesota.	C. A. Taylor.	F. F. Grout, J. G., XVIII, p. 647, 1910.	Diabase.	
28	II(III).″5.4″.″5.	Q 4.02, or 1.11, ab 14.15, an 42.45, di 9.72, hy 16.00, mt 6.96, il 1.52, hm 1.60	Tamarack Falls, Pine County, Minnesota.	F. F. Grout.	F. F. Grout, J. G., XVIII, p. 644, 1910.	Diabase.	
29	II.5.(3)4.(3)4.	or 14.46, ab 23.58, an 33.36, di 1.57, hy 12.19, ol 5.12, mt 4.64, il 2.28, ap 0.67	Mount Devon, Missouri.	W. F. Hillebrand.	A. Johannsen, pers. com.	Devonite (diabase porphyry).	Anal. E. in U. S. G. S. B. 419, p. 40, is of groundmass. Cf. p. 871.
30	II(III).5.4.4.	Q 0.12, or 7.23, ab 22.01, an 35.03, di 8.00, hy 14.33, mt 7.89, il 2.74, ap 1.68	Black Butte, Elkhorn District, Montana.	H. N. Stokes.	J. S. Barrell, U. S. G. S. A. R. 22, (II), p. 514, 1901.	Gabbro.	
31	II(III).5.4.(4)5.	Q 0.48, or 3.34, ab 25.15, an 35.03, di 9.50, hy 12.40, il 2.28, hm 7.63, tn 2.35, ap 0.34	Prospect Peak, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32, (2), p. 438, 1899.	Basalt.	Calculated to 100, as free from 3.26 metallic Fe. Cf. No. 32. In W. T., p. 289.
32	II(III).5.4.(4)5.	Q 0.18, or 3.34, ab 24.63, an 33.92, di 9.72, hy 12.10, il 2.28, hm 7.42, tn 1.96, ap 0.34, Fe 3.26	Prospect Peak, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. B. 148, p. 135, 1897.	Basalt.	Cf. preceding. In W. T., p. 333.
33	II.5.(3)4.4.	Q 3.18, or 10.56, ab 27.77, an 36.97, C 0.41, hy 13.40, mt 3.45, il 2.58, ap 1.34	Trout Creek, San Cristobal quadrangle, Colorado.	G. Steiger.	W. Cross, U. S. G. S. rec. lab.	Diorite porphyry.	
34	II.5.4″.4.	Q 0.96, or 9.45, ab 25.15, an 33.36, di 6.12, hy 18.72, mt 5.80, ap 0.67	Stony Mountain, Ouray County, Colorado.	L. G. Eakins.	W. Cross. U. S. G. S. Fol. 57, p. 7, 1899.	Gabbro.	In W. T., p. 289.
35	II.5″.4.4″.	or 5.00, ab 22.53, an 40.87, ne 6.25, di 15.43, ol 2.27, mt 3.02, il 2.13, ap 0.67	Beaver Creek, Uncompahgre quadrangle, Colorado.	G. Steiger.	E. S. Larsen, U. S. G. S. rec. lab.	Nephelite gabbro.	
36	II.5.″4.4.	Q 2.52, or 7.78, ab 26.20, an 35.31, di 10.63, hy 6.19, mt 6.03, il 2.43, ap 1.01	Yentna River, n. Hayes River, Alaska.	H. N. Stokes.	J. E. Spurr, A. G., XXV, p. 233, 1900.	Augite belugite.	In W. T., p. 289.
37	II″.5.4.″5.	or 1.67, ab 21.48, an 41.70, di 29.95, ol 0.80, il 0.91, ap 0.34	Hedley District, British Columbia.	M. F. Connor.	C. Camsell, Can. G. S. Mem. 2, p. 83, 1910.	Gabbro.	
38	II.5.(3)4.4″.	or 6.12, ab 29.34, an 33.36, di 13.09, hy 6.13, ol 0.31, mt 8.58, il 1.82	Olivine Mountain, Tulameen District, British Columbia.	M. F. Connor.	C. Camsell, Can. G. S. rec. lab.	Gabbro.	

CLASS II. DOSALANE—Continued.

RANG 4. DOCALCIC. HESSASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
39	47.76	18.58	2.19	9.39	4.15	9.39	3.61	0.47	0.53	0.12	2.20	0.78	0.29	BaO 0.02 SrO 0.03	99.51	2.957
A2. II	.796	.182	.014	.131	.104	.168	.058	.005			.028	.005	.004			
40	51.98	15.99	3.10	5.88	5.09	9.68	2.71	0.81	2.08	0.48	1.71	0.31	0.10	S 0.01 Cr_2O_3 none NiO none BaO 0.03 SrO none	99.96	
A1. I	.867	.157	.019	.082	.127	.173	.043	.009			.021	.002	.001			
41	58.25	20.52	0.68	3.88	2.03	7.88	4.25	0.50	1.10	0.24	0.57	0.16	0.10	CO_2 none ZrO_2 0.01 S none BaO none SrO none	100.17	
A1. I	.971	.201	.004	.054	.051	.141	.069	.005			.007	.001	.001			
42	55.53	17.63	2.81	3.59	5.85	8.74	3.09	0.92	1.24		0.56	0.21	0.08	BaO 0.02 SrO 0.06 Li_2O none	100.33	
A1. I	.926	.173	.017	.050	.146	.158	.050	.010			.007	.001	.001			
43	53.91	17.95	2.21	4.80	5.52	10.40	2.90	1.34	0.20	0.20	0.52	0.21	0.10	BaO 0.05 SrO trace Li_2O trace	100.31	
A2. II	.899	.176	.014	.067	.138	.185	.047	.015			.007	.001	.001			
44	52.81	16.60	2.66	6.13	6.12	10.14	2.79	1.05	0.54	0.38	0.84	0.23		BaO 0.03 SrO trace Li_2O trace	100.32	
A2. II	.880	.163	.017	.085	.153	.181	.045	.011			.011	.002				
45	51.21	17.59	4.71	4.42	7.12	10.36	2.49	0.91	1.07	0.58	0.31	0.09	trace	BaO none Li_2O none	100.86	
A2. II	.854	.172	.029	.061	.178	.185	.040	.010			.004	——	——			
46	55.14	19.10	6.16	0.54	4.23	8.36	3.71	1.04	0.91		0.52	0.18	0.11	BaO trace SrO 0.07 Li_2O trace	100.07	
A2. II	.919	.187	.039	.007	.106	.150	.059	.001			.007	.001	.002			
47	53.85	18.53	1.96	5.30	5.88	9.66	2.98	0.74	0.45		0.50	0.05	0.12	Cr_2O_3 trace BaO 0.03 SrO 0.04 Li_2O trace	100.09	
A1. I	.898	.181	.012	.074	.147	.172	.048	.008			.006	——	.002			
48	53.35	19.22	3.28	4.48	4.86	9.76	2.89	0.99	0.77		0.56	0.10	0.15	BaO trace SrO 0.03 Li_2O trace	100.44	
A2. II	.889	.188	.021	.063	.122	.174	.047	.011			.007	.001	.002			
49	52.95	18.25	4.36	4.19	4.93	8.73	3.57	0.77	1.47		0.66	trace	0.12	SO_3 trace BaO 0.01 SrO trace	100.01	
A2. II	.883	.179	.027	.058	.123	.155	.058	.008			.008	——	.002			
50	52.65	17.81	2.08	6.35	5.35	9.03	2.85	0.50	3.08	0.21				CO_2 trace	99.91	
A3. III	.878	.175	.013	.089	.134	.161	.046	.005								
51	47.94	18.90	2.21	8.59	8.21	9.86	2.81	0.29	0.74	0.39	0.57	0.15	trace	BaO none SrO none Li_2O trace	100.66	
A2. II	.799	.185	.014	.120	.205	.176	.045	.003			.007	.001	——			
52	50.77	19.40	4.43	5.59	5.25	9.81	2.64	0.30	0.41	1.30	0.28	0.18			100.36	2.79
A2. II	.846	.190	.028	.078	.131	.175	.042	.003			.004	.001				
53	47.27	20.82	1.85	4.26	6.44	13.02	2.75	0.22	1.27	0.08	0.92	0.74	trace	CO_2 none Cl trace FeS_2 0.20 Cr_2O_3 trace V_2O_3 0.02 NiO none BaO none SrO trace	99.86	
A1. I	.788	.204	.012	.059	.161	.232	.045	.002			.012	.005	——			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4-5. PRESODIC. HESSOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
39	II″.5.(3)4.″5.	or 2.78 ab 30.39 an 33.08 di 7.39 hy 7.72 ol 8.33 mt 3.25 il 4.26 ap 1.67	Ashnola River, Okanagan range, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38 (1), p. 435, 1912.	Gabbro.	
40	II(III).(4)5.″4.4″.	Q 6.84 or 5.00 ab 22.53 an 29.19 di 13.66 hy 11.80 mt 4.41 il 3.19 ap 0.67	Camas Land, Kittitas County, Washington.	H. N. Stokes.	G. O. Smith, U. S. G. S. Fol. 106, p. 6, 1904.	Gabbro.	In W. T., p. 289.
41	(I)II.(4)5.(3)4.″5.	Q 10.02 or 2.78 ab 36.15 an 35.31 di 2.54 hy 9.65 mt 0.93 il 1.12 ap 0.34	Riddles quadrangle, Oregon.	G. Steiger.	G. F. Kay, U. S. G. S. B. 419, p. 167, 1910.	Granodiorite.	
42	II.(4)5.(3)4.4″.	Q 7.50 or 5.56 ab 26.20 an 31.41 di 9.29 hy 13.74 mt 3.94 il 1.06 ap 0.34	Butte Mountain, Plumas County, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 148, p. 195, 1897.	Pyroxene andesite.	In W. T., p. 289.
43	II″.5.(3)4.4.	Q 2.76 or 8.34 ab 24.63 an 31.69 di 15.23 hy 12.66 mt 3.25 il 1.06 ap 0.34	Mount Ingalls, Plumas County, California.	W. F. Hillebrand.	H. W. Turner, A. J. S., XLIV, p. 458, 1892.	Basalt.	Also in U. S. G. S. A. R. 14 (II), p. 492, 1894. In W. T., p. 289.
44	II(III).5.(3)4.4.	Q 3.18 or 6.12 ab 23.58 an 29.75 di 15.05 hy 15.55 mt 3.94 il 1.67 ap 0.67	Mount Ingalls, Plumas County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 14, (II), p. 492, 1894.	Basalt.	In W. T., p. 289.
45	II(III).5.4.4.	Q 2.46 or 5.56 ab 20.96 an 33.92 di 13.90 hy 14.91 mt 6.73 il 0.61	Franklin Hill, Plumas County, California.	G. Steiger.	H. W. Turner, U. S. G. S. A. R. 17, (I), p. 734, 1896.	Basalt.	In W. T., p. 289.
46	II.(4)5.(3)4.4″.	Q 7.74 or 6.12 ab 30.92 an 32.53 di 6.48 hy 7.60 mt 0.46 il 1.06 hm 5.92 ap 0.34	Lassen Peak, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 150, p. 218, 1898.	Secretion in dacite.	Cf. No. 92, I.4.2.4. In W. T., p. 289.
47	II″.5.4.4(5).	Q 3.60 or 4.45 ab 25.15 an 34.75 di 10.57 hy 17.24 mt 2.78 il 0.91	Crater Peak, n. Lassen Peak, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 148, p. 197, 1897.	Hypersthene andesite.	Secretion in No. 76, II.4.3.4. In W. T., p. 289.
48	II.″5.4.4.	Q 4.80 or 6.12 ab 24.63 an 36.14 di 9.18 hy 12.80 mt 4.64 il 1.06 ap 0.34	Chaos, Lassen Peak, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 148, p. 194, 1897.	Secretion in dacite.	Cf. No. 91, I.4.2.4. In W. T., p. 289.
49	II.″5.″4.″5.	Q 4.26 or 4.45 ab 30.39 an 31.41 di 9.29 hy 11.18 mt 6.26 il 1.22	Crater Peak, n. Lassen Peak, California.	R. B. Riggs.	J. S. Diller, U. S. G. S. B. 148, p. 200, 1897.	Basalt.	In W. T., p. 289.
50	II″.″5.4.(4)5.	Q 4.62 or 2.78 ab 24.10 an 34.47 di 8.44 hy 19.28 mt 3.02	Butcher Creek, Shasta County, California.	R. C. Wells.	B. S. Butler, U. S. G. S. B. 419, p. 138, 1910.	Diabase.	
51	II(III).5.4.5.	or 1.67 ab 23.58 an 38.09 di 8.16 hy 6.84 ol 16.56 mt 3.25 il 1.06 ap 0.34	McCloud River, n. Mount Shasta, California.	H. N. Stokes.	J. S. Diller, U. S. G. S. B. 148, p. 190, 1897.	Basalt.	In W. T., p. 289.
52	II.″5.4.″5.	Q 4.92 or 1.69 ab 22.01 an 40.31 di 6.05 hy 16.25 mt 6.50 il 0.61 ap 0.34	Pie Knob, Berkeley Hills, California.	Blasdale.	Lawson and Palache, Un. Cal. Dep. G. B., II, p. 434, 1901.	Basalt.	
53	II.5.4.5.⊙	or 1.12 ab 23.58 an 43.65 di 13.09 hy 1.16 ol 9.52 mt 2.78 il 1.82 ap 1.68	Beaver Creek, Tuolumne County, California.	H. N. Stokes.	H. W. Turner, A. J. S., VII, p. 297, 1899.	Gabbro.	In W. T., p. 291.

CLASS II. DOSALANE—Continued.

RANG 4. DOCALCIC. HESSASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
54	50.38	19.83	6.05	2.00	5.36	10.03	2.15	1.76	1.37		none	none	0.38	SO_3 0.83 Li_2O trace		
A2. II	.840	.194	.038	.028	.134	.178	.033	.019			—	—	.005			
55	47.09	18.40	2.66	5.62	7.06	10.19	2.37	1.34	2.37	0.66	1.19	0.54	none	CO_2 none S 0.03 BaO 0.17	99.69	
A2. II	.785	.180	.017	.078	.177	.182	.039	.014			.015	.004	—			
56	52.63	19.95	3.26	4.26	6.95	8.31	2.80	0.89	0.43	0.08	1.13	none		S trace	100.69	
A2. II	.877	.195	.020	.059	.174	.148	.045	.010			.014	—				
57	52.39	18.10	0.51	7.43	7.46	8.22	3.45	0.86	0.57	0.10	1.36	none		S trace	100.45	
A2. II	.873	.177	.003	.103	.162	.146	.056	.009			.017	—				
58	51.57	18.74	2.23	7.27	7.02	8.58	2.95	0.84	0.33	0.62	0.92	none		S trace	100.57	
A2. II	.860	.184	.014	.101	.176	.154	.048	.009			.012	—				
59	48.03	20.98	7.06	4.51	4.43	9.54	3.28	1.99	0.40	0.21					100.43	
A3. III	.801	2.06	.044	.063	.111	.170	.053	.021							(100.49)	
60	51.04	17.34	2.88	7.33	5.50	9.79	2.88	0.53	0.72	0.96	1.32	0.25	0.13	CO_2 none	100.67	
A2. II	.851	.170	.018	.101	.135	.175	.047	.006			.017	.002	.002			
61	48.94	18.77	4.89	4.77	1.59	11.50	2.13	1.14	1.46	2.32	1.34	0.28	0.83		99.96	
A2. II	.816	.184	.031	.067	.040	.205	.034	.012			.017	.002	.012			
62	57.10	16.24	2.45	3.76	7.49	9.65	2.74	1.11	n. d.		0.52	0.08			100.92	
A2. III	.952	.159	.015	.052	.187	.172	.044	.012			.007	—				
63	47.51	20.80	4.30	5.31	8.18	10.70	1.65	0.30	0.25		0.71	trace			99.71	
A3. III	.792	.027	.027	.074	.205	.191	.027	.003			.009	—				
64	47.15	22.30	2.22	6.93	5.15	12.30	1.81	0.35	1.00		0.90	0.19			100.30	
A2. II	.786	.219	.014	.096	.129	.220	.029	.004			.012	.001			(100.11)	
65	46.60	22.30	4.56	4.89	6.39	11.50	2.17	0.38	0.69		1.15				100.63	
A3. III	.777	.218	.029	.068	.160	.205	.035	.004			.014					
66	56.71	18.80	3.12	5.35	3.62	8.06	3.65	0.77	0.11		0.77	0.08			100.95	
B2. III	.945	.184	.019	.075	.091	.144	.059	.008			.010	—				
67	53.51	18.90	3.37	5.70	4.38	9.15	3.13	0.51	0.12		1.06				99.79	
A3. III	.892	.185	.021	.079	.110	.164	.050	.005			.013					
68	47.15	22.30	2.22	6.93	5.15	12.30	1.81	0.35	1.00		0.90	0.19			100.30	
A2. II	.786	.219	.014	.096	.129	.220	.029	.004			.012	.001			(100.20)	

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4-5. PRESODIC. HESSOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
54	II.5.4.(3)4.	Q 4.44 di 7.78 or 10.56 hy 9.80 ab 17.29 mt 7.66 an 39.48 pr 0.90	Richmond Mountain, Eureka District, Nevada.	J. E. Whitfield.	Hague and Iddings, U. S. G. S. Mon. 20, p. 264, 1892.	Basalt.	In W. T., p. 291.
55	II″.5.4.4.	or 7.78 di 9.33 ab 20.44 hy 8.21 an 35.31 ol 7.98 mt 3.94 il 2.28 ap 1.34	Crater, Silver Peak, Nevada.	G. Steiger.	J. E. Spurr, U. S. G. S. P. P. 55, p. 28, 1906.	Basalt.	
56	II.5.4.4″.	Q 3.60 di 1.76 or 5.56 hy 19.86 ab 23.58 mt 4.64 an 38.92 il 2.13	Volcancito, Jorullo, Mexico.	F. Roel.	E. Ordonez, Cong. G. Int. X, Guide XI, p. 55, 1906.	Basalt.	
57	II″.5.(3)4.4(5).	or 5.00 di 7.72 ab 29.34 hy 18.92 an 31.14 ol 3.25 mt 0.70 il 2.58	Malpais, Jorullo, Mexico.	F. Roel.	E. Ordonez, Cong. G. Int. X, Guide XI, p. 55, 1906.	Basalt.	
58	II(III).5.4.4″.	or 5.00 di 6.09 ab 25.15 hy 21.49 an 35.31 ol 2.22 mt 3.25 il 1.82	Malpais, Jorullo, Mexico.	F. Roel.	E. Ordonez, Cong. G. Int. X, Guide XI, p. 55, 1906.	Basalt.	
59	II.5.″4.″4.	or 11.68 di 8.59 ab 24.10 ol 6.66 an 36.70 mt 10.21 ne 1.99	San José, Tamaulipas, Mexico.	G. I. Finlay.	G. I. Finlay, Ann. N. Y. Ac. Sci., XIV, p. 278, 1904.	Basalt.	
60	II(III).5.″4.(4)5	Q 2.70 di 11.56 or 3.34 hy 16.83 ab 24.63 mt 4.18 an 32.53 il 2.58 ap 0.67	Gold Hill, Canal Zone, Panama.	G. Steiger.	D. F. McDonald, U. S. G. S. rec. lab.	Lava.	
61	II.(4)5.4.4.	Q 7.98 di 13.79 or 6.67 hy 1.26 ab 17.82 mt 7.19 an 38.36 il 2.58 ap 0.67	Empire, Canal Zone, Panama.	C. Palmer.	D. F. McDonald, U. S. G. S. rec. lab.	Andesite.	
62	II(III).(4)5.(3)4.4.	Q 7.44 di 15.19 or 6.67 hy 15.47 ab 23.06 mt 3.48 an 28.63 1. il 1.06	Pointe Burgos, Martinique, West Indies.	Pisani.	A. Lacroix, Mont Pelée, p. 573, 1904.	Quartz basalt.	
63	II(III).5.4(5).″5.	Q 0.24 di 3.77 or 1.67 hy 23.72 ab 14.15 mt 6.26 an 48.37 il 1.37	Ilot des Ramiers, Martinique, West Indies.	Pisani.	A. Lacroix, Mont Pelée, p. 573, 1904.	Basalt.	
64	II.5.4(5).(4)5.	or 2.22 di 7.72 ab 15.20 hy 14.51 an 51.71 ol 2.83 mt 3.25 il 1.82	Rivière Claire, Mont Pelée, Martinique, West Indies.	Pisani.	A. Lacroix, Mont Pelée, p. 543, 1904.	Hornblende norite.	Locality? Same analysis as No. 68, below.
65	II.5.4″.(4)5.	or 2.22 di 5.72 ab 18.34 hy 11.18 an 49.76 ol 3.86 mt 6.73 il 2.13	La Calabasse, Mont Pelée, Martinique, West Indies.	Pisani.	A. Lacroix, Mont Pelée, p. 543, 1904.	Norite.	Inclusion in andesite.
66	II.(4)5.(3)4.(4)5.	Q 8.70 di 6.12 or 4.45 hy 12.18 ab 30.92 mt 4.41 an 32.53 il 1.52	Eruption of 1902, La Soufrière, St. Vincent, West Indies.	Pisani.	A. Lacroix, Mont Pelée, p. 598, 1904.	Andesite.	
67	II.(4)5.4.″5.	Q 6.78 di 7.66 or 2.78 hy 13.22 ab 26.20 mt 4.87 an 36.14 il 1.98	Old Sommaof, La Soufrière, St. Vincent, West Indies.	Pisani.	A. Lacroix, Mont Pelée, p. 598, 1904.	Hypersthene labradorite (basalt).	
68	II.5.4(5).(4)5.	or 2.22 di 7.72 ab 15.20 hy 14.51 an 51.71 ol 2.83 mt 3.25 il 1.82	Chateaubelair, St. Vincent, West Indies.	Pisani.	A. Lacroix, Mont Pelée, p. 598, 1904.	Diorite.	Inclusion in andésite. Locality? Same analysis as No. 64, above.

CLASS II. DOSALANE—Continued.

RANG. 4. DOCALCIC. HESSASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
69	52.81	18.79	3.28	4.58	5.19	9.58	3.23	0.60	0.17	0.20	0.95	0.15	0.28	SO_3 0.33 Cl 0.14 NiO 0.07	100.35	
A2. II	.880	.184	.021	.064	.130	.171	.052	.006			.012	.001	.004			
70	51.85	21.00	3.95	5.07	3.14	9.68	2.60	0.70	0.50		0.96	0.06			99.83	
A2. II	.864	.206	.025	.070	.079	.173	.042	.007			.012	—				
71	52.92	16.66	4.76	4.89	7.96	5.71	5.12	0.89	0.80			0.78			100.49	2.858
A3. III	.882	.164	.030	.068	.199	.102	.082	.010				.006				
72	47.64	19.98	4.83	7.26	7.14	9.62	1.23	1.03	0.12		1.20			CO_2 0.28	100.43	2.979
A3. III	.794	.195	.030	.101	.179	.171	.020	.011			.015					
73	52.8	17.8	1.2	4.8	4.8	12.9	3.0	0.5	1.2						99.5	2.91
B3. IV	.880	.174	.007	.067	.120	.230	.048	.005								
74	47.28	21.07	3.52	3.91	8.06	13.42	1.52	0.29	0.53	0.13	0.28	trace	0.15	Cr_2O_3 0.02 V_2O_3 0.02	100.20	2.90
A2. II	.788	.207	.022	.054	.202	.239	.024	.003			.004	—	.002			
75	49.80	17.77	2.29	8.75	5.67	8.85	1.48	0.48	2.62	1.04	1.56	trace			100.31	2.932
A3. III	.830	.174	.014	.122	.142	.158	.024	.005			.020	—				
76	48.34	20.10	1.97	6.62	5.49	13.16	1.66	0.98	0.44	0.02	0.95	0.04	0.32	CO_2 0.11 S none NiO none BaO 0.10	100.30	
A1. I	.806	.197	.012	.092	.137	.235	.027	.010			.012	—	.005			
77	45.54	23.39	1.98	6.98	4.60	11.82	2.50	0.44	0.72	0.62	1.06	0.13	0.27	S none NiO none BaO none	100.05	
A1. I	.756	.229	.013	.097	.115	.211	.040	.005			.013	.001	004			
78	50.69	20.56	1.55	3.10	6.84	11.99	3.36	none	0.94	0.18	0.42	0.05	0.16	CO_2 none FeS_2 0.11 Cr_2O_3 0.08 V_2O_3 0.02 NiO none BaO none Li_2O trace	100.05	
A1. I	.845	.201	.010	.043	.171	.214	.054	—			.005	—	.002			
79	49.24	21.70	1.02	5.40	5.56	9.70	2.12	1.82	2.95		0.41				99.92	
A3. III	.821	.213	.006	.075	.139	.173	.034	.019			.005					
80	49.45	20.41	1.34	9.51	5.34	9.96	2.73	0.20	0.70		0.32				99.96	
A3. III	.824	.200	.008	.133	.134	.178	.043	.002			.004					
81	49.30	21.60	2.28	7.26	7.82	10.20	2.15	0.29	0.10						101.00	2.97
B3. IV	.822	212	014	.101	.196	.182	.035	.003								
82	56.51	17.90	0.08	5.72	5.58	8.64	2.72	0.82	0.50		0.86	0.15			99.48	
A2. II	.942	.175	.001	.079	.140	.154	.044	.009			.011	.001				
83	46.60	18.90	1.98	8.21	6.41	8.52	2.50	1.69	3.10		1.80	0.30			100.01	
A2. II	.777	.185	.013	.114	.160	.152	.040	.018			.023	.002				

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4-5. PRESODIC. HESSOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
69	II.″5.″4.(4)5.	Q 4.62 or 3.34 ab 27.25 an 35.03 di 9.36 hy 12.73 mt 4.87 il 1.82 ap 0.34	Eruption of 1902. St. Vincent, West Indies.	W. Pollard.	J. S. Flett, Q. J. G. S., LVIII, p. 369, 1902.	Volcanic ash (andesite?).	Collected at Barbados.
70	II.(4)5.4.4(5).	Q 7.68 or 3.89 ab 22.01 an 43.65 di 3.62 hy 10.50 mt 5.80 il 1.82	Vallée de Houelmont, Guadeloupe, West Indies.	Pisani.	A. Lacroix, Mont Pelée, p. 588, 1904.	Basalt.	
71	II″.5.4.(4)5.	or 5.56 ab 42.97 an 20.02 di 2.22 hy 11.04 ol 9.15 mt 6.96 ap 2.02	Panango Hondon, Ruminahui Volcano, Ecuador.	A. Young.	A. Young, Hochg. Ecuad., II (2), p. 243, 1902.	Basalt.	
72	II(III).5.4″.(3)4.	Q 2.28 or 6.12 ab 10.48 an 45.59 di 1.57 hy 24.53 mt 6.96 il 2.28	Förväxlings Point, Spitzbergen.	H. Backlund.	H. Backlund, Ref. N. J., 1911, II, p. 243.	Diabase.	
73	II(III).5.4.(4)5.	Q 2.22 or 2.78 ab 25.15 an 33.64 di 24.63 hy 7.14 mt 1.62 il 0.91	Druim am Eidhne, Skye, Scotland.	J. H. Player.	Geikie and Teall, Q. J. G. S., L, p. 653, 1894.	Gabbro.	Light band. Cf. No. 61, IV.2.1.2.3. In W. T., p. 291.
74	II(III).5.4(5).(4)5.	or 1.67 ab 12.58 an 50.04 di 13.00 hy 12.81 ol 3.69 mt 5.10 il 0.61	Coir' a Mahadaidh, Skye, Scotland.	W. Pollard.	A. Harker, Rocks of Skye, pp. 103, 249, 1904.	Olivine gabbro.	
75	II(III).(4)5.4″.4.	Q 7.38 or 2.78 ab 12.58 an 40.31 di 2.97 hy 24.36 mt 3.25 il 3.04	Auchinstarry, Kilsyth, Dumbartonshire, Scotland.	D. P. Macdonald.	G. W. Tyrrell, G. Mag. (V), VI, p. 361, 1909.	Diabase.	
76	II(III).5.4.4.	or 5.56 ab 14.15 an 44.48 di 17.03 hy 10.32 ol 4.25 mt 2.78 il 1.82	Leac an Leathaird, Mull, Scotland.	E. G. Radley.	G. S. G. B., Sum. Prog. (1912), p. 69, 1913.	Gabbro.	
77	II.5.4.(4)5.	or 2.78 ab 17.82 an 51.15 ne 1.70 di 7.76 ol 12.90 mt 3.02 il 1.98 ap 0.34	Coire Buidhe, Mull, Scotland.	E. G. Radley.	G. S. G. B., Sum. Prog. (1912), p. 70, 1913.	Olivine dolerite.	
78	II.5.4.5.⊙	ab 28.30 an 40.87 di 14.79 hy 5.46 ol 6.12 mt 2.32 il 0.76	Polcoverack, Coverack, Cornwall.	E. G. Radley.	Flett and Hill, G. S. Eng., sheet 359, p. 100, 1912.	Olivine gabbro.	
79	II.5.4.(3)4.	or 10.56 ab 17.82 an 44.48 di 2.94 hy 13.65 ol 5.29 mt 1.39 il 0.76	La Germionniere, Brittany, France.	Pisani.	L. Vandernotte, Mass. Armor., p. 132, 1913.	Quartz diorite.	
80	II″.5.4.5.	or 1.11 ab 22.53 an 43.09 di 5.32 hy 18.83 ol 5.92 mt 1.86 il 0.61	La Morandiere, Pallet, Loire Inferieure, France.	Pisani.	A. Lacroix, B. Sv. Ct. G. Fr., LXVII, p. 23, 1899.	Gabbro.	In W. T., p. 291.
81	II″.5.4″.″5.	or 1.67 ab 18.34 an 48.37 di 1.83 hy 20.32 ol 7.16 mt 3.25	Bois, Pallet, Loire Inferieure, France.	Pisani.	A. Lacroix, B. Sv. Ct. G. Fr., LXVII, p. 23, 1899.	Gabbro.	In W. T., p. 291.
82	II.(4)5.4.4″.	Q 8.64 or 5.00 ab 23.06 an 33.92 di 6.55 hy 19.66 mt 0.23 il 1.67 ap 0.34	Riou Maou, Pyrenees, France.	Pisani.	A. de Romeu, B. Soc. Min. Fr., XXX, p. 137, 1907.	Hornblende labradorite (basalt).	
83	II″.5.″4.4.	or 10.01 ab 20.96 an 35.31 di 4.08 hy 6.41 ol 13.04 mt 3.02 il 3.50 ap 0.67	L'Arbizon, Pyrenees, France.	Pisani.	A. de Romeu, B. Soc. Min. Fr., XXX, p. 179, 1907.	Diabase.	

CLASS II. DOSALANE—Continued.

RANG 4. DOCALCIC. HESSASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
84	49.68	20.86	1.02	5.52	6.50	10.77	3.46	1.38	0.53		0.23	none		S 0.26	100.21	
A2. II	.828	.205	.006	.076	.162	.193	.056	.015			.003	—				
85	50.46	20.08	2.00	5.56	6.27	10.33	3.56	0.68	0.54		0.60	0.12	0.10	S 0.03	100.33	2.90
A2. II	.861	.197	.013	.077	.157	.184	.057	.007			.008	.001	.001			
86	48.80	22.08	3.20	5.28	1.65	10.73	2.11	1.04	1.25	0.15	2.40	0.70	0.14	ZrO_2 0.15	99.85	
A2. II	.813	.217	.020	.074	.041	.191	.034	.001			.030	.005	.002	S 0.17		
87	45.85	18.43	1.76	11.60	4.67	8.73	3.24	1.34	0.81	0.22	1.98	0.68	0.22	S 0.07	99.60	
A2. II	.764	.181	.011	.161	.117	.155	.052	.014			.025	.005	.003			
88	50.50	21.07	1.85	3.62	5.26	13.20	2.09	0.36	0.92	none	0.29	0.36		CO_2 0.32	100.17	
A2. II	.842	.206	.012	.050	.132	.236	.034	.004			.004	.003		SO_3 0.33		
89	52.44	19.55	2.41	5.68	3.27	8.51	2.73	2.23	1.18	0.28	1.08	0.31		CO_2 0.17	99.84	
A2. II	.874	.193	.015	.079	.082	.152	.044	.023			.014	.002				
90	49.93	18.94	2.73	4.45	6.51	10.06	3.53	1.04	1.30	0.08	0.82	0.22		CO_2 0.22	100.09	
A2. II	.832	.185	.017	.062	.163	.180	.056	.011			.010	.002		SO_3 0.26		
91	47.97	22.16	1.12	4.10	4.58	11.96	3.23	0.29	2.05	0.15	0.44	1.14		FeS_2 0.35	99.54	
A2. II	.800	.217	.007	.057	.115	.214	.052	.003			.006	.008				
92	46.50	18.60	9.50	4.31	5.55	9.61	1.76	1.01	2.11		1.01	0.87			100.83	
A2. II	.775	.182	.059	.060	.139	.171	.028	.011			.013	.006				
93	45.09	19.23	4.20	9.86	4.76	10.43	2.86	0.39	0.78	none	1.92	0.56		FeS_2 0.66	100.74	
A2. II	.752	.189	.026	.137	.119	.186	.046	.004			.024	.004				
94	53.14	16.57	2.11	7.39	6.11	8.92	2.94	1.07	1.02		1.05	0.17		SO_3 0.27	100.76	2.902
A2. II	.886	.162	.013	.103	.153	.159	.047	.012			.013	.001				
95	52.38	16.59	1.80	4.44	4.90	12.02	3.52	0.38	1.43	0.21	1.70	0.11	0.03		99.51	2.931
A2. II	.873	.163	.011	.062	.123	.214	.056	.004			.021	.001	—			
96	51.88	20.40	0.79	4.04	3.42	12.23	3.65	0.31	1.66		1.09	0.06	0.09		99.62	2.763
A2. II	.865	.200	.005	.056	.086	.218	.059	.003			.014	—	.001			
97	51.38	23.97	1.42	3.84	2.52	12.85	2.70	0.20	1.14		0.60				100.62	
A3. III	.856	.235	.009	.053	.063	.230	.044	.002			.008					
98	47.41	20.40	3.35	7.24	7.53	9.70	2.14	0.42	1.20		1.11				100.50	
A3. III	.790	.200	.021	.101	.188	.173	.034	.004			.014					

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4-5. PRESODIC. HESSOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
84	II.5''.(3)4.4.	or 8.34 ab 20.44 an 37.25 ne 4.83 di 13.28 ol 13.50 mt 1.39 il 0.46	Saebö, Radö, n. Bergen, Norway.	Lillejord.	C. F. Kolderup, Berg. Mus. Aarb., XII, p. 36, 1903.	Labradorfels (anorthosite).	
85	II.5.''4.(4)5.	or 3.89 ab 29.87 an 36.97 di 10.79 hy 6.94 ol 8.00 mt 3.02 il 1.22 ap 0.34	Rantasjoki, Kiruna District, Lapland, Sweden.	G. Nyblom.	H. Lundbohm, G. F. F., XXXII, p. 787, 1910.	Diabase.	
86	II.(4)5.4.4.	Q 7.80 or 6.12 ab 17.82 an 47.82 di 0.46 hy 7.30 mt 4.64 il 4.56 ap 1.68	Västra Värnsingen, Nordingra Region, Sweden.	M. Wunder.	J. E. Sobral, G. Nord. Reg., p. 106, 1913.	Anorthosite.	
87	II''.5.(3)4.4.	or 7.78 ab 24.63 an 31.97 ne 1.42 di 5.35 ol 19.25 mt 2.55 il 3.80 ap 1.68	Svartsbergvik, Nordingra Region, Sweden.	N. Sahlbom.	J. E. Sobral, G. Nord. Reg., p. 133, 1913	Olivine diabase.	
88	II.5.4''.(4)5.	Q 3.24 or 2.22 ab 17.82 an 46.70 di 12.91 hy 11.50 mt 2.78 il 0.61 ap 1.01	Seeheimer Bruch, Odenwald.	G. Butzbach.	G. Klemm, Nb. Ver. Erdk. (4), XXVII, p. 12, 1906.	Gabbro.	
89	II.5.''4.''4.	Q 4.14 or 12.79 ab 22.53 an 35.03 di 4.32 hy 12.68 mt 3.48 il 2.13 ap 0.67	Hundsruck, n. Rossdorf, Hesse.	K. M. Jene.	G. Klemm, Erl. G. Kt. Hes., Bl. Rossdorf, p. 24, 1912.	Diabase.	
90	II.5.''4.4''.	or 6.12 ab 29.34 an 32.80 di 12.23 hy 2.63 ol 8.90 mt 3.94 il 1.52 ap 0.67	Traisa, Blatt Rossdorf, Hesse.	Stadler.	G. Klemm, Erl. G. Kt. Hes., Bl. Rossdorf, p. 34, 1912.	Diorite.	
91	II.5.4.5.⊙	or 1.67 ab 27.25 an 45.04 di 5.62 hy 3.59 ol 9.94 mt 1.62 il 0.91 ap 2.69	Breiteloh, Hesse.	W. Sonne.	C. Chelius, Nb. Ver. Erdk. (4), XVIII, p. 24, 1897.	Gabbro.	In W. T., p. 291.
92	II''.(4)5.4.4.	Q 6.48 or 6.12 ab 14.67 an 39.75 di 1.73 hy 13.10 mt 10.90 il 1.98 hm 1.92 ap 2.02	Frielendorf, Hesse.	C. Trenzen.	C. Trenzen, N. J., 1902, II, p. 6.	Basalt.	
93	II(III).5.4.''4.	or 2.22 ab 24.10 an 38.64 di 7.79 hy 4.78 ol 10.86 mt 6.03 il 3.65 ap 1.34	Buch, n. Lindenfels, Hesse.	Surv. lab.	C. Chelius, Erl. G. Kt. Hes., Bl. Lindenfels, p. 35, 1901.	Diorite pegmatite.	
94	II(III).5.(3)4.4.	Q 2.58 or 6.67 ab 24.63 an 28.63 di 12.03 hy 19.59 mt 3.02 il 1.98 ap 0.34	Ferdinandstal, Brocken, Harz.	Hesse.	O. H. Erdmannsdoerfer, Jb. Pr. G. L.-A., XXVII, p. 361, 1906.	Diorite.	
95	II(III).5.(3)4.''5.	Q 2.76 or 2.22 ab 29.34 an 28.63 di 24.00 hy 4.79 mt 2.55 il 3.19 ap 0.34	Neurode, Silesia.	A. Lindner.	F. Tannhäuser, Sb. Pr. Ak. Wiss., 1907, II, p. 845.	Diabase.	
96	II.5.4.5.⊙	Q 0.78 or 1.67 ab 30.92 an 38.36 di 18.08 hy 4.88 mt 1.16 il 2.13	Neurode, Silesia.	A. Lindner.	F. Tannhäuser, Sb. Pr. Ak. Wiss., 1907, II, p. 843.	Gabbro.	
97	II.5.4.5.⊙	Q 3.72 or 1.12 ab 23.06 an 52.54 di 9.34 hy 6.47 mt 2.09 il 1.22	Schluckenau, Bohemia.	C. v. John.	C. v. John, Jb. G. R.-A., Wien., LII, p. 149, 1903.	Gabbro.	Inclusion in basalt.
98	II(III).5.4.(4)5.	or 2.22 ab 17.82 an 45.04 di 2.48 hy 20.47 ol 4.23 mt 4.87 il 2.13	Schluckenau, Bohemia.	C. v. John.	C. v. John, Jb. G. R.-A., Wien., LII, p. 150, 1903.	Gabbro.	Inclusion in basalt.

CLASS II. DOSALANE—Continued.

RANG 4. DOCALCIC. HESSASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
99	47.58	23.30	0.73	5.10	2.99	15.33	2.57	0.35	0.10	0.67	0.14		0.33		99.19	2.86
B3. IV	.793	.228	.005	.071	.075	.273	.042	.004			.002		.005			
100	54.39	17.96	2.91	6.29	4.43	7.96	2.40	1.80	1.14		trace	0.59	0.24	S 0.10	100.21	
A2. II	.907	.176	.018	.088	.111	.142	.039	.019			—	.004	.003			
101	47.41	20.20	4.51	9.85	2.83	10.99	2.29	0.43	0.21		0.63				99.35	
B3. IV	.790	.198	.028	.137	.071	.196	.037	.005			.008					
102	51.54	22.46	3.59	2.71	1.86	9.29	3.63	2.15	1.40		0.68	0.46	0.22	CO_2 0.12	100.11	
A2. II	.859	.221	.023	.038	.046	.166	.058	.023			.008	.003	.003			
103	47.60	17.23	4.31	7.20	6.07	9.70	2.62	1.74	1.36		1.50	0.41	0.23		99.97	
A2. II	.793	.169	.027	.100	.152	.173	.042	.018			.019	.003	.003			
104	50.80	17.73	1.39	3.42	10.19	7.62	2.03	1.34	4.33	0.15	0.61				99.61	2.89
A3. III	.847	.174	.009	.047	.255	.136	.032	.014			.008					
105	49.82	19.88	3.31	1.80	4.86	12.73	3.51	0.69	2.44		1.13				100.17	2.98
A3. III	.830	.195	.021	.025	.122	.227	.056	.007			.014					
106	50.81	18.02	1.96	6.39	8.29	10.10	2.30	0.27	0.94		0.64	trace	trace		99.72	
A3. III	.847	.176	.012	.089	.207	.180	.037	.003			.008	—	—			
107	49.18	17.94	4.30	9.04	6.68	9.50	2.84	0.45	n. d.		0.35		0.19		100.47	
A2. II	.820	.175	.027	.125	.167	.170	.045	.005			.004		003			
108	47.71	17.98	4.70	7.38	4.30	9.91	3.02	0.97	0.62		1.67	0.77	0.58		99.61	
A2. II	.795	.176	.029	.103	.108	.177	.048	.010			.021	.005	.007			
109	49.95	19.17	4.72	6.71	5.03	9.61	3.13	0.74	0.09		0.69		trace		99.84	2.939
A3. III	.833	.188	.029	.093	.126	.171	.050	.008			.009		—			
110	53.35	18.94	3.71	5.35	4.15	8.50	2.56	1.19	1.13		0.93				99.81	
A3. III	.889	.186	.023	.075	.104	.152	.041	.013			.012					
111	53.33	21.21	1.67	3.25	2.60	10.04	3.22	2.25	0.90		0.47		1.29		100.23	
A?3. III	.889	.208	.010	.045	.065	.179	.052	.024			.006		.018			
112	53.68	18.73	3.33	5.96	3.64	7.43	3.41	0.51	1.54	0.08	0.82	none	0.30	CO_2 0.19 S 0.04 BaO 0.03	99.75	
A1. I	.895	.184	.021	.083	.091	.132	.055	.005			.010	—	.004			
113	47.23	18.49	6.14	8.79	3.92	7.89	2.84	0.51	1.26	0.04	2.04	0.14	0.63	CO_2 0.11 Cl trace S 0.17 Cr_2O_3 trace BaO 0.01 SrO trace	100.21	
A1. I	.787	.181	.038	.122	.098	.141	.046	.005			.026	.001	.009			
114	50.56	17.67	1.04	8.79	4.77	8.25	3.23	0.93	0.19	0.20	2.43	0.34	0.25	Cl 0.11 S 0.20 X 0.25	99.21	
B2. III	.843	.173	.006	.122	.119	.147	.052	.010			.030	.002	.004			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4-5. PRESODIC. HESSOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
99	II.5.4.″5.	or 2.22 di 21.07 ab 14.67 ol 4.51 an 50.60 mt 1.16 ne 3.98 il 0.30	Richterhof, Bohemia.	A. Donatti.	W. Bergt, Z. D. G. G., LXI, p. 78, 1909.	Anorthosite.	
100	II.(4)5.″4.″4.	Q 7.68 di 2.51 or 10.56 hy 19.51 ab 20.44 mt 4.18 an 32.80 ap 1.34	Kanitz, Brünn, Moravia.	C. v. John.	C. v. John and Suess, Jb. G. R.-A., Wien., LVIII (1), p. 249, 1908.	Quartz diorite.	
101	II″.5.4.(4)5.	Q 0.84 di 9.38 or 2.78 hy 15.70 ab 19.39 mt 6.50 an 43.37 il 1.22	Oraviczabanya, Krasso-Szöreny, Hungary.	K. Emszt.	Rozlozonit and Emszt, Mt. Ung. G. A., XVI, p. 193, 1908.	Gabbro diorite.	
102	(I)II.5.(3)4.4.	Q 1.26 di 3.56 or 12.79 hy 4.22 ab 30.39 mt 5.34 an 38.92 il 1.22 ap 1.01	Avisio Bridge, n. Mezzavalle, Predazzo, Tyrol.	Dittrich and Pohl.	J. Romberg, Anh. Abh. Pr. Ak. W., 1904, p. 41.	Monzonite.	
103	II(III).5.(3)4.4.	or 10.01 di 12.14 ab 22.01 hy 6.41 an 30.30 ol 7.55 mt 6.26 il 2.89 ap 1.01	Coronelle, Malgola, Predazzo, Tyrol.	Dittrich and Pohl.	J. Romberg, Anh. Abh. Pr. Ak. W., 1904, p. 43.	Biotite gabbro.	
104	II(III).5.4.″4.	Q 1.32 di 1.76 or 7.78 hy 28.63 ab 16.77 mt 2.09 an 35.58 il 1.22	Piz Glievers Dado, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Augite porphyrite.	Fresh?
105	II.5.″4.(4)5.	or 3.89 di 20.52 ab 28.30 ol 1.89 an 36.70 mt 2.55 ne 0.57 il 2.13 hm 1.60	Piz Avat, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Augite kersantite.	
106	II(III).5.4.″5.	Q 0.90 di 9.85 or 1.67 hy 25.06 ab 19.39 mt 2.78 an 37.81 il 1.22	Val Donbastone, Valtellina, Lombardy.	Dittrich?	W. Rasch, N. J. B. B., XXXII, p. 222, 1911.	Norite.	
107	II(III).5.4″.(4)5.	or 2.78 di 10.26 ab 23.58 hy 15.76 an 34.75 ol 6.36 mt 6.26 il 0.61	Leprese, Valtellina, Lombardy.	O. Hecker.	O. Hecker, N. J. B. B., XVII, p. 332, 1903.	Hornblende gabbro.	
108	II(III).5.″4.4″.	Q 0.06 di 9.55 or 5.56 hy 14.04 ab 25.15 mt 6.73 an 32.80 il 3.19 ap 1.68	Between Ceppina and San Antonio, Valtellina, Lombardy.	A. Zapf.	A. Zapf, In. Diss., Jena, p. 46, 1910	Hornblende gabbro.	
109	II″.5.4.″5.	Q 0.42 di 9.02 or 4.45 hy 15.48 ab 26.20 mt 6.73 an 36.42 il 1.37	Ivrea, Piedmont.	M. Dittrich.	F. R. van Horn, T. M., P. M., XVII, p. 404, 1898.	Norite.	In W. T., p. 293.
110	II.(4)5.4.4.	Q 8.22 di 4.51 or 7.23 hy 13.49 ab 21.48 mt 5.34 an 36.70 il 1.82	Capo Sperone, San Antioco, Sardinia.	A. Johnsen.	A. Johnsen, Anh. Abh. Pr. Ak. W., No. 2, p. 59, 1912.	Hypersthene basalt.	Also in N. J. Cb., 1912, p. 738.
111	II.5.(3)4.″4.	Q 0.60 di 10.79 or 13.34 hy 7.36 ab 27.25 mt 2.32 an 36.70 il 0.91	Val Barca, Sassari, Sardinia.	F. Millosevich.	F. Millosevich, Mem. Ac. Linc. (5), VII (14), p. 426, 1908.	Hypersthene andesite.	MnO high?
112	II.(4)5.″4.″5.	Q 7.92 di 1.83 or 2.78 hy 15.60 ab 28.82 mt 4.87 an 34.47 il 1.52	Samoyed Urals, Russia.	H. Backlund.	H. Backlund, Mem. Imp. Ac. Sci. St. Pet., XXVIII, No. 3, p. 21, 1912.	Quartz gabbro.	
113	II″.5.4.(4)5.	Q 2.88 di 1.83 or 2.78 hy 17.75 ab 24.10 mt 8.82 an 36.14 il 3.95 ap 0.34	Samoyed Urals, Russia.	H. Backlund.	H. Backlund, Mem. Imp. Ac. Sci., St. Pet., XXVIII, No. 3, p. 30, 1912.	Beerbachite.	
114	II(III).5.(3)4.4″.	Q 0.66 di 6.64 or 5.56 hy 20.50 ab 27.25 mt 1.39 an 30.86 il 4.56 ap 0.67	Goroschki, Volhynia, Russia.	W. Tarassenko.	W. Tarassenko, Ref., N. J., 1899, I, p. 463.	Olivine norite.	In W. T., p. 293.

CLASS II. DOSALANE.—Continued.

RANG 4. DOCALCIC. HESSASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
115	49.13	18.48	0.41	11.69	5.77	7.42	3.08	1.09	0.07	0.06	1.61	0.34	0.15	Cl 0.08 S 0.15	99.53	
A2. III	.819	.181	.003	.162	.144	.132	.050	.012			.020	.002	.002			
116	48.71	19.62	4.18	7.37	4.71	8.36	3.07	1.90	1.12		1.21	0.42			100.67	
A2. II	.812	.192	.026	.103	.118	.149	.050	.020			.015	.003				
117	51.80	16.01	5.80	8.70	5.00	8.25	2.40	1.50	n. d.		0.51				99.97	
A3. III	.863	.157	.036	.121	.125	.147	.039	.016			.006					
118	48.78	22.07	1.92	7.73	5.22	9.67	1.81	1.17	1.68		0.37	0.44	trace		100.86	
A2. II	.813	.218	.012	.107	.131	.173	.029	.012			.005	.003	—			
119	49.2	18.0	3.1	8.9	4.9	8.8	2.7	0.7	1.5		2.3				100.1	2.91
B3. IV	.820	.176	.019	.124	.123	.157	.044	.008			.029					
120	48.9	18.9	0.3	9.0	6.0	12.2	3.0	0.3	0.5		1.4				100.5	2.98
B3. IV	.815	.185	.002	.125	.150	.218	.048	.003			.018					
121	48.62	17.44	5.42	6.55	5.30	10.00	2.30	1.92	0.63		1.29	0.11	0.21		99.79	
A?2. II	.810	.171	.034	.091	.133	.179	.037	.020			.016	.001	.003			
122	48.29	19.38	3.49	5.22	4.19	10.13	3.08	1.08	1.48	0.48	2.00	0.80			99.62	
A2. II	.805	.190	.022	.072	.105	.180	.050	.012			.025	.006				
123	44.44	19.46	5.76	5.02	4.92	14.03	2.12	0.74	0.70	0.07	2.71	0.22			100.19	
A2. II	.741	.191	.036	.069	.123	.250	.034	.008			.034	.002				
124	46.27	18.43	3.98	8.22	3.75	12.33	2.58	0.96	n. d.		2.98	0.33			99.83	
A2. II	.771	.181	025	.114	.094	. 220	.042	010			.037	.002				
125	52.86	18.25	6.61	3.39	4.72	9.58	3.24	0.69	0.24				0.16		99.74	
A3. III	.881	.179	.041	.047	.118	.171	.052	.007					.002			
126	52.13	16.73	3.16	5.43	5.05	9.10	2.81	1.40	2.47		1.60	0.51	trace		100.39	
A2. II	.869	.164	.020	.075	.126	.163	.045	.015			.020	.004	—			
127	48.75	17.41	1.40	7.83	5.18	9.68	3.07	1.27	2.70		2.32	0.19			99.80	
A2. II	.813	.171	.009	.108	.130	.173	.050	.014			.029	.001				
128	53.06	19.95	3.24	4.94	3.64	9.41	3.24	0.94	0.06	0.01	0.77	0.06	0.59	ZrO_2 none Cl 0.08 F 0.07 S 0.03 Cr_2O_3 none BaO 0.06 SrO 0.02	100.17	
A1. I	.884	.196	.020	.068	.091	.168	.052	.010			.010	—	.008			
129	52.33	17.33	3.51	5.73	5.30	10.71	3.17	0.94	0.38	none	0.31	0.07	0.24	ZrO_2 none Cl 0.08 F 0.05 S 0.03 Cr_2O_3 0.01 BaO 0.07 SrO 0.03	100.29	
A1. I	.872	.170	.022	.079	.133	.191	.051	.010			.004	—	.003			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4-5. PRESODIC. HESSOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
115	II″.5.″4.4.	or 6.67 di 1.40 ab 26.20 hy 13.42 an 33.08 ol 14.00 mt 0.70 il 3.04 ap 0.67	Gazkowskaia Rudnaia, Volhynia, Russia.	W. Tarassenko.	W. Tarassenko, Ref., N. J., 1899, I, p. 463.	Olivine norite.	In W. T., p. 293.
116	II.5.(3)4.4.	or 11.12 di 3.87 ab 26.20 hy 7.20 an 33.92 ol 7.95 mt 6.03 il 2.28 ap 1.01	Sao Vicente, Cape Verde Island.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (7), p. 656, 1912.	Trachy-dolerite.	
117	II(III).″5.(3)4.4.	Q 4.80 di 10.30 or 8.90 hy 17.85 ab 20.48 mt 8.35 an 28.36 il 0.91	Near Kadero, Kordofan.	G. Linck.	G. Linck, N. J. B. B., XVII, p. 432, 1903.	Gabbro porphyrite.	
118	II.5.4.4.⊙	Q 1.20 hy 24.98 or 6.67 mt 2.78 ab 15.20 il 0.76 an 45.31 ap 1.01 C 1.43	Near Abu Uruf, Kordofan.	Sprockhoff.	G. Linck, N. J. B. B., XVII, p. 412, 1903.	Gabbro.	
119	II(III).5.4.4″.	Q 1.68 di 7.55 or 4.45 hy 18.62 ab 25.06 mt 4.41 an 34.47 il 4.41	Karakourkoura, French Somali.	H. Arsandaux.	H. Arsandaux, C. R., CXXXVII, p. 1310, 1903.	Labradorit (basalt).	Also in Roches Est Afr., p. 95, 1906.
120	II(III).5.4.5.	or 1.67 di 16.97 ab 25.15 hy 0.56 an 37.25 ol 14.62 mt 0.46 il 2.74	Gubbet Karab, French Somali.	H. Arsandaux.	H. Arsandaux, C. R., CXXXVII, p. 1310, 1903.	Basalt.	Also in Roches Est. Afr., p. 95, 1906.
121	II(III).5.″4.(3)4.	Q 0.06 di 13.87 or 11.12 hy 12.43 ab 19.39 mt 7.89 an 31.69 il 2.43 ap 0.34	Mount Nawigawo, Lake Kivu District, German East Africa.	O. Hauser.	L. Finckh, D. Zentr. Afr. Exp., I (1), p. 18, 1912.	Leucite basanite.	Norm and mode? Alkalies?
122	II.5.″4.4.	Q 0.90 di 7.10 or 6.67 hy 10.41 ab 26.20 mt 5.10 an 35.58 il 3.80 ap 2.02	Raimany River, Sakalave District, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVII, p. 20, 1913.	Labradorite (basalt).	
123	II(III).5.4.4.	or 4.45 di 20.30 ab 16.24 ol 2.03 an 41.42 mt 8.12 ne 0.85 il 5.17 hm 0.16 ap 0.67	Nosy Komba, Madagascar.	Not stated.	A. Lacroix, pers. com.	Essexitic gabbro.	Cf. No. 60, II.5.3.3 and No. 44, II.6.3.4.
124	II(III).5.4.4.	or 5.56 di 19.10 ab 22.01 hy 0.43 an 35.86 ol 4.73 mt 5.80 il 5.62 ap 0.67	Avirons, Reunion Island.	Boiteau.	A. Lacroix, C. R., CLV, p. 543, 1912.	Labradorite (basalt).	
125	II.(4)5.″4.(4)5.	Q 7.20 di 11.12 or 3.89 hy 7.66 ab 27.25 mt 9.51 an 33.36	Anaun Volcano, Kamchatka.	Not stated.	K. Bogdanowitsch, Pet. Mt., L, p. 122, 1904.	Andesite.	Ignition given as 52.86.
126	II″.″5.(3)4.4.	Q 5.64 di 10.26 or 8.34 hy 12.30 ab 23.58 mt 4.64 an 28.91 il 3.04 ap 1.34	Yui, Dogo, Oki Islands, Japan.	K. Yokoyama.	S. Kozu, Sc. Rep. Toh. Un. (2), I, p. 49, 1913.	Andesite.	
127	II(III).5.(3)4.4.	or 7.78 di 14.31 ab 26.20 hy 4.55 an 29.75 ol 7.81 mt 2.09 il 4.41 ap 0.34	Tien-chann, East Yunnan, China.	Pisani.	J. Deprat, Mem. Sv. G. Indoch., I (1), 1, p. 232, 1912.	Labradorite (basalt).	
128	II.5.″4.4″.	Q 4.38 di 7.69 or 5.56 hy 11.42 ab 27.25 mt 4.64 an 37.25 il 1.52	Mayon Volcano, Luzon, Philippine Islands.	E. W. Morley.	J. P. Iddings, pers. com.	Basalt.	Iddings and Morley, Pr. Nat. Ac. Sc., II, p. 533, 1916.
129	II(III).5.(3)4.4″.	Q 1.02 di 18.48 or 5.56 hy 11.72 ab 26.72 mt 5.10 an 30.30 il 0.61	Taal Volcano, Luzon, Philippine Islands.	E. W. Morley.	J. P. Iddings, pers. com.	Basalt.	Iddings and Morley, Pr. Nat. Ac. Sc., II, p. 533, 1916.

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CLASS II. DOSALANE—Continued.

RANG 4. DOCALCIC. HESSASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
130	50.54	21.63	3.64	4.22	3.06	10.47	2.88	1.57	0.72	0.19	0.34	0.24	0.17	ZrO_2 none Cl 0.08 F 0.02 S 0.01 Cr_2O_3 0.01 BaO 0.05 SrO 0.04	99.88	
A1. I	.842	.212	.023	.058	.077	.188	.047	.017			.004	.002	.002			
131	47.98	18.94	7.08	3.98	7.06	11.01	2.56	0.44	0.70	0.38					100.13	
A3. III	.800	.185	.044	.056	.176	.196	.041	.005								
132	53.18	21.14	1.22	6.22	3.66	7.36	4.06	0.74	0.62		0.83		0.57		99.60	
A2. II	.886	.207	.008	.086	.092	.131	.066	.008			.010		.008			
133	50.84	19.81	6.68	3.21	4.01	8.90	3.53	1.01	1.02	0.12	0.81	0.31			100.25	
A2. II	.847	.194	.042	.044	.100	.159	.056	.011			.010	.002				
134	51.12	19.59	2.86	6.53	4.47	9.54	3.11	0.57	0.11	none	0.86	0.14	0.65	ZrO_2 none Cl 0.10 F 0.04 S 0.06 Cr_2O_3 none BaO 0.03 SrO 0.03	99.81	
A1. I	.852	.192	.018	.090	.112	.170	.050	.006			.011	.001	.009			
135	51.68	19.77	6.19	3.33	3.52	8.60	3.13	1.24	0.82		1.35	0.25	0.08	SO_3 0.04	100.00	2.76
A2. II	.861	.194	.039	.046	.088	.154	.050	.013			.016	.002	.001			
136	50.39	21.77	3.51	5.23	3.55	10.61	1.63	1.34	0.06	0.41	0.75	0.60	0.10		99.96	2.88
A2. II	.840	.214	.022	.073	.089	.189	.026	.014			.009	.004	.001			
137	50.04	18.68	0.80	6.91	7.79	9.88	2.35	0.12	1.74	0.28	0.80	0.16	0.14	CO_2 0.27 ZrO_2 none SO_3 0.49 Cl none F none Cr_2O_3 0.02 V_2O_3 0.03 NiO none BaO trace SrO trace Li_2O none CuO 0.08	100.58	2.977
A1. I	.834	.183	.005	.096	.195	.177	.038	.001			.010	.001	.002			
138	48.86	21.88	1.83	4.87	3.79	11.69	3.30	0.20	1.22	1.04	1.26	0.28	0.34	NiO 0.10	100.66	
A2. II	.814	.215	.011	.068	.095	.209	.053	.002			.017	.002	.005			
139	45.28	21.04	5.22	5.14	5.53	11.66	2.57	1.98	0.43	0.13	0.46	0.22	0.31	CO_2 0.02 ZrO_2 none SO_3 0.04 Cl 0.06 F none Cr_2O_3 none V_2O_3 trace NiO none BaO 0.11 SrO trace Li_2O trace	100.20	2.955
A1. I	.755	.206	.033	.071	.138	.208	.042	.021			.006	.002	.004			
140	53.18	17.61	1.59	6.47	6.59	10.42	2.03	0.70	0.40		0.78	trace	0.10	CO_2 trace SO_3 none S trace Cr_2O_3 trace NiO trace BaO 0.13 SrO 0.02	100.35	2.88
A1. I	.886	.173	.010	.090	.165	1.86	.032	.008			.010	—	.001			
141	53.11	15.55	1.26	7.17	6.50	8.93	3.03	0.28	3.12	0.04	0.40		0.59	CO_2 0.32 FeS_2 0.07	100.37	2.91
A2. II	.885	.152	.008	.100	.163	.159	.048	.003			.005		.008			
142	54.95	19.56	3.15	3.78	3.01	8.70	2.97	1.59	1.05		0.95		0.08		99.64	
A2. II	.916	.192	.020	.053	.075	.155	.048	.017			.012		.001			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4-5. PRESODIC. HESSOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
130	II.5.4.4.⊙	Q 1.14 di 7.45 or 9.45 hy 8.44 ab 24.63 mt 5.34 an 41.14 il 0.61 ap 0.67	Antipolo, Luzon, Philippine Islands.	E. W. Morley.	J. P. Iddings, pers. com.	Basalt.	Iddings and Morley, Pr. Nat. Ac. Sc., II, p. 533, 1916.
131	II(III).5.4.(4)5.	Q 0.30 di 12.23 or 2.78 hy 13.46 ab 21.48 mt 10.41 an 38.92	Mancayan, Lepanto Province, Luzon, Philippine Islands.	L. S. Salinger.	A. J. Eveland, B. Min. Bur. Man., 4, p. 39, 1905.	Diorite.	
132	II.5.(3)4.(4)5.	Q 0.72 hy 19.23 or 4.45 mt 1.86 ab 34.58 il 1.52 an 36.42 C 0.20	Salé Itji, Ternate, Celebes.	Ledeboer.	R. D. M. Verbeek, Jb. Mijnw., XXXVII, p. 233, 1908.	Hornblende gabbro.	
133	II.5.(3)4.4″.	Q 3.54 di 6.91 or 6.12 hy 6.80 ab 29.34 mt 7.89 an 35.31 il 1.52 hm 1.28 ap 0.67	Sibajak, Karoland, Sumatra.	M. Dittrich.	H. Stegmann, N. J. B. B., XXVII, p. 442, 1909.	Inclusion in andesite.	Cf. No. 219, II.4.3.4.
134	II.5.4.(4)5.	Q 1.86 di 7.08 or 3.34 hy 16.96 ab 26.20 mt 4.18 an 37.81 il 1.67 ap 0.34	Goentoer Volcano, Java.	E. W. Morley.	J. P. Iddings, Ign. Rocks, II, p. 622, 1913.	Basalt.	Also in Iddings and Morley, J. G., XXIII, p. 233, 1915.
135	II.″5.″4.4.	Q 6.60 di 4.97 or 7.23 hy 6.50 ab 26.20 mt 7.19 an 36.42 il 2.43 hm 1.28 ap 0.67	Koka Triboelan, Sumbawa Island.	A. Lindner.	G. Rack, N. J. B. B., XXXIV, p. 61, 1912.	Labrador-andesite.	
136	II.(4)5.4″.(3)4.	Q 7.14 di 0.43 or 7.78 hy 14.28 ab 13.62 mt 5.10 an 48.37 il 1.37 ap 1.34	Gapit River, Sumbawa Island.	A. Lindner.	G. Rack, N. J. B. B., XXXIV, p. 63, 1912.	Labrador-andesite.	
137	II(III).5.4.5.	Q 0.24 di 6.77 or 0.56 hy 27.17 ab 19.91 mt 1.16 an 40.03 il 1.52 0.34	Murgatroyd's tunnel, New England, New South Wales.	J. C. H. Mingaye.	E. Andrews, Rec. G. S. N. S. W., VIII (3), p. 216, 1907.	Diorite.	
138	II.5.4.5.⊙	or 1.11 d 9.49 ab 27.77 hy 6.84 an 44.48 ol 2.90 mt 2.55 il 2.58 ap 0.67	Dundas, n. Sydney, New South Wales.	W. N. Benson.	W. N. Benson, Pr. R. Soc. N. S. W., XLIV, p. 517, 1910.	Anorthosite.	
139	II.5″.4.″4.	or 11.68 di 12.88 ab 12.58 ol 8.51 an 39.75 mt 7.66 ne 5.11 il 0.91 ap 0.67	Good Dog Mountain, Cambewarra Range, New South Wales.	H. P. White.	Card and Jaquet, Rec. G. S. N. S. W., VII, p. 121, 1902.	Lamprophyre.	
140	II(III).″5.4.4.	Q 5.46 di 11.99 or 4.45 hy 20.03 ab 16.77 mt 2.32 an 36.97 il 1.54	Kangaroo Island, South Australia.	E. R. Stanley.	E. R. Stanley, Tr. R. Soc. S. Aust., XXXIV, p. 72, 1910.	Enstatite basalt.	
141	II(III).″5.″4.5.	Q 3.66 di 13.20 or 1.67 hy 22.37 ab 25.15 mt 1.86 an 28.08 il 0.76	Mount Anketel, West Pilbara, Western Australia.	Not stated.	J. A. Thompson in A. G. Maitland, W. Aust. G. S. B. 33, p. 148, 1909.	Augite andesite.	
142	II.(4)5.″4.4.	Q 8.82 di 6.24 or 9.45 hy 7.41 ab 25.15 mt 4.64 an 35.31 il 1.82	New Plymouth, Taranaki, New Zealand.	J. S. Maclaurin.	E. D. Clarke, N. Z. G. S. B. 14, p. 23, 1912.	Andesite.	

CLASS II. DOSALANE—Continued.

RANG 4. DOCALCIC. HESSASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
143	52.00	18.69	6.71	2.67	3.65	8.72	2.84	1.26	2.82		0.89		0.09		100.34	
A2. II	.867	.183	.042	.038	.091	.155	.046	.014			.011		.001			
144	52.65	18.87	3.28	4.75	4.81	8.80	2.74	0.68	2.19		1.08		0.15	BaO 0.09	100.09	
A2. II	.878	.185	.021	.066	.120	.157	.044	.007			.014		.002			
145	50.05	17.53	4.40	4.82	6.46	8.05	2.47	1.67	2.83		1.42		0.30	CO_2 none	100.00	
A2. II	.834	.172	.028	.067	.162	.144	.040	.018			.018		.004			
146	47.70	18.41	5.40	6.84	5.21	9.60	2.58	0.78	0.82	0.20	0.90	1.05	0.15		99.72	
A2. II	.795	.180	.034	.095	.130	.171	.042	.008			.011	.007	.002			
147	45.78	19.18	3.28	9.14	6.03	8.20	2.27	1.32	2.64	0.38	1.26	0.73	0.17	SO_3 0.17	100.55	
A2. II	.763	.188	.021	.127	.151	.146	.037	.014			.018	.005	.002			
148	45.29	22.69	2.76	5.56	5.75	11.95	2.84	0.52	1.47		0.75	0.03	0.08		99.69	
A2. II	.755	.222	.017	.077	.144	.214	.046	.006			.009	——	.001			
149	49.72	20.95	5.45	3.50	3.41	12.54	2.23	1.13	1.32						100.25	
A3. III	.829	.205	.034	.049	.085	.224	.035	.012								
150	49.63	18.60	8.24	5.33	4.67	9.31	2.36	1.40	1.00						100.54	
A3. III	.827	.182	.052	.074	.117	.166	.038	.015								
151	48.24	17.41	5.62	5.79	7.08	12.27	2.44	1.01	0.60						100.46	
A3. III	.804	.171	.035	.081	.177	.220	.039	.011								
152	47.66	18.66	10.56	2.19	5.07	11.03	2.82	1.00	1.16						100.15	
A3. III	.794	.183	.066	.031	.127	.196	.045	.011								
153	47.44	18.36	12.03	2.16	5.77	10.20	2.22	1.15	1.03						100.36	
A3. III	.791	.180	.075	.030	.144	.182	.035	.013								
154	45.25	18.89	5.52	6.36	6.08	11.00	3.42	1.15	1.23		1.04	0.34			100.28	
A2. II	.754	.185	.034	.089	.152	.196	.055	.012			.013	.002			(100.03)	
155	45.21	19.16	4.86	7.11	5.73	10.82	3.18	1.24	0.94		1.20	0.28			99.73	
A2. II	.754	.188	.031	.099	.143	.193	.052	.013			.015	.002				
156	56.10	19.81	2.07	5.15	3.44	7.20	3.55	1.08	0.75		0.76	trace			99.91	
A3. III	.935	.195	.013	.072	.086	.129	.057	.012			.010	——				
157	51.16	16.12	7.09	7.24	3.68	8.55	3.33	0.57	1.52		0.07	0.96	0.15		100.44	
A2. II	.853	.158	.044	.101	.092	.153	.053	.006			.001	.007	.002			
158	54.24	17.20	2.81	4.98	5.84	10.19	2.91	0.92	0.09		0.91	0.09			100.18	
A2. II	.904	.167	.018	.069	.146	.182	.047	.010			.011	——				
159	49.84	19.37	3.42	3.69	4.71	12.35	2.50	0.87	1.79		1.32	0.11			99.97	
A2. II	.831	.190	.021	.051	.118	.221	.040	.009			.017	.001				

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4-5. PRESODIC. HESSOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
143	II.(4)5.″4.4.	Q 8.28 di 6.91 or 7.78 hy 5.90 ab 24.10 mt 6.50 an 34.19 il 1.67 hm 2.24	New Plymouth, Taranaki, New Zealand.	J. S. Maclaurin.	E. D. Clarke, N. Z. G. S. B. 14, p. 23, 1912.	Andesite.	
144	II.(4)5.4.4(5).	Q 7.74 di 4.88 or 3.89 hy 14.03 ab 23.06 mt 4.87 an 37.25 il 2.13	Thames, Hauraki, Aukland, New Zealand.	J. S. Maclaurin.	C. Fraser, N. Z. G. S. B. 10, p. 24, 1910.	Pyroxene andesite.	
145	II″.5.″4.4.	Q 2.46 di 6.61 or 10.01 hy 16.37 ab 20.96 mt 6.50 an 31.69 il 2.74	Flat Island, Whangaroa, New Zealand.	J. S. Maclaurin.	Bell and Clarke, N. Z. G. S. B. 8, p. 71, 1909.	Dolerite.	
146	II.5.4.4″.	Q 2.10 di 4.05 or 4.45 hy 17.90 ab 22.01 mt 7.89 an 36.14 il 1.67 ap 2.35	Mackley River, Orikaka District, New Zealand.	Not stated.	P. G. Morgan, pers. com.	Diorite.	To be pub. in N. Z. G. S. B. 17.
147	II(III).5.4.4.	or 7.78 hy 17.59 ab 19.39 ol 6.87 an 35.86 mt 4.87 C 0.82 il 2.74 ap 1.68	Inangahua Road, Waitahu, Reefton District, New Zealand.	Not stated.	P. G. Morgan, pers. com.	Diorite.	
148	II.5.4.(4)5.	or 3.34 di 10.05 ab 16.24 ol 11.95 an 47.26 mt 3.94 ne 4.26 il 1.37	New Caledonia.	Boiteau.	A. Lacroix, C. R., CLII, p. 820, 1911.	Diorite.	
149	II.5.4.4.⊙	Q 3.90 di 14.58 or 6.67 hy 3.56 ab 18.34 mt 7.89 an 43.92	St. Paul Island, Indian Ocean.	R. Reinisch.	R. Reinisch, D. Tiefs. Exp., X (3), p. 69, 1908.	Basalt.	
150	II.″5.4.4.	Q 4.56 di 8.19 or 8.34 hy 10.61 ab 19.91 mt 12.06 an 35.86	St. Paul Island, Indian Ocean.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (5), p. 389, 1909.	Basalt.	
151	II(III).5.4.4.	or 6.12 di 22.02 ab 20.44 hy 0.43 an 33.64 ol 9.20 mt 8.12	Station 168, 2,414 meters deep, 114 miles northeast of New Amsterdam.	R. Reinisch.	R. Reinisch, D. Tiefs. Exp., X (3), p. 73, 1908.	Basalt.	Interior of dredged block. Cf. No. 20, p. 773.
152	II″.5.4.4.	Q 0.48 di 14.90 or 6.12 hy 5.80 ab 23.58 mt 7.19 an 35.31 hm 5.60	Gazelle Harbor, Kerguelen Island.	R. Reinisch.	R. Reinisch, D. Tiefs. Exp., X (3), p. 64, 1908.	Basalt.	
153	II″.5.4.4.	Q 2.70 di 10.80 or 7.23 hy 9.40 ab 18.34 mt 6.96 an 36.70 hm 6.84	Gazelle Harbor, Kerguelen Island.	R. Reinisch.	R. Reinisch, D. Tiefs. Exp., X (3), p. 64, 1908.	Basalt.	
154	II(III).5(6).(3) 4.4″.	or 6.67 di 15.14 ab 17.82 ol 9.72 an 32.80 mt 7.89 ne 5.96 il 1.98 ap 0.67	Possession Island, Crozet Islands.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (4), p. 332, 1908.	Basalt.	
155	II(III).5″.(3)4.4.	or 7.23 di 14.19 ab 17.29 ol 10.43 an 34.19 mt 7.19 ne 5.40 il 2.28 ap 0.67	Possession Island, Crozet Islands.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (4), p. 332, 1908.	Basalt.	
156	II.(4)5.(3)4.4″.	Q 7.86 di 0.68 or 6.12 hy 14.74 ab 29.87 mt 3.02 an 35.03 il 1.52	Port Locroy, Graham Land, Antarctica.	Pisani.	E. Gourdon, Exp. Ant. Fr., Petr. vol., p. 183, 1908.	Labradorite (andesite).	
157	II″.(4)5.(3)4.(4) 5.	Q 7.32 di 7.08 or 3.34 hy 13.11 ab 27.77 mt 10.21 an 27.52 il 0.15 ap 2.35	Moreno Island, 64° 4′ S., 61° 20′ W., Antarctica.	E. Zdarek.	A. Pelikan, Voy. Belgica, V, Petr. Unter., I, p. 8, 1909.	Augite diorite.	TiO_2 and P_2O_5 interchanged?
158	II″.″5.″4.4″.	Q 5.04 di 16.03 or 5.56 hy 12.20 ab 24.63 mt 4.18 an 30.58 il 1.67	Bridgman Island, South Shetland Islands, Antarctica.	Boiteau.	E. Gourdon, pers. com.	Basalt.	
159	II.5.4.4.⊙	Q 2.82 di 16.89 or 5.00 hy 5.56 ab 20.96 mt 4.87 an 39.20 il 2.58 ap 0.34	Deception Island, South Shetland Islands, Antarctica.	Boiteau.	E. Gourdon, pers. com.	Labradorite (basalt).	

CLASS II. DOSALANE—Continued.

RANG 4. DOCALCIC. HESSASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
160	49.69	20.07	2.47	5.22	5.75	12.20	2.39	0.45	0.54		0.99	0.09			99.76	
A2. II	.828	.197	.015	.072	.144	.218	.039	.005			.012	—				
161	52.02	18.26	3.55	6.92	4.08	7.93	3.84	0.31	1.44		1.40	0.51			100.26	
A2. II	.867	.179	.022	.096	.102	.141	.062	.003			.018	.004				
162	50.55	18.44	5.29	5.87	4.45	8.39	3.54	0.43	1.23		1.32	0.35			99.96	
A2. II	.843	.181	.033	.082	.111	.150	.057	.005			.017	.002				
163	49.29	16.65	5.39	5.68	5.49	9.64	2.79	0.79	1.62		1.99	0.46			99.79	
A2. II	.822	.163	.034	.079	.137	.172	.045	.008			.025	.003				
164	48.50	19.26	4.24	5.26	4.63	12.86	2.02	1.06	0.50		1.32	0.19			99.84	
A2. II	.808	.189	.026	.073	.116	.230	.032	.012			.017	.001				
165	48.11	23.08	2.29	3.28	5.55	14.53	1.81	0.23	0.88		0.33	0.06			100.15	
A2. II	.802	.226	.014	.046	.139	.259	.029	.002			.004	—				

RANG 5. PERCALCIC. CORSASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	44.04	20.01	4.22	8.61	5.01	11.68	1.24	0.15	1.90	0.11	2.24	0.52	0.28	CO_2 none ZrO_2 0.10 FeS_2 0.25 Cr_2O_3 none V_2O_3 0.05 NiO 0.01 BaO none SrO none Li_2O trace	100.42	3.037
A1. I	.734	.196	.026	.120	.125	.209	.020	.002			.028	.004	.004			
2	43.41	23.15	3.72	4.39	7.65	14.27	0.82	0.22	1.53	0.18	0.39	0.02	0.08	CO_2 0.10 Cl trace FeS_2 0.14 Cr_2O_3 none NiO none BaO none SrO none Li_2O trace	100.09	
A1. I	.724	.226	.023	.061	.191	.255	.013	.002			.005	—	.001			
3	46.39	26.28	2.02	3.15	4.82	15.29	1.63	0.20	0.48	0.10	0.26	trace	0.14	Cr_2O_3 0.03 V_2O_3 0.03	100.82	2.85
A2. II	.773	.258	.013	.044	.121	.273	.026	.002			.003	—	.002			
4	46.55	24.87	3.56	0.40	6.38	14.17	0.84	0.26	3.00		0.33		0.06		100.42	2.88
A2. II	.776	.244	.023	.006	.160	.254	.014	.003			.004		.001			
5	45.20	29.72	2.18	n. d.	3.49	15.40	0.82	0.07	2.80		0.31		0.09		100.08	2.92
A3. III	.753	.291	.014	(.028)	.087	.275	.013	.001			.004		.001			
6	42.16	28.20	1.22	2.14	6.05	15.40	0.81	0.17	3.10			0.20		S 0.07	99.52	
A3. III	.703	.276	.008	.029	.151	.275	.013	.002				.001				
7	48.59	27.54	0.20	1.37	6.91	11.87	1.26	0.15	1.86	0.15	0.06	trace	0.20	CO_2 0.23 Cr_2O_3 0.08 BaO 0.02	100.49	
A2. II	.805	.270	.001	.019	.173	.213	.020	.002			—	—	.003			
8	42.92	26.42	3.97	2.81	7.26	15.40	0.63	trace	0.80						100.21	
A3. III	.715	.259	.025	.039	.182	.272	.009	—								

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG 4-5. PRESODIC. HESSOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
160	II″.5.4.(4)5.	Q 0.24 di 14.52 or 2.78 hy 13.36 ab 20.44 mt 3.48 an 42.53 il 1.82	Sounding, 70° S., 81° W. Paris, Weddell quadrant, Antarctica.	Boiteau.	E. Gourdon, pers. com.	Gabbro.	Dredged block.
161	II.″5.(3)4.5.	Q 4.62 di 3.19 or 1.67 hy 16.03 ab 32.49 mt 5.10 an 31.69 il 2.74 ap 1.34	Jenny Island, Weddell quadrant, Antarctica.	Lassieur.	E. Gourdon, pers. com.	Augite andesite.	
162	II.5.″4.″5.	Q 3.96 di 5.34 or 2.78 hy 12.76 ab 29.87 mt 7.66 an 33.08 il 2.58 ap 0.67	Jenny Island, Weddell quadrant, Antarctica.	Lassieur.	E. Gourdon, pers. com.	Augite andesite.	
163	II(III).″5.″4.4(5).	Q 4.50 di 11.45 or 4.45 hy 10.92 ab 23.58 mt 7.89 an 30.58 il 3.80 ap 1.01	Jenny Island, Weddell quadrant, Antarctica.	Boiteau.	E. Gourdon, pers. com.	Basalt.	
164	II″.5.4.4.	Q 1.56 di 18.25 or 6.67 hy 6.82 ab 16.77 mt 6.03 an 40.31 il 2.58 ap 0.34	Jenny Island, Weddell quadrant, Antarctica.	Boiteau.	E. Gourdon, pers. com.	Gabbro.	
165	II.5.4(5).5.	or 1.11 di 14.17 ab 15.20 hy 9.78 an 54.21 ol 0.76 mt 3.25 il 0.61	Webb Island, Laubeuf Fiord, Weddell quadrant, Antarctica.	Boiteau.	E. Gourdon, pers. com.	Gabbro.	

SUBRANG. NOT NEEDED.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II(III).5.(4)5.0.	Q 2.04 di 5.69 or 1.11 hy 18.95 ab 10.48 mt 6.03 an 48.37 il 4.26 ap 1.01	Stone Run, Cecil County, Maryland.	W. F. Hillebrand.	A. G. Leonard, A. G., XXVIII, p. 146, 1901.	Diorite.	In W. T., p. 293.
2	II.5.″5.0.	or 1.11 di 9.76 ab 6.81 hy 7.02 an 58.66 ol 8.48 mt 5.34 il 0.76	Phoenix Reservoir, Tuolumne County, California.	H. N. Stokes.	H. W. Turner, J. G., VII, p. 150, 1899.	Olivine gabbro.	In W. T., p. 293.
3	II.5.(4)5.5.″0.	or 1.11 di 9.58 ab 13.62 hy 1.06 an 63.94 ol 7.47 mt 3.02 il 0.46	Cuillin Laccolite, Sligachan, Skye, Scotland.	W. Pollard.	A. Harker, Rocks of Skye, p. 103, 1904.	Olivine gabbro.	
4	II.5.″5.0.	Q 1.98 di 5.83 or 1.67 hy 13.30 ab 7.34 mt 0.70 an 63.11 il 0.61 hm 3.20	Schlumpskoppe, Neurode, Silesia.	O. Hauser.	F. Tannhäuser, Sb. Pr. Ak. Wiss., 1908, II, p. 1072.	Forellenstein (troctolite).	
5	(I)II.5.5.0.	Q 0.42 hy 12.00 or 0.56 il 0.61 ab 6.81 an 76.45 C 0.20	Schlumpskoppe, Neurode, Silesia.	O. Hauser.	F. Tannhäuser, Sb. Pr. Ak. Wiss., 1908, II, p. 1070.	Anorthosite.	
6	″II.5.5.0.	or 1.11 di 2.41 ab 5.24 ol 11.91 an 72.56 mt 1.86 ne 0.85 ap 0.34	Ransko, Eisengebirge, Bohemia.	C. v. John.	Hinterlechner and v. John, Jb. G. R. A. Wien, LIX, p. 197, 1909.	Olivine gabbro.	
7	II.5.″5.0.	Q 3.18 hy 20.77 or 1.11 mt 0.23 ab 10.48 an 59.21 C 3.57	Mount Neravetkeu, Samoyed Urals, Russia.	H. Backlund.	H. Backlund, Mem. Imp. Ac. Sci. St. Pet., XXVIII, No. 3, p. 46, 1912.	Anorthosite.	
8	II.5.5.0.⊙	ab 4.72 di 4.81 an 69.50 hy 6.16 ol 8.20 mt 5.80	Talaya, Ural Mountains, Russia.	L.-Lessing and Kultacheff.	Loewinson-Lessing, Jashno-Saorsk., p. 166, 1900.	Pyroxene granulite (gabbro).	In W. T., p. 293.

CLASS II. DOSALANE—Continued.

RANG 5. PERCALCIC. CORSASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
9	44.12	25.13	0.87	3.85	9.51	14.19	1.16	0.17	0.25	0.11	0.20	0.10			99.86	
A2. II	.735	.246	.005	.054	.238	.254	.019	.002			.003	.001				
10	44.40	20.55	6.57	9.26	5.21	11.50	1.14	0.19	1.00						99.82	3.035
A3. III	.740	.201	.041	.129	.130	.205	.018	.002								
11	45.84	20.42	6.51	6.64	4.85	13.27	1.13	0.23	1.27		0.18	0.04	trace		100.38	
A2. II	.764	.200	.041	.092	.121	.238	.018	.002			.002	—	—			
12	47.51	23.03	1.08	4.00	6.69	15.08	1.41	0.22	0.98		0.38				100.38	
A3. III	.992	.225	.007	.056	.167	.270	.023	.002			.005					
13	43.29	21.11	4.98	7.50	6.48	13.25	1.34	0.26	0.17		1.14	trace			100.52	
A3. III	.722	.207	.031	.104	.162	.237	.022	.003			.014	—			(99.48)	

CLASS II. DOSALANE.

RANG 1. PERALKALIC. LARDALASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	57.46	15.40	4.87	0.87	1.37	2.59	5.48	9.44	0.82	0.09	0.60	0.21	trace	CO_2 0.13 SO_3 0.13 Cl 0.20 F trace BaO 0.60 SrO 0.16	100.42	
A1. I	.958	.151	.031	.012	.034	.046	.089	.100			.008	.001	—			
2	51.75	14.52	5.08	3.58	4.55	7.04	2.93	7.61	2.25		0.23	0.18	trace	SO_3 trace Cl 0.05 BaO 0.30 SrO 0.07	100.14	
A1. I	.863	.142	.035	.050	.114	.126	.047	.081			.003	.001	—			
3	51.20	14.47	6.76	2.94	6.19	4.81	2.01	9.50	0.86		1.23	0.70			99.72	
A2. II	.840	.142	.043	.041	.155	.086	.039	.101			.015	.005				
4	49.60	14.30	6.91	3.05	6.54	5.45	1.97	8.78	0.93		1.01	0.59			99.63	
A2. II	.827	.140	.043	.043	.164	.097	.032	.094			.013	.004				

RANG 1. PERALKALIC. LARDALASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	52.53	18.31	0,34	6.43	1.82	3.15	7.26	6.47	1.16			1.59	0.15	Cl 0.40 F 0.32	99.93	
A2. II	.876	.180	.002	.089	.046	.056	.117	.069				.011	.002			
2	52.91	19.49	4.78	2.05	0.29	2.47	7.13	7.88	1.19		none	trace	0.44	Cl 0.53 S 0.52 X 0.48 SrO 0.09 Li_2O trace	100.25	
A1. I	.882	.191	.030	.029	.007	.045	.114	.084			—	—	.006			
3	57.63	17.53	3.46	1.18	0.22	1.35	5.80	9.16	3.22		0.23	trace	trace	Cl 0.08 Li_2O trace	99.86	
A2. II	.961	.172	.022	.017	.006	.024	.094	.098			.003	—	—			
4	53.42	21.04	1.74	2.83	0.61	2.88	7.80	7.48	0.76	0.04	0.60	0.10	0.07	CO_2 0.43 SO_3 0.07 Cl 0.10	99.96	2.609
A2. II	.890	.206	.011	.039	.015	.051	.126	.080			.008	.001	.001			

ORDER 5. PERFELIC. GERMANARE—Continued.

SUBRANG. NOT NEEDED—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
9	II.5.″5.0.	or 1.11 di 5.75 ab 7.07 ol 19.40 an 62.55 mt 1.16 ne 1.56 il 0.46 ap 0.34	Mount Fonjay, Sakalave region, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVII, p. 14, 1913.	Allivalite.	
10	II(III).5.″5.0.	Q 0.96 di 5.50 or 1.11 hy 21.90 ab 9.43 mt 9.51 an 50.32	Bluff, Otago, New Zealand.	L. J. Wild.	L. J. Wild, Tr. N. Z. Inst., XLIV (1911), p. 325, 1912.	Segregation in norite.	
11	II(III).5.(4)5.0.	Q 3.84 di 11.25 or 1.11 hy 13.12 ab 9.43 mt 9.51 an 50.04 il 0.30	Bob Island, 64° 51′ S., 63° 21′ W., Wieneke Island, Antarctica.	E. Zdarek.	A. Pelikan, Voy. Belgica, V, Pet. Unt., I, p. 41, 1909.	Gabbro.	
12	II″.5.(4)5.0.	or 1.11 di 15.60 ab 12.05 hy 6.72 an 55.60 ol 5.97 mt 1.62 il 0.76	Leonie Island, Weddell quadrant, Antarctica.	Lassieur.	E. Gourdon, pers. com.	Gabbro.	
13	II(III).5.(4)5.0.	or 1.67 di 12.36 ab 11.53 hy 3.26 an 50.60 ol 10.67 mt 7.19 il 2.13	Petermann Island, Weddell quadrant, Antarctica.	Lassieur.	E. Gourdon, pers. com.	Gabb	

ORDER 6. LENDOFELIC. NORGARE. (C. I. P. W., 1902.)

SUBRANG 2. DOPOTASSIC. FERGUSOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.″6.1.2″.	or 55.60 ac 14.32 ab 5.76 ns 0.85 ne 11.36 di 8.34 wo 0.58 il 1.22 ap 0.34	Bean Creek, Bearpaw Mountains, Montana.	H. N. Stokes.	Weed and Pirsson, A. J. S., II, p. 192, 1896.	Tinguaite.	In W. T., p. 295.
2	II(III).″6.1(2).2(3).	or 45.04 di 23.86 ab 3.67 ol 1.25 an 3.89 mt 8.12 ne 11.36 il 0.46 ap 0.34	Shonkin Creek, Highwood Mountains, Montana.	E. B. Hurlbut.	L. V. Pirsson, U. S. G. S. B. 237, p. 74, 1905.	Fergusite.	In W. T., p. 293.
3	II″.6.1.2.	or 48.93 di 14.47 an 0.56 ol 6.16 lc 5.67 mt 6.03 ne 11.08 il 2.28 hm 2.72 ap 1.68	Gaussberg, K. Wilhelm II Land, Antarctica.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (1), p. 81, 1906.	Leucite basalt.	
4	II(III).6.1(2).2.	or 47.82 di 15.12 an 3.89 ol 6.58 lc 3.49 mt 6.96 ne 9.09 il 1.98 hm 2.08 ap 1.34	Gaussberg, K. Wilhelm II Land, Antarctica.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (1), p. 81, 1906.	Leucite basalt.	

SUBRANG 3. SODIPOTASSIC. JUDITHOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.6.1.3(4).	or 38.36 ac 2.77 ab 15.72 di 4.52 ne 23.00 ol 10.55 mt 0.46 ap 3.70	Altona Township, Clinton County, New York.	E. W. Morley.	H. P. Cushing, B. G. S. A., IX, p. 248, 1898.	Syenite porphyry.	In W. T., p. 295.
2	(I)II.6.1.3″.	or 46.70 di 2.75 ab 14.15 wo 3.83 ne 22.72 mt 6.96 he 0.82	Neasch's gully, Magnet Cove, Arkansas.	J. F. Williams.	J. F. Williams, Ign. R. Ark., p. 287, 1891.	Leucite tinguaite.	In W. T., p. 293.
3	(I)II.″6.1.″3.	or 54.49 ac 9.24 ab 13.62 di 4.02 ne 13.63 wo 0.81 mt 0.46 il 0.46	Cone Butte, Judith Mountains, Montana.	L. V. Pirsson.	Weed and Pirsson, A. J. S., II, p. 192, 1896.	Tinguaite.	Also in U. S. G. S. A. R. 18 (III), p. 569, 1898. In W. T., p. 293.
4	(I)II.6(7).1.3(4).	or 44.48 di 8.45 ab 9.96 wo 1.16 ne 30.39 mt 2.55 il 1.22 ap 0.34	Leanchoie, Ice River, British Columbia.	M. F. Connor.	J. A. Allan, pers. com.	Nephelite syenite.	

CLASS II. DOSALANE—Continued.

RANG 1. PERALKALIC. LARDALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
5	53.23	13.81	7.11	2.30	1.88	2.35	6.16	6.67	3.81		2.27	0.34	0.28	SO_3 0.21 Cl trace	100.42	2.66
A2. II	.887	.135	.044	.032	.047	.042	.099	.071			.029	.002	.004			
6	50.33	16.40	5.48	3.11	2.64	3.49	6.15	6.07	3.02		2.53	0.75		Cl trace FeS_2 0.16	100.13	2.615
A2. II	.839	.161	.034	.043	.066	.063	.099	.065			.031	.005				
7	57.00	16.06	5.55	3.22	0.64	1.51	8.00	6.18	2.10		0.39			Cl 0.45	101.08	
B3. IV	.950	.157	.034	.044	.016	.027	.129	.066			.005					
8	52.88	14.44	6.72	4.56	1.68	3.80	4.78	7.09	4.00			0.11			100.06	
v3. III	.881	.142	.042	.064	.042	.068	.077	.076				.001				

RANG 1. PERALKALIC. LARDALASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	57.88	14.80	5.86	3.71	none	2.71	9.12	3.06	0.90	0.23	1.23	trace	0.15	ZrO_2 none SO_3 none Cl none	99.65	2.772
A2. II	.965	.145	.037	.051	—	.048	.147	.133			.015	—	.002			
2	56.90	16.34	3.61	5.72	0.22	2.21	8.10	4.96	1.10	0.08	1.09	0.17	trace	Cl trace	100.50	2.783
A2. II	.948	.160	.023	.079	.005	.035	.131	.053			.014	.001	—			
3	55.79	15.76	1.60	7.56	0.41	3.70	7.72	4.34	0.18	0.34	1.81	0.36		Cl none	99.71	2.766
A2. II	.930	.154	.010	.105	.010	.066	.124	.046			.023	.003				
4	54.58	20.43	2.08	3.39	trace	1.56	10.70	5.74	1.02	0.12	0.62	trace	trace		100.24	2.698
A3. III	.905	.200	.013	.047	—	.028	.173	.061			.008	—	—			
5	53.74	14.02	10.63	1.71	trace	1.18	9.02	4.77	3.40		0.50	none	0.36	ZrO_2 1.63	100.96	2.67
B2. III	.896	.137	.066	.024	—	.021	.145	.051			.006	—	.005			
6	53.71	15.37	3.28	5.72	1.58	5.20	6.84	4.11	0.45	0.33	3.40	0.52	0.14		100.65	2.697
A2. II	.895	.151	.021	.079	.040	.093	.110	.044			.043	.004	.002			
7	53.53	19.69	5.09	2.83	none	1.87	9.61	5.23	0.34	0.25	0.44	0.31	0.24	CO_2 0.40 Cl 0.04	99.87	2.751
A2. II	.892	.193	.032	.039	—	.034	.155	.055			.005	.002	.003			
8	53.44	18.64	9.38	0.86	none	0.79	12.10	2.43	1.12	0.34	0.30	none	0.10	ZrO_2 1.00 Cl 0.12	100.62	2.834
A2. II	.891	.183	.059	.012	—	.014	.195	.026			.004	—	.001			
9	53.01	15.33	9.14	4.44	0.10	0.67	11.86	2.60	1.88	0.20	0.33	trace	0.13	ZrO_2 0.65 SO_3 none Cl 0.23	100.57	2.844
A2. III	.884	.150	.057	.062	.003	.012	.191	.028			.004	—	.002			
10	49.64	13.74	7.10	4.97	1.58	4.88	6.33	4.42	0.81	0.14	4.25	1.57	0.03	BaO 0.21	99.67	2.892
A2. II	.828	.135	.044	.069	.040	.088	.102	.047			.054	.011	—			

ORDER 6. LENDOFELIC. NORGARE—Continued.

SUBRANG 3. SODIPOTASSIC. JUDITHOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
5	II″.(5)6.1.3.	or 39.48 ac 16.17 ab 15.20 di 7.56 ne 9.94 ol 1.12 mt 0.70 il 4.41 hm 0.96 ap 0.67	Michelsberg, Katzenbuckel, Odenwald.	O. N. Heidenreich.	W. Freudenberg, Mt. Bad. G. L.-A., V (1), p. 315, 1907.	Hornblende tinguaite.	
6	II.6.1.3(4).	or 36.14 ac 1.39 ab 18.86 di 9.94 ne 17.04 ol 1.40 mt 2.78 il 4.71 hm 3.04 ap 1.68	Michelsberg, Katzenbuckel, Odenwald.	O. N. Heidenreich.	W. Freudenberg, Mt. Bad. G. L.-A., V (1), p. 315, 1907.	Mica tinguaite.	
7	II.″6.1.3(4).	or 36.70 ac 14.78 ab 23.58 di 6.50 ne 13.06 ol 1.91 hl 0.70 mt 0.46 il 0.76	Logans Point, Signal Hill, Dunedin, New Zealand.	C. A. Cotton.	C. A. Cotton, Tr. N. Z. Inst., XLI, p. 118, 1909.	Phonolite.	
8	II.(5)6.1.3.	or 42.26 ac 5.08 ab 14.93 di 14.97 ne 10.65 ol 0.83 mt 7.19 ap 0.34	Puketeraki, Dunedin, New Zealand.	P. Marshall.	P. Marshall, Q. J. G. S., LXII, p. 405, 1906.	Leucitophyre.	

SUBRANG 4. DOSODIC. LARDALOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.(5)6.1.4.	or 18.35 ac 16.17 ab 41.92 di 8.93 ne 9.09 wo 1.39 mt 0.46 il 2.28	North Siorarsuit, Ilimausak region, Greenland.	C. Winther.	N. V. Ussing, G. Julhb., p. 124, 1911.	Pulaskite.	
2	II.6.1.″4.	or 29.47 ac 11.09 ab 30.39 di 8.52 ne 13.92 ol 3.47 il 2.13	Akuliarusek, Igaliko Fjord, Greenland.	C. Winther.	N. V. Ussing, G. Julhb., p. 279, 1911.	Hedrumite.	
3	II.″6.1.4.	or 25.58 ac 4.62 ab 33.80 ns 0.73 ne 12.35 di 13.89 ol 4.17 il 3.50 ap 1.01	Kangerdluarsuk, Ilimausak region, Greenland.	C. Winther.	N. V. Ussing, G. Julhb., p. 190, 1911.	Augite syenite.	
4	″II.6(7).1.4.	or 33.92 ac 6.01 ab 16.77 ns 2.56 ne 30.39 di 6.95 ol 1.12 il 1.22	Akuliarusek, Igaliko Fjord, Greenland.	C. Winther.	N. W. Ussing, G. Julhb., p. 275, 1911.	Nephelite porphyry.	
5	II(III).6.1.(3)4.	or 28.36 ac 27.26 ab 16.77 di 3.97 ne 15.34 wo 0.58 Z 2.38 mt 1.62 il 0.91	Laxefjaeld, Kangerdluarsuk, Greenland.	N. V. Ussing,	N. V. Ussing, G. Julhb., p. 168, 1911.	Aegirite lujavrite.	Incomplete in Rosenbusch, Elemente, p. 126, 1898. In W. T., p. 295.
6	II.″6.1.4.	or 24.46 ac 1.39 ab 34.58 di 13.60 ne 11.64 wo 2.32 mt 4.18 il 6.54 ap 1.34	Niakornarsuk, Korok Fjord, Greenland.	C. Winther.	N. V. Ussing, G. Julhb., p. 243, 1911.	Augite syenite.	
7	″II.6″.1.4.	or 30.58 ac 7.85 ab 22.53 di 4.71 ne 26.98 wo 0.93 mt 3.48 il 0.76 ap 0.67	Korok, Igaliko region, Greenland.	C. Winther.	N. V. Ussing, G. Julhb., p. 235, 1911.	Foyaite.	
8	II.6(7).1.4(5).	or 14.46 ac 17.56 ab 32.49 wo 1.63 ne 26.98 mt 1.86 hl 0.35 hm 2.08 Z 1.46 il 0.61	Tupersuatsiak, Ilimausak region, Greenland.	C. Winther.	N. V. Ussing, G. Julhb., p. 169, 1911.	Aegirite lujavrite.	
9	II(III).6(7).1.4.	or 15.57 ac 26.33 ab 23.06 ns 1.46 ne 22.15 di 2.97 Z 1.65 ol 4.83 il 0.61	Lille Elv, Kangerdluarsuk, Greenland.	C. Winther.	N. V. Ussing, G. Julhb., p. 175, 1911.	Arfvedsonite lujavrite.	
10	II(III).(5)6.1.(3)4.	or 26.13 ac 6.47 ab 27.77 di 8.64 ne 9.94 wo 1.39 il 8.21 hm 2.40 ap 3.70	Mount Hatten, Ilimausak region, Greenland.	C. Winther.	N. V. Ussing, G. Julhb., p. 220, 1911.	Porphyry.	

CLASS II. DOSALANE—Continued.

RANG 1. PERALKALIC. LARDALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
11	47.79	16.88	4.66	5.92	1.51	5.58	7.76	3.26	1.17	0.14	3.82	0.76	trace	CO_2 none Cl none	99.25	2.921
B2. III	.797	.166	.029	.082	.038	.100	.125	.035			.048	.005	—			
12	55.68	20.39	2.10	1.95	0.80	1.92	9.18	5.34	1.50		0.60	0.06	0.31		99.83	
A2. II	.928	.200	.013	.027	0.20	.034	.148	.056			.008	—	.004			
13	52.03	20.58	3.40	1.98	0.27	2.46	8.63	5.46	4.83			0.07	0.13	CO_2 0.26	100.57	2.55
A2. II	.867	.202	.021	.028	.007	.044	.139	.058	.047			—	.002			
14	54.04	20.27	4.66	0.64	0.16	2.75	8.56	6.79	1.93						99.80	
A3. III	.901	.198	.029	.009	.004	.049	.138	.072								
15	54.42	20.76	2.64	1.33	0.22	1.34	10.41	4.89	2.50	0.22	0.40	0.11	0.15	ZrO_2 0.15 Cl 0.23 S 0.01 Cr_2O_3 none NiO none BaO 0.04 SrO trace Li_2O trace	99.82	2.559
A1. I	.907	.203	.016	.018	.006	.024	.168	.053			.005	.001	.002			
16	57.46	18.41	2.40	1.28	none	4.02	9.23	4.93	1.12	0.45	0.42	0.11	0.11	SO_3 0.50 Cl 0.23 S 0.05	100.72	
A2. II	.958	.180	.015	.018	—	.071	.148	.052			.005	.001	.002			
17	47.61	14.26	4.90	4.07	2.62	8.71	6.70	4.08	1.89	0.26	1.38	1.38	0.30	ZrO_2 0.18 SO_3 1.17 Cl 0.37 F trace S' 0.03 Cr_2O_3 trace NiO trace BaO 0.41 SrO 0.36 Li_2O trace	100.68	2.79
A1. I	.793	.140	.031	.057	.066	.155	.108	.043			.017	.010	.004			
18	55.90	19.00	2.05	2.54	1.10	3.12	8.49	5.41	n. d.		1.45		0.28		99.34	2.642
A3. III	.932	.186	.013	.035	.028	.055	.137	.058			.018		.004			
19	59.88	17.87	2.67	1.50	1.04	2.01	7.96	5.69	0.90		0.85	0.32	trace		100.69	
A2. II	.998	.175	.017	.021	.026	.036	.128	.061			.011	.002	—			
20	56.58	19.89	3.18	0.56	0.13	1.10	10.72	5.43	1.77				0.47		99.83	
A3. III	.943	.195	.020	.008	.003	.020	.173	.058					.007			
21	55.65	20.06	3.45	1.25	0.78	1.45	8.99	6.07	1.51						99.21	
B3. IV	.928	.197	.022	.017	.020	.026	.145	.065								
22	56.35	19.85	1.91	2.03	1.17	2.60	8.89	5.31	0.70		1.00	0.67	0.20		100.68	
A2. II	.939	.195	.012	.028	.029	.046	.143	.056			.013	.005	.003			
23	54.55	19.07	2.41	3.12	1.98	3.15	7.67	4.84	0.72		1.40	0.74	0.17		99.82	
A2. II	.909	.187	.015	.043	.050	.056	.124	.051			.018	.005	.002			
24	53.81	19.69	6.20	3.63	0.85	1.73	7.77	4.58	1.52						99.78	
A3. III	.897	.193	.039	.050	.021	.031	.125	.049								

ORDER 6. LENDOFELIC. NORGARE—Continued.

SUBRANG 4. DOSODIC. LARDALOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
11	II.6.1.4.⊙	or 19.46 ab 26.72 an 1.67 ne 21.02 di 9.45 wo 4.18 mt 6.73 il 7.30 ap 1.68	Lake Tasek, Narsak, Ilimausak region, Greenland.	C. Winther.	N. V. Ussing, G. Julhb., p. 216, 1911.	Trachy-dolerite.	
12	(I)II.6.1.4.	or 31.14 ab 29.34 ne 24.99 ac 1.85 di 6.80 wo 0.46 mt 3.02 il 1.22	Brome Mountain, Quebec.	M. F. Connor.	J. A. Dresser, A. J. S., XVII, p. 355, 1904.	Nephelite syenite.	Also in Can. G. S. A. R. XVI (1904), p. 13, G, 1906.
13	(I)II.6″.1.4.	or 32.25 ab 21.74 an 1.39 ne 27.69 di 3.75 wo 3.83 mt 4.87	Heron Bay, Lake Superior, Ontario.	A. H. A. Robinson.	A. P. Coleman, Rep. Bur. Min. Ont., IX, p. 189, 1900.	Heronite.	Not in W. T.
14	(I)II.6″.1.(3)4.	or 40.03 ab 15.20 ne 27.55 ac 5.56 di 0.86 wo 5.22 mt 2.09 hm 1. 8	Magnet Cove, Arkansas.	R. N. Brackett.	J. F. Williams, Ign. R. Ark., p. 287, 1891.	Leucite tinguaite.	In W. T., p. 295.
15	(I)II.6(7).1.4.	or 29.47 ab 23.32 ne 29.96 ac 7.39 ns 0.24 di 5.02 wo 0.35 il 0.76	Between Black and Big Mountains, Uvalde County, Texas.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 168, p. 62, 1900.	Phonolite.	In W. T., p. 295.
16	″II.6.1.4.	or 28.91 ab 35.63 ne 17.04 hl 0.35 th 0.85 ac 5.08 di 2.23 wo 6.61 mt 0.93 il 0.76 ap 0.34	Black Buttes, Sundance quadrangle, Wyoming.	G. Steiger.	W. S. T. Smith, U. S. G. S. Fol. 127, p. 7, 1905.	Phonolite.	
17	II(III).6.1.4.	or 23.91 ab 19.39 an 2.50 ne 14.48 hl 0.59 th 2.13 di 17.48 wo 3.94 mt 7.19 il 2.58 ap 3.36	Two Buttes, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 148, p. 182, 1897.	Tinguaite.	In W. T., p. 295.
18	II.6.1.″4.	or 32.25 ab 25.15 ne 22.72 ac 4.16 di 10.26 wo 1.16 mt 0.93 il 2.74	Foia, Portugal.	G. Pajkull.	Kraatz-Koschlau and Hackmann, T. M. P. M., XVI, p. 262, 1896.	Mica tinguaite.	In W. T., p. 295.
19	″II.(5)6.1.(3)4.	or 33.92 ab 37.73 ne 11.93 ac 6.47 di 6.45 ol 0.31 mt 0.70 il 1.67 ap 0.67	Sundet, Asrum Lake, Norway.	V. Schmelck.	W. C. Brögger, Eg. Kg., III, p. 190, 1899.	Hedrumite.	In W. T., p. 295.
20	(I)II.6.1.4.	or 32.25 ab 24.63 ne 25.56 ac 9.24 ns 1.95 di 4.37 wo 0.23	Asbjornsröd, Hedrum Parish, Lougendal, Norway.	G. Pajkull.	W. C. Brögger, Z. K., XVI, p. 41, 1890.	Tinguaite.	Border of dike. Also in Eg. Kg., I, p. 113, 1894. In W. T., p. 295.
21	(I)II.6.1.″4.	or 36.14 ab 22.01 ne 25.56 ac 6.01 di 5.88 ol 0.14 mt 2.09	Asbjornsröd, Hedrum Parish, Lougendal, Norway.	V. Schmelck.	W. C. Brögger, Eg. Kg., I, p. 191, 1894.	Tinguaite.	Center of dike. In W. T., p. 295.
22	(I)II.6.1.4.	or 31.14 ab 32.22 ne 22.01 ac 1.85 di 6.48 ol 0.80 mt 1.86 il 1.98 ap 1.68	Near Pollen, Farrisvand, Lougendal, Norway.	V. Schmelck.	W. C. Brögger, Eg. Kg., III, p. 19, 1899.	Laurdalite.	In W. T., p. 295.
23	″II.6.1″.4.	or 28.36 ab 34.06 an 3.34 ne 16.76 di 5.99 ol 2.67 mt 3.48 il 2.74 ap 1.68	Löve, Lougendal, Norway.	V. Schmelck.	W. C. Brögger, Eg. Kg., III, p. 19, 1899.	Laurdalite.	In W. T., p. 295.
24	(I)II.″6.1(2).4.	or 27.24 ab 36.68 an 5.28 ne 15.62 di 2.72 ol 1.83 mt 9.05	Stoksund, Norway.	G. Forsberg.	W. C. Brögger, Z. K., XVI, p. 116, 1890.	Syenite pegmatite.	In W. T., p. 297.

CLASS II. DOSALANE—Continued.

RANG 1. PERALKALIC. LARDALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
25	51.95	14.95	4.09	5.70	3.54	6.10	5.43	4.45	1.10		1.95	1.15	0.30		100.71	
A2. II	.866	.147	.026	.079	.089	.109	.088	.048			.024	.008	.004			
26	45.16	15.26	9.57	4.99	3.18	2.87	6.57	3.87	n. d.		6.98	1.54	0.63		100.62	
A2. II	.753	.150	.060	.069	.080	.052	.106	.041			.087	.011	.009			
27	57.78	15.45	3.06	3.11	1.13	1.72	11.03	2.89	0.94		1.83		0.98		99.92	2.67–2.70
A2. II	.963	.151	.019	.043	.028	.031	.177	.031			.023		.014			
28	53.80	15.17	7.11	3.09	1.08	1.72	10.55	5.09	1.31				1.09		100.01	
A3. III	.897	.149	.044	.043	.027	.031	.170	.054					.016			
29	53.68	18.42	5.91	2.57	0.88	2.05	9.46	4.92	0.89		1.35		0.75		100.40	
A2. II	.895	.180	.037	.036	.022	.037	.153	.052			.017		.011			
30	53.67	16.79	6.57	2.53	1.74	2.47	9.07	4.14	0.34		1.96		0.11		100.40	
A2. II	.895	.165	.041	.035	.044	.045	.147	.044			.025		.002			
31	53.50	16.44	8.72	1.48	1.05	1.50	9.98	4.58	1.76		0.86		0.47		100.34	
A2. II	.892	.161	.054	.021	.026	.027	.161	.049			.011		.007			
32	55.10	19.25	2.77	1.66	0.83	5.14	7.41	4.68	2.19	0.40	0.48	0.41	0.32	CO_2 0.22	100.86	2.544
A2. II	.918	.189	.017	.023	.021	.092	.120	.050			.006	.003	.005			
33	54.05	21.06	0.41	3.90	0.86	2.80	9.67	4.18	1.03	0.33	none	none	1.91	SO_3 0.48 Cl 0.25	100.96	2.630
B2. III	.901	.206	.003	.054	.022	.050	.156	.044			—	—	—			
34	50.10	19.90	4.02	1.98	0.90	4.04	8.61	5.94	2.07		1.14	0.63	0.38	CO_2 trace SO_3 0.94 Cl trace	100.65	
A2. II	.835	.195	.025	.028	.023	.072	.139	.063			.014	.004	.005			
35	51.60	19.81	2.24	5.48	2.17	3.95	8.20	5.24	0.58					Cl 0.43	99.70	2.58
A3. III	.860	.194	.014	.076	.054	.071	.132	.055								
36	52.47	15.84	3.30	8.42	1.52	5.05	7.03	2.52	1.94		1.57	0.14		Cl none	100.01	2.766
A2. II	.875	.155	.021	.117	.038	.090	.113	.027			.020	.001				
37	48.23	18.41	3.27	5.00	1.92	6.43	7.77	3.16	3.05		1.90	0.47	trace	CO_2 0.41 S 0.12	100.14	2.670
A2. II	.804	.180	.020	.069	.048	.114	.126	.034			.028	.003	—			
38	54.24	20.84	2.26	2.09	1.21	2.99	9.22	3.84	1.89	1.24	0.51		0.15		100.48	
A2. II	.904	.204	.014	.029	.030	.054	.148	.040			.006		.002			
39	55.15	20.50	1.84	1.73	0.55	0.55	11.00	4.91	2.25		0.34		0.59	Cl 0.49	99.90	
A2. II	.919	.201	.012	.024	.014	.010	.177	.052			.004		.008			

ORDER 6. LENDOFELIC. NORGARE—Continued.

SUBRANG 4. DOSODIC. LARDALOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
25	II″.(5)6.1″.(3)4.	or 26.13 di 15.66 ab 27.77 ol 5.17 an 3.34 mt 6.03 ne 9.94 il 3.65 ap 2.69	Haö, Langesund Fjord, Norway.	V. Schmelck.	W. C. Brögger, Eg. Kg., III, p. 139, 1899.	Soda minette.	In W. T., p. 297.
26	II″.6.1.4.	or 22.80 di 0.65 ab 30.92 ol 5.46 an 0.83 il 11.86 ne 13.35 ap 3.70 pf 1.22	Lyseböfjord, Lardal, Norway.	P. Schei and L. Schmelck.	W. C. Brögger, Eg. Kg., III, p. 19, 1899.	Olivine laurdalite.	In W. T., p. 297.
27	II.(5)6.1.4.	or 17.24 ac 8.78 ab 43.23 ns 4.64 ne 10.65 di 7.24 ol 3.64 il 3.50	Tuoljlucht, Umptek, Kola, Finland.	H. Berghell.	V. Hackmann, Fennia, XI, No. 2, p. 139, 1894.	Nephelite syenite (lujavrite).	In W. T., p. 253.
28	II(III).6″.1.(3)4.	or 30.02 ac 20.33 ab 11.53 ns 3.78 ne 20.73 di 7.15 ol 5.14	Angwundast-schorr, Lujavr-Urt, Kola, Finland.	H. Blankett.	W. Ramsay, Fennia, XV, No. 2, p. 16, 1898.	Lampro-phyllite lujavrite.	Not in W. T.
29	II.6″.1.4.	or 28.91 ac 11.55 ab 19.91 di 8.53 ne 25.56 ol 0.24 mt 2.78 il 2.58	Tsutsknjun, Lujavr-Urt, Kola, Finland.	W. Peterssen.	W. Ramsay, Fennia, XV, No. 2, p. 16, 1898.	Eudialyte lujavrite.	"ZrO_2 in TiO_2." Not in W. T.
30	II.6.1.4.⊙	or 24.46 ac 12.01 ab 25.68 di 9.50 ne 20.45 wo 0.12 mt 2.78 il 3.80 hm 0.48	Angwundast-schorr, Lujavr-Urt, Kola, Finland.	H. Berghell.	W. Ramsay, Fennia, XV, No. 2, p. 16, 1898.	Eudialyte-lampro-phyllite lujavrite.	Not in W. T.
31	II″.6(7).1.4.	or 27.24 ac 22.64 ab 15.46 di 6.12 ne 23.42 ol 0.87 mt 1.16 il 1.67	Angwundas, Lujavr-Urt, Kola, Finland.	A. Zilliacus.	W. Ramsay, Fennia, XV, No. 2, p. 16, 1898.	Aegirite lujavrite.	Not in W. T.
32	(I)II.6.1(2).4.	or 27.80 di 4.54 ab 33.54 wo 4.87 an 5.28 mt 3.94 ne 15.90 il 0.91 ap 1.01	Mädstein, n. Neschwitz, Bohemia.	F. Hanusch.	J. E. Hibsch, T. M. P. M., XIV, p. 98, 1894.	Phonolite.	In W. T., p. 297.
33	(I)II.6″.1″.4.	or 24.46 di 8.08 ab 29.60 ol 3.63 an 4.45 mt 0.70 ne 25.42 hl 0.47 th 0.85	Hohe Riese, n. Radelstein, Bohemia.	F. Hanusch.	J. E. Hibsch, T. M. P. M., XXIV, p. 287, 1905.	Phonolite.	MnO high. Not used in calc. norm.
34	″II.6(7).1.″4.	or 35.03 di 4.97 ab 15.20 wo 3.60 an 1.39 mt 4.41 ne 27.83 il 2.13 th 1.70 hm 0.96 ap 1.34	Tachaberg, Polzen District, Bohemia.	K. H. Schleu-mann.	K. H. Schleumann, Abh. Sachs. Ges. W., XXXII, p. 757, 1913.	Hauyne phonolite.	
35	II.6(7).1″.4.	or 30.58 di 13.52 ab 14.15 ol 5.05 an 3.61 mt 3.25 hl 0.70	Eruption of 1906, Mount Vesuvius.	Pisani.	A. Lacroix, Nouv. Arch. Mus. (4), IX, p. 45, 1907.	Volcanic glass.	Dikelet in leucite-tephrite.
36	II.″6.1(2).4.	or 15.01 di 17.09 ab 38.25 ol 3.84 an 4.17 mt 4.87 ne 11.36 il 3.04 ap 0.34	Soca, Madeira Island.	Klüss.	C. Gagel, Z. D. G. G., LXIV, p. 399, 1912	Essexite.	
37	II.6(7).1(2).4.	or 18.90 di 15.57 ab 20.44 wo 1.74 an 5.56 mt 4.64 ne 24.71 il 4.26 ap 1.01	Barranca del Almendero, Madeira Island.	Klüss.	C. Gagel, Z. D. G. G., LXIV, p. 415, 1912.	Sodalite gauteite.	Fresh?
38	(I)II.6.1″.4.	or 22.24 di 8.53 ab 33.80 ol 0.24 an 4.45 mt 3.25 ne 23.71 il 0.91	Anaga Mountains, n. Mercedes, Teneriffe, Canary Islands.	N. Sahlbom.	H. Preiswerk, N. J. Cb., 1909, p. 396.	Phonolite.	Also in Vh. Nf. Ges. Basel, XXI, p. 210, 1910.
39	(I)II.6″.1.4.	or 28.91 ac 5.54 ab 28.30 ns 1.10 ne 26.98 di 2.38 hl 0.82 ol 2.91 il 0.61	Rouma, Los Islands, French Guinea.	Pisani.	A. Lacroix, Nouv. Arch. Mus., III, p. 38, 1911.	Nephelite syenite.	Also in B. Soc. Fr. Min., XXXV, p. 21, 1912.

CLASS II. DOSALANE—Continued.

RANG 1. PERALKALIC. LARDALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
40	54.75	19.90	4.00	1.64	0.52	0.18	11.30	2.82	3.38		0.35		0.72	ZrO_2 0.26	99.82	
A2. II	.913	.195	.025	.023	.013	.003	.182	.030			.004		.010			
41	60.1	18.4	1.8	2.5	0.3	1.4	9.1	5.2	1.2		0.5			Cl 0.1	100.6	
B3. IV	1.002	.180	.011	.035	.008	.025	.147	.055			.006					
42	57.5	17.8	4.7	1.4	0.2	1.3	9.0	4.5	3.0		none			Cl 0.4	99.8	
B3. IV	.958	.175	.029	.019	.005	.023	.145	.048			——					
43	56.5	18.5	4.4	0.7	0.2	0.9	10.2	4.6	3.5		none			Cl 0.4	99.9	
B3. IV	.942	.181	.028	.010	.005	.016	.165	.049			——					
44	52.48	19.28	4.00	2.93	1.34	4.01	8.66	4.91	1.17	0.29	0.66	trace	0.48	SO_3 0.80	101.01	
B2. III	.875	.189	.025	.040	.034	.071	.140	.052			.008	——	.007			
45	57.81	18.74	5.76	0.42	trace	1.28	9.35	4.52	1.50				trace		99.38	2.64
B3. IV	.964	.184	.036	.005	——	.023	.151	.048					——			
46	53.98	19.43	4.39	2.05	1.07	2.04	8.81	5.27	1.66	0.13	0.57	0.30	0.26		99.96	
A2. II	.899	.190	.028	.029	.027	.037	.142	.056			.007	.002	.004			
47	53.80	18.46	6.22	0.40	1.05	2.53	7.09	5.46	3.54	0.85	0.31	0.53	0.33		100.57	
A3. III	.897	.181	.039	.006	.026	.045	.115	.058			.004	.004	.005			
48	55.32	19.59	1.92	3.12	1.11	2.72	8.73	5.09	1.05		0.59	0.42	trace	ZrO_2 0.33 SO_3 0.26	100.25	2.640
A2. II	.922	.192	.012	.043	.028	.048	.140	.054			.007	.003	——			
49	54.94	19.34	1.80	4.52	1.11	2.05	8.39	5.93	0.32		0.67	0.18	trace	ZrO_2 0.38 SO_3 0.27	99.90	2.584
A2. II	.916	.190	.011	.063	.028	.037	.135	.063			.008	.001	——			
50	54.30	19.71	2.23	4.21	1.19	2.08	8.29	6.15	0.32		0.80	0.15		ZrO_2 0.48 S 0.10	100.01	2.551
A2. II	.905	.193	.014	.058	.030	.038	.134	.065			.010	.001				
51	54.20	19.38	3.83	2.14	1.35	2.15	8.01	5.28	1.04		0.79	0.58	trace	ZrO_2 0.47 SO_3 0.31	99.53	2.607
A2. II	.903	.190	.024	.029	.034	.039	.129	.056			.010	.004	——			
52	53.44	20.39	4.22	1.76	1.12	2.13	8.76	5.75	0.97		0.69	0.49	trace	ZrO_2 0.27 SO_3 0.22	100.21	2.590
A2. II	.891	.200	.026	.025	.028	.038	.141	.062			.009	.003	——			
53	52.78	19.08	3.63	3.79	1.58	5.09	7.95	3.85	0.44		1.50	0.63	trace	CO_2 0.10 Cl 0.33	100.75	
A2. II	.880	.187	.023	.053	.040	.091	.128	.041			.019	.004	——			
54	55.45	17.80	5.90	0.72	0.14	1.90	9.71	4.69	2.64		1.13			Cl 0.72	100.80	
A3. III	.924	.175	.037	.010	.004	.034	.156	.050			.014					

ORDER 6. LENDOFELIC. NORGARE—Continued.

SUBRANG 4. DOSODIC. LARDALOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
40	(I)II.6.1.4″.	or 16.68 ab 40.87 ne 24.71 Z 0.37 ac 7.85 di 0.71 ol 2.76 mt 1.86 il 0.61	Rouma, Los Islands, French Guinea.	Pisani.	A. Lacroix, Nouv. Arch. Mus., III, p. 38, 1911.	Nephelite syenite porphyry.	Also in B. Soc. Fr. Min., XXXV, p. 21, 1912.
41	(I)II.″6.1.4.	or 30.58 ab 40.87 ne 13.35 ac 5.08 ns 1.34 di 6.01 ol 1.16 il 0.91	Gebel Abu-Khrug, East of Nile, Egypt.	J. Couyat.	J. Couyat, C. R., CLI, p. 1140, 1910.	Nephelite syenite.	
42	(I)II.(5)6.1.4.	or 26.69 ab 44.27 ne 12.07 hl 0.70 ac 5.54 di 1.57 wo 1.86 mt 3.94	Gebel Hadarba, East of Nile, Egypt.	J. Couyat.	J. Couyat, C. R., CLI, p. 1140, 1910.	Phonolite.	
43	″II.6.1.4.	or 27.24 ab 31.70 ne 20.30 hl 0.70 ac 12.47 di 2.32 wo 0.23 mt 0.23	Gebel Hadarba, East of Nile, Egypt.	J. Couyat.	J. Couyat, C. R., CLI, p. 1140, 1910.	Microsyenite.	
44	″II.6.1.4.	or 28.91 ab 25.58 an 1.95 ne 23.86 th 1.42 di 9.08 wo 2.67 mt 5.80 il 1.22	Near Kadero, Kordofan.	D. Schimpff.	G. Linck, N. J. B. B., XVII, p. 440, 1903.	Tinguaite.	
45	(I)II.6.1.4.	or 26.69 ab 41.92 ne 15.90 ac 6.93 wo 2.67 mt 1.16 hm 2.56	Edda Gijorgis, Abyssinia.	G. T. Prior.	G. T. Prior, Min. Mag., XII, p. 269, 1900.	Tinguaite.	In W. T., p. 297
46	″II.6.1.4.	or 31.14 ab 26.46 ne 23.71 ac 3.70 di 6.64 ol 0.14 mt 4.64 il 1.06 ap 0.67	Teleki Valley, Kenia Volcano, British East Africa.	G. T. Prior.	G. T. Prior, Min. Mag., XIII, p. 247, 1903.	Kenyte.	
47	(I)II.″6.1.″4.	or 32.80 ab 32.49 an 1.95 ne 15.05 di 5.40 mt 1.62 il 0.61 hm 5.12 ap 1.34	Mount Höhnel, Kenia Volcano, British East Africa.	G. T. Prior.	G. T. Prior, Min. Mag., XIII, p. 247, 1903.	Kenyte.	Iron oxides? Fresh?
48	″II.6.1.4.	or 30.02 ab 30.13 ne 22.86 ac 0.92 di 8.85 ol 1.31 mt 2.32 il 1.06 ap 1.01	Kibo, Kilimanjaro, German East Africa.	Eyme.	L. Finckh, Rosenb. Fests., p. 392, 1906.	Rhomben porphyry.	ZrO_2?
49	″II.6.1.′4.	or 35.03 ab 20.96 ne 24.71 ac 3.70 di 8.04 ol 4.18 mt 0.70 il 1.22 ap 0.34	Kibo, Kilimanjaro, German East Africa.	Eyme.	L. Finckh, Rosenb. Fests., p. 392, 1906.	Katophorite trachyte.	ZrO_2?
50	(I)II.6″.1.″4.	or 36.14 ab 19.39 ne 25.84 ac 2.77 di 8.20 ol 3.07 mt 1.86 il 1.52 ap 0.34	Kibo, Kilimanjaro, German East Africa.	Eyme.	L. Finckh, Rosenb. Fests., p. 392, 1906.	Trachy-dolerite glass.	ZrO_2?
51	(I)II.6.1.4.	or 31.14 ab 33.01 an 1.39 ne 18.74 di 4.54 ol 0.84 mt 4.41 il 1.52 hm 0.80 ap 1.34	Kibo, Kilimanjaro, German East Africa.	Klüss.	L. Finckh, Rosenb. Fests., p. 392, 1906.	Leucite rhomben porphyry.	ZrO_2?
52	(I)II.6″.1.4.	or 34.47 ab 23.06 ne 26.70 ac 1.39 di 6.05 mt 3.71 il 1.37 hm 1.12 ap 1.01	Kibo, Kilimanjaro, German East Africa.	Klüss.	L. Finckh, Rosenb. Fests., p. 392, 1906.	Leucite rhomben porphyry.	ZrO_2?
53	II.6(7).1(2).4.	or 22.80 ab 30.13 an 5.00 ne 20.02 di 11.37 wo 1.16 mt 5.34 il 2.89 ap 1.34	Meru Volcano, German East Africa.	B. Mauritz.	B. Mauritz, T. M. P. M., XXVII, p. 322, 1908.	Trachy-dolerite.	
54	″II.6.1.4.	or 27.80 ab 33.54 ne 17.32 hl 1.17 ac 9.70 di 0.86 wo 3.02 il 1.52 hm 2.56 pf 0.54	Paardefontein, Pretoria, Transvaal.	F. Pisani.	H. A. Brouwer, Transv. Nephsy., p. 91, 1910.	Tinguaite porphyry.	Center of dike.

CLASS II. DOSALANE—Continued.

RANG 1. PERALKALIC. LARDALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
55	53.73	20.35	3.74	2.13	0.47	2.72	7.94	6.05	2.02		0.09		0.51	Cl 0.23	99.98	
A2. II	.896	.199	.023	.030	.012	.048	.128	.065			.001		007			
56	60.41	17.44	1.98	1.78	1.85	2.79	7.51	5.64	0.51						99.91	
A3 III	1.007	.171	.013	.025	.046	.050	.121	.060								
57	52.03	15.10	2.15	5.67	2.44	6.93	6.10	3.47	3.10		1.82	0.60			99.43	
A2. II	.868	.148	.014	.079	.061	.123	.098	.037			.023	.004				
58	55.82	20.19	3.70	1.17	0.25	1.02	9.57	5.60	1.30	0.15	0.01	0.07	0.36	CO_2 0.04 ZrO_2 0.09 SO_3 0.08 Cl 0.37 Cr_2O_3 none V_2O_3 none NiO none BaO trace SrO trace CuO 0.01 Ag, Au none Pt none	99.80	2.594
A1 I	.930	.198	.023	.017	.006	.018	.155	.060			—	—	.005			
59	53.80	18.72	4.99	3.59	0.86	2.80	8.82	5.20	1.90		0.30			Cl 0.14	101.12	
B3. IV	.897	.184	.031	.050	.022	.050	.142	.055			.004					
60	54.60	17.48	5.72	1.02	1.44	3.10	9.32	5.61	1.56		0.80				100.65	
A3. III	.910	.171	.036	.014	.036	.055	.150	.060			.010					
61	54.13	19.11	3.73	1.87	0.66	5.32	8.41	4.68	2.33						100.24	
A3. III	.902	.187	.023	.026	.017	.095	.135	.050								
62	55.47	20.67	2.83	1.86	1.43	3.43	8.33	4.86	0.12	0.08	1.32	0.03	0.02	SrO 0.01	100.46	
A2. II	.925	.203	.018	.026	.036	.061	.134	.052			.017	—	—			

RANG 1. PERALKALIC. LARDALASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	56.64	16.10	4.90	6.86	none	0.39	11.50	1.00	1.54	0.04	0.30	none	0.57	SO_3 none Cl trace Nb_2O_5 0.45	100.29	2.75
A2. II	.944	.158	.031	.095	—	.007	.185	.011			.004	—	.008			

RANG 2. DOMALKALIC. ESSEXASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	50.24	18.43	2.54	5.65	3.65	7.83	2.45	7.45	0.36		1.19	0.47		CO_2 none ZrO_2 none SO_3 none S none BaO 0.29 SrO trace	100.55	
A1. I	.838	.181	.016	.079	.091	.139	.040	.080			.015	.003				
2	54.83	19.59	1.66	3.04	1.49	4.05	2.92	10.40	0.77	0.49	0.73	0.17		CO_2 none ZrO_2 0.01 S none BaO 0.15	100.30	
A2. II	.914	.192	.010	.042	.037	.072	.047	.111			.009	.001				
3	50.68	19.46	3.96	2.51	2.24	6.78	2.61	9.38	0.46	0.16	0.89	0.33		CO_2 none ZrO_2 trace SO_3 none BaO 0.15 CuO none	99.61	
A2. II	.845	.191	.025	.035	.056	.121	.042	.100			.011	.002				
4	50.36	17.62	4.80	2.53	3.27	7.61	1.99	9.39	1.19		1.09	0.40			100.25	2.655
A2. II	.839	.173	.030	.035	.082	.136	.032	.100			.014	.003				
5	51.20	21.21	2.38	3.67	1.99	5.42	2.11	10.63	0.28	0.10	0.74	0.36		ZrO_2 0.03 SO_3 trace BaO 0.33	100.45	
A2. II	.853	.208	.015	.051	.050	.096	.034	.113			.009	.003				

ORDER 6. LENDOFELIC. NORGARE—Continued.

SUBRANG 4. DOSODIC. LARDALOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
55	(I)II.6.1.″4.	or 36.14 di 5.82 ab 22.79 wo 1.63 an 2.50 mt 5.34 ne 23.14 il 0.15 hl 0.35	Bet. Renseburg and Rustenburg, Zwart Kopjes, Transvaal.	E. A. Wülfing.	E. A. Wülfing, N. J., 1888, II, p. 32.	Nephelite syenite.	In W. T., p. 297.
56	″II.(5)6.1.(3)4.	or 33.36 ac 4.62 ab 36.15 di 11.11 ne 11.93 ol 2.19 mt 0.70	Tongging, Toba Lake, Sumatra.	W. Herz.	L. Milch, Z. D. G. G., LI, p. 70. 1899.	Trachyte-andesite.	In W. T., p. 297.
57	II″.″6.1″.4.	or 20.57 di 22.23 ab 29.87 ol 0.48 an 3.61 mt 3.25 ne 11.64 il 3.50 ap 1.34	Vo-men-ko, East Yunnan, China.	Pisani.	J. Deprat, Mem. Ser. G. Indo-Ch., I (1), 1, p. 229, 1912.	Augite syenite.	
58	(I)II.6.1.4.	or 33.36 ac 7.85 ab 25.94 di 4.31 ne 23.71 ol 0.24 hl 0.68 mt 1.39	Minumurra River, Kiama, New South Wales.	J. C. H. Mingaye.	Jaquet, Card, and Harper, Rec. G. S. N. S. W., VIII, p. 41, 1905.	Tinguaite.	
59	II.6″.1.4.	or 30.58 ac 5.08 ab 22.01 di 11.20 ne 24.19 wo 0.23 hl 0.23 mt 4.64 il 0.61	Signal Hill, Dunedin, New Zealand.	C. A. Cotton.	C. A. Cotton, Tr. N. Z. Inst., XLI, p. 121, 1909.	Phonolite.	
60	II.6(7).1.(3)4.	or 33.36 ac 16.63 ab 11.26 ns 0.37 ne 25.42 di 8.77 wo 1.74 il 1.52	Black Point, Rarotonga Island, Cook Islands.	P. Marshall.	P. Marshall, Tr. N. Z. Inst., XLI, p. 99, 1909.	Phonolite.	
61	″II.6.1.4.	or 27.80 di 4.42 ab 28.30 wo 8.47 an 0.56 mt 5.34 ne 23.00	Gazelle Harbor, Kerguelen Island.	R. Reinisch.	R. Reinisch, D. Tiefs. Exp., X (3), p. 64, 1908.	Phonolite.	
62	(I)II.6.1″.4.	or 28.91 di 7.78 ab 30.39 wo 0.93 an 4.73 mt 2.09 ne 21.58 il 2.58 hm 1.44	Observation Hill, Ross Island, S. Victoria Land, Antarctica.	G. T. Prior.	G. T. Prior, Nat. Ant. Exp., I, p. 119, 1907.	Hornblende trachyte.	

SUBRANG 5. PERSODIC. AGPAOSE. (H. S. WASHINGTON, 1917.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.″6.1.″5.	or 6.12 ac 14.32 ab 52.40 ns 0.85 ne 13.35 di 1.73 ol 9.38 il 0.61	Nunasarnak, Tunugdliarfik, Ilimausak region, Greenland.	C. Christensen.	N. V. Ussing, G. Julhb., p. 175, 1911.	Arfvedsonite lujavrite (agpäite).	

SUBRANG 2. DOPOTASSIC. VICOSE. (H. S. WASHINGTON, 1906.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.6.2″.2″.	or 40.03 di 15.46 an 16.96 ol 5.74 lc 3.49 mt 3.71 ne 11.36 il 2.28 ap 1.01	Monte Cavallo, n. Orvieto, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 101, 1906.	Leucite tephrite.	Incorrect in J. G., V, p. 370, 1897. In W. T., p. 297.
2	(I)II.(5)6.″2.2.	or 61.72 di 7.98 ab 0.52 ol 1.97 an 9.45 mt 2.32 ne 13.06 il 1.52 ap 0.34	Monte Fogliano, Vico Volcano, n. Viterbo, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 92, 1906.	Vicoite (leucite tephrite).	
3	II.6″.2.2.	or 39.48 di 12.10 an 13.62 wo 1.04 lc 12.62 mt 5.80 ne 11.93 il 1.52 ap 0.67	Poggio Cotognola, n. Bracciano, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 97, 1906.	Leucite tephrite.	
4	II.6(7).2.2.	or 35.03 di 17.71 an 11.40 wo 0.35 lc 16.13 mt 4.87 ne 9.09 il 2.13 hm 1.44 ap 1.01	Madonna del Riposo, Bracciano, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 97, 1906.	Leucite tephrite.	
5	″II.6(7).2.2.	or 37.53 di 5.69 an 16.96 ol 4.22 lc 19.84 mt 3.48 ne 9.66 il 1.37 ap 1.01	Monte San Antonio, n. Rocca Monfina, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 92, 1906.	Vicoite (leucite tephrite).	

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. ESSEXASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	49.70	18.45	3.39	4.32	2.32	7.91	5.33	4.95	1.09	0.25	1.33	0.40	trace		99.44	
A2. II	.828	.181	.021	.060	.058	.141	.086	.053			.017	.003	——			
2	52.05	15.02	2.65	5.52	5.39	8.14	3.17	6.10	0.35		0.47	0.21	trace	SO_3 0.02 Cl 0.24 BaO 0.42 SrO 0.28	100.03	
A1. I	.868	.147	.017	.076	.135	.145	.051	.065			.006	.001	——			
3	51.94	15.78	4.07	3.17	3.48	6.04	3.44	7.69	2.17		0.39	0.59	trace	SO_3 0.29 Cl 0.08 BaO 0.42 SrO 0.28	99.83	
A1. I	.866	.155	.026	.044	.087	.108	.055	.082			.005	.004				
4	52.53	19.05	4.77	2.10	1.99	5.75	4.03	7.30	1.49	0.13	0.07	0.28	0.13	CO_2 0.27 BaO 0.09 SrO 0.19	100.17	2.719
A2. II	.876	.187	.030	.029	.050	.103	.065	.078			.001	.002	.002			
5	50.49	15.83	6.11	3.04	3.38	7.99	3.12	6.86	1.20	0.29	0.92	0.42	0.11	CO_2 0.07	99.83	2.849
A2. II	.842	.155	.038	.042	.085	.143	.050	.073			.012	.003	.002			
6	51.83	18.25	4.26	1.46	3.28	4.08	4.68	5.75	3.15	0.27	0.86	0.55	trace	CO_2 0.43 BaO 0.43 SrO 0.42	99.70	2.621
A2. II	.864	.179	.027	.020	.082	.073	.076	.062			.011	.004	——			
7	47.8	20.1	6.7	0.8	1.1	5.4	5.5	7.1	2.4		0.7		0.8	SO_3 0.4 BaO 0.8	99.3	
B2. III	.797	.197	.042	.011	.028	.096	.089	.075			.009		.012			
8	50.92	20.60	2.43	1.25	0.53	5.16	5.60	7.50	4.97		0.34	trace	0.36	SO_3 0.45 Cl 0.11	100.22	
A2. II	.849	.202	.015	.018	.013	.092	.090	.080			.004	——	.005			
9	52.24	18.53	2.71	4.63	3.96	8.49	2.99	6.17	0.45						100.17	2.73
A3. III	.871	.182	.017	.064	.099	.152	.048	.066								
10	53.50	20.05	1.10	2.48	2.54	5.42	5.32	8.02	0.50		0.33	0.15		Cl 0.36	99.77	
A2. II	.892	.196	.007	.035	.063	.096	.085	.085			.004	.001				
11	53.13	19.90	1.09	2.93	3.15	6.11	5.92	6.63	0.54		0.42	trace		Cl 0.33	100.15	
A2. II	.886	.195	.007	.040	.079	.109	.095	.070			.005	——				
12	52.20	19.21	1.20	3.25	3.34	6.55	5.75	6.65	1.00		0.84	trace		Cl 0.25	100.24	
A2. II	.870	.188	.008	.045	.083	.117	.093	.071			.011	——				
13	51.85	21.30	1.85	3.32	1.49	6.32	3.80	7.70	0.77		0.81	trace		Cl 0.52	99.64	
A2. II	.864	.209	.012	.046	.037	.113	.061	.082			.010	——				
14	51.71	20.27	1.57	3.26	2.21	6.66	4.91	7.39	0.71		0.83			Cl 0.45	99.97	
A2. II	.862	.199	.010	.046	.055	.120	.079	.079			.010					
15	52.10	15.05	3.40	5.49	4.85	9.13	4.07	5.43			0.88	0.26			100.66	
A2. II	.868	.148	.021	.076	.121	.163	.066	.057			.011	.002				

ORDER 6. LENDOFELIC. NORGARE—Continued.

SUBRANG 3. SODIPOTASSIC. BOROLANOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.		Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.6.2.3(4).	or 29.47 ab 11.00 an 11.68 ne 18.46	di 17.98 wo 1.04 mt 4.87 il 2.58 ap 1.01	Schoolhouse, Magnet Cove, Arkansas.	H. S. Washington.	H. S. Washington, B. G. S. A., XI, p. 399, 1900.	Shonkinite (covite).	Also in J. G., IX, p. 612, 1901. In W. T., p. 297.
2	II(III).″6.2.3.	or 36.14 ab 6.81 an 8.62 ne 10.79	di 24.97 ol 6.09 mt 3.94 il 0.91 ap 0.34	Middle Peak, Highwood Mountains, Montana.	E. B. Hurlbut.	L. V. Pirsson, U. S. G. S. B. 237, p. 92, 1905.	Basic syenite.	In W. T., p. 297.
3	II.(5)6.(1)2.3(4).	or 45.59 ab 8.91 an 6.12 ne 9.66 th 0.57	di 16.09 ol 1.99 mt 6.03 il 0.76 ap 1.34	Shonkin Creek, Highwood Mountains, Montana.	W. M. Bradley.	L. V. Pirsson, U. S. G. S. B. 237, p. 139, 1905.	Syenite porphyry.	In W. T., p. 295.
4	II.(5)6.2.3.	or 43.37 ab 11.53 an 12.23 ne 12.21	di 10.86 wo 0.23 mt 6.96 il 0.15 ap 0.67	Kruger Mountain, Okanagan Range, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38 (1), p. 451, 1912.	Biotite-melanite-nephelite syenite.	
5	II″.(5)6.2.″3.	or 40.59 ab 7.07 an 8.90 ne 10.36	di 18.36 wo 1.86 mt 7.42 il 1.82 hm 0.96 ap 1.01	Kruger Mountain, Okanagan Range, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38 (1), p. 450, 1912.	Malignite.	
6	II.6.2.3.⊙	or 34.47 ab 11.53 an 11.40 ne 15.34	di 14.47 ol 1.05 mt 2.09 il 1.67 hm 1.76 ap 1.34	Rock Creek Chonolith, Midway Mountains, British Columbia.	M. Dittrich.	R. A. Daly, Can. G. S. Mem. 38 (1), p. 405, 1912.	Rhomben porphyry.	Center of mass. Cf. No. 32, II.5.2.3.
7	II.6″.″2.3.	or 41.70 ab 1.57 an 9.17 ne 24.42	di 6.05 wo 4.06 mt 3.25 il 1.37 hm 4.48	Lake Borolan, Assynt, Scotland.	J. H. Player.	Horne and Teall, Tr. R. Soc. Edin., XXXVII(1), p. 178, 1893.	Borolanite.	In W. T., p. 297.
8	(I)II.6.2.3.	or 44.48 ab 7.07 an 10.56 ne 20.02 th 0.85	di 3.78 wo 4.29 mt 3.48 il 0.61	Kubatschka Mountain, n. Praskowitz, Bohemia.	A. Pelikan.	A. Pelikan, T. M. P. M., XXV, p. 122, 1906.	Analcite phonolite.	
9	II.(5)6.2(3).″3.	or 56.70 ab 5.76 an 18.90 ne 10.51	di 19.04 ol 4.95 mt 3.94	San Martino, Vico Volcano, n. Viterbo, Italy.	G. Aichino.	V. Sabatini, Vulc. Cim., p. 506, 1912.	Leucite tephrite.	
10	″II.6.(1)2.3.	or 47.26 ab 3.14 an 8.62 ne 21.02 hl 0.59	di 13.93 ol 1.97 mt 1.62 il 0.61 ap 0.34	Monte Somma, Italy.	Pisani.	A. Lacroix, Nouv. Arch. Mus. (4), IX, p. 146, 1907.	Microsyenite.	
11	II.6.″2.3.	or 38.92 ab 6.81 an 9.73 ne 21.87 hl 0.59	di 16.62 ol 2.57 mt 1.62 il 0.76	Pollena Ravine, Monte Somma, Italy.	Pisani.	A. Lacroix, Nouv. Arch. Mus. (4), IX, p. 137, 1907.	Pollenite (trachyte pumice).	
12	II.6″.(1)2.3.	or 39.48 ab 2.88 an 7.78 ne 23.71 hl 0.47	di 19.89 ol 1.56 mt 1.86 il 1.67	Monte Somma, Italy.	Pisani.	A. Lacroix, Nouv. Arch. Mus. (4), IX, p. 137, 1907.	Pollenite (trachyte).	
13	″II.6.2″.″3.	or 45.59 ab 1.57 an 20.29 ne 14.48 hl 0.82	di 11.76 ol 0.99 mt 2.78 il 1.52	Monte Somma, Italy.	Pisani.	A. Lacroix, Nouv. Arch. Mus. (4), IX, p. 131, 1907.	Leucite tephrite.	
14	II.6.2.3.⊙	or 43.37 an 13.07 lc 0.44 ne 20.73 hl 0.70	di 16.51 ol 0.66 mt 2.32 il 0.52	Monte Somma, Italy.	Pisani.	A. Lacroix, Nouv. Arch. Mus., (4), IX, p. 153, 1907.	Leucite tephrite.	
15	II(III).6.″2.3.	or 31.69 ab 8.38 an 6.95 ne 14.20	di 29.42 ol 2.67 mt 4.87 il 1.67 ap 0.67	Vulcanello, Vulcano, Aeolian Islands.	Pisani.	A. Lacroix, C. R., CXLVII, p. 1454, 1908.	Leucite tephrite.	

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. ESSEXASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
16	55.18	19.02	0.11	3.18	1.08	8.83	4.68	5.61	1.32	0.26	0.46	0.24		SO_3 0.05 Cl 0.02	100.04	
A2. II	.920	.186	.001	.044	.027	.157	.076	.060			.006	.002				
17	50.15	15.86	2.44	5.39	5.30	8.40	4.13	5.00	1.50		1.00	0.86			100.03	
A2. II	.836	.156	.015	.075	.13	.150	.066	.053			.012	.006				
18	51.85	19.08	4.25	2.69	1.48	5.81	4.46	6.61	0.55	0.47	0.66	1.23	0.51	ZrO_2 none Cl 0.21 F 0.10 S 0.01 Cr_2O_3 none BaO 0.17 SrO 0.19	100.40	
A1. I	.864	.187	.027	.038	.037	.104	.072	.070			.008	.009	.007			
19	50.18	17.82	4.04	3.89	2.88	7.19	3.29	6.65	0.96	0.55	0.76	0.76	0.30	ZrO_2 none Cl 0.16 F 0.02 S 0.02 Cr_2O_3 none BaO 0.25 SrO 0.29	100.01	
A1. I	.836	.175	.025	.054	.072	.129	.053	.071			.010	.005	.004			
20	48.66	17.69	4.66	4.40	3.03	6.43	3.93	6.10	0.80	0.58	0.81	0.79	1.49	ZrO_2 none Cl 0.24 F 0.16 S 0.05 Cr_2O_3 none BaO 0.16 SrO 0.21	100.19	
A1. I	.811	.173	.029	.061	.076	.114	.063	.065			.010	.006	.021			
21	46.50	16.48	3.80	7.47	3.46	6.14	4.19	4.54	3.57	0.21	2.40	1.13	0.15	CO_2 0.28 SO_3 none Cl trace Cr_2O_3 none V_2O_3 trace NiO none BaO 0.08 SrO trace	100.40	2.765
A1. I	.775	.162	.024	.104	.087	.110	.068	.048			.030	.008	.002			
22	53.64	18.26	4.66	2.72	1.53	3.70	5.51	5.86	3.73			0.12			99.73	
A3. III	.894	.179	.029	.038	.038	.066	.089	.063				.001				
23	52.25	18.70	2.55	3.69	1.78	3.95	5.10	6.62	2.75		2.29	0.20			99.88	
A2. II	.871	.183	.016	.051	.045	.071	.082	.070			.029	.001				

RANG 2. DOMALKALIC. ESSEXASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	50.98	22.15	1.04	4.25	0.79	7.90	6.84	2.71	1.22	0.12	1.38	0.38	trace	CO_2 trace Cl trace	99.76	2.82
A2. II	.850	.217	.006	.059	.020	.141	.110	.029			.018	.003	—			
2	48.69	17.91	3.09	6.41	3.06	7.30	5.95	2.56	0.95		2.71	1.11	0.15	NiO 0.05 BaO 0.08	100.02	
A2. II	.812	.175	.019	.089	.077	.130	.096	.028			.034	.008	.002			
3	51.58	19.40	4.25	5.25	0.49	3.64	7.49	4.23	1.02		0.35	0.15	0.20	CO_2 1.53	99.59	
A2. II	.860	.190	.027	.073	.012	.065	.121	.045			.004	.001	.003			
4	47.94	17.44	6.84	6.51	2.07	7.47	5.63	2.79	2.04		0.20	1.04			99.92	
A2. II	.799	.171	.043	.090	.052	.133	.091	.030			.003	.007				
5	46.99	17.94	2.56	7.56	3.22	7.85	6.35	2.62	0.65		2.92	0.94	trace	BaO none	99.60	2.919
A2. II	.783	.176	.016	.105	.081	.140	.102	.028			.035	.007	—			
6	53.34	17.92	2.27	5.51	1.40	4.19	6.41	4.32	2.08	0.58	1.60	0.44	0.17	ZrO_2 trace S 0.03 BaO 0.09 SrO 0.06 Ce_2O_3 0.05 Li_2O trace	100.46	2.686
A1. I	.889	.176	.014	.076	.035	.075	.103	.046			.020	.003	.002			

ORDER 6. LENDOFELIC. NORGARE—Continued.

SUBRANG 3. SODIPOTASSIC. BOROLANOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
16	II.(5)6.2.3.	or 33.36 di 15.00 ab 18.86 wo 4.18 an 13.90 mt 0.23 ne 11.36 il 0.91 ap 0.67	Mount Ankitsika, Madagascar.	Not stated.	A. Lacroix, pers. com.	Phonolite breccia.	
17	II(III).6.2.3.	or 29.47 di 20.89 ab 10.74 ol 6.83 an 10.29 mt 3.48 ne 12.92 il 1.82 ap 2.02	Gentungen, Maros, Celebes.	Hinden.	C. Schmidt in Sarasin, Ins. Celebes, IV, p. 24, 1901.	Nephelite shonkinite.	
18	″II.(5)6.2.3.	or 38.92 di 6.45 ab 18.86 ol 1.39 an 12.51 mt 6.26 ne 10.22 il 1.22 ap 3.02	Gillinan River, n. Masin, Mount Mouriah, Java.	E. W. Morley.	J. P. Iddings, Ign. Rocks, II, p. 622, 1913.	Vicoite (leucite tephrite).	Also in Iddings and Morley, J. G., XXIII, p. 233, 1915.
19	II.(5)6.2.″3.	or 39.48 di 14.77 ab 7.34 ol 2.25 an 14.18 mt 5.80 ne 11.08 il 1.52 ap 1.68	Gillinan River, n. Masin, Mount Mouriah, Java	E. W. Morley.	J. P. Iddings, Ign. Rocks, II, p. 622, 1913.	Leucite tephrite.	Also in Iddings and Morley, J. G., XXIII, p. 233, 1915.
20	II.″6.2.3.	or 36.14 di 11.16 ab 9.43 ol 5.70 an 12.51 mt 6.73 ne 12.78 il 1.52 ap 2.02	Gillinan River, n. Masin, Mount Mouriah, Java	E. W. Morley.	J. P. Iddings, Ign. Rocks, II, p. 622, 1913.	Leucite tephrite.	Also in Iddings and Morley, J. G., XXIII, p. 233, 1915.
21	II″.(5)6.2.3″.	or 26.69 di 8.44 ab 17.55 ol 8.36 an 12.79 mt 5.57 ne 9.80 il 4.56 ap 2.69	Wallaya, Camden, New South Wales.	H. P. White.	G. W. Card, pers. com.	Mica lamprophyre.	
22	″II.(5)6.(1)2.3″.	or 35.03 di 8.00 ab 26.98 ol 0.83 an 7.51 mt 6.73 ne 10.65 ap 0.34	Porto Bello Peninsula, Dunedin, New Zealand.	P. Marshall.	P. Marshall, Q. J. G. S., LXII, p. 397, 1906.	Ulrichite (camptonitic tinguaite).	
23	″II.(5)6.″2.3.	or 38.92 di 8.12 ab 18.86 ol 1.04 an 8.62 mt 3.71 ne 13.06 il 4.41 ap 0.34	Papenoo Valley, Tahiti, Society Islands.	Pisani.	A. Lacroix, B. Soc. G. Fr., X, p. 97, 1910.	Nephelite syenite.	

SUBRANG 4. DOSODIC. ESSEXOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″II.6.2(3).4.	or 16.12 di 13.00 ab 24.89 mt 1.39 an 21.68 il 2.74 ne 17.75 ap 1.01	Kakarsuak, n. Narsak, Ilimausak region, Greenland.	C. Winther.	N. V. Ussing, G. Julhb., p. 208, 1911.	Essexite porphyrite.	
2	II.″6.2.4.	or 15.57 di 11.74 ab 28.30 ol 5.11 an 14.18 mt 4.41 ne 11.93 il 5.17 ap 2.69	Mount Johnson, Quebec.	M. F. Connor.	F. D. Adams, J. G., XI, p. 265, 1903.	Olivine essexite.	
3	(I)II.″6.(1)2.4.	or 25.02 di 0.71 ab 35.11 ol 5.15 an 6.67 mt 6.26 ne 15.34 il 0.61 ap 0.34	Hotspur, Monmouth Township, Ontario.	M. F. Connor.	Adams and Barlow, Can. G. S. Mem. 6., p. 264, 1910.	Nephelite syenite.	3.49 per cent calcite as inclusions.
4	II.″6.2.4.	or 16.68 di 13.82 ab 26.20 ol 3.06 an 13.94 mt 9.98 ne 11.64 il 0.46 ap 2.35	Salem Neck, Essex County, Massachusetts.	M. Dittrich.	H. Rosenbusch, Elem. Gest., 1898, p. 172,	Essexite.	TiO_2 low? In W. T., p. 299.
5	II″.6.2.4.	or 15.57 di 16.24 ab 18.86 ol 5.31 an 12.79 mt 3.71 ne 18.74 il 5.32 ap 2.35	Salem Neck, Essex County, Massachusetts.	H. S. Washington.	H. S. Washington, J. G., VII, p. 57, 1899.	Essexite.	In W. T., p. 299.
6	II.(5)6.(1)2.4.	or 25.58 di 8.88 ab 33.54 ol 3.61 an 7.51 mt 3.25 ne 11.08 il 3.04 ap 1.01	Big Hill Canyon, Rio Grande, Trans Pecos, Texas.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 228, p. 75, 1904.	Essexite.	

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. ESSEXASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
7	48.23	17.43	2.77	5.92	2.99	6.38	6.87	2.78	2.84	0.54	2.00	0.69	0.18	ZrO_2 0.04 S 0.08 Cr_2O_3 none V_2O_3 0.04 NiO trace BaO 0.08 SrO 0.08 Li_2O trace	99.97	2.742
A1. I	.804	.171	.017	.082	0.75	.114	.111	.030			.025	.005	.003			
8	47.67	18.22	3.65	3.85	6.35	8.03	4.93	3.82	2.97	0.38			0.28		100.15	
A3. III	.795	.179	.023	.053	.159	.143	.080	.041					.004			
9	54.88	18.53	2.93	1.92	1.26	4.15	6.65	4.90	1.75	0.38	0.93	0.27	0.25	CO_2 0.13 ZrO_2 0.03 SO_3 0.36 Cl 0.14 FeS_2 0.10 BaO 0.18 SrO 0.11	99.85	
A1. I	.915	.182	.018	.026	.032	.074	.107	.052			.012	.002	.004			
10	54.43	19.01	2.85	1.93	0.99	4.33	6.92	5.07	1.68	0.31	0.96	0.25	0.08	CO_2 0.14 ZrO_2 0.04 SO_3 0.42 Cl 0.22 FeS_2 0.07 BaO 0.21 SrO 0.21	100.12	
A1. I	.907	.186	.018	.026	.025	.077	.111	.054			.012	.002	.001			
11	54.34	19.23	3.19	2.11	1.28	4.53	6.38	5.14	1.17	0.14	1.09	0.27	0.08	CO_2 none ZrO_2 0.07 SO_3 0.07 Cl 0.28 V_2O_3 0.02 BaO 0.24 SrO 0.16	99.77	2.68
A1. I	.906	.189	.020	.030	.032	.081	.103	.055			.014	.002	.001			
12	51.42	19.40	3.74	3.33	2.56	7.80	5.28	3.96	0.49	0.04	1.39	0.53	0.23	CO_2 none ZrO_2 none S 0.03 BaO 0.21	100.39	
A1. I	.857	.190	.023	.046	.064	.139	.085	.042			.018	.004	.003			
13	51.19	21.16	2.85	2.31	2.34	6.79	5.43	4.78	0.54	0.08	1.54	0.62	0.25	CO_2 none ZrO_2 none S 0.04 BaO 0.11	100.03	
A1. I	.853	.207	.018	.032	.059	.121	.087	.051			.019	.004	.004			
14	54.40	19.62	2.10	2.56	1.01	5.33	7.21	4.88	3.23		0.43	0.21		S 0.18	101.16	2.626
B2. III	.907	.192	.013	.036	.025	.095	.116	.052			.005	.001				
15	44.22	13.78	5.26	7.02	7.51	8.71	4.38	1.77	2.83	0.34	2.70	1.18	0.40	CO_2 0.37 Cl 0.03 Cr_2O_3 0.03 V_2O_3 0.03 NiO trace BaO 0.10 SrO 0.05 Li_2O trace	100.71	
A1. I	.737	.135	.033	.097	.188	.155	.071	.019			.034	.008	.006			
16	53.12	20.48	5.13	1.50	1.88	4.29	6.20	4.88	2.25		0.25	0.43		SO_3 0.14 Cl 0.28	100.59	2.674
A2. II	.885	.201	.032	.021	.047	.076	.100	.052			.003	.003				
17	55.11	20.08	2.30	3.87	1.67	5.06	7.88	3.16	0.59						99.72	
A3. III	.919	.197	.014	.054	.042	.090	.127	.034								
18	55.07	19.57	3.38	3.42	1.68	5.56	7.10	3.34	0.38						99.50	
A3. III	.918	.192	.021	.048	.042	.100	.114	.035								
19	48.60	19.89	2.97	5.76	1.32	4.43	8.74	2.26	1.73	0.21	1.34	0.56	0.36	CO_2 1.10 SO_3 0.10 F 0.06 S 0.01 BaO 0.05 Ce_2O_3 0.59	100.11	
A1. I	.810	.195	.019	.080	.033	.079	.141	.024			.017	.004	.005			
20	51.91	19.58	6.39	2.30	0.54	5.50	7.70	3.32	0.50		1.56	0.72	trace	Cl trace S trace Cr_2O_3 trace BaO trace SrO trace	100.02	2.713
A3. III	.865	.192	.040	.032	.014	.098	.124	.034			.020	.005	——			

ORDER 6. LENDOFELIC. NORGARE—Continued.

SUBRANG 4. DOSODIC. ESSEXOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
7	II.6.″2.4.	or 16.68 di 15.13 ab 23.84 ol 4.18 an 8.34 mt 3.94 ne 18.60 il 3.80 ap 1.68	Near Big Mountain, Uvalde County, Texas.	W. F. Hillebrand.	T. W. Vaughan, U. S. G. S. B. 168, p. 61, 1900.	Basanite.	In W. T., p. 299.
8	II″.6.2″.″4.	or 22.80 di 18.84 ab 6.29 ol 8.17 an 16.12 mt 5.34 ne 19.31	Alabaugh Creek, Crazy Mountains, Montana.	G. Schneider.	J. E. Wolff, U. S. G. S. B. 150, p. 201, 1898.	Theralite.	In W. T., p. 299.
9	(I)II.(5)6.(1)2.″4.	or 28.91 di 7.91 ab 35.11 wo 0.23 an 8.06 mt 3.25 ne 9.66 il 1.82 hl 0.47 hm 0.32 th 0.57 ap 0.67	Portland Mine, Cripple Creek, Colorado.	W. F. Hillebrand.	Lindgren and Ransome, U. S. G. S. P. P. 54, p. 79, 1906.	Latite phonolite.	
10	(I)II.(5)6.(1)2.″4.	or 30.02 di 5.40 ab 33.01 wo 1.86 an 8.06 mt 3.25 ne 11.36 il 1.82 hl 0.47 hm 0.64 th 0.57 ap 0.67	Bull Cliff, Cripple Creek, Colorado.	W. F. Hillebrand.	Lindgren and Ransome, U. S. G. S. P. P. 54, p. 87, 1906.	Latite phonolite.	
11	(I)II.(5)6.2.(3)4.	or 30.58 di 6.91 ab 31.44 wo 1.04 an 9.17 mt 3.94 ne 11.08 il 2.13 hl 0.47 hm 0.48 ap 0.67	Longfellow mine, Cripple Creek, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. A. R. 16, (II), p. 45, 1895.	Nephelite syenite.	In W. T., p. 263.
12	II.(5)6.2″.″4.	or 23.35 di 13.71 ab 23.58 ol 0.48 an 17.51 mt 5.34 ne 11.36 il 2.74 ap 1.34	Ortiz Mountains, east of Albuquerque, New Mexico.	M. W. Adams.	I. H. Ogilvie, J. G., XVI, p. 235, 1908.	Diorite essexite.	
13	″II.6.2″.(3)4.	or 28.36 di 8.42 ab 18.86 ol 1.68 an 19.18 mt 4.41 ne 14.48 il 1.98 hm 0.80 ap 1.34	Ortiz Mountains, east of Albuquerque, New Mexico.	M. W. Adams.	I. H. Ogilvie, J. G., XVI, p. 235, 1908.	Diorite essexite.	
14	″II.6.(1)2.4.	or 28.91 di 9.87 ab 26.72 wo 2.90 an 6.67 mt 3.02 ne 18.46 il 0.76 ap 0.34	Cuesta de la Camera, Salta, Argentina.	P. Jannasch.	F. Tannhäuser, N. J. B. B., XXII, p. 618, 1906.	Trachyte tephrite.	
15	II.″6.2″.4.	or 10.56 di 18.38 ab 20.44 ol 10.57 an 12.51 mt 7.66 ne 9.09 il 5.17 ap 2.69	Kidlaw, East Lothian, Scotland.	E. G. Radley.	E. B. Bailey, G. S. Scot. Mem. E. Loth., p. 113, 1910.	Analcite basalt.	
16	(I)II.(5)6.2.″4.	or 28.91 di 3.67 ab 29.60 ol 2.10 an 13.62 mt 4.18 ne 12.35 il 0.46 hm 2.24 ap 1.01	Bauza, Columbretes Islands, Spain.	R. Pfohl.	F. Beeke, T. M. P. M., XVI, p. 168, 1896.	Tephritic trachyte	In W. T., p. 263.
17	″II.6.″2.4.	or 18.90 di 12.52 ab 35.11 ol 2.38 an 10.01 mt 3.25 ne 17.04	Stoksund, Norway.	G. Forsberg.	W. C. Brögger, Z. K., XVI, p. 116, 1890.	Rhomben porphyry.	Pressed. Border of lens. In W. T., p. 299.
18	II.″6.2.4.	or 19.46 di 13.05 ab 36.16 ol 0.83 an 11.95 mt 4.87 ne 12.78	Stoksund, Norway.	G. Forsberg.	W. C. Brögger, Z. K., XVI, p. 116, 1890.	Rhomben porphyry.	Pressed. Inner part of lens. In W. T., p. 299.
19	″II.6.2.4(5).	or 13.34 di 2.60 ab 34.84 ol 6.31 an 8.34 mt 4.41 ne 21.16 il 2.58 cc 2.50 ap 1.34	Byske, Almunge, Sweden.	M. Dittrich.	P. Quensel, B. G. Inst. Un. Ups., XII, p. 179, 1914.	Canadite (nephelite syenite).	CO_2 in primary cancrinite.
20	II.″6.″2.4.	or 18.90 di 3.03 ab 37.20 wo 3.83 an 9.45 mt 2.78 ne 15.05 il 3.04 hm 4.48 ap 1.68	Kauling, Rhöngebirge, Germany.	M. Scheidt.	H. Lenk, Vh. Ph. Med. Ges. Wurzb., XXI, p. (36), 1887.	Phonolite.	In W. T., p. 299.

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. ESSEXASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
21	51.40	18.54	2.85	4.69	1.35	7.25	6.72	4.40	0.68	0.12	0.55	0.69	0.46	CO_2 0.20 SO_3, Cl } 0.30	100.20	2.745
A2. II	.857	.182	.018	.065	.034	.130	.108	.047			.007	.005	.007			
22	50.50	17.71	5.41	4.02	3.33	7.91	5.52	3.02	0.45		1.91	0.92			100.70	2.855
A2. II	.842	.174	.034	.056	.083	.141	.089	.032			.024	.006				
23	50.26	20.91	0.19	4.44	1.22	3.84	7.76	4.84	3.99		2.10	0.31			99.86	
A2. II	.838	.205	.001	.061	.030	.068	.125	.051			.026	.002				
24	47.76	18.93	3.34	5.18	4.80	7.45	5.87	3.29	1.01		0.98	0.52	0.50	SO_3 0.42 Cl trace	100.05	
A2. II	.796	.186	.021	.072	.120	.133	.095	.035			.012	.004	.007			
25	47.04	18.53	4.04	3.47	2.75	9.02	5.46	4.73	0.87	0.35	1.30	0.68		CO_2 0.20 ZrO_2 0.16 SO_3 1.25 Cl 0.41 S 0.12 BaO 0.22	100.80	
A1. I	.784	.182	.025	.049	.069	.161	.088	.050			.016	.005				
26	49.08	17.38	5.83	6.05	3.70	7.41	5.84	2.16	n. d.		2.12	0.19			99.76	
A2. II	.818	.170	.036	.084	.093	.132	.094	.023			.027	.001				
27	49.15	17.86	1.07	10.77	3.24	6.57	5.49	2.99	1.21		0.83	0.99	0.75	CO_2 trace Cl trace S trace	100.92	2.790
B2. III	.819	.175	.007	.150	.081	.118	.089	.032			.010	.007	.011		(100.22)	
28	49.90	19.89	2.55	4.78	5.05	7.21	5.60	3.74	0.19	0.13	0.93		trace		99.97	
A3. III	.832	.195	.016	.066	.126	.129	.090	.040			.012		—			
29	48.35	19.94	2.48	5.25	5.15	7.98	5.47	3.99	0.22	0.16	0.12	0.84	trace		99.95	
A2. II	.806	.195	.016	.073	.129	.143	.089	.042			.002	.006	—			
30	52.82	21.13	2.41	2.74	1.09	5.30	7.22	5.34	0.63	0.13	0.86	0.36		SO_3 0.39 Cl 0.23	100.65	
A2. II	.880	.207	.015	.038	.027	.095	.116	.056			.011	.003			(100.35)	
31	51.10	21.10	0.90	5.58	2.81	5.35	6.35	4.21	0.87		1.38			Cl trace	99.65	
A3. III	.852	.207	.006	.078	.070	.096	.103	.045			.017					
32	47.34	16.28	5.82	4.89	3.51	9.50	4.89	3.34	0.20	0.12	2.83	1.01		SO_3 0.43	100.20	
A2. II	.789	.160	.036	.068	.088	.170	.079	.035			.035	.007				
33a	46.66	18.57	2.14	7.48	2.93	7.93	6.49	2.79	0.70	0.20	3.00	0.40	0.19		99.48	
A2. II	.778	.182	.013	.104	.073	.141	.105	.030			.038	.003	.003			
34	46.60	16.79	3.87	7.58	2.88	7.85	5.18	3.31	3.04		1.76	1.76			100.62	
A2. II	.777	.165	.024	.106	.072	.140	.084	.035			.022	.012				
35	51.31	20.70	3.10	2.50	1.02	3.57	6.50	5.38	3.85						99.85	
A3. III	.855	.203	.019	.035	.026	.064	.105	.057								

ORDER 6. LENDOFELIC. NORGARE—Continued.

SUBRANG 4. DOSODIC. ESSEXOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
21	II.6.(1)2.4.	or 26.13 di 19.00 ab 18.34 wo 0.46 an 7.51 mt 4.18 ne 20.73 il 1.06 ap 1.68	Schlossberg, Grosspriessen, Bohemia.	F. Hanusch.	J. E. Hibsch, T. M. P. M., XXI, p. 167, 1902.	Hauyne tephrite.	
22	II.(5)6.2.4.	or 17.79 di 14.69 ab 29.08 ol 1.05 an 14.73 mt 7.42 ne 9.51 il 3.65 hm 0.32 ap 2.02	Rongstock, Bohemia.	R. Pfohl.	J. E. Hibsch, T. M. P. M., XV, p. 487, 1895.	Dolerite (essexite).	Cf. No. 43, II.5.3.3. In W. T., p. 299.
23	"II.6".(1)2.4.	or 28.36 di 7.45 ab 18.86 ol 2.78 an 8.06 mt 0.23 ne 25.28 il 3.95 ap 0.67	Viezzena, Predazzo, Tyrol.	J. A. Ippen.	J. A. Ippen, Sb. Wien. Akad., cxi, I, p. 275, 1902.	Tinguaite porphyry.	
24	II.6.2".4.	or 19.46 di 13.25 ab 14.67 ol 8.45 an 16.96 mt 4.87 ne 17.61 il 1.82 th 0.71 ap 1.34	Schanhübel, Polzen District, Bohemia.	K. H. Scheumann.	K. H. Scheumann, Abh. Sachs. Ges. W., XXXII, p. 758, 1913.	Hauyne trachydolerite.	
25	II.6.2".(3)4.	or 27.80 di 16.89 ab 8.38 wo 0.12 an 18.35 mt 5.80 ne 14.20 il 2.43 hl 0.70 ap 1.68 th 2.27	Rio Nocelletto, Monte Vulture, Italy.	H. S. Washington.	Not published.	Hauynophyre.	
26	II".”6.2.4.	or 12.79 di 16.87 ab 28.30 ol 2.88 an 14.73 mt 8.35 ne 11.36 il 4.10 ap 0.34	Eruption of Jan. 25, 1911, Mount Etna, collected at Catania, Sicily.	F. S. Starrabbia.	F. S. Starrabbia, At. Ac. Gioen. (5), IV, No. XXII, p. 22, 1911.	Basalt sand.	
27	II.(5)6.2(3).4.	or 13.34 di 7.80 ab 27.77 ol 17.37 an 17.24 mt 1.62 ne 10.22 il 1.52 ap 3.25	Ribeira de Massapez, Madeira.	Not stated.	H. Rosenbusch, Elem. Gest., p. 433, 1910.	Diabase (essexite).	K_2O incorrect in Z. D. G. G., LXIV, p. 399, 1912.
28	II.6.2".4.	or 22.24 di 14.30 ab 13.62 ol 7.74 an 18.07 mt 3.71 ne 18.18 il 1.82	Gediz River, n. Kula, Asia Minor.	H. S. Washington.	H. S. Washington, J. G., VIII, p. 613, 1900.	Leucite kulaite.	In W. T., p. 299.
29	II.6.2".”4.	or 23.35 di 13.22 ab 9.43 ol 9.01 an 17.79 mt 3.71 ne 20.16 il 0.30 ap 2.02	Kula, Asia Minor.	H. S. Washington.	H. S. Washington, J. G., VIII, p. 613, 1900.	Kulaite (hornblende basalt).	In W. T., p. 299.
30	(I)II.6.2.”4.	or 31.14 di 8.80 ab 20.96 wo 0.35 an 11.95 mt 3.48 ne 19.31 il 1.67 hl 0.35 ap 1.01 th 0.71	Mount Ankitsika, Madagascar.	Not stated.	A. Lacroix, pers. com.	Phonolite.	
31	II.6.2.4.⊙	or 25.02 di 8.53 ab 18.34 ol 7.38 an 16.40 mt 1.39 ne 19.31 il 2.58	Nosy Komba, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., I, p. 32, 1902.	Covite.	
32	II(III).”6.2".4.	or 19.46 di 19.01 ab 18.86 wo 0.93 an 14.18 mt 7.66 ne 10.79 il 5.32 th 0.71 hm 0.48 ap 2.35	Kasige, Itasy, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVI, p. 179, 1913.	Hauyne andesite.	
33	II".6".2.4.	or 16.68 di 19.72 ab 13.62 ol 3.76 an 13.07 mt 3.02 ne 22.44 il 5.78 ap 1.01	Domain, Auckland, New Zealand.	H. S. Washington.	J. P. Iddings, pers. com.	Nephelite, basanite.	Unpublished.
34	II".6.2.4.	or 19.46 di 12.46 ab 20.96 ol 6.58 an 12.79 mt 5.57 ne 12.50 il 3.34 ap 4.03	Auckland, New Zealand.	P. Marshall.	P. Marshall, Tr. N. Z. Inst., XLIV, p. 307, 1912.	Nephelinite.	
35	(I)II.6.2.(3)4.	or 31.69 di 4.97 ab 22.53 ol 0.21 an 11.40 mt 2.55 ne 17.61 il 3.65 hm 1.28	Papenoo Valley, Tahiti, Society Islands.	Pisani.	A. Lacroix, B. Soc. G. Fr., X, p. 100, 1910.	Nephelite syenite.	Fresh?

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. ESSEXASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
36	49.52	19.40	2.08	5.15	2.12	6.51	7.15	3.85	0.50		3.30			SO_3 0.41 Cl 0.15	100.14	
A2. II	.825	.190	.013	.072	.053	.116	.116	.041			.041					
37	46.10	19.91	2.75	5.02	3.30	6.95	6.10	3.62	2.90		3.02	0.25			99.92	
A2. II	.768	.195	.017	.069	.083	.124	.098	.038			.038	.002			(100.01)	
38	48.70	19.12	2.40	4.77	1.54	6.25	7.83	3.45	2.80		2.37			SO_3 0.83 Cl 0.10	100.19	
A2. II	.812	.187	.015	.067	.039	.112	.126	.037			.030					
39	46.25	19.00	4.65	3.60	2.20	6.61	6.10	3.62	4.38		2.78			SO_3 0.55 Cl 0.25	99.99	
A2. II	.771	.186	.029	.050	.055	.118	.098	.038			.035					
40	48.64	17.04	3.32	6.14	2.58	5.79	7.16	3.02	3.20		2.06			SO_3 0.04 Cl 0.20	99.19	
B2. III	.811	.167	.021	.085	.065	.104	.116	.032			.026				(99.21)	
41	55.93	19.61	1.75	6.32	0.50	3.53	7.75	3.67	0.19	0.10	0.64	0.12	0.13		100.24	
A2. II	.932	.192	.011	.088	.013	.063	.125	.039			.008	.001	.002			
42	45.61	15.70	6.17	7.29	4.84	6.34	5.06	2.67	2.34		3.48		trace	SnO_2 trace	99.50	2.87
A3. III	.760	.154	.039	.101	.121	.113	.082	.029			.044		——			

RANG 3. ALKALICALCIC. SALEMASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	47.64	18.67	3.51	5.84	3.92	8.34	2.31	7.10	n. d.		0.77	0.80	0.18	BaO 0.76	99.84	
A2. II	.794	.183	.022	.081	.098	.149	.037	.076			.010	.006	.003			
2	46.08	20.40	2.12	3.27	6.30	8.48	2.07	6.72	1.70	0.06	1.39	1.19	0.19	ZrO_2 none Cl 0.10 F 0.09 S 0.06 Cr_2O_3 none BaO 0.11 SrO 0.07	100.40	
A1. I	.768	.200	.013	.046	.158	.152	.034	.074			.017	.008	.003			

RANG 3. ALKALICALCIC. SALEMASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	45.06	20.95	6.23	2.84	3.31	8.32	3.51	4.09	3.98	0.30	1.25	0.66			100.50	
A2. II	.751	.205	.039	.039	.083	.148	.056	.043			.016	.005				
2	47.73	17.93	4.47	4.58	4.27	9.59	3.62	4.81	0.44	0.24	0.86	0.52	0.96	ZrO_2 none Cl 0.17 F 0.07 S 0.04 Cr_2O_3 none BaO 0.10 SrO 0.17	100.57	
A1. I	.796	.176	.028	.064	.107	.171	.058	.051			.011	.004	.014			
3	46.60	16.73	4.17	4.78	4.65	10.82	2.62	5.47	0.71	0.45	0.95	1.50	0.41	ZrO_2 none Cl 0.08 F 0.17 S 0.01 Cr_2O_3 none BaO 0.21 SrO 0.13	100.46	
A1. I	.777	.164	.026	.067	.116	.193	.042	.059			.012	.011	.006			

ORDER 6. LENDOFELIC. NORGARE—Continued.

SUBRANG 4. DOSODIC. ESSEXOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
35	II.6.2.4.⊙	or 22.80 di 15.92 ab 17.55 wo 0.58 an 11.12 mt 3.02 ne 21.44 il 6.23 hl 0.23 th 0.71	Papenoo Valley, Tahiti, Society Islands.	Pisani.	A. Lacroix, B. Soc. G. Fr., X, p. 115, 1910.	Hauyno-phyre.	
36	II.6.2.4.⊙	or 21.13 di 12.79 ab 12.05 ol 2.92 an 16.40 mt 3.94 ne 21.30 il 5.78 ap 0.67	Papenoo Valley, Tahiti, Society Islands.	Pisani.	A. Lacroix, B. Soc. G. Fr., X, p. 109, 1910.	Camptonite.	Inclusion in camptonite.
37	II.6″.″2.4.	or 20.57 di 13.88 ab 19.91 wo 1.74 an 10.01 mt 3.48 ne 21.58 il 4.56 hl 0.23 th 1.42	Vairao, Tahiti, Society Islands.	Pisani.	A. Lacroix, B. Soc. G. Fr., X, p. 115, 1910.	Hauyno-phyre.	
38	II.6.2.4.⊙	or 21.13 di 11.88 ab 17.55 wo 0.35 an 16.68 mt 3.48 ne 15.48 il 5.32 hl 0.41 hm 2.24 th 0.99	Vairao, Tahiti, Society Islands.	Pisani.	A. Lacroix, B. Soc. G. Fr., X, p. 115, 1910.	Hauyno-phyre.	Fresh?
39	II.6.(1)2.4.	or 17.79 di 18.67 ab 23.06 ol 1.73 an 6.12 mt 4.87 ne 19.60 il 3.95 hl 0.35	Arue, Tahiti, Society Islands.	P. Marshall.	P. Marshall, Austr. A. A. S., XIII, p. 197, 1912.	Hauyno-phyre.	
40	″II.″6.(1)2.4.	or 21.68 di 7.77 ab 39.56 ol 5.05 an 7.78 mt 2.55 ne 14.06 il 1.22 ap 0.34	Scott Island, S. Victoria Land, Antarctica.	G. T. Prior.	G. T. Prior, Nat. Ant. Exp., I, p. 114, 1907.	Trachy-dolerite.	
41	II(III).6.2.4.	or 16.12 di 15.41 ab 20.96 ol 5.12 an 11.95 mt 9.05 ne 11.93 il 6.69	Franklin Island, S. Victoria Land, Antarctica.	G. T. Prior.	G. T. Prior, Min. Mag., XII, p. 80, 1899.	Basalt.	In W. T., p. 343.

SUBRANG 2. DOPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.6.(2)3.2″.	or 31.14 di 13.38 an 19.46 ol 7.39 lc 8.72 mt 5.10 ne 10.51 il 1.52 ap 2.02	Eruption of April, 1906, Mount Vesuvius, Italy.	R. V. Matteucci.	H. J. Johnston-Lavis, Tr. R. Dubl. Soc., IX, p. 166, 1909.	"Lava" (leucite tephrite).	Three decimals, BaO high?
2	II.6″.3.2″.	or 22.80 di 7.26 an 25.58 ol 10.56 lc 14.39 mt 3.02 ne 9.66 il 2.58 ap 2.69	Gentungen, Pic de Maros, Celebes.	E. W. Morley.	J. P. Iddings, Ign. Rocks, II, p. 627, 1913.	Fergusite.	Also in Iddings and Morley, J. G., XXIII, p. 242, 1915.

SUBRANG 3. SODIPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.(5)6.3.3.	or 23.91 di 5.40 ab 11.79 ol 4.06 an 29.47 mt 5.34 ne 9.51 il 2.43 hm 2.56 ap 1.68	Ledmore River, Assynt, Scotland.	A. Gammell.	A. Gammell, Tr. Edin. G. Soc., IX (5), p. 419, 1910.	Ledmorite (melanite syenite).	
2	II(III).6.(2)3.3.	or 28.36 di 20.43 ab 3.93 ol 4.33 an 18.63 mt 6.50 ne 14.34 il 1.67 ap 1.34	Near Ragou, Mount Mouriah, Java.	E. W. Morley.	J. P. Iddings, Ign. Rocks, II, p. 622, 1913.	Vicoite (leucite tephrite).	Also in Iddings and Morley, J. G., XXIII, p. 233, 1915.
3	II(III).6.(2)3.″3.	or 32.25 di 20.76 an 17.51 ol 4.51 lc 0.44 mt 6.03 ne 11.93 il 1.82 ap 3.70	Near Ragou, Mount Mouriah, Java.	E. W. Morley.	J. P. Iddings, Ign. Rocks, II, p. 622, 1913.	Leucite tephrite.	Also in Iddings and Morley, J. G., XXIII, p. 233, 1915.

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. SALEMASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	51.26	23.78	1.81	2.70	1.96	8.00	6.72	2.16	0.55	0.10	1.65		0.10		100.79	
A2. II	.854	.233	.011	.038	.049	.143	.108	.023			.021		.001			
2	49.96	18.83	2.52	6.64	3.52	7.42	5.26	2.58	0.53	0.07	2.40	0.25	0.20	CO_2 none Cl trace	100.18	
A2. II	.833	.185	.016	.092	.088	.132	.085	.028			.030	.002	.003			
3	44.50	19.95	4.90	5.45	5.05	10.21	4.65	1.82	1.66		2.63				100.82	
A3. III	.742	.196	.031	.076	.126	.182	.075	.019			.033				(101.32)	
4	43.91	19.63	4.16	5.55	5.20	9.49	4.49	1.51	0.53		3.80	0.32	0.07	CO_2 0.51 FeS_2 0.64	99.81	
A2. II	.732	.192	.026	.077	.130	.170	.073	.016			.048	.002	.001			
5	45.32	18.99	3.78	9.78	4.68	9.19	3.78	2.12	0.31	0.09	1.94				99.98	2.975
A3. III	.756	.186	.023	.136	.117	.164	.061	.023			.024					
6	50.47	18.73	4.19	4.92	3.48	8.82	4.62	3.56	0.58		0.51	0.10	0.11	CO_2 trace Cl trace	100.09	
A2. II	.841	.184	.026	.068	.087	.157	.074	.038			.006	.001	.002			
7	43.66	17.35	7.88	5.40	4.27	9.39	5.12	2.07	1.21	1.32					99.66	
A2. II	.728	.170	.049	.075	.107	.167	.083	.022	.015	.009						
8	45.62	18.17	1.28	8.30	6.48	9.43	4.22	1.43	1.54	0.47	2.09	0.71	0.35	CO_2 none BaO trace SrO trace	100.09	
A2. II	.760	.178	.008	.115	.162	.168	.068	.015			.026	.005	.005			
9	44.50	20.31	2.27	8.84	3.90	11.44	3.70	1.64	1.40		0.31	1.22	0.50	CO_2 trace	100.03	
A2. II	.742	.199	.014	.123	.098	.204	.060	.017			.004	.008	.007			
10	44.22	16.47	2.94	10.10	4.28	7.89	4.40	2.21	2.77		3.32	1.48		SO_3 0.26	100.34	
A2. II	.737	.161	.018	.140	.107	.141	.071	.023			.042	.010				
11	47.58	19.83	4.58	1.61	6.06	7.69	5.50	1.75	3.72	0.20	1.40				99.92	2.89
A3. III	.793	.194	.029	.022	.152	.138	.089	.019			.018					
12	50.18	18.86	0.48	7.80	3.54	10.81	4.92	2.05	n. d.		1.10	0.30	0.03	Cl 0.15 V_2O_3 0.05	100.27	
A2. II	.836	.185	.003	.108	.088	.193	.079	.022			.014	.002	—			
13	47.51	19.17	2.72	5.69	7.50	9.66	4.20	1.45	1.21		1.10				100.21	2.86
A3. III	.792	.188	.017	.079	.188	.172	.068	.016								
14	49.75	18.30	2.85	6.28	3.45	9.76	4.96	1.89	0.40		2.45	0.03			100.12	
A2. II	.892	.179	.018	.088	.086	.178	.080	.020			.031	—				
15	48.82	18.71	5.50	4.51	3.43	9.67	4.90	1.86	0.23		2.19	0.09			99.91	2.815
A2. II	.814	.183	.034	.063	.086	.173	.079	.020			.027					
16	49.95	22.50	2.20	6.57	3.71	6.80	5.01	2.68	1.12		0.64				101.18	
A ?3. III	.833	.220	.014	.092	.093	.121	.081	.029			.008				(100.18)	

ORDER 6. LENDOFELIC. NORGARE—Continued.

SUBRANG 4. DOSODIC. SALEMOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	"II.6.3.4".	or 12.79 di 9.02 ab 27.25 ol 1.11 an 28.36 mt 2.55 ne 15.90 il 3.19	Beloeil Mountain, Rouville County, Quebec.	M. F. Connor.	J. J. O'Neill, Can. G. S. Mem. 43, p. 37, 1914.	Rouvillite (theralite).	
2	II.(5)6.(2)3.4.	or 15.57 di 12.06 ab 26.72 ol 6.84 an 20.02 mt 3.71 ne 9.66 il 4.56 ap 0.67	Beloeil Mountain, Rouville County, Quebec.	M. F. Connor.	J. J. O'Neill, Can. G. S. Mem. 43, p. 31, 1914.	Essexite.	
3	II".6.3.4.	or 10.56 di 17.50 ab 11.00 ol 4.22 an 28.36 mt 7.19 ne 15.34 il 5.02	Montreal, Quebec.	A. Pisani.	A. Lacroix, Mat. Min. Mad., I, p. 39, 1902.	Spots in nephelite syenite.	
4	II"."6.3.4".	or 8.90 di 13.02 ab 16.77 ol 5.24 an 28.63 mt 6.03 ne 11.64 il 6.99 ap 0.67	Mount Yamaska, Quebec.	G. A. Young.	G. A. Young, Can. G. S. A. R. 16, (1904), p. 26H, 1906.	Essexite.	
5	II(III)."6.3.4.	or 12.79 di 14.25 ab 12.84 ol 12.06 an 28.36 mt 5.34 ne 10.36 il 3.65	Salem Neck, Essex County, Massachusetts.	H. S. Washington.	H. S. Washington, J. G., VII, p. 63, 1899.	Hornblende gabbro.	In W. T., p. 301.
6	II."6.(2)3."4.	or 21.13 di 18.30 ab 17.82 ol 3.50 an 20.29 mt 6.03 ne 11.36 il 0.91 ap 0.34	Mount Fairview, Rosita Hills, Colorado.	L. G. Eakins.	W. Cross, Pr. Colo. Sci. Soc., II, p. 247, 1887.	Augite diorite.	Also in U. S. G. S. A. R. 17, II, p. 324, 1896. In W. T., p. 301.
7	II(III).6.(2)3.4.	or 12.23 di 15.81 ab 17.29 ol 3.52 an 18.07 mt 11.37 ne 14.20 il 2.28 ap 3.02	Cabo Frio Island, n. Rio de Janeiro, Brazil.	M. Dittrich.	H. Rosenbusch, Elem. Gest., p. 172, 1898.	Essexite.	In W. T., p. 343.
8	II(III).(5)6.3.4".	or 8.34 di 12.71 ab 17.82 ol 15.58 an 26.41 mt 1.86 ne 9.66 il 3.95 ap 1.68	Auchineden Hill, Kilpatrick Hills, Dumbartonshire, Scotland.	A. Scott.	G. W. Tyrrell, Tr. G. Soc. Glas., XIV (III), p. 244, 1912.	Olivine basalt.	
9	II"."6.3(4).4.	or 9.45 di 12.81 ab 11.79 ol 13.51 an 33.92 mt 3.25 ne 10.65 il 0.61 ap 2.69	Steinburg, Westerwald, Germany.	Jungeblodt.	A. Dannenberg, T. M. P. M., XVII, p. 480, 1898.	Augite andesite.	In W. T., p. 301.
10	II(III).(5)6."3.4.	or 12.79 di 10.11 ab 22.01 ol 11.96 an 17.79 mt 4.18 ne 8.24 il 6.38 ap 3.36	Neuwerk, Harz.	Not stated.	O. H. Erdmannsdoerfer, N. J. Cb., p. 40, 1909.	Diabase.	Light facies, Cf. No. 2, III.6.3.5.
11	II."6.3.4".	or 10.56 di 11.45 ab 22.53 ol 6.93 an 23.91 mt 0.93 ne 13.06 il 2.74 hm 4.00	Ezelstock, Verrucano, Switzerland.	L. Hezner.	R. Beder, In. Diss. Zur., p. 24, 1909.	Olivine-augite porphyrite.	
12	II".6.3.4.	or 12.23 di 23.69 ab 17.82 ol 6.64 an 23.35 mt 0.70 ne 12.78 il 2.13 ap 0.67	Eruption March, 1901, Stromboli, Aeolian Islands.	A. Brun.	A. Brun, Arch. Soc. Phys. Geneve (4), XIII, p. 86, 1902.	Basalt.	Also in Exhal. Volc., p. 94, 1911.
13	II(III).(5)6.3.4.	or 8.90 di 15.14 ab 17.29 ol 12.85 an 28.91 mt 3.94 ne 9.94 il 2.13	Costa di Tramontana, Ustica, Aeolian Islands.	A. Martelli.	A. Martelli, Mem. Soc. Ital. Sci., XVII, p. 151, 1912.	Olivine basalt.	
14	II.(5)6.3.4.	or 11.12 di 22.37 ab 23.58 ol 2.08 an 21.96 mt 4.18 ne 9.94 il 4.71	Eruption of 1908, Mount Etna, Sicily.	Pisani.	A. Lacroix, C. R., CXLVII, p. 99, 1908.	Basalt.	
15	II.(5)6.3.4.	or 11.12 di 19.07 ab 25.15 mt 7.89 an 23.35 il 4.10 ne 8.80	Eruption of 1908, Mount Etna, Sicily.	F. S. Starrabba.	F. S. Starrabba, At. Ac. Gioen (5), IV, No. XXII, p. 12, 1911.	Basalt.	
16	II.(5)6.3.4.	or 16.12 di 2.54 ab 23.58 ol 12.72 an 30.58 mt 3.25 ne 10.22 il 1.22	Nosy Komba, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., I, p. 30, 1902.	Microessexite.	

CLASS II. DOSALANE—Continued.

RANG 3. ALKALICALCIC. SALEMASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
17	48.50	21.30	0.95	5.49	4.10	7.42	4.85	3.21	2.12		1.72				99.66	
A3. III	.808	.209	.006	.076	.103	.132	.078	.034			.022					
18	46.40	21.60	4.07	4.95	2.75	8.44	6.29	2.71	1.25		1.57	0.26			100.29	
A2. II	.773	.212	.026	.069	.069	.151	.102	.029			.020	.002			(100.28)	
19	46.71	12.46	3.00	9.03	9.56	11.61	3.10	1.06	1.11		1.74	0.33		Cl trace	99.76	
A2. II	.779	.122	.019	.125	.239	.207	.050	.012			.022	.002				
20	47.50	19.97	3.39	4.74	3.60	6.92	5.25	3.47	2.25		2.96	0.44			100.49	
A2. II	.792	.196	.021	.066	.090	.123	.085	.037			.037	.003				
21	45.10	19.30	1.55	8.70	5.30	9.81	4.32	1.58	0.75		3.49	0.57			100.47	
A2. II	.752	.189	.010	.121	.133	.175	.079	.017			.044	.004				
22	47.40	20.27	5.38	5.48	2.94	7.59	5.78	2.73	0.23		0.63	0.85	0.17		99.45	
A2. II	.790	.199	.034	.076	.074	.136	.094	.029			.008	.006	.002			

RANG 3. ALKALICALCIC. SALEMASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	46.10	18.59	2.63	6.68	3.23	9.86	6.22	0.63	0.80	0.11	3.34	1.41	0.05	CO_2 none Cl none	99.65	2.895
A2. II	.768	.182	.017	.093	.081	.176	.100	.007			.042	.010	—			
2	47.30	18.27	2.24	6.95	6.78	7.95	5.99	1.00	0.07		1.47	1.61			99.63	2.856
A2. II	.788	.179	.014	.097	.170	.142	.097	.011			.018	.011				

RANG 4. DOCALCIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	45.11	19.67	4.32	8.57	5.65	10.45	3.87	0.64	0.83	0.17	0.21	0.25		FeS_2 0.33	100.07	
A2. II	.752	.193	.027	.119	.141	.187	.063	.007			.003	.002				

CLASS II. DOSALANE.

RANG 1. PERALKALIC. LUJAVRASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	50.00	20.03	0.98	3.98	0.69	3.41	8.28	8.44	1.50	0.10	0.99	0.21	0.50	CO_2 0.22 Cl trace FeS_2 0.54 BaO none	99.87	2.701
A2. II	.833	.196	.006	.056	.017	.061	.134	.089			.012	.002	.006			
2	51.93	20.29	3.59	1.20	0.22	1.65	8.49	9.81	0.99	0.10	0.20	0.06	trace	CO_2 0.25 SO_3 0.67 Cl 0.70 F 0.27 BaO 0.09 SrO 0.07	100.58	
A1. I	.866	.199	.023	.017	.006	.030	.137	.104			.003	—	—			
3	53.10	19.07	5.57	none	0.17	1.33	9.41	6.84	3.98					CO_2 0.10	99.57	
A3. III	.885	.187	.035	—	.004	.024	.152	.072								

ORDER 6. LENDOFELIC. NORGARE—Continued.

SUBRANG 4. DOSODIC. SALEMOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
17	II.″6.3.4.	or 18.90 di 7.88 ab 16.50 ol 9.34 an 26.97 mt 1.39 ne 13.20 il 3.34	Jangoa, Nosy Komba, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., I, p. 131, 1902.	Essexite.	
18	II.6.(2)3.4.	or 16.12 di 14.12 ab 12.05 ol 2.25 an 22.52 mt 6.03 ne 22.44 il 3.04 ap 0.67	Berondra, Bezavona Mountains, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., II, p. 194, 1903.	Nephelite monzonite.	
19	II.(5)6.3.4.	or 6.67 di 31.39 ab 15.20 ol 14.35 an 16.68 il 3.34 ne 5.96 ap 0.67	Adolph Friedrich Cone, Lake Kivu District, German East Africa.	O. Hauser.	L. Finckh, D. Zent. Afr. Exp., I (1), p. 22, 1912.	Limburgite.	
20	″II.6.(2)3.4.	or 20.57 di 8.52 ab 18.86 ol 4.29 an 20.57 mt 4.87 ne 13.92 il 5.62 ap 1.01	Papenoo Valley, Tahiti, Society Islands.	Pisani.	A. Lacroix, B. Soc. G. Fr., X, p. 102, 1910.	Nephelite monzonite.	
21	II″.″6.3.4.	or 9.45 di 11.09 ab 17.29 ol 12.20 an 28.63 mt 2.32 ne 11.08 il 6.69 ap 1.34	Papenoo Valley, Tahiti, Society Islands.	Pisani.	A. Lacroix, B. Soc. G. Fr., X, p. 103, 1910.	Nephelite gabbro.	
22	II.6.(2)3.4.	or 16.12 di 9.06 ab 20.96 ol 5.63 an 20.29 mt 7.89 ne 15.34 il 1.22 ap 2.02	Mount Terror, S. Victoria Land, Antarctica.	G. T. Prior.	G. T. Prior. R. S. Cross. Exp., p. 326, 1902.	Basalt.	

SUBRANG 5. PERSODIC. NARSAKOSE. (H. S. WASHINGTON, 1917.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II″.″6.″3.″5.	or 3.89 di 13.61 ab 30.39 ol 4.60 an 20.85 mt 3.94 ne 11.93 il 6.38 ap 3.36	Panernak Bay, Narsak, Ilimausak Region, Greenland.	C. Winther.	N. V. Ussing, G. Julhb., p. 203, 1911.	Essexite	
2	II″.″6.(2)3.(4)5.	or 6.12 di 7.63 ab 28.56 ol 15.86 an 19.74 mt 3.25 ne 12.07 il 2.74 ap 3.70	Pedregal, n. Tlalpam, Mexico.	P. Krais.	Felix and Lenk, Btr. G. Mex., I, p. 103, 1890.	Basalt.	In W. T., p. 303.

SUBRANG 4-5. PRESODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II(III).″6.(3)4.(4)5.	or 3.89 di 13.11 ab 14.15 ol 14.87 an 34.19 mt 6.26 ne 10.22 il 0.46 ap 0.67 pr 0.33	Ober Hambach, Hesse.	R. Marzahn.	Chelius and Klemm, Erl. G. Kt. Hes., Bl. Zweingenberg, p. 37, 1896.	Diorite.	In W. T., p. 303.

ORDER 7. LENFELIC. ITALARE. (C. I. P. W., 1902.)

SUBRANG 3. SODIPOTASSIC. JANEIROSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.7(8).1.3.	or 28.91 ac 2.77 lc 16.13 ns 2.56 ne 30.39 di 12.94 ol 1.23 il 1.82 ap 0.67 pr 0.54	Beemerville, Sussex County, New Jersey.	J. E. Wolff.	J. E. Wolff, B. Mus. Comp. Zool., XXXVIII, p. 276, 1902.	Leucite tinguaite.	
2	″II.7(8).1.3.	or 31.97 ac 10.63 lc 20.28 ns 0.12 ne 26.98 di 4.77 hl 1.17 wo 1.16 th 1.14 il 0.46	Beaver Creek, Bearpaw Mountains, Montana.	H. N. Stokes.	Weed and Pirsson, A. J. S., II., p. 196, 1896.	Leucite tinguaite.	In W. T., p. 303.
3	II.(6)7.1.3(4).	or 40.03 ac 16.17 ab 6.81 ns 0.24 ne 28.97 di 0.86 wo 2.32	Km. 37, Sta. Cruz R. R., Rio de Janeiro, Brazil.	P. Jannasch.	H. Rosenbusch, Elem. Gest., p. 215, 1898.	Tinguaite.	In W. T., p. 303.

CLASS II. DOSALANE—Continued.

RANG 1. PERALKALIC. LUJAVRASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	51.62	15.63	6.06	4.98	trace	3.13	10.09	4.19	2.12		0.44	none	0.33	ZrO_2 1.70 Cl 0.17	100.46	
A2. II	.860	.153	.038	.069	—	.055	.163	.045			.006	—	.005			
2	49.46	23.53	3.04	1.02	trace	0.80	14.71	4.34	1.38		0.16	none	0.17	ZrO_2 0.38 SO_3 none Cl 2.25	101.24 .51	2.53
A2. II	.822	.230	.019	.014	—	.014	.237	.046			.002	—	.002		100.73	
3	49.38	17.31	4.20	5.25	0.53	2.23	13.87	2.55	1.30	0.16	0.63	none	0.08	ZrO_2 0.61 SO_3 none Cl 1.68	99.78 .38	2.653
A2. II	.823	.170	.026	.073	.013	.039	.224	.028			.008	—	.001		99.40	
4	54.74	21.53	4.06	0.94	0.18	0.90	12.84	4.18	0.35	trace	trace	trace	0.14		99.86	
A3. III	.912	.211	.025	.013	.005	.016	.207	.044			—	—	.002			
5	50.40	21.83	2.51	1.41	0.39	3.17	9.96	6.10	2.35	0.15	0.50	0.10	0.27	CO_2 none SO_3 0.62 Cl 0.10 S trace BaO 0.33 SrO 0.07	100.26	
A1. I	.840	.214	.016	.019	.010	.057	.161	.065			.006	.001	.004			
6	44.00	23.31	2.37	7.43	0.25	4.86	10.65	3.09	1.24	0.21	0.75	0.33	0.22	CO_2 0.98 Cl 0.08 FeS_2 0.28 BaO trace SrO 0.01	100.06	
A1. I	.733	.228	.015	.103	.006	.087	.172	.033			.009	.002	.003			
7	48.13	18.44	3.41	4.30	3.06	5.89	8.00	3.80	1.59	0.18	1.74	0.49	0.19	ZrO_2 0.05 Cl 0.29 F 0.06 S 0.09 Cr_2O_3 none NiO 0.02 BaO 0.10 SrO 0.10 Li_2O trace	99.93	2.770
A1. I	.802	.180	.021	.060	.077	.105	.129	.040			.022	.003	.003			
8	51.94	16.66	3.68	2.68	3.81	4.81	7.53	5.63	0.58		3.30		0.20		100.82	2.579
A2 II	.866	.163	.023	.037	.095	.086	.120	.060			.040		.003			
9	54.14	20.61	3.28	2.08	0.83	1.85	9.87	5.25	0.40		0.95		0.25	ZrO_2 0.07 Cl 0.12	100.55	
A2. II	.902	.202	.021	.029	.021	.033	.160	.056			.012		.004			
10	52.25	22.24	2.42	1.98	0.96	1.54	9.78	6.13	0.73		0.60		0.53		99.16	
B2. III	.871	.218	.015	.028	.024	.027	.158	.065			.008		.008			
11	45.22	19.09	5.77	2.20	2.50	2.62	10.33	3.91	5.06		2.10	1.03	0.41	SO_3 0.45 Cl trace F 0.09	100.78	2.623
A2. II	.754	.187	.036	.030	.063	.046	.166	.041			.026	.007	.006			
12	48.86	22.24	4.07	3.32	1.09	3.69	8.92	4.43	2.05						99.53	
A3. III	.814	.218	.026	.046	.027	.066	.144	.047								
13	48.35	23.10	2.48	1.80	0.89	2.51	13.20	3.58	2.91		0.45			Cl 1.49	100.85 .31	
A2. II	.806	.226	.016	.025	.022	.045	.213	.038			.006				100.54	
14	50.16	19.75	4.28	3.62	1.12	3.10	7.63	6.73	3.96			0.13			100.48	
A3. III	.836	.194	.027	.050	.028	.055	.123	.071				.001				

ORDER 7. LENFELIC. ITALARE—Continued.

SUBRANG 4. DOSODIC. LUJAVROSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II(III).″7.1.4.	or 25.02 ac 17.56 ab 9.69 ns 2.07 ne 25.42 di 13.64 Z 2.56 ol 1.43 il 0.76	Kringlerne, Kangerdluarsuk, Ilimausak Region, Greenland.	N. V. Ussing.	N. V. Ussing, G. Julhb., p. 182, 1911.	Kakortokite (eudialyte lujavrite).	White. In W. T., p. 303.
2	(I)II.7(8).1.4″.	or 25.58 ac 9.24 ab 8.91 di 3.48 ne 47.43 il 0.30 hl 3.74 Z 0.55	Kangerdluarsuk, Ilimausak Region, Greenland.	N. V. Ussing.	N. V. Ussing, G. Julhb., p. 154, 1911.	Naujaite (sodalite-nephelite syenite).	In W. T., p. 303.
3	II.7.1.4(5).	or 15.57 ac 0.92 ab 28.30 di 9.38 ne 32.94 ol 1.50 hl 2.81 mt 5.57 Z 0.91 il 1.22	Tupersuatsiak, Ilimausak Region, Greenland.	C. Winther.	N. V. Ussing, G. Julhb., p. 141, 1911.	Sodalite foyaite.	
4	″II.7.1.4.	or 24.46 ac 11.55 ab 21.48 ns 1.83 ne 35.78 di 3.84 ol 0.37	Beloeil Mountain, Rouville County, Quebec.	M. F. Connor.	J. J. O'Neill, Can. G. S. Mem. 43, p. 40, 1914.	Nephelite syenite.	
5	II.7.1.4⊙	or 36.14 ac 7.39 ab 1.31 ns 0.49 ne 39.33 di 7.87 th 1.14 wo 2.78 il 0.91 ap 0.34	Montreal, Quebec.	M. F. Connor.	F. D. Adams, Cong. G. Int. XII, Guide 3, p. 46, 1913.	Tinguaite.	
6	II.7″.1(2).4″.	or 18.35 di 8.62 ab 6.29 ol 5.28 an 6.39 mt 3.48 ne 45.44 il 1.37 ap 0.67 pr 0.28	Glamorgan, Ontario.	M. F. Connor.	Adams and Barlow, Cong. G. Int. XII, Guide 2, p. 96, 1913.	Theralite.	Calcite not calculated in norm.
7	II.(6)7.1″.4.	or 22.24 di 17.86 ab 14.67 ol 1.56 an 4.17 mt 4.87 ne 27.55 il 3.34 hl 0.47 ap 1.01	Mount Inge, Uvalde County, Texas.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 168, p. 61, 1900.	Basanite.	In W. T., p. 303.
8	II″.(6)7.1.(3)4.	or 33.36 ac 7.85 ab 7.34 di 18.36 ne 25.28 ol 0.70 il 6.08 hm 1.39 pf 0.14	Picota, Serra do Monchique, Portugal.	Zilliacus.	K. Koschlau and Hackmann, T. M. P. M., XVI, p. 272, 1896.	Camptonitic tinguaite.	In W. T., p. 303.
9	″II.(6)7 1.4.	or 31.14 ac 6.47 ab 18.86 di 7.55 ne 31.24 ol 0.17 Z 1.28 mt 1.62 il 1.82	Tschasnatschorr, Umptek, Kola, Finland.	F. Eichleiter.	F. Eichleiter, Verh. Wien G. R. A., XXVII, p. 218, 1893.	Nephelite syenite.	In W. T., p. 305.
10	(I)II.″7.1.4.	or 36.14 ac 2.31 ab 12.58 di 6.09 ne 36.64 ol 0.55 mt 2.32 il 1.22	Rabots Spitze, Umptek, Kola, Finland.	V. Hackmann.	V. Hackmann, Fennia, XI, No. 2, p. 132, 1894.	Lujavrite.	In W. T., p. 305.
11	II.7.1.4.⊙	or 22.80 ac 9.24 ab 9.17 di 4.97 ne 36.49 ol 2.80 mt 2.32 il 3.95 ap 0.67	Michelsberg, Katzenbuckel, Odenwald, Germany.	O. N. Heidenreich.	W. Freudenberg, Mt. Bad. G. L.-A., V (1), p. 304, 1907.	Nephelite-mica porphyry.	Fresh?
12	″II.″7.1(2).4.	or 26.13 di 9.03 ab 14.15 ol 0.62 an 7.51 mt 6.93 ne 33.23	Allochet, Lake Le Selle, Monzoni, Tyrol.	J. A. Ippen.	J. A. Ippen, Vh. G. R.-A., Wien, 1903, p. 137.	Allochetite (nephelite porphyry).	
13	(I)II.7″.1.4″.	or 21.13 ac 1.85 ab 14.67 di 6.48 ne 45.44 wo 1.86 hl 2.46 mt 2.78 il 0.91	Leeuwfontein, n. Pretoria, Transvaal.	F. Pisani.	H. A. Brouwer, C. R., CXLVIII, p. 1276, 1909.	Sodalite-aegirite foyaite.	Also in Transv. Nephsy., p. 42, 1910.
14	II.(6)7.1.(3)4.	or 39.48 di 11.76 ab 8.12 mt 6.26 ne 30.53 ap 0.34	Hoopers Inlet, Dunedin, New Zealand.	P. Marshall.	P. Marshall, Q. J. G. S., LXII, p. 396, 1906.	Tinguaite.	

CLASS II. DOSALANE—Continued.

RANG 1. PERALKALIC. LUJAVRASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	45.60	18.93	5.29	4.71	3.63	7.43	9.65	0.84	0.70	0.43	2.36	0.64			100.21	
A2. II	.760	.186	.033	.065	.091	.132	.156	.009			.030	.005				

RANG 2. DOMALKALIC. VULTURASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	47.89	17.87	4.93	3.64	3.68	8.70	2.60	8.23	0.65		0.77	0.36		CO_2 none ZrO_2 0.02 SO_3 0.06 BaO 0.28	99.68	2.781
A2. II	.798	.175	.031	.050	.092	.155	.042	.087			.010	.003				
2	47.20	17.66	3.51	4.50	4.20	9.52	2.25	7.63	0.72	0.57	1.19	0.58		CO_2 none ZrO_2 0.04 S none BaO 0.19	99.76	
A2. II	.787	.173	.022	.063	.105	.170	.036	.081			.015	.004				
3	51.65	21.60	0.85	3.12	1.07	4.29	4.30	11.60	0.25		0.65	trace		SO_3 trace Cl 0.70	100.08	
A3. III	.861	.212	.005	.043	.027	.077	.069	.123			.008	—			(100.20)	
4	48.99	19.82	5.26	2.59	2.82	8.13	3.17	9.06				0.33			100.17	
A3. III	.817	.194	.033	.036	.071	.145	.051	.096				.002				
5	48.28	18.39	1.12	7.88	3.72	9.20	2.84	7.25	0.62		1.28	0.51			101.09	
B2. III	.805	.180	.007	.110	.093	.164	.046	.078			.016	.004				
6	48.10	17.56	2.48	6.10	4.27	8.16	2.67	7.90	0.12	0.04	1.41	1.01		CO_2 none ZrO_2 trace S trace BaO 0.08 CuO none	99.90	
A2. II	.802	.172	.016	.085	.107	.146	.044	.084			.018	.007				
7	47.71	17.61	2.46	5.68	4.80	9.42	2.75	7.64	trace		0.37	0.77		CO_2 none ZrO_2 0.06 SO_3 none S none BaO 0.26	99.53	
A2. II	.795	.173	.015	.079	.120	.168	.045	.081			.005	.005				
8	47.65	18.13	2.63	6.48	4.19	9.01	2.78	7.47	0.13	0.11	1.13	0.50		CO_2 none ZrO_2 0.02 SO_3 trace BaO 0.24	100.47	
A2. II	.794	.178	.017	.090	.105	.161	.045	.080			.014	.004				
9	47.50	18.59	1.52	7.62	3.86	9.16	2.72	7.05	1.25		1.05	trace			100.32	
A3. III	.792	.182	.009	.106	.096	.164	.044	.075			.013	—				

RANG 2. DOMALKALIC. VULTURASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	48.19	18.52	4.51	1.68	1.12	10.29	3.44	8.05	3.00	0.45	1.75				101.00	2.77
B3. IV	.803	.181	.028	.024	.028	.184	.055	.086			.022					
2	51.10	20.30	1.67	3.31	1.82	7.12	5.20	7.84	0.37		0.84			Cl 0.58	100.15	
A3. III	.852	.199	.010	.046	.046	.127	.084	.083			.010					
3	47.94	19.52	3.99	2.01	3.05	10.40	3.07	7.66	0.20		trace	1.42	0.49	SO_3 0.05 Cl trace	99.80	
A3. III	.799	.191	.025	.028	.076	.186	.050	.082			—	.010	.007			
4	47.76	17.29	2.89	3.55	4.22	8.06	4.70	6.77	0.97	0.76	0.75	0.78	0.41	CO_2 0.11 ZrO_2 0.01 Cl 0.25 F 0.09 S 0.03 Cr_2O_3 0.03 BaO 0.12 SrO 0.12	99.67	
A1. I	.796	.170	.018	.050	.106	1.44	.076	.072			.009	.006	.006			

ORDER 7. LENFELIC. ITALARE—Continued.

SUBRANG 3. PERSODIC. ANTANGAINOSE. (A. LACROIX.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II(III).7.1(2).5.	or 5.00 di 20.15 ab 20.96 wo 0.12 an 5.84 mt 7.66 ne 37.94 il 4.56 ap 1.68	Betankolanton, Madagascar.	Boiteau.	A. Lacroix, pers. com.	Camptonite-monchiquite.	

SUBRANG 2. DOPOTASSIC. BRACCIANOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II″.7.2.2″.	or 20.85 di 21.67 an 12.79 ol 0.14 lc 21.58 mt 7.19 ne 11.93 il 1.52 ap 0.92	Crocicchie, n. Lake Bracciano, Italy.	H. S. Washington.	H. S. Washington, J. G., V, p. 49, 1897.	Leucitite.	Complete in R. C. R., p. 109, 1906. In W. T., p. 305.
2	II″.7.2″.2.	or 17.24 di 22.46 an 15.57 ol 2.29 lc 21.80 mt 5.10 ne 10.22 il 2.28 ap 1.34	Arcioni, Rocca di Papa, Alban Hills, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 113, 1906.	Leucitite.	
3	(I)II.7(8).(1)2.2(3).	or 25.58 di 10.92 an 8.34 ol 0.89 lc 33.57 mt 1.16 ne 16.76 il 1.22 hl 1.17	Monte Somma, Italy.	Pisani.	A. Lacroix, Nouv. Arch. Mus., (4), IX, p. 143, 1907.	Leucite sanidinite.	
4	II.7.2.2(3).	or 20.02 di 16.08 an 14.18 wo 1.97 lc 26.16 mt 7.66 ne 13.35 ap 0.67	Lava of 1893, Mount Vesuvius, Italy.	Mrha.	F. Becke, T. M. P. M., XVIII, p. 94, 1898.	Leucite basanite.	In W. T., p. 305.
5	II″.7.2.2(3).	or 15.57 di 21.26 an 15.57 ol 7.26 lc 21.80 mt 1.62 ne 13.06 il 2.43 ap 1.34	Lava of 1906, Mount Vesuvius, Italy.	Pisani.	A. Lacroix, C. R., CXLIII, p. 14, 1906.	Leucite tephrite.	Also in Nouv. Arch. Mus., (4), IX, p. 21, 1907.
6	II″.″7.2.2″.	or 25.86 di 17.89 an 12.23 ol 6.26 lc 16.35 mt 3.71 ne 12.50 il 2.74 ap 2.31	Lava of 1903, Valle del Inferno, Mount Vesuvius, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 116, 1906.	Leucite-tephrite.	
7	II(III).(6)7.2.2(3).	or 11.20 di 23.55 an 13.07 ol 6.05 lc 26.60 mt 3.48 ne 12.78 il 0.76 ap 1.77	Lava of 1631, La Scala, Torre del Greco, Mount Vesuvius, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 118, 1906.	Leucite tephrite.	In W. T., p. 307.
8	II(III).7.2.2(3).	or 14.46 di 21.80 an 14.73 ol 5.59 lc 23.54 mt 3.94 ne 12.78 il 2.13 ap 1.30	Lava of 1872, near observatory, Mount Vesuvius, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 105, 1906.	Leucite tephrite.	In W. T., p. 307.
9	II(III).7″. ″.2(3).	or 10.01 di 23.32 an 17.51 ol 6.69 lc 24.85 mt 2.09 ne 12.50 il 1.98	Scoria of 1906, Mount Vesuvius, Italy.	Pisani.	A. Lacroix, C. R., CXLIII, p. 14, 1906.	Leucite tephrite.	Also in Nouv. Arch. Mus. (4), IX, p. 21, 1907.

SUBRANG 3. SODIPOTASSIC. BAWEANOSE. (J. P. IDDINGS.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.7.2.(2)3.	or 26.97 di 6.05 an 11.12 wo 13.46 lc 16.35 mt 0.46 ne 15.62 il 3.34 hm 4.16	Am. Meallam, Ross shire, Scotland.	W. C. Smith.	W. C. Smith, G. Mag., (V), VI (4), p. 154, 1909.	Borolanite.	
2	II.(6)7.2.3.	or 34.75 di 16.38 an 11.12 wo 1.74 lc 8.94 mt 2.32 ne 21.58 il 1.52 hl 0.94	Monte Somma, Italy.	Pisani.	A. Lacroix, Nouv. Arch. Mus. (4), IX, p. 131, 1907.	Leucite tephrite.	
3	II.7.2.(2)3.	or 20.29 di 18.70 an 16.40 wo 0.93 lc 19.84 mt 5.80 ne 14.20 ap 3.36	Lava of 1906, Mount Vesuvius, Italy.	L. Szathmary.	L. Szathmary, F. K., XXXVII, p. 181, 1907.	Leucite tephrite.	
4	II″.7.(1)2.3.	or 23.38 di 22.70 an 6.12 ol 2.57 lc 13.08 mt 4.18 ne 21.58 il 1.37 ap 2.02	Tandjung, Anger, Bawean Island.	E. W. Morley.	J. P. Iddings, pers. com.	Vicoite (leucite tephrite).	

CLASS II. DOSALANE—Continued.

RANG 2. DOMALKALIC. VULTURASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	42.72	25.08	2.00	4.36	0.97	6.92	11.02	2.69	0.88		0.38	0.19	0.16	CO_2 2.99	100.36	
A2. II	.712	.246	.013	.061	.024	.123	.177	.029			.005	.011	.002			
2	43.68	20.15	2.94	8.97	4.38	7.24	7.00	1.99	0.89		1.10	1.38	0.23	Cl 0.07 F 0.20	100.22	
A2. II	.728	.198	.018	.125	.110	.129	.113	.021			.014	.010	.003			
3	46.34	18.37	2.81	7.24	4.22	8.63	5.94	3.13	2.32		0.78				99.78	
A3. III	.772	.180	.018	.100	.106	.154	.096	.033			.010					
4	44.82	18.11	7.34	3.63	2.92	10.61	5.65	4.30	0.78		0.82	0.78	0.24	SO_3 0.07 Cl 0.03 CuO 0.08	99.51	
A2. II	.747	.177	.046	.050	.073	.189	.091	.046			.010	.006	.003			
5	48.45	22.60	1.90	3.37	1.68	7.23	8.60	3.87	2.25		0.90				100.85	
A3. III	.808	.221	.012	.047	.042	.129	.139	.041			.011					

CLASS II. DOSALANE.

RANG 1. PERALKALIC. NAUJAASE. (H. S. WASHINGTON, 1917.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1.	53.10	20.70	0.07	4.77	1.77	3.18	9.10	5.84	0.70		0.47				99.70	
A3.III	.885	.203	.001	.067	.044	.057	.147	.062			.006					

RANG 1. PERALKALIC. NAUJAASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	43.39	23.13	3.62	3.24	none	0.56	19.68	1.51	1.36	0.21	0.20	none	trace	ZrO_2 0.27 SO_3 none Cl 3.63	100.80 .82	2.545
A2. II	.723	.227	.023	.045	—	.010	.318	.016			.003	—	—		99.98	
2	47.43	23.60	4.59	1.20	0.67	4.42	15.08	2.00	n. d.		0.10				99.09	
B3. IV	.791	.231	.029	.017	.017	.078	.243	.021			.001					

RANG 2. DOMALKALIC. VESUVASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	47.05	17.08	3.04	4.89	5.67	10.63	1.61	7.52	0.71	0.22	1.15	0.17		CO_2 none ZrO_2 0.02 S none NiO 0.05 BaO 0.09 CuO none	99.90	
A1. I	.784	.167	.019	.068	.142	.189	.026	.080			.014	.001				
2	48.20	18.12	3.29	4.30	4.64	8.40	2.51	8.99	n. d.		1.59	0.38			100.42	
A2. II	.803	.177	.021	.060	.116	.150	.040	.096			.020	.003				

RANG 2. DOMALKALIC. VESUVASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	41.66	22.75	2.33	6.08	3.11	7.76	8.81	3.12	1.50	0.03	1.95	0.10	0.14	CO_2 0.40 SO_3 0.05 Cl 0.02 S 0.08	99.88	2.892
A2. II	.694	.223	.014	.085	.078	.139	.142	.033			.024	.001	.002			
2	39.55	18.61	5.00	2.94	3.04	10.86	7.11	5.59	0.61	0.41	1.28	0.78	trace	CO_2 1.22 ZrO_2 0.06 SO_3 2.39 Cl 0.54 S 0.06 Cr_2O_3 none BaO 0.23 SrO trace	100.28	
A1. I	.659	.182	.031	.041	.076	.194	.115	.060			.016	.006	—			

ORDER 7. LENFELIC. ITALARE—Continued.

SUBRANG 4. DOSODIC. VULTUROSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(I)II.7″.″2.4(5).	or 16.12 di 2.85 ab 6.55 ol 5.38 an 11.12 mt 3.02 ne 46.72 il 0.76 ap 0.34	Monmouth Township, Renfrew County, Ontario.	N. N. Evans.	Adams and Barlow, Tr. R. Soc. Can., II (4), p. 39, 1909.	Pyroxene-nephelite syenite.	Also in Can. G. S. Mem. 6, p. 272, 1910.
2	II(III).(6)7.2″.4″.	or 11.68 di 7.39 ab 12.58 ol 14.77 an 17.79 mt 4.18 ne 25.28 il 2.13 ap 3.36	Skallerbol, Almunge, Sweden.	N. Sahlbom.	P. Quensel, B. G. Inst. Ups., XII, (1913), p. 182, 1914.	Theralitic canadite (theralite).	
3	II(III).(6)7.2.4.	or 18.35 di 23.59 ab 4.72 ol 6.21 an 14.18 mt 4.18 ne 24.71 il 1.52	Tatika, Lake Balaton, Hungary.	L. Tomasowsky.	J. Vitalis, F. K., XXXIV, p. 451, 1904.	Nephelite basanite.	
4	II(III).(6)7.2.″4.	or 25.58 di 15.77 ab 1.05 wo 6.50 an 11.12 mt 9.98 ne 25.28 il 1.52 hm 0.48 ap 2.02	Ngoma Crater, Lake Kivu District, German East Africa.	O. Hauser.	L. Finckh, D. Zent. Afr. Exp., I, (1) p. 26, 1912.	Melilite nephelinite.	
5	II.7.″2.4.	or 22.80 di 15.03 ab 6.29 wo 2.55 an 11.40 mt 2.78 ne 36.07 il 1.67	Andevenanaomby River, Bezavona Mountains, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., II, p. 194, 1903.	Nephelite syenite.	

ORDER 8. FELDOLENIC. CAMPANARE. (C. I. P. W., 1902.)

SUBRANG 4. DOSODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.″8.1.4.	or 34.47 ns 0.73 ab 11.53 di 13.37 ne 33.80 ol 4.26 il 0.91	Eruption of 1906, Mount Vesuvius, Italy.	Pisani.	A. Lacroix, Nouv. Arch. Mus. (4) IX, p. 43, 1907.	Obsidian.	Inclusion in No. 2, II.8.2.2.

SUBRANG 5. PERSODIC. NAUJAOSE. (H. S. WASHINGTON, 1917.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.8.1.″5.	or 8.90 ac 10.63 ab 5.50 ns 4.03 ne 56.94 di 2.48 hl 5.97 ol 3.26 Z 0.37 il 0.46	Nunasarnak, Ilimausak Region, Greenland.	C. Winther.	N. V. Ussing, G. Julhb., p. 154, 1911.	Naujaite (sodalite-nephelite syenite).	
2	II.8″.1.″5.	or 11.68 ac 13.40 ab 1.57 ns 0.49 ne 58.79 di 7.88 wo 5.10 il 0.15	Penikkavaara, Kuuosamo, Finland.	M. Dittrich.	V. Hackmann, B. Com. G. Finl., No. 11, p. 22, 1900.	Sussexite.	Low sum due to H_2O? In W. T., p. 305.

SUBRANG 2. DOPOTASSIC. VESUVOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II(III).″8.2(3).2.	or 3.89 di 27.80 an 16.96 ol 3.96 lc 31.83 mt 4.41 ne 7.68 il 2.13 ap 0.34	Pofi, n. Rome, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 135, 1906.	Leucitite.	
2	II″.″8.2.2.	or 11.40 di 21.83 an 11.40 ol 2.68 lc 32.92 mt 4.87 ne 11.36 il 3.04 ap 1.01	Eruption of 1906, Mount Vesuvius, Italy.	Pisani.	A. Lacroix, Nouv. Arch. Mus. (4) IX, p. 43, 1907.	Leucite tephrite.	

SUBRANG 4. DOSODIC. MELFOSE. (H. S. WASHINGTON, 1917.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.8.2.4.⊙	an 13.34 di 17.13 lc 14.39 ol 4.28 ne 40.33 cs 1.20 mt 3.25 il 3.65 ap 0.34	Leauchoie, Ice River, British Columbia.	M. F. Connor.	J. A. Allan, pers. com.	Ijolite.	
2	II″.8.2.″4.	an 12.51 di 15.55 lc 26.16 ol 0.14 ne 21.87 cs 4.82 hl 0.94 mt 5.80 th 4.26 il 2.43 hm 0.96 ap 2.02	Melfi, Monte Vulture, Apulia, Italy.	H. S. Washington.	H. S. Washington, unpublished.	Hauynophyre.	

CLASS II. DOSALANE.

RANG 1. PERALKALIC. URTASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	44.40	19.95	5.15	2.77	1.75	8.49	6.50	8.14	1.17	0.24	1.53	0.37	0.08			
A1. I	.740	.196	.032	.039	.044	.152	.105	.087			.018	.003	.001			
2	45.64	19.50	3.47	3.34	3.04	4.45	11.57	6.96	0.16		2.44		0.19		100.76	
A2. II	.761	.191	.022	.046	.076	.080	.187	.074			.031		.003			
3	46.48	19.00	4.74	2.30	2.49	4.35	8.46	6.78	3.31		1.22	0.15	trace	CO_2 0.36 SO_3 0.19 Cl 0.08	99.91	2.58
A2. II	.775	.186	.030	.032	.062	.078	.136	.072			0.15	.001	—			
4	39.50	21.58	3.22	6.10	2.61	8.60	7.19	8.13	0.42		1.88	0.20		SO_3 0.05 S 0.18	99.66	2.801
A2. II	.658	.212	.020	.085	.065	.154	.116	.086			.024	.001				

RANG 1. PERALKALIC. URTASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	45.46	26.73	4.31	0.60	trace	2.09	15.07	4.23	0.44				0.12		99.05	
B3. IV	.758	.262	.027	.008	—	.037	.243	.045					.002			
2	45.43	28.77	3.10	0.40	0.22	1.86	16.16	3.38	n. d.						99.32	
A3. III	.757	.282	.019	.006	.006	.033	.261	.036								
3	45.28	27.37	3.53	0.49	0.33	1.22	17.29	3.51	0.40				0.19		99.53	
A3. III	.755	.268	.022	.007	.008	.022	.279	.037					.003			
4	43.02	24.63	3.59	2.17	1.96	5.47	14.81	2.99	n. d.		0.63	0.70			99.97	
A2. II	.717	.241	.022	.030	.049	.098	.239	.032			.008	.005				

ORDER 9. PERLENIC. LAPPARE. (C. I. P. W., 1902.)

SUBRANG 3. SODIPOTASSIC. ARKANSOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	II.9.1.3.⊙	an 1.11 lc 37.93 ne 29.82 di 9.50 wo 8.58 cs 2.06 mt 5.10 il 2.74 hm 1.60 ap 1.01	Diamond Jo Quarry, Maguet Cove, Arkansas.	H. S. Washington.	H. S. Washington, J. G., IX, p. 616, 1901.	Arkite (leucite syenite).	In W. T., p. 307.
2	II(III).9.1.3(4).	lc 32.26 ne 33.23 ac 10.16 ns 5.86 di 1.76 ol 6.56 cs 6.19 il 4.71	Wudjavrtschorr, Umptek, Kola, Finland.	V. Hackmann.	V. Hackmann, Fennia, XI, No. 2, p. 151, 1894.	Nephelite porphyry.	In W. T., p. 307.
3	II.(8)9.1.3(4).	or 6.95 lc 25.94 ne 32.38 ac 10.16 di 15.63 wo 0.46 mt 1.86 il 2.28 ap 0.34	Etinde Volcano, Kamerun.	M. Dittrich.	E. Esch, Sb. Pr. Ak., 1901, p. 299.	Leucitite.	Fresh? In W. T., p. 307.
4	II.9.1.3″.	an 2.78 lc 24.42 ne 32.94 kp 9.48 ol 8.73 cs 12.04 mt 4.64 il 3.65 ap 0.34	Niragongo, Lake Kivu District, German East Africa.	Klüss.	L. Finckh, D. Zent. Afr. Exp., I (1), p. 25, 1912.	Leucite nephelinite.	

SUBRANG 4. DOSODIC. URTOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″II.9.1.4″.	lc 19.62 ne 61.63 ac 12.01 di 2.23 wo 1.86 cs 1.03 mt 0.23	Lujavr Urt, Umptek, Kola, Finland.	W. Petersson.	W. Ramsay, G. F. F., XVIII, p. 462, 1896.	Urtite.	In W. T., p. 307.
2	(I)II.″9.1.4(5).	or 5.56 lc 11.34 ne 69.86 ac 6.93 di 1.79 wo 2.90 mt 0.93	Lujavr Urt, Umptek, Kola Finland.	A. Zilliacus.	W. Ramsay, G. F. F., XVIII, p. 462, 1896.	Urtite.	In W. T., p. 307.
3	″II.9.1.4(5).	lc 16.13 ne 65.60 ac 10.16 ns 3.17 di 2.57 ol 0.64 cs 0.95	Lujavr Urt, Umptek, Kola, Finland.	N. Sahlbom.	W. Ramsay, G. F. F., XVIII, p. 462, 1896.	Urtite.	In W. T., p. 307.
4	II.9.1.4(5).	lc 13.95 ne 59.36 ac 10.16 ns 0.98 ol 5.78 cs 6.88 il 1.06 ap 1.68	Iivaara, Kuusamo, Finland.	A. Zilliacus.	V. Hackmann, B. C. G. Finl., No. 11, p. 17, 1900.	Ijolite.	In W. T., p. 307.

CLASS III. SALFEMANE. (C. I. P. W., 1902.)

RANG 1. PERALKALIC. ROCKALLASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	73.60	4.70	13.10	n. d.	0.11	0.37	6.96	trace	n. d.			trace	0.93	NiO 0.06	99.83	2.93
A3. III	1.227	.046	(.067)	(.030)	.003	.007	.113	—				—	.013			
2	69.80	5.10	13.23	0.78	0.11	0.72	8.04	0.22	0.46	0.31	0.34	0.07	0.12	CO_2 none ZrO_2 1.17 SO_3 none Cl none S none BaO none Ce_2O_3 0.37	100.84	
A1. I	1.163	.050	.083	.011	.003	.013	.130	.002			.004	—	.002			

CLASS III. SALFEMANE.

RANG 1. PERALKALIC. CUCULLASE. (H. S. WASHINGTON, 1917.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	67.35	8.21	10.81	3.63	0.09	0.11	7.25	3.35	n. d.						100.80	
B3. IV	1.123	.080	.068	.050	.002	.002	.117	.036								

RANG 1. PERALKALIC. CUCULLASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	63.88	7.29	14.80	3.46	0.29	0.40	9.32	1.29	n. d.						100.73	
B3. IV	1.065	.071	.093	.048	.007	.007	.150	.014								
2	64.04	8.43	5.69	3.79	4.71	0.40	6.67	1.58	3.76			trace	trace		99.07	
B3. IV	1.067	.083	.036	.053	.118	.007	.108	.017				—	—		(100.07)	

RANG 1. PERALKALIC. CUCULLASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	68.29	8.71	11.60	trace	0.40	0.51	10.63	0.67	n. d.						100.81	
B3. IV	1.138	.085	.073	—	.010	.009	.171	.007								

RANG 2. DOMALKALIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	51.17	12.52	3.66	4.84	6.21	6.55	3.56	2.25	2.00	0.11	2.27	3.92	0.60		99.76	2.88
A2. II	.853	.123	.023	.067	.155	.117	.057	.024			.028	.027	.009			

RANG 3. ALKALICALCIC. VAALASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	55.71	14.85	2.88	6.12	11.78	2.52	1.84	2.45	0.52		1.20	0.38	0.29		100.50	
A2. II	.929	.146	.018	.085	.295	.045	.030	.027			.015	.003	.004			
2	50.02	12.80	4.76	8.60	4.09	8.66	1.88	1.78	1.69	2.16	3.31	0.48			100.23	
A2. II	.834	.125	.030	.119	.102	.155	.030	.019			.041	.003				
3	59.90	11.55	0.87	4.59	7.15	10.60	1.78	2.86	0.37		0.57				100.24	
A3. III	.998	.113	.005	.064	.179	.189	.029	.031			.007					

ORDER 3. QUARFELIC. ATLANTARE. (C. I. P. W., 1902.)

SUBRANG 5 PERSODIC. ROCKALLOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(II)III.(2)3.1.5. *1.1.1.5.4.*	Q 37.80 ac 30.95 ab 24.10 di 1.70 hy 5.08	Rockall Island, northwest of Ireland.	C. J. S. Makins.	J. W. Judd, Tr. R. Ir. Ac., XXXI (II), p. 54, 1897.	Rockallite.	MnO high? In W. T., p. 311.
2	"III.3.1.5. *1.1.1.5.5.*	Q 30.18 ac 37.88 or 1.12 di 2.64 ab 25.15 mt 0.23 Z 1.83 il 0.61 ap 0.17	Rockall Island, northwest of Ireland.	H. S. Washington.	H. S. Washington, Q. J. G. S., LXX, p. 297, 1914.	Rockallite.	Part of same specimen as No. **1.**

ORDER 4. QUARDOFELIC. VAALARE. (C. I. P. W., 1902.)

SUBRANG 3. SODIPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(II)III.4.1.3. *1.1.1.5.5.*	Q 18.72 ac 31.42 or 20.02 ns 0.61 ab 23.06 di 0.49 hy 6.54	Cocavera, Capo alla Cuculla, Corsica.	J. Deprat.	J. Deprat, B. Sv. Ct. G. Fr., XVII, No. 114, p. 43, 1906.	Riebeckite granite.	

SUBRANG 4. DOSODIC. CUCULLOSE. (H. S. WASHINGTON, 1917.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.4.1.4.⊙ *1.1.1.5.5.*	Q 12.30 ac 42.97 or 7.78 di 1.70 ab 29.87 hy 6.14	Capo alla Cuculla, Corsica.	J. Deprat.	J. Deprat, B. Sv. Ct. G. Fr., XVII, No. 114, p. 45, 1906.	Riebeckite syenite.	
2	(II)III.4.1.4. *1.1.1.3.*	Q 14.46 ac 16.63 or 9.45 ns 0.73 ab 34.58 di 1.57 hy 18.03	Lumbwa, Uganda.	M. Goldschlag.	M. Goldschlag, N. J. Cb., 1912, p. 588.	Pantellerite.	

SUBRANG 5. PERSODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(II)III.4.1.5″. *1.1.1.5.5.*	Q 17.82 ac 33.73 or 3.89 ns 2.44 ab 40.87 di 1.94 hy 0.10	Capo alla Cuculla, Corsica.	J. Deprat.	J. Deprat, B. Sv. Ct. G. Fr., XVII, No. 114, p. 46, 1906.	Aegirite granite.	

SUBRANG 4. DOSODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(II)III.4(5).2. 4. *3.1.1.2.*	Q 7.98 hy 18.80 or 13.34 mt 5.34 ab 29.87 il 4.26 an 7.51 ap 9.07 C 1.53	Muottals da Pontresina, Bernina District, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Lamprophyre.	

SUBRANG 3. SODIPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.4.(2)3.3. *2.1.1.2.*	Q 9.96 hy 36.89 or 15.01 mt 4.18 ab 15.72 il 2.28 an 9.73 ap 1.01 C 5.51	Usmi, Hyvinge, Finland.	N. Sahlbom.	V. Hackmann, B. C. G. Fin., No. 15, p. 55, 1905.	Quartz gabbro.	
2	(II)III 4″.3(4).3(4). *2.1.2.3.*	Q 10.14 di 15.60 or 10.56 hy 8.93 ab 15.72 mt 6.96 an 21.13 il 6.23 ap 1.01	Analmainty, Sakalave District, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVII, p. 20, 1913.	Labradorite (basalt).	
3	"III.4″.3.3. *1.1.2.2.*	Q 9.90 di 30.37 or 17.24 hy 10.17 ab 15.20 mt 1.16 an 14.73 il 1.06	Tatarca River, Jenisei District, Siberia.	(?)	A. Meister, Reg. Aurif. Sib., IX, p. 152, 1910.	Pyroxene monzonite.	

CLASS III. SALFEMANE—Continued.

RANG 3. ALKALICALCIC. VAALASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	50.99	12.40	2.10	11.80	4.09	6.46	2.38	2.19	1.21	0.12	4.66	1.86	0.11	CO_2 trace S trace	100.37	
A2. II	.850	.122	.013	.164	.102	.115	.039	.023			.058	.013	.002			
2	50.85	12.54	10.03	7.11	5.57	9.33	2.37	1.13	0.34			0.76		SO_3 0.05	100.08	
A3. III	.848	.123	.062	.099	.139	.166	.039	.012				.005				
3	57.06	8.50	1.11	5.40	11.19	12.04	1.39	0.95	1.25	0.18	0.52	0.05	0.13	CO_2 none ZrO_2 none S none BaO trace SrO none	99.77	
A2. II	.951	.083	.007	.075	.280	.216	.023	.010			.007	—	.002			
4	55.87	13.52	2.70	5.89	6.51	8.87	2.42	1.72	1.56	0.09	0.56	0.25	0.10	BaO 0.02 SrO none Li_2O trace	100.08	
A2. II	.931	.132	.017	.082	.163	.159	.039	.018			.007	.002	.001			
5	50.57	11.70	12.36	5.89	3.98	7.89	3.70	0.82	1.44		1.02				99.37	2.913
B3. IV	.843	.115	.077	.082	.100	.141	.060	.009			.013					
6	52.47	11.75	6.13	6.92	4.33	7.55	2.85	2.31	2.15	0.14	2.39	0.26	0.19	CO_2 0.22 ZrO_2 0.12 SO_3 0.08 BaO 0.06 SrO 0.03	99.95	
A1. I	.875	.115	.038	.096	.108	.135	.046	.024			.030	.002	.003			
7	59.90	8.49	2.04	4.60	12.07	8.58	2.36	0.76	0.35	0.17	0.25	0.31		CO_2 0.45 SO_3 0.10	100.42	
A2. II	.998	.083	.013	.064	.302	.154	.038	.008			.003	.002				
8	50.47	12.41	8.78	3.89	5.73	10.19	2.57	1.19	1.09		1.51	1.31			99.14	2.909
B2. III	.841	.122	.055	.054	.143	.182	.041	.013			.019	.009				
9	53.39	12.18	6.18	6.70	6.17	6.80	2.70	1.76	2.09		1.39	0.25		CO_2 0.28 SO_3 0.24	100.13	
A2. II	.890	.119	.039	.093	.154	.121	.044	.019			.017	.002				
10	50.69	12.40	10.19	7.60	5.58	6.90	2.32	1.28	2.16		0.60				99.72	
A3. III	.845	.122	.064	.106	.140	.123	.037	.014			.008					
11	53.88	13.43	2.67	6.53	6.53	7.57	3.08	1.09	2.47		2.18	0.75	0.06		100.24	
A2. II	.898	.132	.017	.090	.163	.135	.050	.012			.027	.005	—			
12	52.05	13.61	5.22	6.54	5.23	9.57	2.54	1.28	1.83	0.16	1.77	0.33			100.13	
A2. II	.868	.133	.033	.091	.131	.171	.041	.014			.022	.002				
13	52.7	11.4	9.0	3.7	7.4	11.6	2.3	0.7	1.4						100.2	
B3. IV	.878	.112	.056	.051	.185	.207	.037	.007								
14	52.67	10.62	10.43	4.21	7.04	11.70	2.19	0.65	0.38						99.89	
A3. III	.878	.104	.065	.058	.176	.209	.035	.007								

RANG 3. ALKALICALCIC. VAALASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	52.22	10.66	9.39	5.15	6.64	11.27	2.34	0.51	1.98						100.16	
A3. III	.870	.104	.059	.072	.166	.201	.038	.005								

ORDER 4. QUARDOFELIC. VAALARE—Continued.

SUBRANG 4. DOSODIC. VAALOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″III.4(5).3.(3)4. 2.1.2.3.	Q 8.94 or 12.79 ab 20.44 an 16.68 di 2.78 hy 21.35 mt 3.02 il 8.82 ap 4.37	Rose's mill, Nelson County, Virginia.	W. M. Thornton.	Watson and Taber, Va. G. S. B. III A, p. 95, 1913.	Gabbro.	
2	III.4″.3″.4. 2.1.2.3.	Q 8.70 or 6.67 ab 20.44 an 20.02 di 17.14 hy 10.57 mt 14.38 ap 1.68	Rockland Ridge, Columbia River, Washington.	E. A. Schneider.	E. A. Schneider, A. J. S., XXXVI, p. 237, 1888.	Augite andesite.	In W. T., p. 311.
3	III(IV).4.3(4).4″. 1.1.2.2.	Q 8.04 or 5.56 ab 12.05 an 13.90 di 36.85 hy 19.77 mt 1.62 il 1.06	Evans Creek, Riddles quadrangle, Oregon.	G. Steiger.	G. F. Kay, U. S. G. S. B. 419, p. 167, 1910.	Granodiorite?	
4	(II)III.4(5).3″.4″. 2.1.2.2.	Q 8.46 or 10.01 ab 20.44 an 20.85 di 17.27 hy 15.62 mt 3.94 il 1.06 ap 0.67	Near Emigrant Gap, Placer County, California.	W. F. Hillebrand.	W. Lindgren, U. S. G. S. B. 148, p. 212, 1897.	Gabbro.	In W. T., p. 311.
5	″III.4 (5). (2)3. 4 (5). 3.1.2.3.	Q 8.52 or 5.00 ab 31.44 an 12.79 di 20.52 hy 0.50 mt 16.01 il 1.98 hm 1.28	Rio de Janeiro, Brazil.	T. L. Bailey.	E. O. Hovey, T. M. P. M., XIII, p. 216, 1892.	Diabase.	In W. T., p. 311
6	III(IV).4(5). (2)3.″4. 2.1.2.3.	Q 8.58 or 13.34 ab 24.10 an 12.51 di 18.51 hy 6.02 mt 8.82 il 4.56 ap 0.67	Gansen, Holmestrand, Norway.	H. S. Washington.	Made for W. C. Brögger. (Unpublished.)	Essexitic lava.	
7	III.4.3.4″. 1.1.2.2.	Q 11.88 or 4.45 ab 19.91 an 10.29 di 24.14 hy 23.83 mt 3.02 il 0.46 ap 0.67	Mühltal, Odenwald, Germany.	G. Butzbach.	G. Klemm, Nb. Ver. Erdk. (4), XXVII, p. 15, 1906.	Gabbro.	Border of No. 78, III.5.3.4.
8	″III.4″.3.4. 2.1.2.2.	Q 9.24 or 7.23 ab 21.48 an 18.90 di 18.14 hy 5.90 mt 8.12 il 2.89 hm 3.20 ap 3.02	Kalte Büche, Roth, Rhöngebirge.	P. Schmidt.	P. Schmidt, N. J., 1905, II, p. 213.	Dolerite.	
9	(II)III.4″.3.4. 2.1.2.3.	Q 9.06 or 10.56 ab 23.06 an 15.57 di 12.88 hy 14.13 mt 9.05 il 2.58 ap 0.67	Bielstein, Brocken, Harz.	Pufahl.	O. H. Erdmannsdoerfer, Jb. Pr. G. L.-A., XXVII, p. 359, 1906.	Biotite gabbro.	
10	″III.4″.3″.4. 3.1.2.3.	Q 10.26 or 7.78 ab 19.39 an 19.74 di 11.55 hy 12.97 mt 14.85 il 1.22	Petris, Comität Arad, Hungary.	K. Emszt.	P. Rozlozsnik, F. K., XXXV, p. 517, 1905.	Diabase.	Three decimals.
11	(II)III.4(5).3.4. 2.1.2.2.	Q 7.74 or 6.67 ab 26.20 an 19.46 di 9.53 hy 18.25 mt 3.94 il 4.10 ap 1.68	Monte Olivetto, n. Teolo, Euganean Hills, Italy.	M. Stark.	M. Stark, T. M. P. M., XXV, p. 331, 1906.	Dolerite.	
12	(II)III.4(5).3″.4. 2.1.2.3.	Q 7.74 or 7.78 ab 21.48 an 21.68 di 18.96 hy 8.68 mt 7.66 il 3.34 ap 0.67	Andranomilevina, Sakalave District, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVII, p. 20, 1913.	Labradorite (basalt).	
13	III.4″.3(4).4″. 2.1.2.2.	Q 9.24 or 3.89 ab 19.35 an 18.90 di 30.02 hy 4.60 mt 11.83 hm 0.80	Oudedrift, n. Beaufort West, Cape Colony.	Wappler (student).	E. Cohen, N. J. B. B., V, p. 233, 1887.	Olivine diabase.	In W. T., p. 311.
14	III.4.3(4).4″. 2.1.3.2.	Q 10.74 or 3.89 ab 18.34 an 17.24 di 31.75 hy 2.90 mt 13.46 hm 1.12	Nels Poort, n. Beaufort West, Cape Colony.	Holdermann (student).	E. Cohen, N. J. B. B., V, p. 233, 1887.	Olivine diabase.	In W. T., p. 311.

SUBRANG 5. PERSODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.4.3″.(4)5. 2.1.3.2.	Q 10.26 or 2.78 ab 19.91 an 16.96 di 30.59 hy 3.96 mt 13.69	Colesburg, Cape Colony.	A. Bernthsen.	E. Cohen, N. J. B. B., V, p. 245, 1887.	Diabase porphyrite.	In W. T., p. 311.

CLASS III. SALFEMANE—Continued.

RANG 4. DOCALCIC. KOGHASE. (H. S. WASHINGTON, 1917.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	52.40	13.55	2.73	9.79	5.53	10.01	2.32	0.40	1.05	0.62	1.08	0.12	0.26	FeS_2 0.13 NiO trace BaO trace SrO none Li_2O none	99.99	
A2. II	.873	.133	.017	.137	.138	.178	.037	.004			.014	.001	.004			
2	56.18	14.76	2.12	6.98	8.11	7.97	1.62	0.80	1.37			0.08	0.17		100.16	
A3. III	.936	.145	.013	.097	.203	.143	.026	.009				——	.002			
3	42.10	12.06	1.10	8.43	5.62	8.63	1.97	1.12	3.80	0.20	10.15	3.77	0.63	CO_2 none S none	99.58	
A2. II	.702	.118	.007	.117	.141	.154	.032	.012			.127	.027	.009			
4	52.94	14.22	2.08	8.11	6.99	10.92	1.40	0.49	1.56	0.12	0.73	0.08	0.35		99.99	2.980
A2. II	.882	.140	.013	.113	.175	.195	.023	.005			.009	——	.005			
5	51.92	14.13	2.97	6.92	8.22	11.53	1.38	0.47	1.07	0.10	0.83	0.04	0.14	CO_2 0.06	99.78	3.000
A2. II	.865	.138	.019	.096	.206	.205	.023	.005			.010	——	.002			
6	52.58	15.58	2.07	6.68	5.75	10.37	1.79	0.82	3.13	0.22	0.89	0.09	0.15	CO_2 0.22 S none BaO 0.03 SrO trace	100.37	
A2. II	.876	.153	.013	.093	.144	.186	.029	.009			.011	——	.002			
7	54.21	13.25	4.26	10.00	5.03	8.99	1.79	0.74	none		1.49	0.01	0.21	CO_2 0.04 S trace CoO trace CuO trace PbO none	100.02	
A2. II	.904	.130	.027	.139	.126	.161	.029	.008			.019	——	.003			
8	52.16	14.72	4.11	7.18	9.44	8.44	1.49	0.32	1.06		0.42	0.06	0.48	CO_2 none FeS_2 0.29	100.17	
A2. II	.869	.144	.025	.100	.236	.150	.024	.003			.005	——	.007			
9	51.68	13.52	4.87	9.71	5.19	8.84	2.14	0.12	0.50		1.20	0.17	0.66	CO_2 0.04 ZrO_2 trace SO_3 0.06 FeS_2 0.80 CoO 0.55 BaO none Cu 0.01 Pb 0.02	100.08	
A1. I	.861	.133	.030	.136	.130	.158	.034	.001			.015	.001	.009			
10	56.03	12.51	0.45	15.73	6.08	4.17	2.01	0.73	0.70		0.74		.019		99.34	
A2. II	.934	.122	.003	.218	.152	.075	.032	.008			.009		.003			
11	52.85	14.76	5.75	4.13	8.87	10.06	1.12	0.25	1.07		0.56	0.24			99.66	
A2. II	.881	.145	.036	.057	.222	.180	.018	.003			.007	.002				
12	50.19	15.34	7.43	4.65	6.69	11.32	1.82	0.63	0.34		2.24	0.14	trace		100.79	
A2. II	.837	.150	.046	.065	.167	.202	.029	.007			.028	.001				
13	51.97	15.16	1.94	12.50	4.74	9.36	1.30	0.40	0.53		1.55	0.16	0.06		99.67	
A2. II	.866	.148	.012	.174	.119	.167	.021	.004			.019	.001	001			
14	51.94	15.36	3.11	9.81	4.93	10.54	0.77	0.49	0.43		1.53	0.85	0.21		100.01	
A2. II	.866	.150	.019	.136	.123	.188	.012	.005			.019	.006	.003			
15	52.38	14.06	6.86	4.82	8.02	7.12	1.78	1.26	0.62	0.52	1.95	0.36	0.04	SO_3 none Cl trace NiO trace Li_2O none	99.79	2.920
A2. II	.873	.138	.043	.067	.201	.127	.029	.014			.024	.003	——			

ORDER 4. QUARDOFELIC. VAALARE—Continued.

SUBRANG 4-5. PRESODIC. KOGHOSE. (A. LACROIX, 1911.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.4(5).4.(4)5. *2.1.2.3.*	Q 6.96 di 19.08 or 2.22 hy 18.34 ab 19.39 mt 3.94 an 25.58 il 2.13	Pine Hill, South Britain, Connecticut.	W. F. Hillebrand.	W. H. Hobbs, U. S. G. S. A. R. 17, III, p. 60, 1901.	Olivine basalt.	In W. T., p. 329.
2	"III.4.4.4. *1.1.1.2.*	Q 11.88 di 9.49 or 5.00 hy 27.04 ab 13.62 mt 3.02 an 28.08	Rock Creek Tunnel, Washington, District of Columbia.	L. G. Eakins.	G. H. Williams, U. S. G. S. B. 148, p. 85, 1897.	Hornblende diorite.	In W. T., p. 311.
3	III.4".(3)4.4. *3.1.2.3.*	Q 8.94 hy 14.10 or 6.67 il 19.30 ab 16.77 hm 1.12 an 20.57 ap 9.07	Near James River Gap. Virginia.	W. M. Thornton.	T. L. Watson, pers. com.	Gabbro.	
4	III.4(5).4.4". *1.1.1.3.*	Q 8.16 di 18.86 or 2.78 hy 20.94 ab 12.05 mt 3.02 an 31.14 il 1.37	Moyie Sill, Purcell Mountains, British Columbia.	M. Dittrich.	R. A. Daly, Rosenb. Fests., p. 218, 1906.	Gabbro.	Also in Can. G. S. Mem. 38 (1), p. 234, 1912.
5	III.4(5).4.4". *1.1.2.2.*	Q 6.42 di 21.29 or 2.78 hy 19.44 ab 12.05 mt 4.41 an 30.58 il 1.52	Moyie Sill, Purcell Mountains, British Columbia.	M. Dittrich.	R. A. Daly, A. J. S., XX, p. 193, 1905.	Hornblende gabbro.	Also in Can. G. S. Mem. 38 (1), p. 224, 1912.
6	(II)III.4(5).4.4. *2.1.2.3.*	Q 7.86 di 16.08 or 5.00 hy 15.94 ab 15.20 mt 3.02 an 31.97 il 1.67	Riddles quadrangle, Oregon.	G. Steiger.	G. F. Kay, U. S. G. S. B. 419, p. 167, 1910.	Basaltic greenstone.	
7	(II)III.4.4.4. *2.1.1.3.*	Q 14.46 di 7.58 or 4.45 hy 21.52 ab 15.20 mt 6.26 an 25.85 il 2.89	Demerara River, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Brit. Gui., p. 95, 1908.	Quartz diabase.	Average sample. Incorrect in W. T., p. 439.
8	III.4(5).4.(4)5. *2.1.1.2.*	Q 7.62 di 7.39 or 1.67 hy 30.21 ab 12.58 mt 5.80 an 32.53 il 0.77	Upper Barama River, British Guiana.	J. B. Harrison.	J. B. Harrison. R. G. N. W. Dist., Pt. II, p. 9, 1898.	Diorite.	In W. T., p. 333.
9	III.4".4.5. *2.1.2.3.*	Q 10.08 di 13.11 or 0.56 hy 19.70 ab 17.82 mt 6.96 an 27.24 il 2.28 ap 0.34	Mazaruni District, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Brit. Gui., p. 95, 1908.	Diabase.	In W. T., p. 311.
10	III.4.(3)4.4. *1.1.1.3.*	Q 10.98 hy 42.79 or 4.45 mt 0.70 ab 16.77 il 1.37 an 20.85 C 0.71	Burnt Hill, King Charles Land, Spitzbergen.	N. Sahlbom.	A. Hamberg, G. F. F., XXI, p. 523, 1899.	Hypersthene andesite.	In W. T., p. 421.
11	(II)III.4.4.(5).4.(5). *2.1.2.2.*	Q 13.32 di 10.68 or 1.67 hy 19.05 ab 9.43 mt 8.35 an 34.47 il 1.06 ap 0.67	Godinyesd, Comität Hunyad, Hungary.	K. Emszt.	P. Rozlozsnik, F. K., XXXV, p. 530, 1905.	Olivine basalt.	Three decimals.
12	"III.4(5).4.4. *2.1.2.2.*	Q 8.46 di 18.36 or 3.89 hy 8.20 ab 15.20 mt 8.58 an 31.69 il 4.26 hm 1.44 ap 0.34	Maraho Volcano, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 129, 1909.	Olivine basalt.	
13	"III.4".4".4". *2.1.2.3.*	Q 10.02 di 9.56 or 2.22 hy 25.97 ab 11.00 mt 2.78 an 34.19 il 2.89 ap 0.34	Mihara Volcano, Oshima, Seven Izu Islands, Japan.	Takayanagi.	S. Kozu, pers. com.	Andesitic basalt.	
14	(II)III.4.(4)5.4. *2.1.2.3.*	Q 14.34 di 8.07 or 2.78 hy 21.62 ab 6.29 mt 4.41 an 36.97 il 2.89 ap 2.02	Mihara Volcano, Oshima, Seven Izu Islands, Japan.	Takayanagi.	S. Kozu, pers. com.	Andesitic basalt.	Eruption of 1912.
15	(II)III.4.4."4. *2.1.2.2.*	Q 12.48 di 4.75 or 7.78 hy 17.90 ab 14.67 mt 9.98 an 26.41 il 3.65 ap 1.01	Jim Jim, Macedon, Victoria.	A. G. Hall.	Skeats and Summers, G. S. Vict. B. 24, p. 35, 1912.	Andesite-basalt.	

CLASS III. SALFEMANE—Continued.

RANG 4. DOCALCIC. KOGHASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
16	52.00	10.72	2.50	11.61	3.63	16.02	0.78	0.37	0.18	0.14	1.40	0.11	0.25	CO_2 0.05 ZrO_2 none Cl trace F none S trace Cr_2O_3 trace V_2O_3 0.05 NiO none BaO 0.01 SrO none	99.82	3.144
A1 I	.867	.105	.016	.161	.091	.286	.013	.004			.018	.001	.004			
17	44.17	10.57	9.20	10.92	4.56	9.12	1.94	0.16	2.28	0.16	4.99	0.40	0.51	CO_2 0.35 ZrO_2 none Cr_2O_3 none V_2O_3 0.19 BaO 0.01	99.79	3.27
A1. I	.736	.104	.058	.151	.114	.163	.031	.002			.062	.003	.007			
18	53.60	13.25	2.32	7.48	5.15	9.30	1.87	1.09	1.47	0.76	3.53	0.15	0.15	CO_2 none SO_3 0.24	100.36	
A2. II	.893	.130	.014	.104	.129	.166	.030	.012			.044	.001	.002			
19	56.63	9.70	1.44	7.66	11.52	9.22	1.42	0.15	0.87		0.37	0.03	0.30		99.31	
B2. III	.944	.095	.009	.107	.288	.164	.023	.002			.005	—	.004			

RANG 5. PERCALCIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	57.29	12.07	0.89	5.70	4.02	17.77	0.39	trace	0.31	0.37	0.70	0.04	0.58		100.13	
A2. II	.955	.118	.006	.079	.101	.318	.006	—			.009	—	.008			
2	50.00	13.91	3.92	5.63	6.97	14.62	0.48	0.65	0.38	0.12	1.82	(0.71)	0.32	FeS_2 0.03	99.56	3.05
A2. II	.833	.136	.024	.078	.174	.261	.008	.007			.023		.005			

CLASS III. SALFEMANE.

RANG 1. PERALKALIC. ORENDASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	54.17	10.16	3.34	0.65	6.62	4.19	1.21	11.91	1.01	0.52	2.67	1.59	0.06	CO_2 0.49 ZrO_2 0.22 SO_3 0.16 Cl 0.06 F 0.36 Cr_2O_3 0.05 NiO trace BaO 0.59 SrO 0.18 Li_2O trace	100.21	2.699
A1. I	.903	.100	.021	.009	.166	.075	.019	.127			.033	.011	.001			
2	54.08	9.49	3.19	1.03	6.74	3.55	1.39	11.76	2.71	0.79	2.08	1.35	0.05	SO_3 0.29 Cl 0.04 F 0.49 Cr_2O_3 0.07 BaO 0.67 SrO 0.20 Li_2O trace	99.97	2.686
A1. I	.901	.093	.020	.014	.169	.064	.022	.125			.026	.010	—			
3	51.07	9.93	2.72	1.19	10.31	4.87	0.82	9.92	2.19	2.04	2.13	1.53	0.04	CO_2 none SO_3 0.33 BaO 0.57	99.66	
A2. II	.851	.097	017	.017	.258	.088	.013	.105			.027	.011	—			
4	50.78	9.05	2.96	3.64	14.29	5.29	1.05	7.39	2.53		1.28	1.31	0.09	CO_2 0.46	100.15	
A2. II	.846	.089	.019	.050	.357	.095	.017	.079			.016	.009	.001			

ORDER 4. QUARDOFELIC. VAALARE—Continued.

SUBRANG 4-5 PRESODIC KOGHOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
16	III.4.4″.4. *1.1.3.4.*	Q 10.32 di 45.80 or 2.22 hy 3.21 ab 6.81 mt 3.71 an 24.46 il 2.74 ap 0.34	Broken Hill, New South Wales.	Not stated.	A. R. Dep. Min. N. S. W. (1909), p. 198, 1910.	Pyroxenite.	
17	III.4.″4.5. *3.1.2.3.*	Q 9.72 di 18.38 or 1.11 hy 7.54 ab 16.24 mt 13.46 an 19.74 il 9.42 ap 1.01	Marifana Mine, Kalgoorlic, West Australia.	H. Bowley.	E. S. Simpson, W. Aust. G. S. B. 42 (1), p. 132, 1912.	"Basic pegmatite" (hornblendite).	
18	(II)III.4.″4.4. *2.1.2.3.*	Q 12.06 di 16.84 or 6.67 hy 11.10 ab 16.77 mt 3.25 an 24.46 il 6.69 ap 0.34	Kirwans Hill, Reefton District, New Zealand.	Not stated.	P. G. Morgan, pers. com.	Diabase.	
19	III″.4.4.″5. *1.1.2.2.*	Q 10.50 di 21.07 or 1.11 hy 31.44 ab 12.05 mt 2.09 an 19.46 il 0.76	Mount Koghi, New Caledonia.	Boiteau.	A. Lacroix, C. R., CLII, p. 820, 1911.	Quartz diorite.	

SUBRANG. NOT NEEDED.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.(3)4.5.0.	Q 18.96 di 39.67 or —— wo 3.83 ab 3.14 mt 1.39 an 31.14 il 1.37	Hiriart Hill, Pala, San Diego County, California.	W. T. Shaller.	W. T. Schaller, U. S. G. S. rec. lab.	Quartz-augite rock.	Igneous?.
2	III.4″.5.0.	Q 9.06 di 31.01 or 3.89 hy 7.38 ab 4.19 mt 5.57 an 33.64 il 3.50 ap 0.71	Zeia River, Amur District, Siberia.	P. Todakis.	E. Ahnert, Reg. Aurif. Sib., X, Table VII, 1910.	Gabbro.	"P_2O_5"= $Ca_3P_2O_8$.

ORDER 5. PERFELIC. GALLARE. (C. I. P. W., 1902.)

SUBRANG 1. PERPOTASSIC. ORENDOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″III.5.1.1. *2.1.2.1.*	or 55.60 ac 8.78 ks 4.16 di 4.54 hy 14.50 il 1.52 hm 0.32 tn 2.55 pf 1.56 ap 3.70	North Table Butte, Leucite Hills, Wyoming.	W. F. Hillebrand.	W. Cross, A. J. S., IV, p. 130, 1897.	Orendite.	In W. T., p. 313.
2	III.5.1.1.⊙ *2.1.2.1.*	Q 1.32 ac 9.24 or 51.71 ns 0.24 ks 4.93 di 5.62 hy 14.30 il 2.13 tn 2.35 ap 3.36	15-mile Spring, Leucite Hills, Wyoming.	W. F. Hillebrand.	W. Cross, A. J. S., IV, p. 130, 1897.	Orendite.	In W. T., p. 313.
3	″III.5.1.1. *2.3.2.1.*	or 53.93 ac 6.01 ks 1.23 di 9.72 hy 2.50 ol 13.16 il 2.58 hm 2.72 pf 1.36 ap 3.70	Hallock Butte, Leucite Hills, Wyoming.	C. Palmer.	W. Cross, U. S. G. S. B. 512, p. 11, 1912.	Orendite.	
4	III.5.1.1(2). *1.3.2.1.*	or 43.92 ac 3.23 ab 4.72 di 14.17 ne 0.28 ol 22.56 mt 2.78 il 2.43 ap 3.02	Jumilla, Murcia, Spain.	M. Dittrich.	A. Osann, Rosenb. Fests., p. 290, 1906.	Jumillite.	

CLASS III. SALFEMANE—Continued.

RANG 1. PERALKALIC. ORENDASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	57.13	10.28	1.90	4.11	9.73	3.37	2.56	6.07	2.55		1.60	0.82	0.09	CO_2 0.07	100.28	
A2. II	.952	.101	.012	.057	.243	.061	.041	.065			.020	.006	.001			
2	48.81	8.17	3.46	3.22	14.84	7.06	1.71	5.73	3.46		1.34	1.39	trace	CO_2 0.81 BaO 0.25 SrO 0.09	100.34	
A2. II	.814	.080	.022	.044	.371	.126	.027	.061			.017	.010				
3	48.45	11.80	9.15	0.96	4.00	5.59	4.18	7.05	3.02		1.96	3.76	0.20	SO_3 0.20 Cl trace	100.32	2.759
A2. II	.808	.116	.058	.014	.100	.100	.068	.075			.025	.026	.003			
4	55.56	10.70	2.00	5.19	4.56	8.42	1.45	7.48	1.45	1.42	0.81		0.61		99.65	2.67
A2. II	.926	.105	.013	.072	.114	.150	.023	.080			.010		.009			

RANG 1. PERALKALIC. ORENDASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	50.00	9.87	3.46	5.01	11.92	8.31	2.41	5.02	1.16	0.17	0.73	0.81	trace	CO_2 0.31 SO_3 0.02 Cl 0.08 F 0.16 Cr_2O_3 0.11 NiO 0.07 BaO 0.32 SrO 0.07 Li_2O trace	100.01	
A1. I	.833	.096	.022	.069	.298	.148	.039	.053			.009	.006	—			

RANG 1. PERALKALIC. ORENDASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	49.57	9.61	5.59	4.59	1.28	13.91	4.90	3.23	0.38		0.65	5.98	0.57	CO_2 none	100.26	
A2. II	.826	.094	.035	.064	.032	.248	.079	.034			.008	.042	.008			
2	60.09	11.02	6.10	4.45	2.45	5.62	7.12	2.53	0.48				0.45		100.31	
A3. III	1.002	.108	.038	.062	.061	.100	.115	.027					.006		(100.48)	
3	49.20	9.23	7.73	3.24	1.35	11.55	6.20	1.96	2.20		7.13	0.06			99.85	
A2. II	.820	.090	.048	.045	.034	.206	.100	.021			.089	—				

RANG 1. PERALKALIC. ORENDASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	32.83	9.24	35.77	14.84	0.47	0.55	4.92	0.86	0.35		0.62	trace	0.05	S 0.03	100.53	
A2. II	.547	.091	.224	.206	.012	.010	.088	.009			.008	—	—			

RANG 2. DOMALKALIC. KILAUASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	52.26	10.63	2.47	5.45	9.32	5.62	1.60	5.99	1.97	0.98	1.92	0.98	0.12	CO_2 0.75 ZrO_2 0.08	100.14	
A2. II	.871	.104	.015	.076	.233	.100	.026	.064			.024	.007	.002			
2	50.86	11.14	2.93	5.21	11.26	6.97	1.73	5.85	0.95	0.64	0.84	0.79	0.13	CO_2 none ZrO_2 0.02 S 0.02 Cr_2O_3 0.11 V_2O_3 none NiO 0.04 BaO 0.31 SrO 0.22	100.02	
A1. I	.848	.109	.018	.072	.282	.125	.027	.063			.011	.006	.002			

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 2. DOPOTASSIC. FORTUNOSE. (H. S. WASHINGTON, 1917.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″III.5.1.2(3). *1.1.2.2.*	Q 0.66 ac 2.31 or 36.14 di 9.02 ab 18.86 hy 24.13 mt 1.62 il 3.04 ap 2.02	Fortuna, Murcia, Spain.	M. Dittrich.	A. Osann, Rosenb. Fests., p. 277, 1906.	Fortunite (verite?).	Verite. Rosen. Fests., p. 307, 1906.
2	III.5.1.2.⊙ *1.3.2.2.*	or 33.92 ac 3.70 ab 6.29 di 20.19 ne 1.99 ol 20.69 mt 3.25 il 2.58 ap 3.36	Jumilla, Murcia, Spain.	M. Dittrich.	A. Osann, Rosenb. Fests., p. 290, 1906.	Jumillite.	Not fresh.
3	(II)III.5″.1.2(3). *2.2.3.2.*	or 41.70 ac 12.47 ab 14.41 di 1.08 ne 3.83 ol 6.65 il 2.58 hm 4.96 pf 1.09 ap 8.74	Michelsberg, Katzenbuckel, Odenwald, Germany.	O. N. Heidenreich.	W. Freudenberg, Mt. Bad. G. L.-A., V (1), p. 315, 1907.	Tinguaite.	
4	″III.5.1.2. *1.1.3.3.*	or 44.48 di 33.54 ab 11.53 ol 1.97 an 0.56 mt 3.02 ne 0.28 il 1.52	Studencho, n. Eule, Bohemia.	J. Friedrichsen.	V. Rosicky, Sb. Böhm. Ges. W., 1901, XXX, p. 29.	Augite minette.	MnO high?

SUBRANG 3. SODIPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.5(6).1.″3. *2.2.2.2.*	or 29.47 di 27.33 ab 9.96 ol 15.61 an 1.11 mt 5.10 ne 5.68 il 1.37 ap 2.02	Beaver Creek, Bearpaw Mountains, Montana.	H. N. Stokes.	Weed and Pirsson, A. J. S., I, p. 360, 1896.	Shonkinite.	In W. T., p. 339.

SUBRANG 4. DOSODIC. PIENAROSE. (H. A. BROUWER, 1910.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.5.1.(3)4. *2.1.4.4.*	or 18.90 ac 8.78 ab 31.44 di 18.82 wo 3.25 mt 3.71 il 1.22 ap 14.11	Ahvenvaara, Kuuosamo, Finland.	N. Sahlbom.	V. Hackmann, B. C. G. Fin., No. 11, p. 36, 1900.	Pyroxene- apatite syenite.	In W. T., p. 313.
2	(II)III.5.1.4. *1.1.3.3.*	Q 1.68 ac 12.47 or 15.01 di 23.14 ab 42.44 hy 2.09 mt 2.55	Mount Firsowaya, Ilmen Mountains, Russia.	J. Morozewicz.	A. Karpinsky, Ref. N. J., 1903, II, p. 369.	Augite syenite.	
3	III.5″.1.4. *1.1.4.4.3.*	or 11.68 ac 14.32 ab 30.92 di 7.34 ne 2.84 wo 14.85 il 6.84 hm 2.72 pf 5.98	Leeuwfontein, n. Pretoria, Transvaal.	F. Pisani.	H. A. Brouwer, Trans. Nephsy., p. 50, 1910.	Pienarite (aegirite phonolite).	

SUBRANG 5. PERSODIC. GELLIVAROSE. (H. S. WASHINGTON, 1917.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.5.1.″5. *5.1.1.0.*	or 5.00 ac 2.77 ab 39.30 ol 0.84 ne 1.99 mt 45.94 il 1.22 hm 3.20	Kapten, Gellivare, Sweden.	G. Nyblom.	A. G. Högbom, G. F. F., XXXII, p. 569, 1910.	Magnetite syenite porphyry.	

SUBRANG 2. DOPOTASSIC. PROWERSOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.5.(1)2.2. *2.2.2.2.*	or 35.58 di 13.90 ab 13.62 hy 15.17 an 3.89 ol 4.77 mt 3.48 il 3.65 ap 2.35	Burkettville, Knox County, Maine.	G. Steiger.	E. S. Bastin, J. G., XIV, p. 179, 1906.	Syenite porphyry.	Not fresh.
2	III.5.″2.2. *2.3.2.2.*	or 35.03 di 19.82 ab 10.48 ol 17.64 an 5.28 mt 4.18 ne 1.99 il 1.67 ap 2.02	Wildcat Gulch, Uncompahgre quadrangle, Colorado.	G. Steiger.	E. S. Larsen, U. S. G. S. rec. lab.	Shonkinite.	

CLASS III. SALFEMANE—Continued.

RANG 2. DOMALKALIC. KILAUASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
3	50.41	12.30	5.71	3.06	8.69	7.08	0.97	7.53	1.80	0.46	1.47	0.46	0.15	ZrO_2 none Cl trace S none NiO 0.04 BaO 0.23 SrO 0.06 Li_2O trace	100.42	2.88
A1. I	.840	.120	.036	.043	.217	.127	.016	.080			.018	.003	.002			
4	56.72	11.05	2.53	3.59	9.91	2.90	1.43	6.62	2.76		1.37	0.95	trace	BaO 0.09	99.92	
A2. II	.945	.109	.016	.050	.248	.052	.023	.070			.017	.007	——			
5	43.37	9.96	9.64	8.78	5.62	9.23	0.97	4.76	1.24	0.07	4.69	1.82			100.15	3.13
A2. II	.723	.098	.060	.122	.141	.164	.016	.051			.059	.013				

RANG 2. DOMALKALIC. KILAUASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	47.32	11.22	2.91	5.81	15.96	7.11	1.88	3.79	1.71	0.31	0.75	0.61	0.11	CO_2 0.13 Cr_2O_3 trace NiO trace BaO 0.22 SrO 0.05 Li_2O trace	99.89	
A1. I	.789	.110	.018	.080	.399	.127	.030	.040			.009	.004	002			
2	53.32	14.16	2.15	5.08	7.90	7.12	2.39	4.80	1.24	0.26	0.90	0.66	0.10	BaO 0.12 SrO 0.05	100.25	2.831
A2. II	.889	.138	.014	.071	.198	.127	.039	.051			.023	.005	.001			
3	48.84	13.83	2.92	12.24	2.18	6.05	3.20	3.59	1.01	0.22	4.39	0.73	0.22	S 0.15 BaO 0.01	99.58	
A2. II	.814	.136	.018	.170	.055	.108	.052	.038			.055	.005	.003			
4	51.22	12.28	6.08	4.86	9.62	6.78	2.54	3.26	2.60		0.54	0.37			100.15	2.818
A2. II	.854	.120	.038	.068	.241	.121	.041	.035			.007	.003				
5	51.13	12.79	4.34	5.09	3.60	12.39	2.58	5.12	0.74		0.97	1.26	0.21		100.22	
A2. II	.852	.125	.027	.071	.090	.221	.042	.054			.012	.009	.003			
6	51.98	11.37	1.47	6.46	8.84	8.24	2.63	4.07	2.31	0.09	1.52	0.68			99.76	
A2. II	.866	.111	.009	.090	.221	.147	.042	.043			.019	.005				
7	50.32	14.51	3.84	5.32	6.97	7.70	3.84	3.60	2.01		1.51	0.26			99.88	2.85
A2. II	.839	.142	.024	.074	.174	.138	.062	.038			.019	.002				
8	49.25	9.26	2.07	6.91	13.84	7.48	2.65	3.22	2.36	0.37	1.32	1.38			100.11	2.92
A2. II	.821	.091	.013	.096	.346	.134	.043	.034			.017	.010				
9	49.05	12.88	2.04	6.87	8.20	6.96	3.42	3.81	1.93	0.32	3.75	0.65			99.88	
A2. II	.818	.126	.013	.095	.205	.124	.055	.040			.047	.005				
10	48.05	13.42	3.54	7.68	6.41	9.05	3.06	3.85	1.55		2.96	0.58		SO_3 0.12	100.27	2.874
A2. II	.801	.132	.022	.107	.160	.162	.049	.041			.037	.004				

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 2. DOPOTASSIC. PROWERSOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
3	″III.5.2.″2. *2.2.2.2.*	or 44.48 di 20.09 ab 4.19 ol 8.82 an 6.67 mt 6.26 ne 2.27 il 2.74 hm 1.44 ap 1.01	Two Buttes, Prowers County, Colorado.	W. F. Hillebrand.	W. Cross, J. G., XIV, p. 168, 1906.	Syenitic lamprophyre.	In W. T., p. **313.**
4	(II)III.″5.(1)2.2. *2.1.1.2.*	Q 4.62 di 2.84 or 38.92 hy 25.71 ab 12.05 mt 3.71 an 4.45 il 2.58 ap 2.35	Fortuna, Murcia, Spain.	M. Dittrich.	A. Osann, Rosenb. Fests., p. 277, 1906.	Fortunite (trachyte).	
5	III.5.2″.2. *3.1.2.3.*	Q 1.50 di 19.50 or 28.36 hy 5.43 ab 8.38 mt 13.92 an 8.62 il 8.97 ap 4.37	Voralp, Aarmassif, Switzerland.	O. Fischer.	O. Fischer, T. M. P. M., XXIV, p. 77, 1905.	Hornblende minette.	

SUBRANG 3. SODIPOTASSIC. LAMAROSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.5″.2(3).3. *1.4.2.2.*	or 22.24 di 16.27 ab 9.43 ol 28.07 an 11.12 mt 4.18 ne 3.41 il 1.37 ap 1.34	Sunlight Valley, Yellowstone National Park.	H. N. Stokes.	Hague and Jaggar, U. S. G. S. B. 168, p. 97, 1900.	Leucite absarokite.	In W. T., p. **313.**
2	(II)III.5.2(3).″3. *2.2.2.2.*	or 28.36 di 13.68 ab 20.44 hy 9.12 an 13.34 ol 6.30 mt 3.25 il 3.50 ap 1.68	Pend d'Oreille River, Nelson Range, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38 (1), p. 307, 1912.	Augite minette.	
3	(II)III.5.2″.3″. *2.2.2.4.*	or 21.13 di 10.62 ab 27.25 hy 8.94 an 12.79 ol 3.29 mt 4.18 il 8.36 ap 1.68	Norrsand, N. Ulfön, Nordingra, Sweden.	N. Sahlbom.	J. E. Sobral, G. Nord. Reg., p. 116, 1913.	Kentallenite.	
4	III.5.2(3).3. *2.1.2.2.*	or 19.46 di 14.66 ab 21.48 hy 16.55 an 12.23 ol 2.20 mt 8.82 il 1.06 ap 1.01	Niederthalheim, n. Aachen, Rheinland.	A. Lindner.	E. Dathe, Jb. Pr. G. L.-A., XIX, p. CXXIX, 1899.	Vogesite.	Not in W. T.
5	III.5″.2.3. *2.1.3.3.*	or 30.02 di 28.12 ab 13.10 wo 4.29 an 8.06 mt 6.26 ne 4.83 il 1.82 ap 3.02	Forcella, Canzacoli, n. Predazzo, Tyrol.	Dittrich and Pohl.	J. Romberg, Anh. Abh. Pr. Ak., 1904, p. 36.	Shonkinite.	
6	III.5.2.3.⊙ *1.2.2.2.*	or 23.91 di 23.85 ab 22.01 hy 1.70 an 6.39 ol 12.35 mt 2.09 il 2.89 ap 1.68	Piz Posta Bialla, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Hornblende syenite.	
7	(II)III.5(6).2.3(4). *2.2.2.2.*	or 21.13 di 19.64 ab 22.01 ol 9.70 an 11.68 mt 5.57 ne 5.68 il 2.89 ap 0.67	Posta Bialla Glacier, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Syenite.	
8	III.5.(1)2.3. *1.3.2.2.*	or 18.90 di 19.24 ab 21.74 ol 24.41 an 3.89 mt 3.02 ne 0.43 il 2.58 ap 3.36	Gliemsastockli, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Basic syenite.	
9	″III.5.2.3″. *2.3.2.2.*	or 22.24 di 16.77 ab 22.53 ol 12.25 an 8.62 mt 3.02 ne 3.41 il 7.14 ap 1.68	Monte Boes, n. Pozzo Maggiore, Sardinia.	H. S. Washington.	H. S. Washington, C. R. Cong. G. Int., XII, p. 231, 1914.	Basalt.	
10	III.5(6).2″.3. *2.2.2.3.*	or 22.80 di 23.91 ab 14.15 ol 7.91 an 11.68 mt 5.10 ne 6.25 il 5.62 ap 1.34	Muhawura, Lake Kivu District, German Central Africa.	Klüss.	L. Finckh, D. Zent. Afr. Exp., I (1), p. 18, 1912.	Leucite basanite.	

CLASS III. SALFEMANE—Continued.

RANG 2. DOMALKALIC. KILAUSE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
11	48.75	13.50	11.21	4.83	3.73	9.51	2.96	3.34	0.33		0.88	0.48		BaO 0.48	100.00	2.78
A2. II	.813	.132	.070	.067	.093	.170	.048	.035			.011	.003				
12	47.02	12.52	4.81	5.83	9.92	8.38	3.23	3.23	0.70	0.69	2.60	1.23	0.12	CO_2 trace SO_3 none Cl trace Li_2O trace	100.28	2.888
A2. II	.784	.123	.030	.081	.248	.150	.052	.034			.033	.008	.002			

RANG 2. DOMALKALIC. KILAUASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	46.52	10.48	4.40	7.79	10.58	9.49	3.12	1.55	1.79		2.98	0.83	0.11	CO_2 trace X 0.73 Li_2O trace	100.37	2.99
A2. II	.775	.103	.028	.108	.265	.169	.050	.016			.037	.006	.002			
2	48.16	12.85	2.79	7.11	10.45	8.13	3.18	2.79	1.47	0.45	1.50	0.70	0.14	ZrO_2 trace S trace Cr_2O_3 0.07 NiO 0.04 BaO 0.25 SrO 0.15 Cu trace	100.23	
A1 I	.803	.126	.018	.099	.261	.145	.052	.030			.019	.005	.002			
3	52.85	13.25	2.36	8.71	6.84	8.47	4.72	1.53	0.93		0.35	0.40			100.41	2.93
A2. II	.881	.130	.015	.121	.171	.151	.076	.016			.004	.003				
4	53.29	8.81	4.68	6.66	9.07	8.99	3.21	1.87	1.51	0.17	1.41	trace		CO_2 none	99.67	
A2. II	.886	.086	.029	.093	.227	.161	.052	.020			.018	——				
5	47.87	13.25	2.86	12.90	2.83	7.60	4.80	2.21	1.00	0.36	1.51	1.96	0.32	CO_2 none Cl 0.21 S 0.10	100.48	
A2. II	.798	.130	.018	.179	.071	.136	.077	.023			.019	.014	.005			
6	49.17	12.22	3.10	13.31	5.01	6.42	4.07	1.09	2.25	0.60	2.33	0.25	0.39	CO_2 0.16	100.37	2.96
A2. II	.820	.120	.019	.185	.125	.114	.066	.012			.029	.002	.005			
7	47.95	13.14	12.23	3.44	6.16	8.59	4.10	1.80	0.40	0.23	0.43	0.99		SO_3 0.46	99.92	
A2. II	.799	.129	.077	.048	.154	.154	.066	.020			.005	.007				
8	45.80	10.13	3.93	6.95	12.48	9.52	2.60	1.90	2.71		2.09	1.84			99.95	
A2. II	.763	.099	.024	.097	.312	.170	.042	.020			.026	.013				
9	51.21	7.98	8.85	6.54	7.13	9.92	2.77	1.31	0.93	0.19	1.51		1.58		99.92	2.877
A?2. II	.854	.078	.055	.090	.178	.177	.045	.014			.019		.023			
10	46.03	12.01	4.37	6.85	5.22	11.71	3.27	2.24	2.69		3.23	2.51	0.26	CO_2 trace Cl trace	100.39	2.852
A2. II	.767	.118	.028	.095	.131	.209	.053	.023			.040	.018	.004			
11	43.35	11.46	11.98	2.26	11.69	7.76	3.88	0.99	2.41	0.59	2.43	1.54			100.34	2.974
A2. II	.723	.112	.075	.031	.292	.138	.063	.011			.030	.011				
12	46.18	14.26	6.93	5.72	7.23	8.24	4.75	1.32	2.14		2.27	0.51			99.55	
A2. II	.770	.140	.043	.079	.181	.147	.077	.014			.028	.004				

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 3. SODIPOTASSIC. LAMAROSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
11	(II)III.5.2(3).3″ *3.1.3.3.*	Q 0.78, or 19.46, ab 25.15, an 13.62; di 20.09, wo 2.09, mt 12.99, il 1.67, hm 2.24, ap 1.01	Sorimandi Volcano, Sumbawa Island, Dutch East Indies.	A. Lindner.	G. Rack, N. J. B. B., XXXIV, p. 71, 1912.	Leucite tephrite.	Norm and mode?
12	III.5″.2.3(4). *2.3.2.2.*	or 18.90, ab 18.34, an 10.29, ne 4.83; di 18.57, ol 12.98, mt 6.96, il 5.28, ap 2.69	Woodend, Macedon, Victoria.	A. G. Hall.	Skeats and Summers, Vict. G. S. B. 24, p. 31, 1912.	Woodendite (orthoclase basalt).	

SUBRANG 4. DOSODIC. KILAUOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.5.2(3).4. *2.2.2.2.*	or 8.90, ab 24.63, an 10.29, ne 0.85; di 24.73, ol 14.06, mt 6.50, il 5.62, ap 2.02	Volcano Butte, Castle Mountains, Montana.	L. V. Pirsson.	Weed and Pirsson, U. S. G. S. B. 139, p. 130, 1896.	Basalt.	In W. T., p. 315.
2	III.5(6).2(3).(3)4. *2.3.2.3.*	or 16.68, ab 18.34, an 12.23, ne 4.83; di 18.92, ol 18.23, mt 4.18, il 2.89, ap 1.68	Pilot Knob, Routt County, Colorado.	W. F. Hillebrand.	H. S. Gale, U. S. G. S. B. 419, p. 118, 1910.	Olivine basalt.	
3	″III.5.2.4″. *1.2.2.3.*	or 8.90, ab 35.12, an 10.56, ne 2.56; di 23.47, ol 13.95, mt 3.48, il 0.61, ap 1.01	Cerro San Miguel, Atlixco, Puebla, Mexico.	A. Hoppe.	Felix and Lenk, Btr. G. Mex., II, p. 215, 1899.	Basalt.	In W. T., p. 315.
4	III″.5.″2.4. *2.1.2.2.*	Q 0.36, or 11.12, ab 27.25, an 3.89; di 32.55, hy 13.27, mt 6.73, il 2.74	Garabal Hill, n. Loch Lomond, Scotland.	Not stated.	Wyllie and Scott, G. Mag. (V), X, p. 540, 1913.	Hornblendite.	
5	(II)III.5″.2.4. *2.3.2.4.*	or 12.79, ab 31.96, an 10.29, ne 4.54; di 12.35, ol 15.20, mt 4.18, il 2.89, ap 4.70	Korsberget, N. Ulfön, Nordingra, Sweden.	N. Sahlbom.	J. E. Sobral, G. Nord. Reg., p. 108, 1913.	Kentallenite.	
6	III.5.2(3).4″. *2.2.2.3.*	or 6.67, ab 34.58, an 11.68; di 15.16, hy 8.68, ol 11.10, mt 4.41, il 4.41, ap 0.67	Hartenrod, n. Herborn, Hesse-Nassau.	F. Heineck.	F. Heineck, N. J. B. B., XVII, p. 99, 1903.	Diabase.	
7	″III.5.2″.4. *3.2.2.2.*	or 11.12, ab 33.01, an 11.95, ne 0.85; di 19.01, ol 4.62, mt 9.98, il 0.76, hm 5.44, ap 2.35	Birkenauer Thal, Hesse.	Surv. lab.	G. Klemm, Erl. G. Kt. Hes., Bl. Birkenau, p. 26, 1905.	Diorite.	
8	III.5.2(3).″4. *2.2.2.2.*	or 11.12, ab 22.01, an 10.29; di 11.02, hy 13.04, ol 13.61, mt 5.57, il 3.95, ap 4.37	Burg, n. Grossenritter, Hesse-Nassau.	M. Dittrich.	R. Bernges, N. J. B. B., XXXI, p. 632, 1911.	Basalt.	
9	III″.(4)5.2.4. *2.1.2.2.*	Q 4.86, or 8.34, ab 23.58, an 5.28; di 35.06, hy 6.22, mt 12.76, il 2.09	Zampachn, n. Eule, Bohemia.	J. Friedrichsen.	V. Rosicky, Sb. Böhm. Ges. W., 1901, XXX, p. 29.	Schlieren in granite.	MnO high.
10	III.5.2(3).4. *2.2.3.3.*	or 12.79, ab 25.68, an 11.68, ne 1.14; di 23.75, ol 4.20, mt 6.50, il 6.08, ap 6.05	Rabenstein, n. Pohorschau, Bohemia.	R. Hönig-schmidt.	Hibsch and Seeman, T. M. P. M., XXXII, p. 85, 1913.	Tephrite.	
11	III.5.2″.4(5). *2.3.2.1.*	or 6.12, ab 28.30, an 10.56, ne 2.56; di 13.61, ol 16.03, mt 0.23, il 4.56, hm 11.84, ap 3.70	Hutberg, n. Tetschen, Bohemia.	R. Pfohl.	J. E. Hibsch, T. M. P. M., XIV, p. 110, 1894.	Augitite.	In W. T., p. 343.
12	III.5(6).2(3).4″. *2.2.2.2.*	or 7.78, ab 27.77, an 13.90, ne 6.82; di 18.27, ol 7.48, mt 9.98, il 4.26, ap 1.34	Mencshely, Balaton Lake, Hungary.	K. Emszt.	J. Vitális, Erf. Bal. Sees, I, (1), No. 2, p. 87, 1911.	Limburgite.	

CLASS III. SALFEMANE—Continued.

RANG 2. DOMALKALIC. KILAUASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
13	54.53	13.06	6.85	4.86	3.14	9.83	4.62	1.59	0.52		0.96				99.96	2.687
A3. III	.909	.128	.043	.068	.078	.176	.074	.018			.012				(99.44)	
14	53.09	10.87	8.03	3.87	8.85	9.63	3.23	1.57	1.13						100.27	
A3. III	.885	.106	.050	.054	.221	.171	.051	.017								
15	49.45	13.97	8.10	11.17	1.90	5.92	5.05	1.75	1.19		trace	0.16	0.85		99.51	2.74
B2. III	.824	.137	.051	.156	.048	.105	.082	.019			——	.001	.012			
16	47.63	15.02	8.15	10.40	3.50	6.87	4.92	1.80	0.30		0.12	0.08	0.80		99.59	2.76
B2. III	.794	.147	.051	.144	.088	.123	.079	.019			.002	——	.011			
17	45.81	11.90	4.62	8.09	5.39	10.67	4.28	1.40	0.53	0.47	4.05	2.20	0.17	CO_2 none ZrO_2 none SO_2 none S 0.03 Cr_2O_3 none BaO 0.04 SrO trace Li_2O none	99.65	
A1. I	.764	.117	.029	.112	.135	.190	.069	.015			.051	.015	.002			

RANG 2. DOMALKALIC. KILAUASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	56.45	13.81	1.73	3.95	8.67	6.69	5.03	0.46	2.02	0.67	0.31	0.02	trace	CO_2 none S trace Cr_2O_3 trace BaO trace SrO 0.02	99.83	
A2. II	.941	.135	.011	.055	.217	.120	.081	.005			.004	——	——			
2	50.76	14.57	4.11	10.59	2.86	7.64	5.54	1.04	0.94	(0.18)	1.60	0.06	0.09	S 0.06	99.76	
A2. II	.846	.143	.026	.147	.072	.137	.089	.011			.020	——	.001			
3	51.83	8.13	5.58	6.91	8.86	12.54	3.63	0.71	2.82						101.01	
B3. IV	.864	.080	.035	.096	.222	.224	.058	.009								
4	47.55	11.35	9.26	2.34	6.06	12.90	4.35	0.67	2.70		1.91	1.15			100.24	
A2. II	.793	.111	.058	.032	.152	.230	.070	.007			.024	.008				

RANG 3. ALKALICALCIC. CAMPTONASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	49.71	13.30	4.41	3.37	7.96	8.03	1.49	4.81	4.07		1.57	0.66	0.17	Cr_2O_3 trace BaO 0.46	100.01	
A2. II	.829	.130	.027	.048	.199	.143	.024	.051			.020	.005	.002			
2	48.36	12.42	5.25	2.48	9.36	8.65	1.46	3.97	5.54		1.18	0.84	0.13	Cr_2O_3 trace BaO 0.29	99.93	
A2. II	.806	.122	.033	.035	.234	.154	.023	.042			.015	.006	.002			
3	42.31	11.40	4.07	6.11	11.31	11.02	0.82	3.69	2.72	2.28	2.00	1.44	0.11	CO_2 trace Cr_2O_3 0.05 BaO 0.64 SrO 0.16	100.13	2.817
A1. I	.705	.112	.025	.085	.283	.196	.013	.039			.025	.010	.002			
4	55.58	12.41	0.59	6.70	10.93	7.95	1.01	2.96	0.64		0.56	trace	0.50	CO_2 none ZrO_2 none Cl 0.09 CoO none S none BaO 0.16 Cu none Pb none	100.08	
A1. I	.926	.122	.004	.093	.273	.142	.016	.032			.007	——	.007			

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 4. DOSODIC. KILAUOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
13	(II)III.5.2.4. *2.1.2.3.*	Q 3.24 di 20.08 or 10.01 wo 5.68 ab 38.78 mt 9.98 an 10.01 il 1.82	Mount Kouragio, Aegina, Greece.	A. Röhrig.	H. S. Washington, J. G., III, p. 150, 1895.	Pyroxene andesite.	In W. T., p. 315.
14	III.5.2(3).4. *2.1.2.2.*	Q 2.58 di 28.79 or 9.45 hy 9.26 ab 26.72 mt 11.60 an 10.56	Richmond, Cape Colony.	Kinnicut and Birney.	E. Cohen, N. J. B. B., V, p. 234, 1887.	Diabase.	In W. T., p. 315.
15	(II)III.5.2.4. *2.3.2.4.*	or 10.56 di 14.80 ab 39.03 ol 9.65 an 10.01 mt 11.60 ne 2.13 ap 0.67	Crater Wall, Kilauea, Hawaii, Hawaiian Islands.	O. Silvestri.	O. Silvestri, B. C. G. It., XIX, p. 178, 1888.	Basalt.	MnO high, TiO_2 low. In W. T., p. 315.
16	(II)III.5(6).2.4. *2.2.2.4.*	or 10.56 di 17.48 ab 28.56 ol 10.03 an 13.34 mt 11.83 ne 6.96 il 0.30	Crater Wall, Kilauea, Hawaii, Hawaiian Islands.	O. Silvestri.	O. Silvestri, B. C. G. It., XIX, p. 181, 1888.	Basalt.	MnO high, TiO_2 low. In W. T., p. 315.
17	III.5″.2.4″. *2.2.3.3.*	or 8.34 di 23.81 ab 29.34 ol 4.72 an 9.17 mt 6.72 ne 3.69 il 7.75 ap 5.04	Waimea Canyon, Kauai, Hawaiian Islands.	W. T. Schaller.	W. Cross, U. S. G. S. P. P. 88, p. 15, 1915.	Kauaiite (gabbro).	

SUBRANG 5. PERSODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(II)III.5.2(3).5. *1.1.2.2.*	or 2.78 di 15.69 ab 42.44 hy 19.53 an 13.62 mt 2.55 il 0.61	Brush Creek, Port Orford quadrangle, Oregon.	H. N. Stokes.	J. S. Diller, U. S. G. S. Fol. 89, p. 4, 1903.	Gabbro.	
2	(II)III.5″.2.(4)5. *2.2.2.4.*	or 6.12 di 22.06 ab 37.73 ol 7.10 an 11.05 mt 6.03 ne 4.26 il 3.04	Pahtosvaara, Kiruna District, Finland.	G. Nyblom.	H. Lundbohm, G. F. F., XXXII, p. 787, 1910.	Soda greenstone.	
3	III(IV).5.2.(4)5. *2.1.3.2.*	or 4.45 di 46.80 ab 28.30 ol 5.62 an 3.89 mt 8.12 ne 1.14	Malinka Sosnowka, Koswinsky, N. Ural Mountains, Russia.	L. Duparc.	Duparc and Pearce, Oural Nord, I, p. 189, 1902.	Diabase.	
4	III.5″.2.″5. *2.1.3.2.*	or 3.89 di 32.83 ab 29.08 wo 1.97 an 9.45 mt 1.86 ne 4.12 il 3.65 hm 8.00 ap 2.69	Pou-tche-ho, East Yunnan, China.	Pisani.	J. Deprat, Mem. Sv. G. Indoch., I (1), 1, p. 230, 1912.	Diabase.	

SUBRANG 2. DOPOTASSIC. ABSAROKOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″III.5.″3.2″. *2.1.2.2.*	or 28.36 di 16.01 ab 12.58 hy 11.46 an 15.29 ol 0.98 mt 6.26 il 3.04 ap 1.68	Cache Creek, Yellowstone National Park.	L. G. Eakins.	J. P. Iddings, J. G., III, p. 938, 1895.	Absarokite.	Not fresh. Also in U. S. G. S. Mon. 32 (II), p. 329, 1899. In W. T., p. 315.
2	III.5.3.2(3). *2.1.2.2.*	or 23.35 di 17.06 ab 12.05 hy 13.30 an 15.85 ol 1.54 mt 5.10 il 2.28 hm 1.76 ap 2.02	Clarks Fork River, Yellowstone National Park.	L. G. Eakins.	J. P. Iddings, J G., III, p. 938, 1895.	Absarokite.	Not fresh. Also in U. S. G. S. Mon. 32, (II), p. 329, 1899. In W. T., p. 315.
3	III.5″.3.2. *2.3.2.2.*	or 21.68 di 23.49 ab 0.52 ol 15.71 an 16.68 mt 5.80 ne 3.41 il 3.80 ap 3.36	Rossland, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38 (II), p. 368, 1912.	Missourite.	
4	III.″5.3(4).2″. *1.1.2.2.*	Q 3.60 di 15.23 or 17.79 hy 31.70 ab 8.38 mt 0.93 an 20.57 il 1.06	Pigeon Island, Essequibo River, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Brit. Gui., p. 77, 1908.	Syenite.	

CLASS III. SALFEMANE—Continned.

RANG 3. ALKALICALCIC. CAMPTONASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	50.82	11.44	0.25	8.94	14.01	8.14	1.79	3.45	0.58		0.59	0.20	0.19	Cr_2O_3 0.03 NiO trace BaO 0.06	100.49	
A2. II	.847	.112	.002	.124	.350	.145	.029	.037			.007	.001	.003			
2	51.76	12.36	4.88	4.60	9.57	7.14	1.99	3.83	3.05		0.47	0.56	0.11		100.32	
A2. II	.863	.121	.030	.064	.239	.127	.032	.040			.006	.004	.002			
3	51.68	14.07	4.71	4.57	7.72	6.65	2.45	4.16	2.09		1.08	0.72	trace	SO_3 0.13 Li_2O trace	100.03	
A2. II	.861	.138	.029	.064	.193	.119	.040	.045			.013	.005	—			
4	50.59	11.53	1.83	7.64	11.27	8.79	2.27	2.33	1.76	0.21	0.80	0.48	0.17	SO_3 none Cl trace NiO 0.06 BaO 0.10 SrO 0.03	99.86	
A1. I	.843	.112	.011	.106	.282	.157	.037	.025			.010	.003	.002			
5	48.95	12.98	3.63	4.68	11.73	7.66	2.31	3.96	3.16		0.49	0.67	0.13		100.35	
A2. II	.816	.127	.023	.065	.293	.137	.037	.042			.006	.005	.002			
6	42.95	12.44	10.16	5.18	5.82	13.11	2.10	2.29	1.98	0.91	1.34	1.37	0.29	SO_3 0.15 Cl 0.07 S none BaO none	100.16	
A1. I	.716	.122	.064	.072	.146	.234	.034	.024			.017	.010	.004			
7	43.49	12.76	5.92	5.18	9.23	10.54	2.40	2.53	3.05	1.86	2.10	0.75	0.10	CO_2 0.25 S 0.11 BaO 0.13 SrO 0.12	100.52	
A1. I	.725	.125	.037	.072	.231	.188	.039	.027			.026	.005	.001			
8	54.09	15.02	4.12	5.15	7.28	7.72	1.99	3.55	1.49						100.37	
B3. IV	.902	.147	.025	.072	.182	.137	.032	.038								
9	52.09	11.93	1.84	7.11	12.48	7.84	2.04	3.01	0.35		0.73	0.34	0.15	CO_2 0.16 Cr_2O_3 0.10 NiO 0.07	100.24	
A2. II	.868	.117	.012	.099	.312	.140	.033	.032			.009	.002	.002			
10	55.57	14.37	1.66	7.08	8.27	4.94	29.0	2.96	1.58		1.00	0.31	0.20		99.84	
A2. II	.926	.141	.010	.099	.207	.088	.047	.032			.002	.002	.003			
11	47.39	13.39	3.25	5.12	12.34	9.73	1.86	2.56	3.01		0.75	0.24	0.15	CO_2 0.22	100.01	
A2. II	.790	.131	.020	.071	.309	.173	.030	.028			.009	.002	.002			
12	54.50	13.67	0.63	11.44	3.25	6.41	2.97	3.07	0.13	0.15	2.18	0.46	0.21	Cl 0.12M S 0.25	99.60	
A2. II	.908	.134	.004	.159	.081	.114	.048	.033			.027	.003	.003			
13	43.79	14.65	11.78	7.65	2.99	10.16	2.53	2.65	0.88		1.49	0.79	0.42	SO_3 0.05 Cl 0.03 CuO trace	99.86	
A2. II	.730	.144	.074	.107	.075	.181	.040	.029			.019	.006	.006			
14	45.26	15.70	2.44	6.16	8.28	11.95	1.73	3.42	1.12	0.29	1.66	0.90	0.34	ZrO_2 0.01 Cl 0.25 F 0.08 S 0.05 Cr_2O_3 none BaO 0.10 SrO 0.06	99.80	
A1. I	.754	.154	.015	.086	.207	.214	.027	.036			.021	.006	.005			

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 3. SODIPOTASSIC. KENTALLENOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.5.″3.3. *1.3.2.2.*	or 20.57 di 21.51 ab 12.58 ol 29.05 an 12.79 mt 0.46 ne 1.42 il 1.06 ap 0.34	Bet. South Boulder and Antelope creeks, Montana.	L. G. Eakins.	G. P. Merrill, Pr. U. S. Nat. Mus., XVII, p. 670, 1895.	Lamprophyre.	In W. T., p. 317.
2	III.5.″3.3. *2.1.2.2.*	or 22.24 di 14.26 ab 16.79 hy 21.14 an 13.62 mt 6.96 il 0.91 ap 1.34	Raven Creek, Yellowstone National Park.	L. G. Eakins.	J. P. Iddings, J. G., III, p. 938, 1895.	Absarokite.	Also in U. S. G. S. Mon. 32, (II), p. 329, 1899. In W. T., p. 315.
3	(II)III.5.(2)3.3. *2.1.2.2.*	or 25.02 di 10.74 ab 20.96 hy 13.22 an 14.73 ol 2.79 mt 6.73 il 1.98 ap 1.68	Two Ocean Pass, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32 (2), p. 329, 1899.	Absarokite.	In W. T., p. 317.
4	III.5.3.3(4). *1.2.2.2.*	or 13.90 di 21.69 ab 19.39 hy 8.74 an 13.90 ol 14.88 mt 2.55 il 1.52 ap 1.01	Indian Creek Laccolith, Yellowstone National Park.	W. F. Hillebrand.	J. P. Iddings, U. S. G. S. Mon. 32 (2), p. 83, 1899.	Andesite-porphyry.	Lower part of sheet. Cf. No. 18. II.5.2.3. In W. T., p. 317.
5	III.5.(2)3.3. *2.3.2.2.*	or 23.35 di 15.81 ab 15.72 ol 19.09 an 13.34 mt 5.34 ne 1.99 il 0.91 ap 1.68	Lamar River, Yellowstone National Park.	L. G. Eakins.	J. P. Iddings, J. G., III, p. 938, 1895.	Absarokite.	Also in U. S. G. S. Mon. 32 (II), p. 329, 1899. In W. T., p. 313.
6	III.5.3.3″. *3.1.3.2.*	or 13.34 di 29.59 ab 14.15 ol 0.63 an 17.70 mt 11.37 ne 1.99 il 2.58 hm 2.40 ap 3.34	Mineral Hill, Sundance quadrangle, Wyoming.	G. Steiger.	W. S. T. Smith, U. S. G. S. Fol. 127, p. 7, 1905.	Augite vogesite.	
7	III.5(6).3.3″. *2.2.2.2.*	or 15.01 di 24.32 ab 9.96 ol 9.22 an 16.40 mt 8.58 ne 5.68 il 3.95 ap 1.68	Near Mica Butte, Apishapa quadrangle, Colorado.	G. Steiger.	W. Cross, U. S. G. S. P. P. 90, p. 25, 1914.	Hornblende vogesite.	Not fresh.
8	(II)III.5.3.3. *2.1.2.2.*	Q 2.34 di 13.28 or 21.13 hy 18.08 ab 16.77 mt 5.80 an 21.41	Beinn an Fhurain, Inchnadampf, Assynt, Scotland.	J. J. H. Teall.	J. J. H. Teall, G. Mag., XXIII, p. 350, 1886.	Diorite porphyry.	In W. T., p. 317.
9	III.5.3.3.⊙ *1.2.2.2.*	or 17.79 di 18.04 ab 17.29 hy 12.04 an 14.46 ol 15.14 mt 2.78 il 1.37 ap 0.67	Allt an Sithein, Glen Shira, Argyll, Scotland.	W. Pollard.	Hill and Kynaston, Q. J. G. S., LVI, p. 537, 1900.	Kentallenite.	In W. T., p. 317.
10	(II)III.5.3.3″. *2.1.1.2.*	Q 1.32 di 4.26 or 17.79 hy 29.20 ab 24.63 mt 2.32 an 17.24 il 1.82 ap 0.67	Vallo, Lower Tornea, Finland.	N. Sahlbom.	V. Hackmann, B. C. G. Fin., No. 15, p. 56, 1905.	Quartz gabbro.	
11	III.5.3.3.⊙ *2.3.2.2.*	or 15.57 di 20.47 ab 13.10 ol 19.22 an 20.29 mt 4.64 ne 1.42 il 1.37 ap 0.67	Reichenau, n. Konigsbrück, Lausitz.	P. J. Beger.	P. J. Beger, Vh. Sächs. Ges. W., LXV, p. 376, 1913.	Kersantite.	
12	(II)III.5.(2)3.3″. *2.1.2.2*	Q 3.12 di 12.01 or 18.35 hy 19.30 ab 25.15 mt 0.93 an 14.73 il 4.10 ap 1.01	Goroschki, Wolhynia, Russia.	W. Tarassenko.	W. Tarassenko, Ref. N. J., 1899, I, p. 463.	Pyroxene syenite.	In W. T., p. 317.
13	III.5.3.3″. *3.1.2.3.*	or 16.12 di 18.96 ab 19.39 ol 0.69 an 20.85 mt 17.17 ne 0.85 il 2.89 ap 2.02	Namlagira, Lake Kivu District, German East Africa.	O. Hauser.	L. Finckh, D. Zent. Afr. Exp., I, (1), p. 19, 1912.	Leucite theralite.	
14	III.5(6).3″.″3. *2.2.2.2.*	or 20.02 di 22.92 ab 2.10 ol 12.22 an 25.30 mt 3.48 ne 6.53 il 3.19 ap 2.02	Gentungen River, Maros District, Celebes.	E. W. Morley.	J. P. Iddings, Ign. Rocks, II, p. 627, 1913.	Biotite kentallenite.	Also in Iddings and Morley, J. G., XXIII, p. 240, 1915.

CLASS III. SALFEMANE—Continued.

RANG 3. ALKALICALCIC. CAMPTONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
15	46.54	15.95	5.24	5.51	4.70	10.69	2.28	4.44	0.52	0.59	1.11	1.18	0.18	ZrO_2 0.01 Cl 0.07 F 0.06 S 0.09 Cr_2O_3 none BaO 0.13 SrO 0.24	99.53	
A1. I	.776	.156	.033	.076	.118	.191	.037	.047			.014	.008	.003			
16	51.68	14.77	1.26	10.70	4.67	8.37	2.61	2.52	0.13	0.01	2.91	0.26	0.33	SO_3 none Cl 0.12 Li_2O none	100.34	
A2. II	.861	.145	.008	.149	.117	.150	.042	.027			.036	.002	.005			
17	43.58	11.46	3.40	9.13	10.80	9.88	2.18	2.13	2.40	0.47	3.32	0.95	trace	SO_3 none Cl trace Li_2O none	99.70	2.978
A2. II	.726	.112	.021	.126	.270	.177	.035	.022			.042	.007	—			
18	43.06	13.06	4.68	8.10	9.92	9.30	2.14	2.14	2.53	0.76	3.60	0.96	0.43	CO_2 trace SO_3 none Cl trace Li_2O none	100.68	2.935
A2. II	.718	.128	.029	.113	.248	.166	.034	.023			.045	.007	.006			
19	47.20	11.78	1.94	9.04	9.95	11.63	1.61	1.67	1.24	0.28	4.31	trace	0.26	CO_2 0.17 NiO 0.03 BaO none SrO none	101.11	
B2. III	.787	.116	.012	.125	.249	.207	.026	.018			.054		.004			
RANG 3. ALKALICALCIC. CAMPTONASE.																
1	46.61	15.34	8.40	8.14	5.27	9.27	3.04	1.41	1.41		0.55		0.39		99.83	
A2. II	.777	.150	.052	.113	.132	.166	.049	.015			.007		.006			
2	51.41	14.13	3.48	9.25	5.54	6.40	3.43	1.80	1.98	0.12	1.20	0.06	0.30		99.10	
B2. III	.857	.138	.022	.129	.139	.114	.055	.019			.015	—	.004			
3	50.76	13.90	4.13	10.28	4.73	8.14	2.82	0.85	1.57	0.23	1.50	0.07	0.34	NiO none	99.32	
B2. III	.846	.136	.026	.143	.118	.145	.045	.009			.019	—	.005			
4	50.12	15.70	1.42	6.89	9.50	11.30	2.91	1.07	1.03	0.21	0.55			S 0.14 BaO none	100.84	
A2. II	.835	.154	.009	.096	.235	.202	.047	.012			.007					
5	43.94	16.17	3.96	10.06	5.05	9.59	2.93	1.51	1.42	0.13	4.13	0.69	trace	CO_2 0.09 BaO none	99.67	
A2. II	.732	.159	.025	.140	.126	.171	.047	.016			.052	.005	—			
6	47.12	14.43	3.33	11.71	6.05	9.63	2.58	1.11	0.34	0.28	3.27				99.85	3.072
A2. II	.785	.142	.021	.163	.151	.172	.042	.012			.041					
7	52.37	15.06	2.34	9.82	5.38	7.33	4.04	0.92	2.24		0.21		0.32		100.03	
A2. II	.873	.147	.015	.137	.135	.130	.065	.010			.003		.005			
8	50.57	13.58	3.26	10.09	4.98	7.67	2.92	1.89	0.16	0.94	2.68	0.28	0.36	Cl 0.09 F 0.09 S 0.03 BaO 0.09 SrO 0.10	99.78	
A1. I	.843	.133	.020	.140	.125	.120	.047	.020			.034	.002	.005			
9	46.40	14.17	2.03	13.12	4.94	9.65	3.14	1.12	0.02	0.25	3.03	0.80	0.44	ZrO_2 0.05 Cl 0.15 F 0.04 S 0.14 BaO 0.18 SrO 0.10	99.77	
A1. I	.773	.139	.013	.182	.124	.172	.051	.012			.038	.006	.006			
10	47.16	14.45	1.61	13.81	5.24	8.13	3.09	1.20	0.48	0.12	3.37	0.57	0.24	CO_2 0.35 S 0.14 Cr_2O_3 trace NiO 0.02 BaO trace SrO trace	99.98	
A1. I	.786	.142	.010	.192	.131	.144	.050	.013			.042	.004	.003			

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 3. SODIPOTASSIC. KENTALLENOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
15	(II)III.5(6).3.3. *2.2.2.3.*	or 26.13 di 20.94 ab 7.86 ol 4.29 an 20.02 mt 7.66 ne 6.25 il 2.13 ap 2.69	Gillinan River, n. Masin, Mount Mouriah, Java.	E. W. Morley.	J. P. Iddings, Ign. Rocks, II, p. 622, 1913.	Leucitophyre.	Also in Iddings and Morley, J. G., XXIII, p. 233, 1915.
16	″III.5.3.3(4). *2.1.2.3.*	Q 0.06 di 15.38 or 15.01 hy 18.50 ab 22.01 mt 1.86 an 21.13 il 5.47 ap 0.67	Meredith, Victoria.	Not stated.	A. R. Secy. Mines Vict., (1910), p. 64, 1911.	Tachylite.	
17	III.5″.3.3(4). *2.3.2.2.*	or 12.23 di 21.99 ab 13.10 ol 17.79 an 15.29 mt 4.87 ne 2.84 il 6.38 ap 2.35	Woodend, Macedon, Victoria.	A. G. Hall.	Skeats and Summers, Vict. G. S. B. 24, p. 28, 1912.	Limburgite.	
18	III.5.3.3(4). *2.3.2.2″.*	or 12.79 di 15.90 ab 15.20 ol 16.56 an 19.74 mt 6.73 ne 1.42 il 6.84 ap 2.35	Kings Quarry, Macedon, Victoria.	A. G. Hall.	Skeats and Summers, Vict. G. S. B. 24, p. 28, 1912.	Limburgite.	
19	III.5.3(4).3″. *2.2.2.2.*	or 10.01 di 30.06 ab 13.62 hy 4.16 an 20.02 ol 10.73 mt 2.78 il 8.21	Dingo Creek, Nandewar Mountains, New South Wales.	H. I. Jenson.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXII, p. 904, 1908.	Dolerite.	

SUBRANG 4. DOSODIC. CAMPTONOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″III.5.3″.4. *2.2.2.3.*	or 8.34 di 18.08 ab 25.68 ol 8.96 an 23.91 mt 12.06 il 1.06	Coldbrook Marsh, St. John, New Brunswick.	W. D. Matthew.	W. D. Matthew, Tr. N. Y. Ac. Sci., XIV, p. 214, 1895.	Quartz diabase.	In. W. T., p. 273.
2	″III.5.3.4. *2.1.2.3.*	or 10.56 di 11.44 ab 28.82 hy 20.93 an 17.79 mt 5.10 il 2.28	Wapus Creek, Gowganda District, Ontario.	M. F. Connor.	W. H. Collins, Can. G. S. Mem. 33, p. 76, 1913.	Quartz diabase.	
3	″III.″5.3(4).4″. *2.1.2.3.*	Q 4.44 di 14.54 or 5.00 hy 18.17 ab 23.58 mt 6.03 an 22.80 il 2.89	Rankin Township, Gowganda District, Ontario.	M. F. Connor.	W. H. Collins, Can. G. S. Mem. 33, p. 76, 1913.	Diabase.	
4	III 5 3(4) 4 *1.3.2.2.*	or 6.67 di 23.97 ab 19.91 ol 17.65 an 26.41 mt 2.07 ne 2.56 il 1.06	O'Brien Mine, Cobalt, Ontario.	N. L. Bowen.	N. L. Bowen, J. Can. Ming. Inst., XII (1909), p. 519, 1910.	Diabase.	Also in J. G., XVIII, p. 661, 1910.
5	(II)III.5.3(4).4. *3.3.2.3.*	or 8.90 di 13.14 ab 22.01 ol 10.58 an 26.69 mt 5.80 ne 1.42 il 7.90 ap 1.68	Lockes Hill, Belknap Mountains, New Hampshire	H. S. Washington.	H. S. Washington, A. J. S., XXII, p. 495, 1906.	Essexite (hornblende gabbro).	In W. T., p. 319.
6	III.5.3(4).4. *2.2.2.3.*	or 6.67 di 19.23 ab 22.01 hy 7.46 an 24.46 ol 8.42 mt 4.87 il 6.23	Rockport, Cape Ann, Essex County, Massachusetts.	H. S. Washington.	H. S. Washington, J. G., VII, p. 289, 1899.	Diabase.	In W. T., p. 319.
7	(II)III.5.3.4(5). *1.2.2.3.*	or [illegible].56 di 13.43 ab 34.06 hy 14.42 an 20.02 ol 6.47 mt 3.48 il 0.46	Middlefield, Connecticut.	J. H. Pratt.	H. E. Gregory, U. S. G. S. B. 165, p. 176, 1900.	Diabase.	In W. T., pp. 317, 319.
8	III.5.3.4⊙. *2.1.2.3.*	Q 2.76 di 10.79 or 11.12 hy 19.17 ab 24.63 mt 4.64 an 18.35 il 5.17 ap 0.67	Heath Mountain, Warren County, New York.	E. W. Morley.	W. J. Miller, J. G., XXI, p. 174, 1913.	Diabase.	
9	III.5.3.4.⊙ *2.3.2.3.*	or 6.67 di 17.70 ab 26.72 ol 16.05 an 21.13 mt 3.02 il 5.78 ap 2.02	North Creek, Warren County, New York.	E. W. Morley.	W. J. Miller, J. G., XXI, p. 170, 1913.	Hornblende norite.	
10	III.5.3.4.⊙ *2.3.2.3.*	or [illegible].23 di 12.09 ab 26.20 hy 8.18 an 21.96 ol 13.07 mt 2.32 il 6.38 ap 1.34	Elizabethtown, Essex County, New York.	W. F. Hillebrand.	J. F. Kemp, U. S. G. S. B. 168, p. 37, 1900.	Norite.	In W. T., p. 319.

CLASS III. SALFEMANE—Continued.

RANG 3. ALKALICALCIC. CAMPTONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
11	46.74	16.63	2.17	10.60	6.11	8.66	3.81	0.86	0.73	0.12	2.54	0.33	0.26	CO_2 0.07 S 0.11 Cr_2O_3 trace NiO 0.03 BaO trace SrO trace	99.77	
A1. I	.779	.163	.014	.147	.153	.154	.061	.009			.030	.002	.004			
12	44.77	12.46	4.63	12.99	5.34	10.20	2.47	0.95	0.48	0.12	5.26	0.28	0.17	CO_2 0.37 S 0.26 NiO trace BaO trace	100.75	3.090
A2. II	.736	.122	.029	.180	.134	.182	.040	.010			.064	.002	.002			
13	51.82	14.18	0.57	9.07	8.39	8.60	2.79	1.26	1.40	0.30	1.17	0.17	0.13		99.85	2.95
A2. II	.864	.139	.004	.126	.210	.154	.045	.014			.015	.001	.002			
14	51.34	12.71	2.65	14.14	3.66	7.44	2.43	1.44	0.69	0.18	3.47	0.20	0.36		100.71	3.089
A2. II	.856	.125	.016	.196	.092	.133	.039	.015			.043	.002	.005			
15	50.34	15.23	2.82	11.17	5.81	9.61	2.93	1.02	0.07	0.19	1.56	0.20	0.14		101.09	2.968
B2. III	.839	.149	.018	.155	.145	.172	.047	.011			.020	.001	.002			
16	49.68	14.02	4.97	9.52	5.80	6.50	3.49	1.41	1.89	0.54	1.39	0.21	0.18	SrO trace	99.60	2.949
A2. II	.828	.137	.031	.132	.145	.116	.056	.015			.017	.002	.003			
17	51.08	16.45	0.84	10.08	6.95	5.57	3.49	1.28	0.51	0.08	4.44	0.14	0.08	CO_2 trace S trace	100.99	2.977
A2. II	.851	.161	.005	.140	.174	.100	.056	.014			.056	.001	.001			
18	48.11	14.74	2.54	11.85	5.10	6.72	2.92	1.92	1.73	0.27	3.17	0.44	0.19	FeS_2 0.13 Cr_2O_3 0.01 V_2O_3 0.03 NiO 0.03 BaO 0.04 SrO 0.02	99.96	
A1. I	.802	.144	.015	.165	.128	.120	.047	.020			.039	.003	.003			
19	50.07	12.63	3.84	10.30	5.23	6.55	3.53	1.90	1.96	0.86	2.50	0.22	0.42	CO_2 none ZrO_2 none SO_3 none S none BaO 0.02 SrO none	100.03	
A1. I	.835	.124	.024	.143	.131	.117	.056	.020			.031	.002	.006			
20	52.34	14.17	2.40	10.78	3.51	7.25	3.73	2.37	0.43	0.18	2.21	0.80	0.09	S 0.14	100.40	
A2. II	.872	.139	.015	.150	.088	.130	.060	.026			.028	.006	.001			
21	48.45	12.70	2.00	13.24	4.39	8.50	3.94	1.22	1.58	none	3.17	0.72	0.17	CO_2 none Cr_2O_3 0.10	100.18	2.90
A2. II	.808	.125	.013	.184	.110	.152	.064	.013			.040	.005	.00			
22	45.65	15.20	6.71	13.81	2.95	6.33	3.09	1.05	2.29		1.66	0.25	0.71	BaO none SrO none	99.70	2.85
A2. II	.761	.149	.042	.192	.074	.112	.050	.011			.021	.002	.010			
23	51.14	13.95	2.15	12.97	2.21	6.56	3.59	2.33	0.22	0.12	2.41	1.59	0.44	ZrO_2 0.12 Cl trace F 0.10 FeS_2 0.15 NiO trace BaO 0.25 SrO trace V_2O_3 trace	100.30	2.907
A1. I	.852	.137	.013	.181	.055	.117	.058	.024			.030	.011	.006			

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 4. DOSODIC. CAMPTONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
11	(II)III.5.3.4(5). *2.3.2.3.*	or 5.00 di 13.08 ab 27.25 ol 16.86 an 25.02 mt 3.25 no 2.56 il 4.56 ap 0.67	Elizabethtown, Essex County, New York.	W. F. Hillebrand.	J. F. Kemp, U. S. G. S. B. 168, p. 37, 1900.	Norite.	Gneissoid form of No. 19, III.5.4.4–5. In W. T., p. 319.
12	III.5.3″.4. *2.2.2.3.*	or 5.56 di 24.02 ab 20.96 hy 6.07 an 19.46 ol 5.31 mt 6.73 il 9.73 ap 0.67	Lincoln Pond, Essex County, New York.	G. Steiger.	J. F. Kemp, U. S. G. S. A. R. 19, III, p. 407, 1899.	Gabbro.	In W. T., p. 319.
13	III.5.3″.4. *1.2.2.3.*	or 7.78 di 16.11 ab 23.58 hy 18.66 an 22.24 ol 6.46 mt 0.93 il 2.28 ap 0.34	Scotch Plains, New Jersey.	R. B. Gage.	J. V. Lewis, N. J. G. S. A. R. (1907), p. 159, 1908.	Basalt.	Lower layer. Cf. No. 22, III.5.4.5.
14	III.″5.3″.4. *2.1.2.4.*	Q 6.00 di 13.19 or 8.34 hy 21.26 ab 20.44 mt 3.71 an 19.74 il 6.74 ap 0.67	Jersey City, New Jersey.	R. B. Gage.	J. V. Lewis, N. J. G. S. A. R. (1907), p. 121, 1908.	Quartz diabase.	Also in A. J. S. XXVI, p. 158, 1908.
15	III.5.3(4).4. *2.2.2.3.*	or 6.12 di 17.97 ab 24.63 hy 13.63 an 25.30 ol 5.75 mt 4.18 il 3.04 ap 0.34	Rocky Hill, New Jersey.	A. H. Phillips.	A. H. Phillips, A. J. S., VIII, p. 279, 1899.	Dolerite.	In W. T., p. 319.
16	″III.5.3.4. *2.1.2.3.*	or 8.34 di 9.80 ab 29.34 hy 20.08 an 18.35 ol 0.79 mt 7.19 il 2.58 ap 0.67	Millington, New Jersey.	R. B. Gage.	J. V. Lewis, N. J. G. S. A. R. (1907), p. 159, 1908.	Basalt.	
17	(II)III.5.3″.4. *2.1″.1.3.*	or 7.78 di 1.36 ab 29.34 hy 24.87 an 25.30 ol 1.76 mt 1.16 il 8.51 ap 0.34	Roseland, Nelson County, Virginia.	W. M. Thornton.	Watson and Taber, Va. G. S. B. III A, p. 95, 1913.	Gabbro.	
18	″III.5.3.4. *2.2.2.3.*	or 11.12 di 7.64 ab 24.63 hy 17.37 an 21.41 ol 4.92 mt 3.48 il 5.93 ap 1.01	Near Limestone Cove, Unicoi County, Tennessee.	W. F. Hillebrand.	A. Keith, U. S. G. S. B. 168, p. 59, 1900.	Gabbro.	In W. T., p. 319.
19	III.5.(2)3.4. *2.1.2.3.*	or 11.12 di 14.47 ab 29.34 hy 17.28 an 13.34 ol 0.76 mt 5.57 il 4.71 ap 0.60	Eagle River Section, Keweenaw Point, Michigan.	G. Steiger.	A. N. Winchell, J. G., XVI, p. 772, 1908.	Diabase.	
20	(II)III.5.(2)3.4. *2.1.2.2.*	or 14.46 di 13.21 ab 31.44 hy 15.70 an 14.73 ol 0.51 mt 3.48 il 4.26 ap 2.02	Richmond, Minnesota.	E. M. Pennock.	F. F. Grout, J. G., XVIII, p. 656, 1910.	Gabbro.	
21	III.5.(2)3.4. *2.2.2.2.*	or 7.23 di 20.29 ab 33.64 hy 1.66 an 13.34 ol 12.64 mt 3.02 il 6.08 ap 1.68	Stearns County, Minnesota.	F. F. Grout.	F. F. Grout, J. G., XVIII, p. 655, 1910.	Diabase.	
22	″III.5.3″.4″. *2.1.1.2.*	or 6.12 di 4.02 ab 26.20 hy 21.05 an 24.46 ol 1.99 mt 9.74 il 3.19 ap 0.67	Duluth, Minnesota.	A. N. Winchell.	A. N. Winchell, A. G., XXVI, p. 293, 1900.	Orthoclase gabbro.	In W. T., p. 319.
23	(II)III.5.(2)3.4. *2.1.2.4.*	Q 1.56 di 5.98 or 13.34 hy 21.43 ab 30.39 mt 3.02 an 15.29 il 4.56 ap 3.70	Cinder Butte, Snake River Plains, Idaho.	W. F. Hillebrand.	I. C. Russell, U. S. B. S. B. 199, p. 87, 1902.	Basalt.	

CLASS III. SALFEMANE—Continued.

RANG 3. ALKALICALCIC. CAMPTONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
24	49.22	12.02	2.77	8.80	9.29	10.56	1.90	1.70	1.63	0.27	0.95	0.43	trace	SO_3 0.04 Cl 0.08 S 0.05 BaO 0.03 SrO 0.03	99.77	
A1. I	.820	.118	.017	.122	.232	.189	.021	.018			.012	.003	—			
25	53.56	16.07	3.21	5.29	7.23	8.77	3.06	1.94	0.19	0.68	0.18	0.11			100.29	
A2. II	.893	.158	.020	.073	.181	.157	.049	.021		.008	.001	.002				
26	51.81	15.24	3.66	4.86	8.89	9.06	2.83	2.08	0.67		0.77	0.18	0.08		100.13	
A2. II	.864	.149	.023	.068	.222	.162	.045	.022			.010	.001	.001			
27	51.70	15.18	2.09	8.54	8.18	8.73	2.31	1.81	0.16		1.24	0.21	trace	Cl trace S 0.09	100.24	
A2. II	.862	.149	.013	.119	.205	.155	.037	.020			.014	.001	—			
28	47.28	11.56	3.52	5.71	13.17	9.20	2.73	2.17	2.96		0.88	0.59	0.13	Cl 0.18	100.08	
A2. II	.788	.113	.022	.079	.329	.164	.043	.023			.011	.004	.002			
29	53.27	15.43	2.43	6.50	6.16	8.18	3.51	1.71	0.62	none	1.30	0.50	0.12	CO_2 none	99.73	
A2. II	.888	.151	.015	.090	.154	.146	.056	.018			.016	.004	.002			
30	49.73	15.46	3.32	8.14	7.20	9.63	3.30	0.87	0.32	0.16	1.59	0.42	0.13	CO_2 none	100.27	
A2. II	.829	.152	.021	.113	.180	.171	.053	.009			.020	.003	.002			
31	48.35	15.47	4.80	7.58	8.15	8.81	3.09	0.95	0.73	0.28	1.33	0.33	0.21	ZrO_2 none SO_3 0.07 S trace Cr_2O_3 trace NiO 0.02 BaO 0.06 SrO 0.03 Li_2O trace	100.26	2.970
A1. I	.806	.152	.030	.106	.204	.157	.050	.010			.015	.002	.003			
32	49.36	16.35	2.93	8.55	7.06	10.08	2.67	0.82	0.65	0.22	0.98	0.30	0.19	NiO 0.05 BaO 0.04 SrO none Li_2O none	100.25	
A2. II	.823	.160	.018	.119	.177	.180	.043	009			.012	.002	.003			
33	45.30	14.95	1.98	9.32	8.29	8.87	4.27	1.27	0.85		2.66	2.23	trace		99.99	
A2. II	.755	.147	.012	.129	.207	.159	.069	.013			.032	.015	—			
34	54.64	12.09	1.81	5.03	11.86	7.74	2.35	1.01	2.44	0.12	0.61	trace	0.13	CO_2 none NiO 0.05 BaO 0.05 SrO trace Li_2O trace	100.01	
A2. II	.911	.119	.011	.070	.297	.138	.038	.011			.008	—	.002			
35	50.66	13.97	2.55	10.20	4.45	8.08	3.32	1.95	0.43	0.27	2.39	1.01	0.29	Cl 0.02 NiO trace BaO 0.22 SrO trace Li_2O none	99.81	
A2. II	.844	.137	.016	.141	.111	.144	.053	.021			.030	.007	.004			
36	54.56	16.04	0.95	6.07	8.71	8.89	3.05	1.18	0.28		0.53	0.18	0.17	Cr_2O_3 trace BaO 0.03 SrO trace Li_2O trace	100.38	
A2. II	.909	.157	.006	.085	.218	.159	.049	.013			.007	.001	.002			

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 4. DOSODIC. CAMPTONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
24	III.5.3″.(3)4. *2.2.2.2.*	or 10.01 di 24.53 ab 15.72 hy 14.42 an 19.46 ol 6.65 mt 3.94 il 1.82 ap 1.01	Red Mountains, Montana.	H. N. Stokes.	H. W. Weed, J. G., VII, p. 739, 1899.	Gabbro.	In W. T., p. 317.
25	(II)III.5.3.4. *2.1.2.2.*	Q 0.24 di 14.52 or 11.68 hy 17.32 ab 25.68 mt 4.64 an 24.46 il 1.22 ap 0.34	Hurricane Ridge, Crandall Basin, Yellowstone National Park.	L. G. Eakins.	J. P. Iddings, U. S. G. S. Mon. 32 (II), p. 260, 1899.	Gabbro-porphyry.	In W. T., p. 319.
26	″III.5.3.″4. *2.2.2.2.*	or 12.23 di 16.92 ab 23.58 hy 11.72 an 22.80 ol 4.60 mt 5.34 il 1.52 ap 0.34	Hurricane Ridge, Crandall Basin, Yellowstone National Park.	L. G. Eakins.	J. P. Iddings, U. S. G. S. Mon. 32 (II), p. 260, 1899.	Gabbro-porphyry.	In W. T., p. 319.
27	III.5.3(4).(3)4. *1.1.2.2.*	or 11.12 di 13.57 ab 19.39 hy 20.12 an 25.58 ol 4.29 mt 3.02 il 2.13 ap 0.34	Dunraven Peak, Yellowstone National Park.	F. A. Gooch.	J. P. Iddings, U. S. G. S. B. 148, p. 135, 1897.	Basalt.	In W. T., p. 319.
28	III.5″.3.(3)4. *2.3.2.2.*	or 12.79 di 17.82 ab 14.93 ol 21.92 an 19.46 mt 5.10 ne 4.12 il 1.67 ap 1.34	Ishawooa Canyon, Wyoming.	J. P. Whitfield.	A. Hague, A. J. S., XXXVIII, p. 46, 1889.	Leucite phonolite.	Leucite absarokite in Iddings, J. G., III, p. 938, 1895. In W. T., p. 321.
29	(II)III.5.3.4. *2.1.2.2.*	Q 1.14 di 12.61 or 10.01 hy 17.34 ab 29.34 mt 3.48 an 21.41 il 2.43 ap 1.34	Folsom, Colfax County, New Mexico.	G. Steiger.	J. B. Mertie, U. S. G. S. rec. lab.	Basalt.	
30	″III.5.3″.4(5). *2.2.2.3.*	or 5.00 di 16.01 ab 27.77 hy 9.50 an 25.02 ol 7.62 mt 4.87 il 3.04 ap 1.01	Barella Mesa, Colfax County, New Mexico.	G. Steiger.	J. B. Mertie, U. S. G. S. rec. lab.	Basalt.	
31	″III.5.3(4).4″. *2.2.2.2.*	or 5.56 di 12.98 ab 26.20 hy 8.84 an 25.58 ol 9.92 mt 6.96 il 2.28 ap 0.67	San Rafael Flow, Colfax County, New Mexico.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 168, p. 171, 1900.	Basalt.	In W. T., p. 321.
32	″III.5.3(4).4″. *2.2.2.3.*	or 5.00 di 14.74 ab 22.53 hy 13.98 an 30.02 ol 6.32 mt 4.18 il 1.82 ap 0.67	Santa Maria Basin, Arizona.	W. F. Hillebrand.	J. P. Iddings, U. S. G. S. B. 148, p. 187, 1897.	Mica basalt.	In W. T., p. 333.
33	″III.5(6).3.4. *2.4.2.3.*	or 7.23 di 7.66 ab 25.15 ol 20.46 an 20.85 mt 2.78 ne 5.96 il 4.86 ap 5.04	Near Mount Trumbull, Arizona.	L. G. Eakins.	U. S. G. S. B. 148, p. 188, 1897.	Lava (basalt?).	In W. T., p. 321.
34	III.″5.3″.4. *1.1.2.2.*	Q 3.54 di 15.01 or 6.12 hy 29.58 ab 19.91 mt 2.55 an 19.46 il 1.22	Near Table Mountain, Butte County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 17, I, p. 731, 1896.	Quartz diorite.	In W. T., p. 321.
35	″III.5.3.4. *2.1.2.3.*	Q 0.36 di 13.39 or 11.68 hy 17.50 ab 27.77 mt 3.71 an 17.51 il 4.56 ap 2.35	Oroville, Table Mountain, Butte County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 14, II, p. 491, 1894.	Basalt.	In W. T., p. 321.
36	″III.5.3(4).4. *1.1.2.2.*	or 7.23 di 13.69 ab 25.68 hy 23.66 an 26.41 ol 0.94 mt 1.39 il 1.06 ap 0.34	Near Cinder Cone, Lassen Peak, California.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. B. 79, p. 29, 1891.	Quartz basalt.	In W. T., p. 321.

CLASS III. SALFEMANE—Continued.

RANG 3. ALKALICALCIC. CAMPTONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
37	53.46	14.81	2.60	5.15	7.27	8.44	2.60	1.30	2.13	0.12	0.70	0.16	0.18	CO_2 0.44 FeS_2 0.26 NiO 0.05 BaO 0.05 SrO trace Li_2O trace	99.76	
A1. I	.891	.145	.016	.072	.182	.150	.042	.014			.009	.001	.003			
38	51.27	12.14	2.51	6.71	10.88	10.32	2.00	1.63	1.16	0.17	0.60	0.21	0.21	NiO 0.04 BaO 0.07 SrO trace Li_2O trace	99.92	
A2. II	.855	.119	.015	.093	.272	.184	.032	.017			.008	.001	.003			
39	47.91	14.26	1.65	7.80	10.83	9.60	3.01	1.89	0.37		2.70		trace	Li_2O trace	100.02	
A3. III	.799	.140	.010	.108	.271	.171	.048	.020			.034		—			
40	51.56	15.24	2.73	5.99	8.30	7.67	3.78	1.85	0.16	0.15	1.81	0.47	0.15	Cr_2O_3 0.01 BaO 0.07 SrO 0.05 Li_2O trace	99.95	
A2. II	.859	.149	.017	.083	.208	.138	.060	.020			.023	.003	.002			
41	48.23	14.69	4.49	5.85	6.73	12.12	2.55	1.49	0.98	1.50	1.00	0.46	0.17	CO_2 trace SO_3 0.05 Cl 0.09 F none Cr_2O_3 0.06	100.46	
A1. I	.804	.144	.028	.082	.168	.198	.041	.016			.013	.003	.002			
42	52.18	15.59	0.75	8.11	7.89	10.40	2.88	1.25	0.73		0.16	0.05	0.16	Cl trace S 0.01 NiO 0.14 CuO 0.05	100.35	3.00
A2. II	.870	.153	.005	.113	.197	.186	.047	.013			.002	—	.002			
43	50.80	10.43	3.95	6.91	12.13	10.17	2.77	1.52	0.67		0.30	trace	0.45	CO_2 none ZrO_2 none Cl 0.06 S none CoO none BaO 0.18 CuPb none	100.34	
A1. I	.847	.102	.025	.096	.303	.182	.045	.016			.004	—	.006			
44	54.51	12.26	1.64	7.60	6.89	8.80	2.37	1.85	0.94	0.04	1.74	0.78	0.32	CO_2 0.36 FeS_2 0.20 NiO 0.03 BaO none	100.33	
A2. II	.909	.120	.010	.106	.172	.157	.039	.020			.022	.006	.005			
45	52.84	14.06	1.73	8.38	5.55	8.72	2.90	1.74	1.15	0.08	2.19	0.29	0.25	FeS_2 0.14 NiO 0.05 BaO none	100.07	
A2. II	.881	.138	.011	.117	.139	.155	.047	.018			.027	.002	.004			
46	52.83	11.74	6.66	6.13	6.41	8.05	2.67	2.06	1.20	0.20	1.82	0.08			99.85	
A2. II	.881	.115	.042	.085	.160	.144	.044	.022			.023	—				
47	51.53	11.05	2.73	10.98	5.21	9.68	3.48	0.86	1.26	0.71	1.53	0.22	0.45	CO_2 0.08 FeS_2 0.26 BaO none	100.07	
A2. II	.859	.109	.017	.153	.130	.173	.056	.009			.019	.002	.006			
48	49.92	12.83	6.96	6.21	3.78	7.25	3.72	1.73	1.05	3.58	2.04	0.45	0.52	CO_2 none Cr_2O_3 trace V_2O_3 0.04 NiO 0.03 BaO 0.09 SrO trace	100.20	
A1. I	.832	.126	.044	.086	.095	.130	.060	.018			.026	.003	.007			
49	49.53	15.05	4.49	9.07	4.25	8.08	3.93	1.25	1.06	1.47	1.76	0.43	0.29	SO_3 0.07 Cr_2O_3 trace V_2O_3 0.01 NiO 0.04 BaO 0.05 SrO trace	100.83	
A1. I	.826	.148	.028	.126	.106	.145	.063	.014			.022	.003	.004			
50	47.45	14.83	2.47	14.71	5.00	8.87	2.97	0.99	1.00		1.47			CO_2 0.36	100.12	3.10
A3. III	.791	.145	.015	.204	.125	.159	.048	.011			.018					
51	45.10	15.04	8.85	4.62	6.68	8.71	3.78	1.04	1.76	1.31	2.66	0.56	0.45	CO_2 none SrO 0.04	100.60	
A2. II	.752	.147	.056	.064	.167	.155	.061	.011			.033	.004	.006			

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 4. DOSODIC. CAMPTONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
37	(II)III.″5.3(4).4. *2.1.2.2.*	Q 5.22 or 7.78 ab 22.01 an 24.74 di 13.20 hy 18.33 mt 3.71 il 1.37 ap 0.34	Near Sonora, Tuolumne County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 17, I, p. 731, 1896.	Diorite.	In W. T., p. 321.
38	III.5.3″.(3)4. *1.1.2.2.*	or 9.45 ab 16.77 an 19.46 di 24.72 hy 17.49 ol 5.41 mt 3.48 il 1.22 ap 0.34	Milton, Sierra County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 17, I, p. 734, 1896.	Diabase porphyry.	In W. T., p. 321.
39	III.5″.3.4. *2.3.2.2.*	or 11.12 ab 15.72 an 20.02 ne 4.83 di 21.99 ol 17.96 mt 2.32 il 5.17	American Flat Creek, Washoe, Nevada.	S. L. Penfield.	Hague and Iddings, U. S. G. S. B. 17, p. 33, 1885.	Basalt.	In W. T., p. 321.
40	(II)III.5.3.4. *2.2.2.2.*	or 11.12 ab 31.44 an 19.18 di 13.03 hy 5.46 ol 10.84 mt 3.94 il 3.50 ap 1.01	Salto de Anton, Cuernavaca, Mexico.	F. N. Guild.	F. N. Guild, A. J. S., XXII, p. 170, 1906.	Basalt.	K_2O given as 1.25.
41	″III.5.3(4).4. *2.1.2.2.*	or 8.90 ab 21.48 an 24.19 di 22.49 hy 6.58 ol 3.68 mt 6.50 il 1.98 ap 1.01	Monte Lirio, Panama.	W. C. Wheeler.	D. F. McDonald, U. S. G. S. rec. lab.	Basalt.	
42	″III.5.3(4).4. *1.2.2.2.*	or 7.23 ab 24.63 an 25.85 di 21.15 hy 6.90 ol 12.40 mt 1.16 il 0.30	Cuyuni River, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Brit. Gui., p. 95, 1908.	Olivine diabase.	
43	III.5.(2)3.4. *1.2.2.2.*	or 8.90 ab 23.58 an 11.40 di 31.32 ol 17.92 mt 5.80 il 0.61	Mazaruni River, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Brit. Gui., p. 78, 1908.	Basic syenite.	
44	III.(4)5.3.″4. *2.1.2.3.*	Q 6.36 or 11.12 ab 20.44 an 16.96 di 17.19 hy 19.26 mt 2.32 il 3.34 ap 2.02	Carn Dubh, Scotland.	W. Pollard.	J. S. Flett, G. S. Scot., Mem. XCIII, p. 95, 1912.	Gabbro.	
45	″III.5.3.4. *2.1.2.3.*	Q 2.28 or 10.01 ab 24.63 an 20.29 di 17.10 hy 17.78 mt 2.55 il 4.10 ap 0.67	Diebidale River, Scotland.	E. G. Radley.	J. S. Flett, G. S. Scot., Mem. XCIII, p. 95, 1912.	Gabbro.	
46	″III.(4)5.″3.″4. *2.1.2.2.*	Q 6.72 or 12.23 ab 23.06 an 13.62 di 20.84 hy 8.82 mt 9.74 il 3.50	Garabal Burn, n. Loch Lomond, Scotland.	Not stated.	Wyllie and Scott, G. Mag. (V), X. p. 540, 1913.	Diorite.	
47	III.5.(2)3.4(5). *2.2″.2.3.*	Q 0.24 or 5.00 ab 29.34 an 12.23 di 28.27 hy 15.12 mt 3.94 il 2.89 ap 0.67	Sheet 52, Scotland.	E. G. Radley.	G. S. Grt. Br., Sum. Prog. (1913), p. 82, 1914.	Tholeiite.	
48	(II)III.″5.(2)3.4. *3.1.2.3.*	Q 4.68 or 10.01 ab 31.44 an 13.34 di 16.00 hy 4.89 mt 10.21 il 3.95 ap 1.01	Eilean a' Bhaird, Canna Island, Scotland.	W. Pollard.	A. Harker, G. S. Scot., Mem. Sh. 60, p. 130, 1908.	Mugearite.	Not fresh?
49	(II)III.5.3.4″. *2.2.2.3.*	or 7.78 ab 33.01 an 19.74 di 14.72 hy 7.50 ol 4.69 mt 6.50 il 3.34 ap 1.01	Ealaist, Canna Island, Scotland.	W. Pollard.	A. Harker, G. S. Scot., Mem. Sh. 60, p. 125, 1908.	Olivine dolerite.	
50	″III.3″.4″. *2.3.2.3.*	or 6.12 ab 25.15 an 23.91 di 17.11 hy 1.79 ol 18.40 mt 3.48 il 2.74	Scourie, Sutherland, Scotland.	J. J. H. Teall.	J. J. H. Teall. Q. J. G. S., XLI, p. 135, 1885.	Dolerite.	In W. T., p. 321.
51	″III.5.3.4(5). *3.2.2.2.*	or 6.12 ab 30.13 an 20.85 ne 0.99 di 14.47 ol 7.00 mt 8.58 il 5.02 hm 3.04 ap 3.14	Duncomb Hill, Kilpatrick Hills, Dumbartonshire, Scotland.	A. Scott.	G. W. Tyrrell, Tr. G. Soc. Glas., XIV (III), p. 247, 1912.	Basalt.	

CLASS III. SALFEMANE—Continued.

RANG 3. ALKALICALCIC. CAMPTONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
52	46.28	14.18	3.79	7.34	10.82	9.88	2.58	1.01	1.66	0.31	2.06	0.44	0.09	CO_2 none Cl none S none NiO 0.05 BaO none SrO none	100.49	
A1. I	.771	.139	.024	.102	.271	.177	.042	.011			.026	.003	.001			
53	51.22	14.06	4.32	8.73	4.42	8.33	2.55	1.25	1.28		2.42	0.25	0.16	CO_2 0.19 FeS_2 0.49	99.67	2.98
A2. II	.854	.138	.027	.121	.111	.148	.042	.014			.030	.002	.002			
54	50.71	14.78	3.52	8.95	5.90	8.21	2.76	1.39	1.78		1.92		0.31	CO_2 0.25	100.48	2.944
A2. II	.845	.145	.022	.125	.148	.146	.044	.015			.024		.004			
55	50.46	13.89	3.69	9.02	5.03	8.81	2.85	1.33	1.95		2.26	0.37	0.22	CO_2 0.19	100.07	2.853
A2. II	.841	.136	.023	.125	.126	.157	.046	.014		.028	.003	.003	.003			
56	50.55	15.00	2.54	7.90	6.25	7.85	3.53	1.10	3.14	0.55	1.58				99.99	
A2. II	.843	.147	.016	.110	.156	.140	.056	.012			.020					
57	49.67	12.46	1.77	8.71	10.50	9.57	2.42	0.63	2.82	0.37	1.13	0.13	0.09	CO_2 trace	100.27	
A2. II	.828	.122	.011	.121	.263	.171	.039	.007			.017	.001	.001			
58	42.88	14.31	4.70	9.14	5.67	10.90	2.52	1.92	2.52	0.25	3.68	0.54	0.32	CO_2 0.13 S 0.22 NiO 0.07 BaO none SrO none	100.07	
A1. I	.715	.140	.029	.127	.142	.195	.040	.020			.046	.004	.005			
59	52.80	13.80	2.00	10.20	3.97	6.78	3.51	1.74	1.10		3.83	0.22			99.95	
A2. II	.880	.135	.013	.142	.099	.121	.056	.019			.048	.002				
60	51.90	13.78	0.80	11.00	4.76	6.72	4.02	1.39	2.50		3.44	0.19			100.40	
A2. II	.865	.135	.005	.153	.119	.120	.065	.015			.043	.001				
61	48.45	16.10	1.50	9.27	6.88	8.85	4.15	1.64	n. d.		3.22	trace			100.06	
A3. III	.808	.158	.009	.129	.172	.158	.067	.017			.040	—				
62	44.95	17.29	2.30	9.61	9.25	8.45	2.82	2.02	1.37		2.82	0.51			101.39	
B2. III	.749	.169	.014	.133	.231	.151	.045	.021			.035	.004				
63	47.66	14.36	2.83	8.44	8.19	9.36	3.51	1.54	0.17	0.20	3.83	0.45			100.54	
A2. II	.794	.141	.018	.117	.205	.167	.056	.016			.048	.003				
64	50.19	14.39	2.04	9.60	8.99	7.93	3.20	0.87	0.12	0.08	1.47	0.63	0.18	CO_2 trace Cr_2O_3 0.03 NiO 0.11	99.83	
A2. II	.837	.141	.013	.133	.225	.141	.052	.009			.017	.004	.003			
65	49.75	14.14	3.45	8.80	8.92	7.69	3.15	0.97	0.44	0.25	1.38	0.62	0.16	CO_2 trace Cr_2O_3 0.02 NiO 0.02	99.76	
A2. II	.829	.139	.022	.122	.223	.138	.051	.010			.017	.004	.002			
66	49.12	13.82	6.76	12.53	3.19	8.70	2.49	1.26	0.78		0.80		0.08		99.53	
A2. II	.819	.135	.042	.174	.080	.155	.040	.014			.010		.001			

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 4. DOSODIC. CAMPTONOSE—Continued.

No.	Symbol.	Norm.		Locality.	Analyst.	Reference.	Rock name.	Remarks.
52	III.5.3(4).4. *2.3.2.2.*	or 6.12 ab 21.48 an 23.91 ne 0.28	di 17.92 ol 18.29 mt 5.57 il 3.95 ap 1.01	Redside, East Lothian, Scotland.	E. G. Radley.	E. B. Bailey, G. S. Scot. Mem. Sh. 33, p. 121, 1910.	Basalt.	
53	(II)III.(4)5.3″.4. *2.1.2.3.*	Q 7.02 or 7.78 ab 22.01 an 22.80	di 13.44 hy 13.34 mt 6.28 il 4.56 ap 0.67	Whin Sill, Cauldron Snout, Durham, England.	J. J. H. Teall.	J. J. H. Teall, Q. J. G. S., XL, p. 654, 1884.	Diabase.	In W. T., p. 321.
54	″III.5.3″.4. *2.1.2.3.*	Q 2.04 or 8.34 ab 23.06 an 23.91	di 13.60 hy 18.06 mt 5.10 il 3.65	Whin Sill, Bourgovicus, Northumberland, England.	J. J. H. Teall.	J. J. H. Teall. Q. J. G. S., XL, p. 654, 1884.	Diabase.	In W. T., p. 321.
55	″III.″5.3.4. *2.1.2.3.*	Q 3.90 or 7.78 ab 24.10 an 21.13	di 16.20 hy 14.80 mt 5.34 il 4.26 ap 1.01	Whin Sill, England.	A. M. Finlayson.	A. M. Finlayson, Q. J. G. S., LXVI, p. 304, 1910.	Diabase.	
56	(II)III.5.3.4″. *2.1.2.3.*	or 16.67 ab 29.34 an 21.96	di 13.92 hy 15.54 ol 2.25 mt 3.71 il 3.04	Carn Llidi, St. Davids Head, Pembrokeshire, Wales.	J. V. Elsden.	J. V. Elsden, Q. J. G. S., LXIV, p. 281, 1908.	Gabbro.	
57	III.5.3(4).4(5). *1.2.2.2.*	or 3.89 ab 20.44 an 21.13	di 20.67 hy 18.01 ol 7.83 mt 2.55 il 2.58 ap 0.34	St. Davids Head, Pembrokeshire, Wales.	J. V. Elsden.	J. V. Elsden, Q. J. G. S., LXIV, p. 278, 1908.	Biotite norite.	
58	III.5″.3″.″4. 2.2.2.3.	or 11.12 ab 13.36 an 22.24 ne 4.12	di 22.96 ol 7.69 mt 6.73 il 6.99 ap 1.34	Lynher, Cornwall.	W. Pollard.	J. S. Flett, G. S. Eng., Mem. Sh. 348, p. 100, 1907.	Proterobase.	
59	(II)III.″5.3.4. *2.1.2.3.*	Q 4.56 or 10.56 ab 29.34 an 16.68	di 12.43 hy 14.42 mt 3.02 il 7.30 ap 0.67	Mauny, Brittany, France.	Pisani.	L. Vandernotte, Mass. Armor., p. 121, 1913.	Microgabbro.	
60	6″III.5.″3.4. *2.1.2.3.*	or 8.34 ab 34.06 an 15.29	di 14.32 hy 16.11 ol 1.86 mt 1.16 il 6.54 ap 0.34	Moulin Huile, Brittany, France.	Pisani.	L. Vandernotte, Mass. Armor., p. 117, 1913.	Andesite.	"Rich in pyrite."
61	(II)III.5(6).3.4. *2.3.2.3.*	or 9 45 ab 22.53 an 20.57 ne 6.82	di 19.00 ol 13.46 mt 2.09 il 6.08	Agde, Herault, France.	Pisani.	A. Michel-Levy, C. R., CXLVIII, p. 1530, 1909.	Basalt.	
62	(II)III.5″.3(4).″4. *2.4.2.2.*	or 11.68 ab 15.20 an 28.63 ne 4.54	di 8.60 ol 21.97 mt 3.25 il 5.32 ap 1.21	Bonne d'Ordanche, Mont Dore, Auvergne.	Pisani.	A. Lacroix, Mat. Min. Mad., I, p. 192, 1902.	Nephelinic gabbro.	
63	III.5.3.4.⊙ *2.3.2.2.*	or 8.90 ab 24.63 an 19.18 ne 2.56	di 19.59 ol 12.88 mt 4.18 il 7.30 ap 1.00	Castelfullit, n. Olot, Catalonia, Spain.	H. S. Washington.	H. S. Washington, A. J. S., XXIV, p. 239, 1907.	Basalt.	
64	III.5.3″.4(5). *2.2.2.3.*	or 5.00 an 27.25 an 22.24	di 10.85 hy 16.20 ol 11.07 mt 3.02 il 2.58 ap 1.34	Cape Augusta Victoria, Wood Bay, Spitzbergen.	M. Dittrich.	V. M. Goldschmidt, Skr. Vids. Krist., 1911, No. 9, p. 16.	Basalt.	
65	III.5.3.4″. *2.2.2.2.*	or 5.56 ab 26.72 an 21.68	di 10.57 hy 17.97 ol 7.55 mt 5.10 il 2.58 ap 1.34	Cape Augusta Victoria, Wood Bay, Spitzbergen.	M. Dittrich.	V. M. Goldschmidt, Skr. Vids. Krist., 1911, No. 9, p. 16.	Basalt.	
66	III.5.3(4).4. *2.1.2.4.*	Q 3.36 or 7.78 ab 20.96 an 22.52	di 17.42 hy 15.40 mt 9.74 il 1.52	Cape Weissenfels, King Charles Land, Spitzbergen.	N. Sahlbom.	A. Hamberg, G. F. F., XXI, p. 523, 1899.	Basalt.	In W. T., p. 321.

CLASS III. SALFEMANE—Continued.

RANG 3. ALKALICALCIC. CAMPTONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
67	47.90	16.55	5.67	7.50	4.44	9.35	3.23	2.08	0.20		1.91	0.32	0.60		99.75	
A2. II	.798	.162	.035	.104	.111	.167	.045	.022			.023	.002	.009			
68	51.23	12.70	4.00	10.48	6.51	8.40	3.04	1.55	0.39		1.21	0.19	trace		99.70	
A2. II	.854	.124	.025	.146	.163	.150	.049	.017			.015	.001	—			
69	48.66	14.06	3.87	10.34	5.53	8.73	2.45	1.42	1.00		2.60	0.79	0.22	S 0.18 BaO 0.01	99.86	
A2. II	.811	.138	.024	.143	.138	.155	.040	.015			.033	.006	.003			
70	48.50	16.17	4.65	11.38	4.24	7.28	3.07	1.67	1.94		0.80	0.67	trace		100.37	2.860
A2. II	.808	.158	.029	.158	.106	.130	.050	.018			.010	.005	—		(100.07)	
71	45.82	17.34	1.70	11.69	5.81	8.98	3.32	1.42	0.51	0.21	2.20	0.56	0.22	S trace BaO trace	99.78	
A2. II	.754	.170	.011	.163	.145	.161	.053	.015			.028	.004	.003			
72	51.65	13.51	3.57	4.62	11.45	6.60	2.80	2.18	3.08		0.49	0.17			100.72	2.783
A2. II	.861	.132	.023	.064	.286	.118	.045	.023			.006	.001				
73	49.92	13.39	8.07	4.82	6.13	10.68	2.83	1.11	0.94		1.80	1.06			100.75	2.963
A3. III	.832	.131	.050	.067	.153	.191	.045	.012			.023	.007				
74	49.83	13.20	7.29	4.67	5.90	11.57	2.78	1.31	1.07		1.73	0.78			100.13	2.892
A2. II	.831	.129	.046	.065	.148	.207	.045	.014			.022	.005				
75	49.67	12.72	8.19	4.26	7.41	9.38	3.56	1.35	0.91		1.67	1.07			100.19	2.888
A2. II	.828	.125	.051	.059	.185	.168	.057	.015			.021	.008				
76	48.89	13.66	3.64	7.44	8.83	8.68	3.14	1.20	2.59		1.76	0.39		SO_3 0.07	100.29	2.876
A2. II	.815	.134	.022	.103	.221	.155	.050	.013			.022	.003				
77	48.83	12.90	4.81	6.55	7.68	9.89	3.32	1.43	1.24		1.89	1.27			99.81	2.938
A2. II	.814	.126	.030	.091	.192	.177	.053	.015			.024	.009				
78	52.28	10.66	3.05	4.81	11.58	9.75	2.42	1.43	1.35	0.37	0.92	1.44		CO_2 0.09 SO_3 0.12	100.27	
A2. II	.871	.104	.019	.067	.290	.174	.039	.015			.011	.010				
79	51.03	13.15	4.31	1.59	6.44	14.10	3.06	2.24	1.17		0.85	0.19		Cl trace Fe_7S_8 1.97	100.39	
A2. II	.851	.129	.027	.022	.161	.252	.049	.024			.011	.001				
80	52.97	14.22	3.29	6.72	7.44	7.07	3.05	0.76	1.18	1.23	1.70	0.25		CO_2 0.09 SO_3 none	99.97	
A2. II	.883	.139	.021	.093	.186	.127	.049	.008			.021	.002				

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 4. DOSODIC. CAMPTONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
67	(II)III.5.3″.″4. *2.2.2.3.*	or 12.23 di 14.94 ab 23.58 hy 5.64 an 26.41 ol 4.08 mt 8.12 il 3.50 ap 0.67	Tofteholmen, Christiania Fjord, Norway.	V. Schmelck.	W. C. Brögger, Eg. Kg., III, p. 83, 1899.	Essexite.	In W. T., p. 323.
68	III.5.3.4.⊙ *2.1.2.3.*	or 9.45 di 20.34 ab 25.68 hy 16.66 an 16.12 ol 2.65 mt 5.80 il 2.28 ap 0.34	Halleberg, Sweden.	A. Merian.	A. Merian, N. J. B. B., III, p. 289, 1885.	Diabase.	In W. T., p. 323.
69	III.5.3(4).4. *2.1.2.3.*	Q 2.16 di 11.87 or 8.34 hy 19.71 ab 20.96 mt 5.57 an 23.07 il 5.02 ap 2.02	Asleskär, Loftahammar, Sweden.	R. Mauzelius.	A. Gavelin, Sv. G. Und., Aarb. III, No. 7, p. 65, 1910.	Gabbro- diabase.	
70	(II)III.5.3″.4. *2.2.2.3.*	or 10.01 di 5.37 ab 26.20 hy 17.06 an 25.02 ol 4.88 mt 6.73 il 1.52 ap 1.68	Silfberg, Dalarne, Sweden.	O. Larsson.	M. Weibull, Lunds Un. Aarsk., XXXIII, (2), 1897, No. 4, p. 24.	Diabase.	Not in W. T.
71	(II)III.5″.3(4).4. *2.4.2.3.*	or 8.34 di 10.61 ab 19.39 ol 19.21 an 28.36 mt 2.55 ne 4.54 il 4.26 ap 1.34	Svartsbergviken, N. Ulfön, Nordingra, Sweden.	N. Sahlbom.	J. E. Sobral, G. Nord. Reg., p. 131, 1913.	Olivine diabase.	
72	III.5.3.″4. *2.2.2.2.*	or 12.79 di 11.21 ab 23.58 hy 17.81 an 17.79 ol 7.46 mt 5.34 il 0.91 ap 0.34	Rösselberg, n. Karpenstein, Aachen, Rheinland.	Lindner.	E. Dathe, Jb. Pr. G. L.-A., XIX, p. cxxix, 1899.	Vogesite.	Not in W. T.
73	″III.(4)5.3″.4. *3.1.2.2.*	Q 5.70 di 20.30 or 6.67 hy 5.90 ab 23.58 mt 10.21 an 20.57 il 3.50 hm 0.96 ap 2.35	Strutberg, Roth, Rhöngebirge.	P. Schmidt.	P. Schmidt, Ref. N. J., 1905, II, p. 213.	Dolerite.	
74	III.″5.3.4. *2.1.3.2.* *2.1.2.2.*	Q 4.14 di 25.92 or 7.78 hy 2.80 ab 23.58 mt 9.98 an 19.46 il 3.34 hm 0.48 ap 1.68	Strutberg, Roth, Rhöngebirge.	P. Schmidt.	P. Schmidt, Ref. N. J., 1905, II, p. 213.	Dolerite.	
75	III.5.″3.4.	Q 1.02 di 19.01 or 8.34 hy 9.70 ab 29.87 mt 8.82 an 14.73 il 3.19 hm 2.08 ap 2.69	Reupers, Roth, Rhöngebirge.	P. Schmidt.	P. Schmidt, Ref. N. J., 1905, II, p. 213.	Dolerite.	
76	III.5.3.4.⊙ *2.2.2.2.*	or 7.23 di 16.49 ab 26.20 hy 9.38 an 19.74 ol 9.06 mt 5.10 il 3.34 ap 1.01	Gangolfsberg, Roth, Rhöngebirge.	Halfcke.	H. Proescholdt, Jb. Pr. G. L.-A., XIV, p. 12, 1894.	Dolerite.	In W. T., p. 323
77	III.5.3.4.⊙ *2.2.2.2.*	or 8.34 di 19.70 ab 27.77 hy 8.85 an 16.12 ol 4.18 mt 5.57 il 4.56 ap 3.02	Gangolfsberg, Roth, Rhöngebirge.	P. Schmidt.	P. Schmidt, Ref. N. J., 1905, II, p. 213.	Dolerite.	
78	III.5.3.4.⊙ *2.1.2.2.*	Q 1.74 di 20.01 or 8.34 hy 24.43 ab 20.44 mt 4.41 an 13.90 il 1.67 ap 3.36	Muhltal, Odenwald.	G. Butzbach.	G. Klemm, Nb. Ver. Erdk. (4), XXVII, p. 15, 1906.	Gabbro.	Cf. No. 7, III.4.3.4.
79	III.5″.″3.″4. *2.1.3.1.*	or 13.34 di 34.78 ab 19.12 wo 4.29 an 15.01 mt 2.55 ne 3.55 il 1.67 hm 2.56 pr 1.97	Michelsberg, Katzenbuckel, Odenwald.	O. N. Heiden- reich.	W. Freudenberg, Mt. Bad. G. L.-A., V (1), p. 289, 1907.	Theralite.	
80	(II)III(4)5.3″4(5). *2.1.2.2.*	Q 6.06 di 8.71 or 4.45 hy 21.01 ab 25.68 mt 4.87 an 22.52 il 3.69 ap 0.67	Abertshausen, Giessen, Hesse.	K. M. Jene.	W. Schottler, Abh. G. L.-A., Darm., IV (3), p. 466, 1908.	Trapp (diabase).	

CLASS III. SALFEMANE—Continued.

RANG 3. ALKALICALCIC. CAMPTONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
81	50.38	13.94	2.71	7.16	8.76	7.81	3.22	0.94	0.49	1.78	2.02	0.32		CO_2 0.15 SO_3 none	99.68	
A2. II	.840	.137	.017	.100	.219	.139	052	.010			.025	.002				
82	48.56	11.92	4.62	6.85	10.38	8.16	2.66	1.70	2.00	1.06	1.84	0.52		SO_3 0.65	100.92	
A2. II	.809	.117	.029	.095	.260	.146	.043	.018			.023	.004				
83	45.01	14.81	3.05	6.97	8.75	8.27	2.66	1.81	2.07	0.67	3.96	1.46		CO_2 0.31 SO_3 0.10	99.90	
A2. II	.750	.145	.019	.097	.219	.148	.043	.020			.050	.010				
84	43.81	15.32	1.51	7.61	12.82	9.12	2.57	1.85	1.50	0.29	2.36	0.88		CO_2 0.11 SO_3 0.23	99.98	
A2. II	.730	.150	.019	.106	.321	.163	.042	.020			.030	.006				
85	49.53	14.10	6.12	6.21	6.61	9.39	2.28	2.12	0.86		1.86	0.98			100.06	
A2. II	.826	.138	.038	.086	.165	.168	.037	.022			.023	.007				
86	49.08	13.43	6.49	5.92	9.58	8.92	3.42	1.00	0.32		1.82	0.51			100.49	
A2. II	.818	.132	.041	.082	.240	.159	.055	.011			.023	.004				
87	48.39	12.07	8.23	7.82	8.48	8.81	2.67	0.90	1.81		0.25	0.97		CO_2 0.36	100.76	
A2. II	.807	.118	.051	.108	.212	.157	.043	.010			.003	.007				
88	49.05	14.36	4.25	6.35	8.38	8.38	3.47	2.26	1.57		2.18	0.09	0.24		100.33	
A2. II	.818	.141	.027	.089	.210	.150	.055	.024			.027	——	.003			
89	45.96	11.77	5.35	5.85	14.02	8.64	2.63	1.81	1.35		1.90	0.56			99.84	
A2. II	.766	.115	.034	.082	.351	.154	.042	.020			.024	.004				
90	45.88	12.60	3.47	11.03	6.42	9.97	3.48	1.11	3.17	0.49	1.62	0.11	0.25	CO_2 0.15 S trace	99.75	2.98
A2. II	.765	.123	.022	.153	.161	.178	.056	.012			.020	.001	.003			
91	53.92	11.86	2.09	8.66	7.78	10.88	2.03	1.05	1.57		trace	0.12		SO_3 0.24	100.20	2.97
A3. III	.899	.116	.013	.120	.195	.195	.032	.012			——	.001				
92	53.48	15.35	1.63	7.96	5.68	8.48	2.75	2.19	1.25		0.92	0.31		SO_3 0.19	100.19	2.896
A2. II	.891	.150	.010	.111	.142	.152	.045	.023			.012	.002				
93	46.33	14.46	2.22	11.09	4.89	10.58	2.83	1.31	3.23		2.52	0.30		CO_2 0.27 SO_3 0.23 Cl 0.13	100.39	
A2. II	.772	.142	.014	.154	.122	.189	.045	.014			.032	.002				
94	47.97	13.57	2.89	8.42	8.67	8.43	3.37	2.01	2.18		1.92	0.51		SO_3 0.07	100.01	
A2. II	.800	.133	.018	.117	.217	.150	.055	.021			.024	.004				
95	46.43	13.88	3.54	8.42	8.24	8.38	3.78	1.85	2.22		2.47	0.57		CO_2 0.30 SO_3 0.12 S trace Cu 0.13	100.23	
A2. II	.774	.136	.022	.117	.206	.150	.061	.020			.031	.004				

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 4. DOSODIC. CAMPTONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
81	III.5.3.4″. *2.1.2.2.*	or 5.56 di 12.57 ab 27.25 hy 20.70 an 20.85 ol 0.90 mt 3.94 il 3.80 ap 0.67	Arnsberg, Giessen, Hesse.	K. M. Jene.	W. Schottler, Abh. G. L.-A., Darm., IV (3), p. 466, 1908.	Trapp (diabase).	
82	III.5.3.4.⊙ *2.2.2.2.*	or 10.01 di 16.98 ab 22.53 hy 13.38 an 15.57 ol 7.31 mt 6.73 il 3.50 ap 1.34	Galgenberg, Giessen, Hesse.	Tritt.	W. Schottler, Abh. G. L.-A., Darm., IV (3), p. 466, 1908.	Trapp (diabase).	
83	″III.5.3″.″4. *2.3.2.2.*	or 11.16 di 7.26 ab 22.53 hy 3.86 an 22.80 ol 15.43 mt 4.41 il 7.60 ap 3.36	Kehrenberg, Giessen, Hesse.	G. Butzbach.	W. Schottler, Abh. G. L.-A., Darm., IV (3), p. 460, 1908.	Basalt.	
84	III.5(6).3″.″4. *2.4.2.2.*	or 11.12 di 12.14 ab 10.22 ol 24.18 an 24.46 mt 4.41 ne 6.39 il 4.56 ap 2.02	Kesselbach, Giessen, Hesse.	G. Butzbach.	W. Schottler, Abh. G. L.-A., Darm., IV (3), p. 460, 1908.	Basalt.	
85	″III.5.3″.(3)4. *2.1.2.2.*	Q 3.48 di 14.55 or 12.23 hy 12.91 ab 19.39 mt 8.82 an 21.96 il 3.50 ap 2.35	Grenzebach, Hesse.	C. Trenzen.	C. Trenzen, N. J., 1902, II, p. 21.	Dolerite.	
86	III.5.3.4″. *2.2.2.2.*	or 6.12 di 17.47 ab 28.82 hy 8.39 an 18.35 ol 6.91 mt 9.51 il 3.50 ap 1.34	Londorf, Vogelsberg, Hesse.	A. Streng.	A. Streng, N. J., 1888, II, p. 211.	Dolerite.	In W. T., p. 323.
87	III.5.3.4.⊙ *2.1.2.2.*	Q 1.44 di 16.25 or 5.56 hy 20.98 ab 22.53 mt 11.83 an 18.07 il 0.46 ap 3.25	Laubach, Vogelsberg, Hesse.	J. M. Ledroit.	J. M. Ledroit, Ber. Oberh. Ges., XXIV, p. 151, 1886.	Basalt.	In W. T., p. 323.
88	″III.5.3.4. *2.2.2.2.*	Q 13.34 di 19.43 ab 24.10 ol 12.00 an 17.24 mt 6.26 ne 2.56 il 4.10	Klein Staufenberg, n. Kassel, Hesse.	Fromm.	F. Bender, In. Diss. Wurz., p. 30, 1911.	Basalt.	
89	III.5.3.″4. *2.3.2.2.*	or 11.12 di 18.17 ab 17.29 ol 21.40 an 14.73 mt 7.89 ne 2.56 il 3.65 ap 1.34	Schwengeberg, Lange Berg, Hesse-Nassau.	M. Dittrich.	R. Bernges, N. J. B. B., XXXI, p. 623, 1911.	Leucite basalt.	
90	III.5(6).3.4″. *2.2.2.3.*	or 6.67 di 27.46 ab 20.44 ol 12.65 an 15.29 mt 5.10 ne 4.83 il 3.04 ap 0.34	Schönbach, n. Herborn, Hesse-Nassau.	E. Reuning.	E. Reuning, N. J. B. B., XXIV, p. 432, 1907.	Diabase.	
91	III.5.3(4).4. *1.1.2.3.*	Q 4.14 di 27.26 or 6.67 hy 20.28 ab 16.77 mt 3.02 an 20.02 ap 0.34	Heppeln, Brocken, Harz.	Klüss.	O.H. Erdmannsdoerfer, Jb. Pr. G. L.-A., XXVII, p. 361, 1906.	Biotite gabbro.	
92	(II)III.5.3.″4. *1.1.2.3.*	Q 1.50 di 15.38 or 12.79 hy 18.88 ab 23.58 mt 2.32 an 22.80 il 1.82 ap 0.67	Riefenbach, n. Harzburg, Brocken, Harz.	Eyme.	O.H. Erdmannsdoerfer, Jb. Pr. G. L.-A., XXVII, p. 362, 1906.	Biotite gabbro.	
93	III.5.3″.4. *2.2.2.3.*	or 7.78 di 22.88 ab 22.01 ol 11.12 an 23.07 mt 3.25 ne 0.85 il 4.86 ap 0.67	Forstort Winde, n. Rübeland, Harz.	Not stated.	O.H. Erdmannsdoerfer, N. J. Cb., 1909, p. 40.	Diabase.	
94	III.5.″3.4. *2.3.2.2.*	or 11.68 di 17.95 ab 24.10 ol 16.43 an 15.85 mt 4.18 ne 2.56 il 3.65 ap 1.34	Bramburg, Sollings, Prussia.	Klüss.	H. Stremme, Jb. Pr. G. L.-A., XXXII (I), p. 284, 1911.	Basalt.	
95	III.5(6).″3.4. *2.3.2.2.*	or 11.12 di 18.35 ab 21.48 ol 14.57 an 15.29 mt 5.10 ne 5.68 il 4.71 ap 1.34	Bramburg, Sollings, Prussia.	Eyme.	H. Stremme, Jb. Pr. G. L.-A., XXXII (I), p. 284, 1911.	Basalt.	

CLASS III. SALFEMANE—Continued.

RANG 3. ALKALICALCIC. CAMPTONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
96	46.19	12.15	3.28	7.81	11.65	8.53	3.05	2.02	2.63		2.01	1.03		CO_2 0.18	100.53	2.92
A2. II	.770	.119	.021	.108	.291	.151	.049	.021			.025	.007				
97	51.03	14.82	2.23	5.61	9.77	7.01	4.19	1.05	3.49		0.95		0.18		100.33	
A2. II	.851	.145	.014	.078	.244	.125	.068	.012			.012		.003			
98	47.31	16.66	2.67	6.55	8.20	9.61	3.40	1.44	2.88		1.33				100.05	2.99
A3. III	.789	.163	.016	.091	.205	.171	.055	.016			.017					
99	45.17	13.00	9.08	5.04	6.66	12.64	2.72	1.88	2.12	0.10	1.47				99.88	
A3. III	.753	.127	.057	.070	.167	.226	.044	.020			.018					
100	53.48	13.59	1.78	8.30	5.88	7.20	4.38	1.02	0.79	0.11	2.52	0.59			99.64	
A2. II	.892	.133	.011	.115	.147	.129	.071	.011			.031	.004				
101	52.40	15.26	0.74	8.33	7.45	7.33	3.54	0.99	0.29	0.06	3.12	0.49	0.08	NiO 0.06	100.14	
A2. II	.873	.150	.005	.115	.186	.130	.057	.011			.039	.004	.001			
102	52.20	13.20	1.29	7.91	8.71	7.95	3.20	1.01	1.68	0.29	2.00	0.24			99.68	
A2. II	.870	.129	.008	.110	.218	.142	.052	.011			.025	.002				
103	49.00	15.63	4.03	5.00	7.86	8.16	3.93	2.60	0.13	0.18	3.25	0.63			100.40	
A2. II	.817	.153	.025	.069	.197	.146	.063	.028			.041	.004				
104	51.01	15.09	2.07	6.88	6.52	11.34	2.53	2.02	0.15		0.83	1.44	0.13	ZrO_2 none SO_3 0.06 Cr_2O_3 0.05	100.12	
A. I	.850	.148	.013	.096	.163	.202	.040	.021			.010	.010	.002			
105	50.83	16.66	1.52	6.64	6.08	10.99	2.66	2.05	0.36		0.81	1.61	0.12		100.33	
A2. II	.847	.163	.009	.092	.152	.196	.043	.022			.010	.011	.102			
106	48.46	15.92	3.42	8.00	5.05	10.02	4.13	1.61	0.01	0.03	2.03	0.65	0.18	CO_2 none ZrO_2 none SO_3 0.14 SrO 0.09 Ba	99.74	
A2. II	.808	.156	.021	.111	.126	.179	.066	.017			.025	.005	.003			
107	46.40	14.34	4.09	8.22	7.00	9.85	3.59	1.00	0.14	0.08	4.54	0.85	0.25	CO_2 none ZrO_2 none SO_3 0.12 BaO 0.09 SrO 0.03	100.59	
A1. I	.773	.141	.026	.114	.175	.177	.058	.011			.057	.006	.003			
108	46.22	12.23	4.91	7.71	6.74	9.86	3.39	1.13	0.17	0.05	5.68	1.46			99.55	
A2. II	.770	.120	.031	.107	.169	.176	.055	.012			.071	.010				
109	45.72	12.45	1.57	12.01	5.29	9.58	3.40	1.08	0.40	0.01	6.43	1.54	0.16	CO_2 none NiO 0.15 SrO 0.03	99.82	
A2. II	.762	.122	.010	.167	.132	.171	.055	.011			.080	.010	.002			
110	44.83	11.73	1.35	11.79	5.50	9.63	3.34	1.40	0.81	0.10	6.88	2.14	0.20		99.70	
A2. II	.747	.115	.009	.164	.138	.172	.054	.015			.086	.015	.003			

ORDER 4. PERFELIC. GALLARE—Continued.

SUBRANG 4. DOSODIC. CAMPTONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
96	III.5″.3.(3)4. 2.3.2.2.	or 11.67 ab 19.91 an 13.62 ne 3.12 di 17.51 ol 20.72 mt 4.87 il 3.80 ap 2.35	Breitenberg, n. Oberellen, Prussia.	Not stated.	F. Beyschlag, Erl. G. Kt. Pr., Bl. Altmorschen, p. 24, 1891.	Basalt.	In W. T., p. 323.
97	(II)III.5.3.4(5). 2.3.2.2.	or 6.67 ab 35.63 an 18.07 di 13.34 hy 0.33 ol 17.86 mt 3.25 il 1.82	Mount Goryczkowy, Posredni, Tatra Mountains, Hungary.	Z. Weyberg.	Z. Weyberg, Ref. N. J., 1912, I, p. 398.	Diorite.	
98	(II)III.5″.3.4. 2.3.2.2.	or 8.90 ab 19.39 an 25.58 ne 5.11 di 17.57 ol 14.22 mt 3.71 il 2.58	Val Rosegg, Bernina District, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Gabbro-diorite.	
99	III.5(6).3.″4. 2.1.3.2.	or 11.12 ab 12.05 an 17.51 ne 5.94 di 35.21 ol 0.28 mt 12.06 il 2.74 hm 0.80	Trift, Aarmassif, Switzerland.	O. Fischer.	O. Fischer, T. M. P. M., XXIV, p. 87, 1905.	Amphibolite (hornblende gabbro).	
100	″III.5.(2)3.4(5). 2.1.2.3.	Q 0.78 or 6.12 ab 37.20 an 14.18 di 14.74 hy 17.13 mt 2.55 il 4.71 ap 1.34	Monte Austida, Sardinia.	H. S. Washington.	H. S. Washington, C. R. Cong. G. Int., XII, p. 231, 1914.	Basalt.	
101	″III.5.3.4″. 2.1.2.3.	Q 0.48 or 6.12 ab 29.87 an 22.80 di 7.88 hy 24.28 mt 1.16 il 5.93 ap 1.34	Cuglieri, Monte Ferru, Sardinia.	H. S. Washington.	H. S. Washington, A. J. S., XXXIX, p. 524, 1915.	Basalt.	
102	III.5.3.4″. 2.1.2.2.	or 6.12 ab 27.25 an 18.35 di 15.48 hy 23.62 ol 0.62 mt 1.86 il 3.80 ap 0.67	Monte Tuvonari, Monte Ferru, Sardinia.	H. S. Washington.	H. S. Washington, A. J. S., XXXIX, p. 524, 1915.	Basalt.	
103	(II)III.5″.(2)3.4. 2.2.2.2.	or 15.57 ab 25.15 an 17.24 ne 4.26 di 15.37 ol 9.09 mt 5.80 il 6.23 ap 1.34	Tres Nuraghes, n. Bosa, Sardinia.	H. S. Washington.	H. S. Washington, Q. J. G. S., LXIII, p. 74, 1907.	Basalt.	
104	III.5.3″.(3)4. 1.1.2.2.	or 11.68 ab 20.96 an 23.63 di 19.00 hy 14.24 ol 2.93 mt 3.02 il 1.52 ap 3.36	November, 1915, Stromboli, Aeolian Islands.	H. S. Washington.	F. A. Perret, A. J. S., XLII, p. 451, 1916.	Basalt.	
105	(II)III.5.3(4).″4. 1.2.2.3.	or 12.23 ab 22.53 an 27.24 di 13.82 hy 12.38 ol 4.22 mt 2.09 il 1.52 ap 3.70	August, 1914, Stromboli, Aeolian Islands.	H. S. Washington.	F. A. Perret, A. J. S., XLII, p. 451, 1916.	Basalt.	
106	(II)III.5″.3.4. 2.2.2.3.	or 9.45 ab 15.68 an 20.29 ne 4.83 di 20.24 ol 8.50 mt 4.87 il 3.80 ap 1.68	Lava of 1910, Mount Etna, Sicily.	H. S. Washington.	Unpublished.	Basalt.	
107	III.5.3.4″. 2.2.2.3.	or 6.12 ab 28.30 an 20.02 ne 1.14 di 18.81 ol 9.32 mt 6.03 il 8.66 ap 2.02	Cuddia Ferle, Pantelleria.	H. S. Washington.	H. S. Washington, J. G., XXI, p. 711, 1914.	Basalt.	
108	III.5.3.4.⊙ 2.1.2.3.	or 6.67 ab 28.82 an 14.73 di 19.54 hy 8.06 ol 0.28 mt 7.19 il 10.79 ap 3.36	Monte Sant'Elmo, Pantelleria.	H. S. Washington.	H. S. Washington, J. G., XXI, p. 711, 1914.	Basalt.	
109	III.5.3.4″. 2.2.2.3.	or 6.12 ab 28.82 an 15.57 di 18.77 hy 5.74 ol 6.29 mt 2.32 il 12.16 ap 3.36	Costa Zeneti, Pantelleria.	H. S. Washington.	H. S. Washington, J. G. XXI, p. 711, 1914.	Basalt.	Dike in tuff.
110	III.5.(2)3.4. 3.2.2.3.	or 8.34 ab 28.30 an 12.79 di 17.22 hy 5.21 ol 6.78 mt 2.09 il 13.07 ap 5.04	Foerstner Volcano, n. Pantelleria.	H. S. Washington.	H. S. Washington, A. J. S., XXVII, p. 145, 1909.	Basalt.	Submarine eruption of 1891.

CLASS III. SALFEMANE—Continued.

RANG 3. ALKALICALCIC. CAMPTONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
111	48.06	15.90	3.37	7.97	7.11	9.37	3.19	0.85	0.40	0.06	3.31	0.36	0.06	CO_2 none Cl 0.14 NiO 0.09 CuO none	100.24	
A1. I	.801	.156	.021	.111	.178	.168	.052	.009			.041	.003	——			
112	46.55	14.55	3.17	7.88	8.61	8.75	3.71	1.62	0.14	0.03	3.84	0.55	0.10	NiO 0.12	99.62	
A2. II	.776	.143	.020	.110	.215	.156	.060	.017			.048	.004	.001			
113	45.75	13.98	3.23	8.02	14.69	7.11	3.10	1.10	0.16	0.04	2.90	0.36	0.06	CO_2 none Cr_2O_3 trace NiO 0.14	100.64	
A2. II	.763	.137	.020	.111	.367	.127	.050	.012			.036	.003	——			
114	50.42	13.35	3.92	12.00	3.99	7.99	2.77	1.35	1.04		2.25	0.15	0.35	FeS_2 0.48 NiO 0.07	100.13	3.017
A2. II	.840	.131	.024	.167	.100	.143	.045	.015			.028	.001	.005			
115	49.15	11.48	3.97	13.22	5.39	8.63	2.64	1.36	0.37	0.20	2.41	0.32	0.44	FeS_2 0.22 NiO 0.07 BaO 0.04	99.91	3.090
A1. I	.819	.112	.025	.183	.135	.154	.043	.015			.030	.002	.006			
116	47.73	13.33	0.68	14.99	5.63	7.41	2.77	1.17	"Increase."	0.11	4.04	0.61	0.30	Cl 0.10 S 0.26	99.13	
A3. III	.796	.131	.004	.208	.141	.132	.045	.012			.049	.004	.004			
117	47.34	14.03	0.80	17.20	2.24	6.89	2.74	2.34	"Increase."	0.05	4.17	1.07	0.21	Cl 0.10 S 0.30	99.48	
A3. III	.789	.137	.005	.239	.056	.123	.044	.025			.051	.008	.003			
118	46.97	16.16	10.66	4.38	4.56	9.02	4.76	1.26	1.74		0.14		0.75		100.40	2.988
A2. II	.783	.159	.067	.061	.114	.161	.077	.014			.002		.011			
119	44.57	13.58	12.97	5.43	5.17	11.09	3.81	0.97	1.96				0.17		99.72	3.077
A3. III	.743	.133	.081	.075	.129	.198	.061	.011					.002			
120	46.44	16.30	4.82	7.07	4.92	10.03	3.82	1.44	1.40		2.90	0.82		S 0.08	100.04	2.906
A2. II	.774	.160	.030	.099	.123	.179	.061	.015			.036	.006				
121	45.69	17.02	4.59	8.52	5.62	11.31	3.21	1.07	0.76		1.30	0.57		Cl 0.04 S 0.08	99.91	2.965
A2. II	.762	.167	.029	.118	.141	.202	.052	.012			.016	.004				
122	44.86	16.18	7.22	7.10	5.34	9.95	3.78	1.39	0.85		2.52	0.92		S 0.06	100.17	2.939
A2. II	.748	.159	.045	.099	.134	.178	.061	.015			.032	.006				
123	44.50	13.85	3.47	9.02	11.00	10.06	2.70	0.92	0.71		2.61	0.84		S 0.07	99.75	3.034
A2. II	.742	.136	.022	.125	.275	.180	.044	.010			.033	.006				
124	44.40	15.40	5.20	7.81	7.23	9.92	2.83	1.19	2.15		2.77	0.77		S 0.04	99.71	2.931
A2. II	.740	.151	.033	.108	.181	.177	.045	.013			.035	.005				
125	43.85	12.94	2.70	10.51	11.90	9.49	2.42	1.06	1.69		2.53	0.61		S 0.05	99.75	3.006
A2. II	.731	.127	.017	.146	.298	.170	.039	.012			.032	.004				

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 4. DOSODIC. CAMPTONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
111	III.5.3(4).4″. *2.2.2.3.*	or 5.00, ab 26.20, an 26.97, di 13.63, hy 10.30, ol 5.31, mt 4.87, il 6.23, ap 1.01	Monte Ponente, Linosa Island.	H. S. Washington.	H. S. Washington, J. G., XVI, p. 17, 1908.	Basalt.	
112	III.5″.3.4. *2.3.2.2.*	or 9.45, ab 23.32, an 18.35, ne 4.40, di 17.05, ol 13.53, mt 4.64, il 7.30, ap 1.34	Il Fosso, Linosa Island.	H. S. Washington.	H. S. Washington, J. G., XVI, p. 23, 1908.	Basalt.	Block in tuff.
113	III.5.3.4.⊙ *2.4.1.2.*	or 6.67, ab 22.01, an 20.85, ne 2.27, di 9.26, ol 28.17, mt 4.64, il 5.47, ap 1.01	Monte Raneri, Linosa Island.	H. S. Washington.	H. S. Washington, J. G., XVI, p. 26, 1908.	Olivine basalt.	
114	III.5.3.4.⊙ *2.1.2.4.*	Q 2.94, or 8.34, ab 23.58, an 19.74, di 16.12, hy 17.72, mt 5.57, il 4.26, ap 0.34	Schtscheliki, Lake Onega, Olonez, Russia.	W. Wahl.	W. Wahl, T. M. P. M., XXVI, p. 124, 1907.	Diabase.	
115	III.5.3.4.⊙ *2.1.2.3.*	or 8.34, ab 22.53, an 15.01, di 21.33, hy 20.65, mt 5.80, il 4.56, ap 0.67	Schtscheliki, Lake Onega, Olonez, Russia.	W. Wahl.	W. Wahl, Fennia, XXIV, No. 3, p. 20, 1908.	Diabase.	
116	III.5.3.4.⊙ *2.2.2.3.*	or 6.67, ab 23.58, an 20.57, di 10.33, hy 20.71, ol 6.93, mt 0.93, il 7.45, ap 1.34	Goroschki, Volhynia, Russia.	W. Tarassenko.	W. Tarassenko, Ref. N. J., 1899, I, p. 463.	Olivine gabbro.	In W. T., p. 325.
117	III.5.3.(3)4. *2.2.2.4.*	or 13.90, ab 23.06, an 18.90, di 6.72, hy 19.31, ol 5.29, mt 1.16, il 7.25, ap 2.69	Goroschki, Volhynia, Russia.	W. Tarassenko.	W. Tarassenko, Ref. N. J., 1899, I, p. 463.	Olivine-pyroxene syenite.	In W. T., p. 325.
118	(II)III 5(6).″3.4″. *3.1.2.3.*	or 7.78, ab 27.51, an 18.90, ne 6.96, di 20.19, ol 1.78, mt 15.54, il 0.30	Dalnaya Gora, S. Ural Mountains, Russia.	J. Morozewicz.	J. Morozewicz, T. M. P. M., XXIII, p. 123, 1904.	Augite diorite (gabbro).	
119	III.5(6).3.4(5). *3.1.3.2.*	or 6.12, ab 22.01, an 16.96, ne 5.40, di 27.86, wo 0.93, mt 17.86, hm 0.64	Beresowaya Gora, Ural Mountains.	J. Morozewicz.	J. Morozewicz, C. G. Rus. Mem. XVIII, No. 1, p. 10, 1901.	Augite diorite.	Also in T. M. P. M., XXIII, p. 120, 1904.
120	(II)III.5.3.4. *3.2.2.3.*	or 8.34, ab 26.72, an 23.35, ne 2.84, di 16.71, ol 6.21, mt 6.96, il 5.47, ap 2.02	Punta do Sol, Madeira.	Eyme.	C. Gagel, Z. D. G. G., LXIV, p. 428, 1912.	Trachydolerite.	
121	(II)III.5″.3(4).4. *2.2.2.3.*	or 6.67, ab 18.86, an 28.63, ne 4.54, di 19.31, ol 10.37, mt 6.73, il 2.43, ap 1.34	Soca, Madeira.	Eyme.	C. Gagel, Z. D. G. G., LXIV, p. 399, 1912.	Essexite.	
122	(II)III.5″.3.4. *3.2.2.3.*	or 8.34, ab 23.58, an 23.07, ne 4.54, di 16.55, ol 6.02, mt 10.44, il 4.86, ap 2.02	Pico Serrado, Madeira.	Klüss.	C. Gagel, Z. D. G. G., LXIV, p. 428, 1912.	Trachydolerite.	
123	III.5.3(4).4″. *2.3.2.2.*	or 5.56, ab 18.34, an 22.80, ne 2.56, di 17.36, ol 20.42, mt 5.10, il 5.02, ap 2.02	Punta Delgada, n. Sao Vicente, Madeira.	Klüss.	C. Gagel, Z. D. G. G., LXIV, p. 428, 1912.	Essexite-melaphyre.	
124	III.5.3(4).4. *2.3.2.2.*	or 7.23, ab 23.06, an 25.85, ne 0.28, di 14.85, ol 11.68, mt 7.66, il 5.32, ap 1.68	Lombo Grande Curral, Madeira.	Klüss.	C. Gagel, Z. D. G. G., LXIV, p. 428, 1912.	Trachydolerite.	
125	III.5″.3(4).4. *2.3.2.2.*	or 6.67, ab 14.41, an 21.13, ne 3.27, di 18.14, ol 24.44, mt 3.94, il 4.86, ap 1.34	Ribeira de Massapez, Madeira.	Klüss.	C. Gagel, Z. D. G. G., LXIV, p. 429, 1912.	Essexite porphyry.	

CLASS III. SALFEMANE—Continued.

RANG 3. ALKALICALCIC. CAMPTONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
126	43.79	13.73	3.37	10.20	9.46	10.54	2.71	1.25	1.66		2.82	0.67		S 0.04	100.24	3.022
A2. II	.730	.135	.021	.142	.237	.188	.044	.014			.035	.005				
127	42.40	14.19	6.14	7.69	9.02	11.08	2.50	1.43	1.37		3.68	0.67		S 0.06	100.23	3.033
A2. II	.707	.139	.038	.107	.226	.198	.040	.015			.046	.005				
128	42.19	13.80	5.52	8.87	8.55	11.39	2.50	1.21	1.91		3.15	0.72		S 0.12	99.85	3.010
A2. II	.703	.135	.034	.124	.214	.204	.040	.013			.039	.005				
129	47.95	16.18	3.95	6.21	7.92	8.01	4.68	1.02	1.50		2.68	0.32			100.42	
A2. II	.799	.159	.025	.086	.198	.143	.076				.034	.002				
130	47.81	13.71	6.31	5.83	7.47	9.28	2.27	1.62	1.99	0.65	2.87	0.52	0.11		100.44	
A2. II	.787	.134	.039	.081	.187	.166	.037	.017			.036	.004	.002			
131	45.73	11.20	6.46	5.53	11.36	10.45	2.19	1.36	1.20	0.50	3.23	0.21	0.54	Cr_2O_3 0.16	100.12	
A2. II	.762	.110	.041	.076	.284	.187	.035	.015			.040	.001	.008			
132	49.05	13.73	8.26	9.31	3.96	7.01	3.34	1.89	0.62	0.68	0.32		0.41		99.97	
A2. II	.818	.135	.052	.129	.099	.125	.054	.020			.004		.006			
133	48.50	12.32	10.87	5.33	5.36	10.42	3.45	1.74	0.39		2.23	0.24	trace		100.85	
A2. II	.808	.121	.068	.074	.134	.186	.056	.018			.028	.002	——			
134	46.60	15.06	12.26	6.15	2.58	9.66	3.89	0.97	0.80		1.98	0.44	0.71	CO_2 trace SO_3 trace	101.10	
B2. III	.777	.148	.077	.086	.065	.172	.063	.010			.025	.003	.010			
135	50.62	16.45	2.61	7.02	6.61	9.23	3.04	1.42	0.18	0.37	1.77	0.39			99.71	
A2. II	.847	.161	.016	.097	.165	.164	.049	.015			.022	.003				
136	47.81	13.94	3.26	8.35	9.52	8.73	2.97	0.87	2.16		2.07	0.67	0.25		100.62	
A2. II	.797	.137	.021	.116	.238	.155	.048	.009			.026	.005	.004			
137	44.55	16.25	1.90	14.40	9.43	6.29	3.29	1.04	0.12		3.45	0.06			100.78	
A2. II	.743	.159	.012	.200	.236	.113	.053	.011			.043	——				
138	47.22	15.21	3.99	6.55	7.37	8.49	3.29	2.18	0.56		2.60	0.41			99.75	
A2. II	.787	.149	.025	.091	.184	.152	.053	.023			.033	.003				
139	47.38	11.51	5.17	8.49	6.87	11.43	2.02	1.76	0.97		3.65	0.52			99.77	
A2. II	.790	.113	.032	.118	.172	.204	.032	.019			.046	.004				
140	46.70	13.21	2.62	7.26	11.48	9.76	2.28	1.36	2.44		2.36	0.31			99.78	
A2. II	.778	.129	.016	.101	.287	.174	.037	.015			.030	.002			(99.72)	

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 4. DOSODIC. CAMPTONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rcok name.	Remarks.
126	III.5(6).3″.4. *2.3.2.2.*	or 7.78 di 21.10 ab 13.10 ol 17.98 an 21.41 mt 4.87 ne 5.40 il 5.32 ap 1.68	Rabaçal, Madeira.	Eyme.	C. Gagel, Z. D. G. G., LXIV, p. 429, 1912.	Trachydolerite.	
127	III.5″.3(4).4. *2.2.2.2.*	or 8.34 di 21.24 ab 13.10 ol 11.09 an 23.35 mt 8.82 ne 4.26 il 6.99 ap 1.68	Nossa Senhora, Gran Curral, Madeira.	Eyme.	C. Gagel, Z. D. G. G., LXIV, p. 429, 1912.	Trachydolerite.	
128	III.5(6).3(4).4. *2.2.2.2.*	or 7.23 di 23.32 ab 12.05 ol 12.19 an 22.80 mt 7.89 ne 4.83 il 5.93 ap 1.68	Caniçal, Madeira.	Eyme.	C. Gagel, Z. D. G. G., LXIV, p. 429, 1912.	Limburgitic trachydolerite.	
129	(II)III.5″.3.4(5). *2.3.2.2.*	or 6.12 di 14.08 ab 29.87 ol 11.88 an 20.02 mt 5.80 ne 5.40 il 5.17 ap 0.67	Les Mamelles, Cap Verde, Senegal.	Pisani.	J. Chantard, C. R., CXLIII, p. 921, 1906.	Basalt.	Also in B. Soc. G. Fr. (4), VII, p. 437, 1907.
130	III.5.3(4).4. *2.1.2.2.*	Q 2.70 di 15.87 or 9.45 hy 12.36 ab 19.39 mt 9.05 an 22.24 il 5.47 ap 1.34	Fernando Poo Island, West Africa.	A. Lindner.	W. Boese, N. J. B. B., XXXIV, p. 280, 1912.	Basalt.	Three decimals.
131	III.5.3.4.⊙ *2.2.2.2.*	or 8.34 di 25.95 ab 18.34 hy 3.70 an 16.68 ol 9.16 mt 9.51 il 6.08 ap 0.67	St. Isabel, Fernando Poo Island, West Africa.	A. Lindner.	W. Boese, N. J. B. B., XXXIV, p. 294, 1912.	Basalt.	Three decimals.
132	″III.5.3.4. *2.1.2.3.*	Q 0.60 di 14.72 or 11.12 hy 13.03 ab 28.30 mt 12.06 an 16.96 il 0.61	Tegele, Kordofan.	D. Schimpff.	G. Linck, N. J. B. B., XVII, p. 437, 1903.	Gabbro-porphyrite.	TiO_2 low?
133	III.5.(2)3.4. *3.1.3.2.*	Q 0.24 di 28.51 or 10.01 hy 0.20 ab 29.34 mt 10.67 an 13.07 il 4.26 hm 3.52 ap 0.67	Alid Volcano, Buia, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 132, 1909.	Olivine basalt.	
134	(II)III.5.3.4(5). *3.1.3.3.*	Q 2.22 di 14.04 or 5.56 wo 2.55 ab 33.01 mt 16.47 an 20.85 il 3.80 hm 0.96 ap 1.01	Aden, Arabia.	E. Manasse.	E. Manasse, Mem. Soc. Tosc., XXIV, p. 178, 1908.	Basalt.	
135	(II)III.5.3(4).4. *2.1.2.2.*	or 8.34 di 12.79 ab 25.68 hy 13.32 an 26.97 ol 3.46 mt 3.71 il 3.34 ap 1.01	Near Amboutra, Madagascar.	Not stated.	A. Lacroix, pers. com.	Hypersthene gabbro.	
136	III.5.3″.4″. *2.2.2.2.*	or 5.00 di 12.91 ab 25.15 hy 11.30 an 22.24 ol 11.51 mt 4.87 il 3.95 ap 1.68	Near Trtriw, Antsirabe, Madagascar.	Not stated.	Duparc, Wunder and Sabot, Mem. Soc. Phys. Gen., XXXVI, p. 298, 1910.	Basalt.	
137	″III.5.3(4).4″. *2.4.1.3.*	or 6.12 di 4.11 ab 21.48 ol 29.83 an 26.41 mt 2.78 ne 3.41 il 6.54	Anabohitsy, n. Ampanihy, Mahafaly, Madagascar.	Pisani.	A. Lacroix, B. Soc. Min. Fr., XXXI, p. 323, 1908.	Troctolite.	
138	(II)III.5.3.4. *2.3.2.2.*	or 12.79 di 15.22 ab 24.10 ol 11.10 an 20.29 mt 5.80 ne 1.99 il 5.02 ap 1.01	Soanindravina, Ankaratra, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVI, p. 177, 1913.	Basalt.	
139	III.5.3.(3)4. *2.1.2.3.*	Q 1.14 di 28.63 or 10.56 hy 8.81 ab 16.77 mt 7.42 an 17.24 il 6.99 ap 1.34	Bras Rouge, Cilaos, Reunion Island.	Boiteau.	A. Lacroix, C. R., CLV, p. 543, 1912.	Gabbro.	
140	III.5.3(4)4. *2.3.2.2.*	or 8.34 di 19.89 ab 19.39 hy 1.26 an 21.41 ol 18.05 mt 3.71 il 4.56 ap 0.67	Cilaos, Reunion Island.	Boiteau.	A. Lacroix, C. R., CLV, p. 543, 1912.	Basalt.	

CLASS III. SALFEMANE—Continued.

RANG 3. ALKALICALCIC. CAMPTONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
141	45.57	17.16	3.64	8.41	5.33	10.33	3.10	1.88	0.94		2.82	0.54			99.72	
A2. II	.760	.168	.023	.117	.133	.184	.050	.020			.035	.004			(99.74)	
142	47.67	14.20	3.59	9.18	6.24	8.98	3.21	2.41	0.92		2.64	0.66		SO_3 trace S 0.10	99.80	2.889
A2. II	.795	.139	.023	.128	.156	.161	.052	.026			.033	.005				
143	50.42	13.32	5.15	8.52	5.89	10.70	2.63	1.22	0.61		1.18	0.20			99.84	
A2. II	.840	.131	.032	.118	.147	.191	.042	.013			.015	.001				
144	53.29	13.20	1.14	10.72	7.78	6.81	2.38	1.40	1.22	0.71	1.14	0.08	0.15		100.02	
A2. II	.888	.129	.007	.149	.195	.121	.029	.015			.014	—	.002			
145	49.03	14.43	1.29	9.40	11.93	7.28	3.14	1.24	0.73		1.71	0.44	trace		100.62	
A2. II	.817	.141	.008	.131	.300	.130	.051	.013			.021	.003	—			
146	47.56	14.13	1.89	10.00	8.37	8.43	2.95	1.38	1.92		2.77	0.66	0.13		100.29	
A2. II	.793	.139	.012	.139	.209	.150	.048	.015			.035	.005	.002		(100.19)	
147	42.93	10.71	6.03	6.14	11.48	11.21	2.42	1.98	2.78		2.48	1.38	1.23		100.77	
A2. II	.716	.105	.038	.085	.287	.200	.039	.021			.031	.010	.018			
148	51.35	14.50	1.77	9.99	3.75	8.50	2.62	1.77	2.62		3.80				100.67	
A3. III	.856	.142	.011	.139	.094	.152	.042	.019			.048					
149	47.40	13.96	2.30	10.80	6.87	7.65	2.57	1.62	2.70		3.70	0.39			99.76	
A2. II	.790	.137	.014	.150	.172	.137	.042	.017			.046	.003				
150	50.04	11.65	2.63	15.76	5.58	7.89	3.08	0.89	0.19		1.93	0.20			99.84	
A2. II	.834	.114	.016	.219	.140	.141	.050	.009			.024	.001				
151	54.10	13.42	4.06	7.43	4.43	7.97	3.87	1.15	0.88	none	2.35	0.46	0.30		100.36	2.79
A2. II	.902	.131	.025	.103	.111	.143	.063	.012			.030	.003	.004			
152	50.27	12.50	2.44	8.18	10.25	7.52	3.29	1.42	1.14	0.46	2.26	0.60	0.18		100.57	2.88
A2. II	.838	.123	.015	.114	.256	.134	.053	.015			.028	.004	.003			
153	48.55	12.45	3.60	10.43	7.64	7.58	3.20	1.75	1.66	0.34	1.34	0.61	0.25		99.40	
A2. II	.809	.122	.023	.144	.191	.136	.052	.019			.017	.004	.002			
154	47.50	14.19	1.78	12.15	5.06	7.47	3.85	1.58	1.59	0.33	3.08	0.79	0.20		99.57	2.79
A2. II	.792	.139	.011	.169	.127	.134	.062	.017			.029	.005	.003			

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 4. DOSODIC. CAMPTONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
141	(II)III.5″.3″.4. 2.2.2.3.	or 11.12 di 16.57 ab 18.08 ol 9.42 an 27.24 mt 5.34 ne 4.40 il 5.32 ap 1.34	Cilaos, Reunion Island.	Boiteau.	A. Lacroix, C. R., CLV, p. 541, 1912.	Essexitic gabbro.	
142	″III.5.3.″4. 2.3.2.3.	or 14.46 di 18.89 ab 22.79 ol 11.49 an 16.96 mt 5.34 ne 2.41 il 5.02 ap 1.68	Mukira Lava Field, Lake Kivu District, German Central Africa.	Eyme.	L. Finckh, D. Zent. Afr. Exp., I (1), p. 18, 1912.	Leucite basanite.	
143	III.5.3″.4. 2.1.2.3.	Q 1.68 di 25.34 or 7.23 hy 11.72 ab 22.01 mt 7.42 an 21.13 il 2.28 ap 0.34	Lebombo Mountain, Swaziland, Transvaal.	R. Reinisch.	J. M. Henderson, Tr. G. Soc. S. Afr., XII, p. 30, 1910.	Diabase.	
144	III.5.3″.4. 1.1.2.3.	Q 2.70 di 10.52 or 8.34 hy 31.22 ab 20.44 mt 1.62 an 20.85 il 2.13	Umhlatuzi Crossing, Zululand, Natal.	G. T. Prior.	G. T. Prior, Ann. Natal Mus., II (2), p. 149, 1910.	Dolerite.	
145	III.5.3.4.⊙ 1.4.2.2.	or 7.23 di 9.64 ab 26.72 hy 2.92 an 21.41 ol 25.93 mt 1.86 il 3.19 ap 1.01	Nakamura Bay, Dogo, Oki Islands, Japan.	K. Yokoyama.	S. Kozu, Sci. Rep. Toho. Un. (2), I, p. 51, 1913.	Basalt.	
146	III.5.3.4.⊙ 2.3.2.3.	or 8.34 di 12.89 ab 25.15 hy 5.18 an 21.13 ol 15.91 mt 2.78 il 5.32 ap 1.68	Daimanji Yama, Dogo, Oki Islands, Japan.	K. Yokoyama.	S. Kozu, Sci. Rep. Toho. Un. (2), I, p. 51, 1913.	Basalt.	SiO_2 given as 47.45. Corr. by S. K.
147	III″.5(6).″3.(3)4. 2.2″.2.2.	or 11.68 di 26.64 ab 11.53 ol 12.69 an 12.51 mt 8.82 ne 4.83 il 4.71 ap 3.36	Agusowami, Iwami, Japan.	K. Yokoyama.	S. Kozu, pers. com.	Limburgite.	
148	(II)III.″5.3″.″4. 2.1.2.3.	Q 4.98 di 16.40 or 10.56 hy 11.80 ab 22.01 mt 2.55 an 22.52 il 7.30	Tchang-li, East Yunnan, China.	Pisani.	J. Deprat, Mem. Sv. G. Ind. Ch., I (1), 1, p. 235, 1912.	Basalt.	
149	III.5.3″.4. 2.2.2.3.	or 9.45 di 11.16 ab 22.01 hy 16.73 an 21.68 ol 5.01 mt 3.25 il 6.99 ap 1.01	Bet. Ta-tzeu and Chou-kou, East Yunnan, China.	Pisani.	J. Deprat, Mem. Sv. G. Ind. Ch., I (1), 1, p. 233, 1912.	Basalt.	
150	III.5.3.4″. 2.1.2.3.	or 5.00 di 19.43 ab 26.20 hy 20.27 an 15.29 ol 5.63 mt 3.71 il 3.65 ap 0.34	St. Thomas Mount, n. Madras, India.	H. S. Washington.	H. S. Washington, A. J. S., XLI, p. 330, 1916.	Norite.	
151	(II)III.(4)5.″3.4″. 2.2.2.3.	Q 6.00 di 17.43 or 6.67 hy 9.46 ab 33.01 mt 5.80 an 15.57 il 4.56 ap 1.01	Springbrook, Queensland.	G. R. Patten.	A. R. Agric. Chem. Qld., 1914.	Andesite.	H. C. Richards, pers. com.
152	III.5.3.4.⊙ 2.2.2.2.	or 8.34 di 14.74 ab 27.77 hy 12.40 an 15.29 ol 11.73 mt 3.48 il 4.26 ap 1.34	Toowoomba, Queensland.	G. R. Patten.	A. R. Agric. Chem. Qld., 1912.	Olivine basalt.	H. C. Richards, pers. com.
153	III.5.″3.4. 2.3.2.3.	or 10.56 di 16.38 ab 27.25 hy 5.24 an 14.18 ol 14.68 mt 5.34 il 2.58 ap 1.34	Pittsworth, Queensland.	G. R. Patten.	A. R. Agric. Chem. Qld., 1912.	Basalt.	H. C. Richards, pers. com.
154	(II)III.5.″3.4. 2.3.2.3.	or 9.45 di 13.24 ab 30.39 ol 17.43 an 16.68 mt 2.55 ne 1.14 il 4.41 ap 1.68	Mount Lindsay, Queensland.	G. R. Patten.	A. R. Agric. Chem. Qld., 1914.	Basalt.	H. C. Richards, pers. com.

CLASS III. SALFEMANE—Continued.

RANG 3. ALKALICALCIC. CAMPTONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
155	49.43	12.73	5.06	8.47	6.96	8.59	3.50	1.21	1.11	0.73	2.26	0.49	0.08	CO_2 0.28 ZrO_2 none SO_3 none Cl trace S trace Cr_2O_3 trace NiO 0.05 BaO none SrO none Li_2O none	100.95	3.18
A1. I	.824	.125	.032	.118	.174	.154	.056	.013			.028	.003	.001		(100.89)	
156	55.05	14.15	1.80	5.31	8.07	9.36	2.82	0.72	1.46	0.22	0.57	0.06	0.22	CO_2 0.02 ZrO_2 none SO_3 0.01 Cl 0.02 F none Cr_2O_3 0.01 V_2O_3 0.01 NiO none BaO none SrO trace CuO 0.01	99.89	2.814
A1. I	.918	.139	.011	.074	.202	.157	.045	.008			.007	—	.003			
157	48.92	14.87	3.99	7.44	5.73	7.26	3.42	1.80	1.56	0.82	2.78	0.59	0.29	CO_2 0.09 ZrO_2 none SO_3 0.08 Cl 0.02 S none Cr_2O_3 0.01 V_2O_3 0.02 NiO 0.04 BaO 0.04 SrO trace Li_2O trace CuO 0.06	99.83	2.865
A1. I	.815	.146	.025	.103	.143	.130	.055	.019			.035	.004	.004			
158	48.39	13.36	5.80	6.48	4.57	8.90	3.61	1.18	1.57	1.33	3.74	3.63	3.36	CO_2 0.05 ZrO_2 none SO_3 trace Cl trace S none Cr_2O_3 none V_2O_3 none NiO 0.01 BaO 0.06 SrO trace Li_2O none	100.04	2.799
A1. I	.807	.131	.036	.090	.114	.159	.058	.013			.046	.004	.005			
159	46.26	13.36	2.34	10.53	8.87	9.18	3.27	1.23	2.08	0.15	1.78	0.42	0.12	CO_2 0.06 ZrO_2 none SO_3 0.13 Cl 0.01 F none Cr_2O_3 0.02 V_2O_3 0.03 NiO 0.01 BaO 0.05 SrO trace	99.90	2.947
A1. I	.771	.131	.015	.146	.222	.164	.053	.013			.022	.003	.002			
160	46.51	15.27	2.50	8.92	8.40	9.12	3.12	1.17	1.21	0.22	2.20	0.33	0.05	CO_2 0.61 SO_3 0.11 Cl 0.04 Cr_2O_3 0.02 V_2O_3 0.03 NiO 0.03 BaO 0.04 SrO trace Li_2O trace CuO trace	99.90	3.014
A1. I	.775	.150	.016	.124	.210	.163	.050	.012			.028	.002	—			
161	45.06	14.60	2.60	9.00	9.64	9.86	2.90	0.85	2.73	0.55	1.55	0.61	0.19	CO_2 0.05 ZrO_2 none SO_3 none Cl none S none Cr_2O_3 0.02 V_2O_3 0.02 NiO none BaO trace Li_2O none	100.23	2.911
A1. I	.751	.143	.016	.125	.241	.176	.047	.009			.019	.004	.003			
162	46.20	17.44	1.30	9.54	7.38	9.02	3.69	1.10	2.11	0.09	1.30	0.56	0.17	CO_2 0.04 ZrO_2 none SO_3 none Cl trace S none Cr_2O_3 none V_2O_3 trace NiO none BaO 0.03 SrO none Cu none	99.97	2.934
A1. I	.770	.171	.008	.132	.185	.161	.060	.012			.016	.004	.002			
163	52.01	13.50	6.25	4.82	8.48	7.81	2.74	1.17	0.67	0.24	2.20	0.39	0.07	CO_2 none SO_3 none Cl trace NiO 0.03 Li_2O trace	100.38	2.867
A2. II	.867	.132	.039	.067	.212	.139	.044	.013			.028	.003	.001			
164	51.72	13.36	2.80	8.16	7.20	7.68	2.87	1.34	0.96	1.61	2.30	0.25	trace	SO_3 none Cl trace Li_2O none	100.25	2.828
A2. II	.862	.131	.018	.114	.180	.138	.047	.015			.029	.002	—			

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 4. DOSODIC. CAMPTONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
155	III.5.3.4.⊙ *2.1.2.3.*	or 7.23, ab 29.34, an 15.57, di 19.71, hy 10.70, ol 3.60, mt 7.42, il 4.26, ap 1.01	Yandina, Queensland.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXI, p. 169, 1906.	Basalt.	
156	"III."5.3(4).4(5). *1.1.2.2.*	Q 5.16, or 4.45, ab 23.58, an 23.91, di 18.08, hy 19.31, mt 2.55, il 1.06	Bakers Creek, New England, New South Wales.	J. C. H. Mingaye.	E. C. Andrews, Rec. G. S. N. S. W., VIII (3), p. 214, 1907.	Diorite.	
157	(II)III.5.3.4. *2.1.2.3.*	or 10.56, ab 28.82, an 20.02, di 10.07, hy 14.36, ol 0.93, mt 5.80, il 5.32, ap 1.34	Canobolas Mountains, n. Orange, New South Wales.	J. C. H. Mingaye.	Mingaye and White, Rec. G. S. N. S. W., VII (4), p. 304, 1904.	Olivine basalt.	
158	(II)III.5.3.4. *3.1.2.3.*	Q 3.18, or 7.23, ab 30.39, an 16.68, di 18.57, hy 3.66, mt 8.35, il 6.99, ap 1.34	Bong Bong Flow, Kiama, New South Wales.	H. P. White.	Jaquet, Card, and Harper, Rec. G. S. N. S. W., VIII (I), p. 23, 1905.	Basalt.	
159	III.5".3.4. *2.3.2.3.*	or 7.23, ab 20.44, an 18.07, ne 3.98, di 20.18, ol 19.67, mt 3.48, il 3.34, ap 1.01	Reservoir quarry, Prospect, n. Sydney, New South Wales.	J. C. H. Mingaye.	Jensen and Jevons, Pr. R. Soc. N. S. W., XLV, p. 504, 1912.	Pallio-essexite.	
160	III.5.3.4.⊙ *2.3.2.2.*	or 6.67, ab 23.58, an 24.46, ne 1.42, di 15.51, ol 17.42, mt 3.71, il 4.26, ap 0.67	Camden Park, Sydney, New South Wales.	J. C. H. Mingaye.	G. W. Card in Mingaye and White, Rec. G. S. N. S. W., VII (3), p. 230, 1903.	Olivine basalt.	
161	III.5.3(4).4". *2.3.2.2.*	or 5.00, ab 19.39, an 24.19, ne 2.84, di 17.09, ol 20.36, mt 3.71, il 2.89, ap 1.34	Cooma District, New South Wales.	Not stated.	A. R. Dep. Min. N. S. W. (1909), p. 198, 1910.	Olivine basalt.	
162	(II)III.5".3".4". *1(2).(3)4."2."3.*	or 6.67, ab 20.96, an 27.52, ne 5.68, di 11.16, ol 20.16, mt 1.86, il 2.43, ap 1.34	Wanyambilli, New South Wales.	H. P. White.	N. S. W. Dep. Min. A. R. (1912), p. 198, 1913.	Olivine dolerite.	
163	"III.(4)5.3".4. *2.1.2.2.*	Q 6.54, or 7.23, ab 23.06, an 20.85, di 11.66, hy 15.80, mt 9.05, il 4.26, ap 1.01	Hay Hill, Macedon, Victoria.	A. G. Hall.	Skeats and Summers, Vict. G. S. B. 24, p. 35, 1912.	Andesitic basalt.	
164	III.5.3.4.⊙ *2.1.2.3.*	Q 2.58, or 8.34, ab 24.63, an 19.18, di 13.93, hy 20.10, mt 4.18, il 4.41, ap 0.67	Jim Jim, Macedon, Victoria.	R. J. Lewis.	Skeats and Summers, Vict. G. S. B. 24, p. 33, 1912.	Anorthoclase basalt.	

CLASS III. SALFEMANE—Continued.

RANG 3. ALKALICALCIC. CAMPTONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
165	45.10	12.86	5.66	7.10	8.56	9.10	3.99	1.02	1.53	1.10	3.50	1.00	0.08	CO_2 trace SO_3 none Cl trace Li_2O none	100.60	2.854
A2. II	.752	.126	.036	.044	.214	.163	.065	.011			.044	.007	.001			
166	43.24	13.19	4.42	8.46	8.48	9.32	2.28	1.68	2.46	2.03	3.15	1.13	0.18	CO_2 trace SO_3 none Cl trace Li_2O none	100.02	2.901
A2. II	.721	.129	.028	.118	.212	.166	.037	.018			.039	.008	.003			
167	43.82	12.90	6.74	6.25	9.32	9.44	2.49	1.75	1.70	1.26	3.50	1.02	0.37	CO_2 trace SO_3 none Cl trace Li_2O none	100.56	2.995
A2. II	.730	.126	.042	.087	.233	.169	.040	.019			.044	.007	.005			
168	50.53	15.13	5.28	5.68	7.59	8.41	3.26	0.94	0.63	0.76	1.70	0.35	0.10	CO_2 none SO_3 none Cl trace NiO 0.02	100.36	2.922
A2. II	.842	.148	.033	.079	.190	.150	.053	.010			.021	.002	.001			
169	49.29	13.99	7.54	4.49	8.82	8.28	2.97	1.04	0.69	0.79	1.75	0.38	0.15	CO_2 none SO_3 none Cl trace NiO 0.06	100.24	2.895
A2. II	.822	.137	.047	.062	.221	.148	.048	.011			.022	.003	.002			
170	46.29	13.71	3.03	9.14	9.50	8.60	3.26	1.62	0.39	0.31	2.95	0.71	0.14	CO_2 trace SO_3 trace Cl trace Cr_2O_3 0.05 NiO 0.01	99.71	2.959
A2. II	.772	.134	.019	.127	.238	.154	.053	.017			.037	.005	.002			
171	45.15	12.93	5.26	6.88	11.35	9.97	2.90	1.76	0.32	0.29	2.65	0.73	0.16	CO_2 none NiO 0.01	100.36	2.914
A2. II	.753	.127	.033	.096	.284	.179	.047	.019			.033	.005	.002			
172	50.44	14.47	6.32	5.01	7.93	8.75	2.59	1.11	0.60	0.60	1.80	0.31	0.19	CO_2 none SO_3 none Cl none NiO 0.01	100.13	
A2. II	.841	.142	.039	.069	.198	.156	.042	.012			.023	.002	.003			
173	45.56	13.32	2.30	9.68	11.12	8.77	3.02	1.53	1.28	0.27	3.00	0.71	0.19	CO_2 none SO_3 none Cl 0.05 Cr_2O_3 0.06 NiO 0.01	100.87	2.994
A1. I	.759	.130	.014	.135	.278	.157	.048	.016			.038	.005	.003			
174	44.95	15.50	2.04	10.47	7.43	8.24	3.04	1.98	2.60	0.52	2.77	0.52	0.21	CO_2 0.18	100.45	2.91
A2. II	.749	.152	.013	.146	.186	.147	.049	.021			.035	.004	.003			
175	51.93	14.26	2.49	10.76	5.28	7.89	2.79	0.81	1.13	0.09	1.75	0.31	0.57	CO_2 none FeS_2 0.15	100.21	
A2. II	.866	.140	.016	.150	.132	.141	.045	.009			.022	.002	.008			
176	49.27	13.57	2.47	12.78	4.26	8.51	2.44	1.42	0.55	0.22	2.13	1.23	0.50	CO_2 0.10 ZrO_2 none FeS_2 0.15 V_2O_3 0.09 BaO none	99.69	2.99
A1. I	.821	.133	.016	.178	.107	.152	.039	.015			.027	.008	.007			
177	49.80	13.76	3.09	11.97	5.02	10.25	3.00	1.15	trace		0.95	0.22	0.10		99.31	
B2. III	.830	.135	.019	.167	.126	.183	.048	.013			.012	.002	.001			
178	49.74	12.36	1.64	10.08	8.83	10.88	2.45	0.55	0.17	0.05	2.49	0.41	0.14	CO_2 none ZrO_2 trace SO_3 trace Cl 0.10 S 0.04 Cr_2O_3 0.04 V_2O_3 0.02 MoO_3 0.01 Ce_2O_3 trace NiO 0.05 BaO trace SrO 0.07 CuO none	100.12	
A1. I	.829	.121	.010	.140	.221	.195	.040	.006			.031	.003	.002			

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 4. DOSODIC. CAMPTONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
165	III.5(6).3(4).4(5). *2.2.2.2.*	or 6.12 di 24.41 ab 23.58 ol 7.07 an 13.90 mt 0.23 ne 5.68 il 10.21 hm 5.60 ap 2.35	Woodend, Macedon, Victoria.	A. G. Hall.	Skeats and Summers, Vict. G. S. B. 24, p. 28, 1912.	Limburgite.	
166	III.5.3.″4. *2.3.2.2.*	or 10.01 di 14.46 ab 19.39 hy 2.66 an 20.57 ol 13.47 mt 6.50 il 5.93 ap 2.69	Woodend, Macedon, Victoria.	A. G. Hall.	Skeats and Summers, Vict. G. S. B. 24, p. 28, 1912.	Limburgite.	
167	III.5.3.″4. *3.3.2.2.*	or 10.56 di 17.12 ab 20.96 hy 0.80 an 18.63 ol 10.77 mt 9.74 il 6.69 ap 2.35	King's quarry, Macedon, Victoria.	A. G. Hall.	Skeats and Summers, Vict. G. S. B. 24, p. 28, 1912.	Limburgite.	
168	″III.5.3″.4″. *2.1.2.2.*	Q 1.20 di 12.75 or 5.56 hy 16.41 ab 27.77 mt 7.66 an 23.63 il 3.19 ap 0.67	Marida Yallock, Camperdown District, Victoria.	A. G. Hall.	H. J. Grayson, Vict. G. S. Mem. No. 9, p. 22, 1910.	Basalt.	
169	III.5.3″.4″. *2.1.2.2.*	Q 1.26 di 15.12 or 6.12 hy 15.10 ab 25.15 mt 9.74 an 21.68 il 3.34 hm 0.80 ap 0.11	Kolora, Camperdown District, Victoria.	A. G. Hall.	H. J. Grayson, Vict. G. S. Mem. No. 9, p. 22, 1910.	Basalt.	
170	III.5.3.4.⊙ *2.3.2.2.*	or 9.45 di 15.63 ab 22.01 ol 18.67 an 18.63 mt 4.41 ne 3.12 il 5.62 ap 1.68	Camperdown, Victoria.	A. G. Hall.	H. J. Grayson, Vict. G. S. Mem. No. 9, p. 22, 1910.	Basalt.	
171	III.5(6).3.4. *2.3.2.2.*	or 10.56 di 22.14 ab 14.67 ol 15.75 an 16.96 mt 7.66 ne 5.40 il 5.02 ap 1.68	Mount Terang, Camperdown District, Victoria.	A. A. Topp.	H. J. Grayson, Vict. G. S. Mem. No. 9, p. 22, 1910.	Basalt.	
172	″III.″5.3(4).4. *2.1.2.2.*	Q 4.32 di 13.28 or 6.67 hy 14.92 ab 22.01 mt 9.05 an 24.46 il 3.50 ap 0.67	Warrnambool, Victoria.	Not stated.	A. R. Sec. Min. Vict. (1910), p. 64, 1911.	Basalt.	
173	III.5″.3.4. *2.3.2.2.*	or 8.90 di 16.56 ab 18.60 ol 22.48 an 18.35 mt 3.25 ne 3.55 il 5.78 ap 1.68	Balwyn, n. Doncaster, Victoria.	F. Chapman.	Chapman and Thiels, Pr. R. Soc. Vict., XXIV (1), p. 133, 1911.	Limburgite.	
174	″III.5″.3.4. *2.3.2.3.*	or 11.68 di 11.81 ab 18.34 ol 19.11 an 22.80 mt 3.02 ne 3.98 il 5.32 ap 1.34	Tullamarine, Bourke County, Victoria.	F. L. Stilwell.	F. L. Stilwell. Pr. R. Soc. Vict., XXIV (1), p. 177, 1911.	Basalt.	
175	″III.″5.3(4).4″. *2.1.2.3.*	Q 4.20 di 11.11 or 5.00 hy 23.50 ab 23.58 mt 3.71 an 23.91 il 3.34 ap 0.67	Secret Creek, Ashburton Goldfield, West Australia.	Not stated.	J. A. Thompson in A. G. Maitland, W. Aust. G. S. B. 33, p. 164, 1909.	Quartz dolerite.	
176	III.5.3″.4. ″*2.1.2.(3)4.*	Q 2.64 di 10.77 or 8.34 hy 24.01 ab 20.44 mt 3.71 an 21.96 il 4.10 ap 2.69	Mount Holmes, West Australia.	Surv. lab.	R. A. Farquaharson, W. Aust. G. S. B. 43, p. 49, 1912.	Quartz dolerite.	
177	III.5.3.4.⊙ *2.2.2.3.*	or 7.23 di 23.73 ab 25.15 hy 7.36 an 20.57 ol 8.49 mt 4.41 il 1.82 ap 0.67	Crater, Kilauea, Hawaii, Hawaiian Islands.	O. Silvestri.	O. Silvestri, B. C. G. It., XIX, p. 141, 1888.	Basalt.	In W. T., p. 325.
178	III.5.3(4).4. *2.1.2.3.*	or 3.34 di 24.78 ab 20.96 hy 17.00 an 20.85 ol 4.67 mt 2.32 il 4.71 ap 1.01	Halemaumau, Kilauea, Hawaii, Hawaiian Islands.	J. B. Ferguson.	Day and Shepherd, B. G. S. A., XXIV, p. 586, 1913.	Basalt.	

CLASS III. SALFEMANE—Continued.

RANG 3. ALKALICALCIC. CAMPTONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
179	45.96	10.94	5.85	6.39	10.82	9.96	2.40	1.92	0.36	0.12	5.50	trace	0.08	CO_2 none NiO 0.02	100.32	
A2. II	.766	.107	.037	.089	.271	.178	.039	.020			.069	—	.001			
180	44.26	13.32	4.60	8.19	9.42	10.95	2.40	0.99	0.37		5.02	0.45			99.97	
A2. II	.738	.131	.029	.114	.236	.196	.039	.011			.063	.003				
181	46.36	16.70	7.53	6.23	5.84	9.77	3.22	1.12	0.35		1.88	0.58			99.58	
A2. II	.773	.164	.047	.086	.146	.175	.052	.012			.024	.004				
182	44.71	11.24	5.48	8.21	14.32	10.22	2.50	1.01	0.21		2.00	0.37			100.27	
A2. II	.745	.110	.034	.114	.358	.182	.040	.011			.025	.003				
183	49.44	11.38	2.41	12.53	12.26	7.30	2.91	1.19	trace	0.12	0.72	0.12	0.32		100.70	
A2. II	.824	.111	.015	.174	.307	.130	.047	.013			.009	.001	.005			
184	47.20	15.29	9.57	6.13	5.90	8.93	3.61	0.85	1.12		1.14	0.46			100.20	
A2. II	.787	.150	.060	.085	.148	.159	.058	.009			.014	.003				
185	50.22	16.20	3.13	8.07	7.54	8.57	3.36	1.38	0.22		1.95		trace		100.64	2.79
A3. III	.837	.159	.019	.112	.189	.153	.054	.015			.024		—			
186	48.97	16.12	1.90	9.63	7.64	8.73	2.99	1.21	1.39		1.62		trace		100.20	2.89
A3. III	.816	.158	.012	.134	.191	.155	.048	.013			.020		—			

RANG 3. ALKALICALCIC. CAMPTONASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	44.97	15.76	4.44	12.13	4.15	8.67	4.02	0.32	0.39		4.87	0.35	0.17		100.24	
A2. II	.750	.155	.028	.168	.104	.155	.065	.003			.061	.002	.002			
2	50.36	14.57	2.48	8.31	7.62	11.13	3.04	0.44	0.78		1.70		0.46	Cr_2O_3 trace	100.89	3.04
A2. III	.839	.143	.016	.115	.191	.198	.049	.005			.021		.007			
3	51.77	14.59	3.62	6.90	7.18	7.79	3.92	0.64	1.85	0.46	1.13	0.18	0.05		100.08	2.91
B2. II	.863	.143	.023	.096	.180	.139	.063	.007			.014	.001	.001			
4	49.71	13.66	5.49	9.51	6.13	5.85	4.51	0.37	2.66	0.48	1.53	0.10	0.13		100.13	2.91
A2. II	.829	.134	.034	.132	.153	.105	.073	.004			.019	.001	.002			
5	49.09	15.11	0.48	7.85	7.66	11.03	3.24	0.37	0.39	0.02	3.40	0.34	0.25	CO_2 none ZrO_2 none S 0.06 Cr_2O_3 0.04 BaO none	99.33	
B1. II	.818	.148	.003	.109	.192	.196	.052	.004			.043	.002	.004			
6	53.06	12.83	1.20	5.10	7.50	13.71	3.56	0.05	2.16	0.16	0.42	trace	0.16	CO_2 0.25 S trace Cr_2O_3 0.06 NiO trace BaO none SrO none	100.22	
A1. I	.884	.126	.008	.071	.188	.245	.057	—			.005	—	.002			

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 4. DOSODIC. CAMPTONOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
179	III.5.3.″4. *2.2.2.2.*	or 11.12 di 28.08 ab 18.34 ol 9.94 an 13.34 mt 4.64 ne 1.14 il 10.49 hm 2.72	Malaiola, Savaii, Samoa.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXII, p. 706, 1908.	Olivine. basalt.	
180	III.5.3(4).4. *2.2.2.2.*	or 6.12 di 22.97 ab 18.86 ol 11.12 an 22.52 mt 6.73 ne 0.85 il 9.58 ap 1.01	Papenoo Valley, Tahiti, Society Islands.	Pisani.	A. Lacroix, B. Soc. G. Fr., X, p. 110, 1910.	Microgabbro.	
181	(II)III.5.3(4).4. *3.2.2.2.*	or 6.67 di 13.58 ab 27.25 hy 3.20 an 27.80 ol 4.95 mt 10.90 il 3.65 ap 1.34	Drygalski, Mountain, Heard Island.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (3), p. 258, 1908.	Basalt.	
182	III(IV).5(6).3.4. *2.3.2.2.*	or 6.12 di 24.89 ab 13.36 ol 22.89 an 16.40 mt 7.89 ne 4.12 il 3.80 ap 1.01	Heard Island.	R. Reinisch.	R. Reinisch. D. Sudp. Exp., II (3), p. 258, 1908.	Basalt.	
183	III.5.3.4.⊙ *1.3.2.2.*	or 7.23 di 17.25 ab 24.63 hy 3.78 an 14.18 ol 28.38 mt 3.48 il 1.37 ap 0.34	Carnley Island, Auckland Islands.	A. M. Wright.	Speight and Finlayson, Subant. Islds., p. 722, 1909.	Gabbro.	
184	″III.5.3.4(5). *3.1.2.2.*	or 5.00 di 14.39 ab 30.39 hy 8.26 an 23.07 ol 0.90 mt 13.92 il 2.13 ap 1.01	Philippi Lake, Kerguelon Island.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (2), p. 218, 1908.	Dolerite.	
185	(II)III.5.3″.4. *2.3.2.2.*	or 8.34 di 14.40 ab 28.30 hy 4.45 an 24.74 ol 11.89 mt 4.64 il 3.65	Cockburn Island, W. Antarctica.	G. T. Prior.	G. T. Prior, Min. Mag., XII, p. 89, 1899.	Basalt glass.	**Crust of No. 183. In W. T., p. 325.**
186	(II)III.5.3(4).4. *3.3.2.3.*	or 7.23 di 13.17 ab 25.15 hy 5.01 an 26.97 ol 15.41 mt 2.78 il 3.04	Cockburn Island, W. Antarctica.	G. T. Prior.	G. T. Prior, Min. Mag., XII, p. 89, 1899.	Basalt.	**In W. T., p. 325.**

SUBRANG 5. PERSODIC. ORNOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(II)III.5.3.5. *3.3.2.3.*	or 1.67 di 13.95 ab 31.44 ol 9.18 an 24.19 mt 6.50 ne 1.42 il 9.27 ap 0.67	Skreia, Havnefjord, Jones Sound, Ellesmere Land.	P. Schei.	C. Bugge, Rep. 2 Fram. Exp., No. 22, p. 37, 1910.	Diorite porphyry.	
2	III.5.3(4).(4)5. *2.2.2.3.*	or 2.78 di 24.66 ab 25.68 hy 8.67 an 24.74 ol 6.99 mt 3.71 il 3.19	Maltby Park, New Haven, Connecticut.	G. W. Hawes.	G. W. Hawes, A. J. S., XI, p. 123, 1876.	Meta-dolerite.	Not in W. T.
3	″III.5.3.″5. *2.1.2.2.*	or 3.89 di 14.77 ab 33.01 hy 16.88 an 20.29 ol 1.39 mt 5.34 il 2.13 ap 0.34	Hartshorn's quarry, Springfield, New Jersey.	R. B. Gage.	J. V. Lewis, N. J. G. S. A. R. (1907), p. 159, 1908.	Basalt.	
4	″III.5.″3.5. *2.2.2.3.*	or 2.22 di 10.23 ab 38.25 hy 15.20 an 15.85 ol 4.22 mt 7.89 il 2.89 ap 0.34	Millington, New Jersey.	R. B. Gage.	J. V. Lewis, N. J. G. S. A. R. (1907), p. 159, 1908.	Basalt.	
5	III.5.3(4).5. *2.2.2.2.*	or 2.22 di 21.72 ab 27.25 hy 4.95 an 25.58 ol 9.02 mt 0.70 il 6.54 ap 0.67	Ortiz Mountains, New Mexico.	M. W. Adams.	I. H. Ogilvie, J. G., XVI, p. 236, 1908.	Andesite.	
6	III.5.3.5.⊙ *1.1.4.2.*	ab 29.87 di 39.36 an 19.18 hy 3.46 ol 3.12 mt 1.86 il 0.76	Sawtooth Rock, Port Orford quadrangle, Oregon.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. Fol. 89, p. 4, 1903.	Basalt.	

CLASS III. SALFEMANE—Continued.

RANG 3. ALKALICALCIC. CAMPTONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
7	51.01	11.89	1.57	6.08	8.87	10.36	4.17	0.15	2.09	0.24	0.98	0.17	trace	FeS_2 1.73 CuS trace	99.35	
2A. II	.850	.117	.010	.085	.222	.185	.068	.002			.012	.001	—			
8	46.11	15.97	3.31	9.16	8.35	8.49	3.42	0.63	1.99		0.54	0.47	0.65		99.09	
B2. III	.769	.156	021	127	.209	.152	.055	.007			.007	.003	.009		(99.10)	
9	52.39	15.08	4.42	8.04	4.42	8.53	4.45	0.28	0.38	0.23	1.16	0.36		CO_2 0.28	100.02	
A3. III	.873	148	0.23	.112	.111	.152	.072	.003			.015	.003				
10	44.87	13.60	5.65	5.68	9.39	11.05	3.41	0.45	2.05	1.48	2.13				100.08	
A3. III	.748	.133	.036	.079	.235	.197	.055	.005			.027					
11	52.44	14.23	2.78	7.05	7.40	6.71	3.25	0.65	0.50	2.03	2.09	0.13		CO_2 0.25 SO_3 0.04	99.55	
A2. II	.874	.140	.018	.098	.185	.120	.053	.007			.026	.001				
12	53.52	13.56	4.93	6.61	7.37	7.39	3.22	0.68	1.03		1.84				100.05	
A3. III	.892	.133	.031	.092	.184	.132	.051	.007			.023					
13	52.39	15.08	4.42	8.04	8.53	4.42	4.45	0.28	0.38	0.23	1.16	0.36		CO_2 0.28	100.02	
A2. II	.873	.148	.028	.112	.213	.079	.072	.003			.015	.002				
14	50.05	14.22	4.81	8.72	5.71	9.01	4.24	0.43	0.35	0.19	1.67	0.26		CO_2 0.23	99.89	
A2. II	.834	.139	.030	.121	.143	.161	.068	.005			.021	.002				
15	48.60	16.38	3.01	9.65	6.04	10.18	2.71	0.53	0.59	0.11	1.43	0.12		CO_2 0.12 FeS_2 0.21	99.68	
A2. II	.810	.162	.019	.134	.151	.182	.044	.006			.018	.001				
16	51.41	13.70	4.36	6.08	6.43	11.61	3.88	0.55	1.89		0.88				100.79	
A3. III	.857	.134	.028	.085	.161	.207	.063	.006			.011					
17	50.22	14.96	2.54	10.31	7.16	7.90	3.92	0.58	0.73		1.85	0.08	0.09		100.34	
A2. II	.837		.016	.143	.179	.141	.063	.006			.023	—	.001			
18	50.19	16.00	5.07	5.81	5.55	10.87	3.44	0.46	2.38		1.06				100.83	
A3. III	.837	.157	.032	.081	.139	.195	.055	.005			.013					
19	50.19	13.93	2.13	9.68	10.13	7.29	3.84	0.31	0.82		1.74	0.11	0.37		100.54	
A2. II	.837	.137	.013	.135	.253	.130	.062	.003			.022	.001	.005			
20	49.44	15.38	7.26	5.07	8.14	7.75	3.51	0.44	2.02		1.40	0.14	0.11		100.66	
A2. II	.824	.151	.046	.071	.204	.139	.056	.005			.018	.001	.002			
21	49.16	14.15	5.03	6.68	6.95	9.12	3.94	0.48	1.42		1.82	0.29	0.48		99.52	
A2. II	.819	.139	.031	.093	.174	.163	.064	.005			.023	.002	.007			
22	46.52	15.02	4.05	5.91	11.85	8.85	4.01	0.49	1.13		1.90	0.24	0.52		100.49	
A2. II	.775	.147	.025	.082	.296	.158	.065	005			024	002	007			

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 5. PERSODIC. ORNOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
7	III.5.(2)3.5. 2.2.2.2.	or 1.12, ab 34.58, an 13.07, ne 0.57; di 30.12, ol 11.56, mt 2.32, il 1.82, ap 0.34, pr 1.73	Grass Valley, Nevada County, California.	H. N. Stokes.	W. Lindgren, U. S. G. S. A. R. 17, (II), p. 66, 1896.	Diabase.	
8	″III.5.3(4).(4)5. 2.4.2.2.	or 3.89, ab 25.94, an 26.13, ne 1.56; di 10.88, ol 21.77, mt 4.87, il 1.06, ap 1.01	Ornö, Sweden.	R. Mauzelius.	A. Cederström, G. F. F., XV, p. 108, 1893.	Ornoite.	In W. T., p. 327.
9	(II)III.5.3.5. 2.1.2.3.	Q 1.68, or 1.67, ab 37.73, an 20.29; di 15.73, hy 12.48, mt 6.50, il 2.28, ap 1.01	Heppenheim, Kirschhäusertal, Odenwald.	K. M. Jene.	G. Klemm, Nb. Ver. Erdk., (4), XXVIII, p. 25, 1907.	Diabase.	
10	III.5(6).3.″5. 2.2.2.2.	or 2.78, ab 19.39, an 20.29, ne 5.11; di 27.26, ol 9.08, mt 8.35, il 4.10	Wiebel, n. Steinbach, Giessen, Hesse.	A. Streng.	W. Schottler, Abh. G. L.-A. Darm., IV, (3), p. 458, 1908.	Basalt.	
11	(II)III.″5.3″.(4)5.	Q 4.68, or 3.89, ab 27.77, an 22.24; di 8.25, hy 22.04, mt 4.18, il 3.95, ap 0.34	Dorf Gill, Giessen, Hesse.	Surv. lab.	W. Schottler, Erl. G. Kt. Hes., Bl. Giessen, p. 84, 1913.	Trapp.	
12	″III.(4)5.3″.″5.	Q 6.90, or 3.89, ab 26.72, an 20.85; di 12.63, hy 17.40, mt 7.19, il 3.50	Londorf, Vogelsberg, Hesse.	A. Streng.	A. Streng, N. J., 1888, II, p. 217.	Vitro-dolerite.	In W. T., p. 327.
13	″III.5.3.5. 2.1.1.2.	or 1.67, ab 37.73, an 20.29; hy 29.34, ol 0.76, mt 6.50, il 2.28, ap 0.67	West border of Blatt Rossdorf, Hesse.	K. M. Jene.	G. Klemm, Erl. G. Kt. Hes., Bl. Rossdorf, p. 24, 1912.	Diabase.	
14	″III.5.3.″5. 2.2.2.3.	or 2.78, ab 35.63, an 18.35; di 19.94, hy 5.54, ol 6.12, mt 6.96, il 3.19, ap 0.67	Kahleberg, n. Darmstadt, Hesse.	K. M. Jene.	G. Klemm, Erl. G. Kt. Hes., Bl. Rossdorf, p. 24, 1912.	Diabase.	
15	″III.5.3.″5. 2.2.2.3.	or 3.34, ab 23.06, an 31.14; di 15.33, hy 13.87, ol 4.73, mt 4.41, il 2.74, ap 0.34	Ober Ramstadt, n. Darmstadt, Hesse.	K. M. Jene.	G. Klemm, Erl. G. Kt. Hes., Bl. Rossdorf, p. 38, 1912.	Diorite.	
16	III.5.3.″5. 2.2.2.2.	or 3.34, ab 32.49, an 18.07, ne 0.28; di 31.69, ol 5.00, mt 6.50, il 1.67	Kohlhau, Lausitz.	R. Reinisch.	R. Reinisch, Hab. Schr. Leip., p. 37, 1902.	Diabase.	
17	″III.5.3.″5. 2.3.2.3.	or 3.34, ab 33.01, an 21.68; di 14.35, hy 6.84, ol 13.09, mt 3.71, il 3.50	Neusalza, Lausitz.	M. Voigt.	M. Voigt, In Diss. Leip., p. 18, 1906.	Norite.	
18	(II)III.5.3(4).″5. 2.1.2.2.	Q 0.60, or 2.78, ab 28.82, an 26.97; di 21.81, hy 8.21, mt 7.42, il 1.98	Warmsdorf, Lausitz.	R. Reinisch.	R. Reinisch, Hab. Schr., p. 37, 1902.	Diabase.	
19	III.5.3.5.⊙ 2.3.2.2.	or 1.67, ab 32.49, an 20.20; di 12.49, hy 9.07, ol 17.38, mt 3.02, il 3.34, ap 0.34	Gerstenberg, Lausitz.	M. Voigt.	M. Voigt, In. Diss. Leip., p. 18, 1906.	Olivine norite.	
20	″III.5.3(4).″5. 2.1.2.2.	Q 1.14, or 2.78, ab 29.34, an 25.02; di 10.00, hy 16.92, mt 10.67, il 2.74, ap 0.34	Durhennersdorf, Lausitz.	M. Voigt.	M. Voigt, In. Diss. Leip., p. 37, 1906.	Diorite.	
21	″III.5.3.″5. 2.2.2.2.	or 2.78, ab 33.54, an 19.46; di 20.70, hy 3.32, ol 7.36, mt 7.19	Nieder Guhrig, Lausitz.	M. Voigt.	M. Voigt, In. Diss. Leip., p. 25, 1906.	Olivine diabase.	
22	III.5(6).3.″5. 2.3.2.2.	or 2.78, ab 23.84, an 21.41, ne 5.54; di 16.27, ol 19.33, mt 6.03, il 3.65, ap 0.67	Belmsdorf, Lausitz.	M. Voigt.	M. Voigt, In. Diss. Leip., p. 25, 1906.	Diabase.	

CLASS III. SALFEMANE—Continued.

RANG 3. ALKALICALCIC. CAMPTONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
23	42.58	14.68	5.96	11.29	6.32	10.10	3.39	0.64	1.55		3.49	0.22	0.13		100.35	
A2. II	.710	.144	.038	.157	.158	.180	.055	.007			.044	.002	.002			
24	49.20	14.36	4.51	4.62	8.23	10.17	4.52	0.44	2.20		1.14				99.39	
A3. III	.820	.141	.028	.064	.206	.182	.073	.005			.014					
25	46.78	14.66	7.25	5.22	6.81	9.61	3.08	0.45	1.78		1.78	0.45			99.37	
B2. III	.776	.144	.046	.072	.170	.171	.050	.005			.022	.003				
26	46.53	15.17	9.99	8.55	5.05	8.71	3.47	0.34	0.50		1.48		trace		99.79	
A3. III	.776	.149	.063	.119	.126	.155	.056	.004			.019	—				
27	49.58	13.84	6.21	3.56	6.74	10.59	4.40	0.92	2.77	0.01	1.54				100.16	2.989
A3. III	.826	.136	.039	.050	.169	.188	.071	.010			.019					
28	48.71	15.17	4.52	7.88	5.34	8.60	4.27	0.98	1.41	0.20	2.67				99.75	2.98
A3. III	.812	.149	.028	.110	.134	.154	.069	.010			.033					
29	47.49	15.73	3.21	11.80	7.56	9.24	3.42	0.67	n. d.		0.54		0.08		100.04	
A2. II	.792	.154	.020	.164	.189	.164	.055	.007			.007		.005			
30	52.21	13.93	3.62	6.01	7.56	10.24	3.30	0.25	0.35		2.13				99.60	
A3. III	.870	.136	.023	.083	.189	.183	.053	.003			.027					
31	44.37	11.36	7.23	3.49	9.28	8.50	3.67	0.74	3.28	1.95	5.21	0.99		CO_2 none	100.07	
A2. II	.740	.111	.045	.049	.232	.152	.060	.008			.065	.007				
32	53.20	10.74	3.50	4.68	12.09	10.88	2.43	0.20	1.72	0.12	0.18	0.03	0.61	CO_2 trace S 0.01 Cr_2O_3 0.16	100.55	
A2. II	.887	.105	.022	.065	.303	.195	.039	.002			.002	—	.009			
33	47.19	12.88	11.30	5.42	6.15	9.62	3.55	0.79	1.92		0.44	0.29	0.18	S trace	99.73	2.978
A2. II	.787	.126	.071	.075	.154	.171	.057	.008			.006	.002	.003			
34	50.27	14.04	8.68	3.95	6.81	9.56	3.86	0.70	0.31	0.36	1.81	0.25	trace	CO_2 trace	100.60	
A2. II	.838	.138	.054	.055	.170	.171	.062	.008			.023	.002	—			
35	48.51	14.05	2.40	10.35	6.05	8.00	4.51	0.67	3.12		2.96	0.13			100.75	
A2. II	.809	.138	.015	.144	.151	.143	.073	.007			.037	.001				
36	54.33	11.43	6.10	7.47	11.70	4.25	3.52	0.59	0.60		0.13	0.06			100.18	
A2. II	.906	.112	.038	.104	.293	.076	.056	.006			.002	—				
37	52.15	15.31	2.60	7.45	7.05	8.31	3.85	0.70	0.88		2.31	0.09			99.70	
A2. II	.869	.150	.016	.104	.176	.148	.062	.008			.027	—			(100.78)	
38	46.96	15.19	8.35	7.30	6.63	8.34	4.53	0.59	1.09		1.45	0.17	0.12		100.72	
A2. II	.783	.149	.052	.101	.166	.149	.073	.006			.018	.001	.002			

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 5. PERSODIC. ORNOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
23	III.5(6).3″.(4)5. *2.2.2.3.*	or 3.89 di 20.62 ab 18.34 ol 11.58 an 22.80 mt 8.82 ne 5.68 il 6.69 ap 0.67	Golentz, Lausitz.	M. Voigt.	M. Voigt, In. Diss. Leip., p. 39, 1906.	Camptonite.	
24	III.5″.3.″5. *2.2.2.2.*	or 2.78 di 26.05 ab 29.34 ol 7.98 an 17.51 mt 6.50 ne 4.83 il 2.13	Tharandt, Saxony.	R. Reinisch.	R. Reinisch, Hab. Schr. Leip., p. 38, 1902.	Diabase.	
25	″III.5.3(4).″5. *2.1.2.2.*	or 2.78 di 15.61 ab 28.82 hy 8.66 an 24.74 ol 1.12 mt 10.67 il 3.34 ap 1.01	Toti Hegy, Lake Balaton, Comität Zala, Hungary.	K. Emszt.	K. Emszt, Jb. Ung. G. A. (1904), p. 338, 1906.	Basalt.	3 decimals.
26	″III.5.3(4).″5. *3.1.2.3.*	Q 0.54 di 14.74 or 2.22 hy 10.40 ab 29.34 mt 14.62 an 24.74 il 2.89	Rosztoka, Comität Szepes, Hungary.	P. Rozlozsnik.	B. V. Horvarth, Jb. Ung. G. A. (1910), p. 368, 1912.	Grünstein (diabase).	
27	III.5″.(2)3.″5. *2.1.2.2.*	or 5.56 di 28.94 ab 29.87 ol 2.45 an 15.29 mt 7.19 ne 3.98 il 2.89 hm 1.28	Piz Mondin, Lower Engadine, Switzerland.	L. Hezner.	U. Grubenmann, Btr. G. Kt. Schw., XXIII, p. 236, 1909.	Diabase.	
28	(II)III.5.3.(4)5. *2.2.2.3.*	or 5.56 di 18.97 ab 33.01 ol 8.69 an 19.46 mt 6.50 ne 1.70 il 5.02	Piz Tumbif, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Diorite.	
29	III.5.3(4).(4)5. *2.3.2.3.*	or 3.89 di 16.54 ab 23.84 ol 21.58 an 25.58 mt 4.64 ne 2.60 il 1.06	Val Scala, Valtellina, Lombardy.	O. Hecker.	O. Hecker, N. J. B. B., XVII, p. 343, 1903.	Norite- gabbro.	
30	III.5.3″.5. *2.1.2.2.*	Q 2.94 di 22.73 or 1.67 hy 12.48 ab 27.77 mt 5.34 an 22.24 il 4.10	Monte Capanne, Elba Island.	P. Alvisi.	P. Alvisi, Mem. Soc. Tosc., XXVIII, p. 205, 1912.	Diorite.	
31	III.5.(2)3.(4)5. *3.2.2.2.*	or 4.45 di 15.12 ab 31.44 hy 5.00 an 11.95 ol 7.84 il 7.45 hm 7.23 pf 2.18 ap 2.35	Monte Columbar- giu, n. Scano, Monte Ferru, Sardinia.	H. S. Washing- ton.	H. S. Washington, B. Soc. G. It., XXXIII, p. 153, 1914.	Ghizite, (biotite- analcite basalt).	Also in J. G., XXII, p. 748, 1914.
32	III″.5.3(4).5. *1.1.2.2.*	Q 1.74 di 28.91 or 1.11 hy 23.19 ab 20.44 mt 5.10 an 17.79 il 0.30	Chanema River, Samoyed Urals, Russia.	H. Backlund.	H. Backlund, Mem. Ac. Sci., St. P., XXVIII, No. 3, p. 24, 1912.	Spessartite.	
33	III.5.3.(4)5. *3.1.2.2.*	Q 1.02 di 22.28 or 4.45 hy 5.20 ab 29.87 mt 16.47 an 16.96 il 0.91 ap 0.67	Issatschki Hill, Poltawa, Russia.	J. Morozewicz.	J. Morozewicz, Mem. C. G. Russ., VII, p. 30, 1903.	Oligoclase diabase.	
34	″III.5.3.(4)5. *2.1.2.2.*	Q 0.96 di 20.74 or 4.45 hy 7.40 ab 32.49 mt 7.42 an 18.90 il 3.50 hm 3.52 ap 0.67	Bet. Ghadames and Tripoli, Tripoli.	E. Manasse.	E. Manasse, B. Soc. G. It., XXIV, p. 139, 1905.	Olivine basalt.	
35	″III.5.″3.″5. *2.3.2.3.*	or 3.89 di 18.70 ab 34.06 ol 13.22 an 16.12 mt 3.48 ne 2.27 il 5.62 ap 0.34	French Guinea.	Not stated. Pisani?	Lemoine and Chau- tard, B. Soc. G. Fr. (4), VIII, p. 35, 1908.	Diabase.	
36	III.5.3.(4)5. *2.1.1.2.*	Q 3.06 di 5.78 or 3.34 hy 34.99 ab 29.34 mt 8.82 an 13.90 il 0.30	Zoanlé, Ivory Coast.	Pisani.	A. Lacroix, N. Arch. Mus., III, p. 118, 1911.	Norite.	
37	(II)III.5.3.(4)5. *2.1.2.2.*	or 4.45 di 15.27 ab 32.49 hy 14.82 an 22.24 ol 2.50 mt 3.71 il 4.10	Pointe de Fanu, Cap Verde, Senegal.	Pisani.	J. Chantard, B. Soc. G. Fr. (4), VII, p. 437, 1907.	Dolerite.	
38	″III.5″.3.″5. *2.2.2.3.*	or 3.34 di 16.84 ab 31.44 ol 9.25 an 19.46 mt 12.06 ne 3.69 il 2.74 ap 0.34	Marahano, Debaroa, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 125, 1909.	Olivine basalt.	

CLASS III. SALFEMANE—Continued.

RANG 3. ALKALICALCIC. CAMPTONASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
39	51.69	13.16	3.99	8.65	6.84	8.41	2.76	0.45	1.00	0.55	1.70	0.28	0.14		99.62	2.92
A2. II	.862	.129	.025	.120	.171	.150	.045	.005			.023	.002	.002			
40	52.70	14.27	1.48	11.07	6.38	8.23	3.15	0.23	0.12	0.24	0.83		0.18	CO_2 0.15 FeS_2 0.49	99.53	2.96
A2. II	.878	.140	.009	.154	.160	.146	.051	.002			.010		.003			
41	51.63	12.10	8.67	3.10	9.40	9.17	3.10	0.30	(0.33)	(0.47)	2.47	0.26	0.30	SO_3 0.07 S 0.03 Cr_2O_3 trace CuO 0.48	101.08	
B2. III	.861	.119	.054	.043	.235	.163	.050	.003			.031	.002	.004			
42	49.88	13.79	9.65	2.61	6.12	9.59	3.30	0.17	(1.14)	(1.84)	3.97	0.26	0.67	SO_3 0.09 S 0.02 Cr_2O_3 trace CuO 0.14	100.26	
A?2. III	.831	.135	.060	.036	.153	.171	.053	.002			.050	.002	.010			

RANG 4. DOCALCIC. AUVERGNASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	49.94	16.13	1.11	6.38	9.14	12.82	0.37	1.38	1.45	0.20	0.58	0.37		FeS_2 0.14	100.01	
A?. II	.832	.158	.007	.089	.229	.229	.006	.015			.007	.003				

RANG 4. DOCALCIC. AUVERGNASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	49.58	16.37	1.73	11.55	5.37	10.26	2.14	1.05	0.44	0.14	1.00	0.03	0.17	Cl 0.25 S 0.05 Cr_2O_3 none BaO trace SrO trace	100.13	
A2. II	.826	.160	.011	.161	.134	.183	.018	.011			.013	—	.002			
2	44.26	13.95	7.84	8.87	6.59	10.41	1.81	1.75	1.54	0.33	1.41	0.85	0.19	CO_2 0.33 ZrO_2 none SO_3 none Cl, F none S 0.13 NiO none BaO 0.03 SrO 0.03	100.32	3.074
A1. I	.738	.738	.049	.124	.165	.186	.029	.019			.018	.006	.003			
3	40.82	17.55	6.75	6.29	6.91	10.34	1.90	2.77	4.25		1.90	0.54	0.15		100.17	
A2. II	.680	.172	.043	.088	.173	.185	.031	.030			.024	.004	.002			
4	47.12	15.96	4.03	9.90	4.90	13.33	1.15	2.01	0.92		0.56	0.57			100.45	
A2. II	.785	.156	.025	.138	.123	.238	.019	.021			.007	.004				
5	44.14	15.22	3.55	7.59	12.91	10.75	1.86	1.78	0.02	0.11	1.38	0.41		CO_2 0.03 SO_3 0.22	99.97	
A2. II	.736	.149	.023	.106	.323	.192	.030	.019			.017	.003				
6	44.91	17.15	1.68	6.45	14.27	11.28	1.01	0.89	1.52	0.26	0.46				99.88	
A3. III	.749	.168	.011	.090	.357	.202	.016	.010			.006					
7	46.05	14.88	4.22	5.78	5.98	13.47	1.41	2.56	3.01	0.52	0.93	0.59	0.21	ZrO_2 none Cl 0.09 F 0.03 S 0.04 Cr_2O_3 none BaO 0.06 SrO 0.07	99.90	
A1. I	.768	.146	.026	.081	.150	.241	.023	.028			.012	.004	.003			
8	44.56	11.68	3.95	6.88	11.91	10.37	1.03	2.31	2.97	0.84	2.90	0.40	0.24	CO_2 none Cl trace S 0.06 Cr_2O_3 0.09 NiO 0.01 BaO trace	100.20	2.895
A1. I	.743	.115	.025	.096	.298	.186	.016	.024			.036	.003	.003			

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 5. PERSODIC. ORNOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
39	III.(4)5.3(4).(4)5. *2.1.2.3.*	Q 5.70 or 2.78 ab 23.58 an 21.96 di 14.43 hy 19.86 mt 5.80 il 3.50 ap 0.67	Bundamba, Queensland.	G. R. Patten.	A. R. Agric. Chem. Qld., 1914	Basalt.	H. C. Richards, pers. com.
40	III.5.3(4).5. *1.1.2.3.*	Q 1.74 or 1.11 ab 26.72 an 24.19 di 13.60 hy 27.45 mt 2.09 il 1.52	Southern Cross, Greenmount, West Australia.	C. G. Gibson?	C. G. Gibson, W. Aust. G. S. B. 17, p. 20, 1904.	Quartz diorite.	
41	III.(4)5.3.5. *2.1.2.2*	Q 5.16 or 1.67 ab 26.20 an 18.35 di 19.44 hy 14.50 mt 3.71 il 4.71 hm 6.08 ap 0.67	Waianae, Oahu, Hawaiian Islands.	A. B. Lyons.	A. B. Lyons, A. J. S., II, p. 424, 1896.	Basalt.	Dried before analysis. Iron oxides? CuO? In W. T., p. 329.
42	"III.(4)5.3".5. *3.1.2.2.*	Q 6.24 or 1.11 ab 27.77 an 22.24 di 17.28 hy 7.30 il 6.99 hm 9.65 tn 0.78 ap 0.67	Koolan Range, Waimea, Oahu, Hawaiian Islands.	A. B. Lyons.	A. B. Lyons, A. J. S., II, p. 424, 1896.	Basalt.	Dried before analysis. Iron oxides? CuO? In W. T., p. 329.

SUBRANG 1-2. PREPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.5.4(5).2. *1.1.2.2.*	Q 2.64 or 8.34 ab 3.14 an 38.09 di 18.12 hy 24.19 mt 1.62 il 1.06 ap 1.01	Dilburg, Hesse.	K. M. Jene.	G. Klemm, Erl. G. Kt. Hes., Bl. Messel, p. 8, 1910.	Diorite.	

SUBRANG 3. SODIPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.5.4.3(4). *1(2).1."2.3.*	Q 3.42 or 6.12 ab 9.43 an 36.42 di 14.38 hy 24.29 mt 2.55 il 1.98	Grassy Portage Bay, Rainy Lake, Ontario.	M. F. Connor.	A. C. Lawson, Can. G. S. Mem. 40, p. 50, 1913.	Hornblende gabbro.	
2	III.5.(3)4.3(4). *2.2.2.3.*	or 10.56 ab 15.20 an 24.74 di 17.30 hy 9.54 ol 4.71 mt 11.39 il 2.74 ap 2.02	Caribou, Boulder County, Colorado.	G. Steiger.	E. S. Bastin, U. S. G. S. rec. lab.	Gabbro.	
3	(II)III:5(6).(3)4.3. *3.3.2.2.*	or 16.68 ab 3.41 an 30.86 ne 6.96 di 13.40 ol 10.03 mt 9.98 il 3.65 ap 1.34	Schriesheim, Odenwald.	M. Dittrich.	W. Salomon, Vh. Nh. Ver. Heid., VII, p. 650, 1904.	Diorite.	Fresh?
4	III.5.4.3.⊙ *2.1.2.3.*	or 11.68 ab 9.96 an 32.25 di 25.14 hy 8.09 ol 4.20 mt 5.80 il 1.06 ap 1.34	Langenberg, Hesse.	C. Trenzen.	C. Trenzen, N. J., 1902, II, p. 32.	Basalt.	
5	III.5(6)."4.3(4). *2.3.2.2.*	or 10.56 ab 5.76 an 27.80 ne 5.40 di 18.16 ol 23.15 mt 5.34 il 2.58 ap 1.01	Watzenborn, Giessen, Hesse.	Stadler.	W. Schottler, Abh. G. L.-A. Darm., IV (3), p. 458, 1908.	Basalt (limburgite).	
6	III.5.4".3(4). *1.4.2.2.*	or 5.56 ab 8.38 an 39.48 di 13.28 hy 0.83 ol 27.32 mt 2.55 il 0.91	Premier Mine, Elandsfontein, Pretoria, Transvaal.	M. Dittrich?	A. P. Wagner, Tr. G. Soc. S. Afr., XIV, p. 57, 1911.	Griquaite (garnet diopside rock).	Nodule in kimberlite. Igneous?
7	III.5.(3)4.3. *2.(1)2.(2)3.2(3).*	or 15.57 ab 8.91 an 26.41 ne 1.70 di 29.72 ol 4.89 mt 6.03 il 1.82 ap 1.34	Pic de Maros, Celebes.	E. W. Morley.	Iddings and Morley, J. G., XXIII, p. 240, 1915.	Absarokite.	
8	III.5.(3)4.(2)3. *2.2.2.2.*	or 13.34 ab 8.38 an 20.85 di 22.17 hy 6.96 ol 12.37 mt 5.80 il 5.47 ap 1.01	Euroa, Victoria.	D. L. Mahony.	A. R. Secy. Min. Vict. (1911), p. 62, 1912.	Limburgite.	

CLASS III. SALFEMANE—Continued.

RANG 4. DOCALCIC. AUVERGNASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
9	49.10	16.11	0.60	10.62	7.43	11.76	1.04	1.06	0.50	0.20	1.20	0.09	0.21	CO_2 0.16 ZrO_2 none Cl 0.22 S none Cr_2O_3 0.01 N_2O_3 0.03 NiO 0.02 BaO none SrO trace ZnS 0.03	100.39	3.124
A1. I	.816	.158	.004	.147	.186	.210	.017	.012			.015	—	.003			
10	49.75	16.70	1.61	8.06	6.98	11.35	1.62	1.52	1.51		0.80		0.10	CO_2 none	100.00	
A2. II	.829	.164	.010	.112	.175	.203	.026	.016			.010		.001			
11	47.44	11.81	1.58	9.44	12.30	12.32	1.12	1.09	0.70		1.25		0.39	CO_2 0.05 FeS_2 0.23 Cr_2O_3 0.20	99.92	
A2. II	.791	.116	.010	.131	.308	.220	.018	.012			.016		.006			
12	53.03	15.78	3.12	5.63	6.39	10.41	2.60	0.69	1.44		0.06	none	trace		99.15	
B2. III	.884	.155	.019	.078	.160	.186	.042	.007			—	—				

RANG 4. DOCALCIC. AUVERGNASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	47.80	18.24	0.35	9.27	8.08	11.44	2.24	0.45	0.58		1.46	0.24	0.55		100.70	
A2. II	.797	.179	.002	.129	.202	.204	.036	.005			.018	.002	.008			
2	47.11	14.33	4.88	11.06	8.45	9.12	1.91	0.20	1.52		0.78	0.29	0.21	SO_3 0.53 Cl 0.09	100.58	
A2. II	.785	.140	.031	.154	.211	.163	.031	.002			.010	.002	.003			
3	50.69	16.11	0.70	7.05	8.20	12.09	1.78	0.78	1.65	0.16	0.53			S 0.07 NiO 0.11	99.92	
A3. III	.845	.158	.004	.098	.205	.216	.029	.008			.007				(99.82)	
4	49.58	16.37	1.73	11.55	5.37	10.26	2.14	1.05	0.44	0.14	1.00	0.03	0.17	Cl 0.25 S 0.05 Cr_2O_3 none BaO trace SrO trace	100.13	
A1. I	.826	.160	.011	.161	.134	.183	.034	.011			.013	—	.002			
5	49.40	12.22	1.87	7.44	11.80	11.60	2.16	0.93	0.98	0.14	0.90	0.17	0.17	CO_2 0.25 Cl 0.13 S 0.10 Cr_2O_3 0.08 BaO 0.03 SrO 0.04	100.41	
A1. I	.823	.120	.012	.103	.295	.207	.035	.010			.011	.001	.002			
6	44.91	14.41	5.22	13.11	5.78	10.32	1.01	0.87	1.13		1.84			S 0.12 NiO 0.73	99.45	
A3. III	.749	.141	.033	.182	.145	.184	.016	.009			.023					
7	53.01	15.54	1.85	6.09	7.70	10.60	2.37	0.62	0.73	0.47	1.70	trace		CO_2 none S trace	100.68	
A3. III	.884	.152	.012	.085	.193	.189	.039	.007			.021	—				
8	47.20	18.64	1.96	6.82	8.28	11.52	2.91	0.28	1.44		0.84				99.89	3.02
A3. III	.787	.182	.013	.094	.207	.205	.047	.003			.011					
9	46.29	17.16	2.57	9.87	7.79	12.04	2.21	0.16	0.51		1.21				99.81	3.06
A3. III	.772	.168	.016	.138	.195	.215	.035	.002			.014					
10	45.66	16.26	2.97	8.51	10.21	12.25	1.34	0.31	0.92		1.39				99.82	3.04
A3. III	.761	.159	.019	.118	.255	.219	.022	.003			.018					

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 3. SODIPOTASSIC—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
9	III.5.4″.3″. *1.1.2.3.*	or 6.67 ab 8.91 an 35.86 di 18.56 hy 23.35 ol 2.34 mt 0.93 il 2.28	Broken Hill, New South Wales.	Not stated.	A. R. Dep. Min N. S. W. (1909), p. 198, 1910.	Dolerite.	
10	″III.5.4.3(4). *1.1.2.3.*	or 8.90 ab 13.62 an 33.92 di 18.40 hy 17.23 ol 2.59 mt 2.32 il 1.52	Taupo Bay, Whangaroa, New Zealand.	J. S. Maclaurin. rin.	Bell and Clarke, N. Z. G. S. B. 8, p. 77, 1909.	Diorite.	
11	III(IV) 5.4.3(4). *1.2.2.2.*	or 6.67 ab 9.43 an 23.91 di 30.09 hy 6.18 ol 17.88 mt 2.32 il 2.43	Happy Creek, Kakapotahi River, Mikonui, New Zealand	J. S. Maclaurin.	P. G. Morgan, N. Z. G. S. B. 6, p. 141, 1908	Quartz diorite.	
12	(II)III″5.″4.3(4). *1.1.2.2*	Q 4.74 or 3.89 ab 22.01 an 29.47 di 17.98 hy 15.08 mt 4.41	Antwerp Island, W. Antarctica.	E. Zdarek.	A. Pelikan, Voy. Belg., V, Pet. Unt., I, p. 32, 1909.	Gabbro.	

SUBRANG 4-5. PRESODIC. AUVERGNOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(II)III.5.4.(4)5. *1.3.2.3.*	or 2.78 ab 18.86 an 38.36 di 13.44 hy 5.38 ol 17.30 mt 0.46 il 2.74 ap 0.67	Umanak Island, Nugsuaks Peninsula, Greenland.	W. C. Phalen.	W. C. Phalen, Smiths. Misc. Coll., XLV, p. 190, 1904.	Diorite.	
2	III.5.4.5.⊙ *2.1.1.3.*	Q 0.18 or 1.11 ab 16.24 an 29.75 di 11.12 hy 30.97 mt 7.19 il 1.52 ap 0.67	Ovifak, Disko Island, Greenland.	T. Nicolau.	T. Nicolau, Medd. Grnl., XXIV, p. 232, 1900.	Basalt.	Not in W. T.
3	III.5.4.4.⊙ *1.1.2.2.*	or 4.45 ab 15.20 an 33.64 di 21.42 hy 20.26 ol 0.97 mt 0.93 il 1.06	Silver Bar Mine, Cobalt, Ontario.	R. E. Hore.	R. E. Hore, J. G., XVIII, p. 275, 1910.	Quartz diabase.	
4	III.5.4.4.⊙ *1.1.2.3.*	or 6.12 ab 17.82 an 31.97 di 15.78 hy 20.35 ol 2.61 mt 2.55 il 1.98	Grassy Portage Bay, Rainy Lake, Ontario.	M. F. Connor.	A. C. Lawson, Can. G. S. Mem. 40, p. 50, 1913.	Hornblende gabbro.	
5	III.5.(3)4.4. *1.2.2.2.*	or 5.56 ab 18.34 an 20.85 di 28.76 hy 4.49 ol 15.86 mt 2.78 il 1.67 ap 0.34	Rocky Islet Bay, Rainy Lake, Ontario.	M. F. Connor.	A. C. Lawson, Can. G. S. Mem. 40, p. 91, 1913.	Basic facies of syenite.	
6	III.5.4.4.⊙ *2.1.2.3.*	Q 0.96 or 5.00 ab 8.38 an 32.80 di 15.28 hy 24.83 mt 7.66 il 3.50	Lutterworth, Victoria County, Ontario.	F. J. Pope,	F. J. Pope, Tr. Am. Inst. M. E., XXIX, p. 401, 1899.	Diabase.	Not in W. T.
7	″III.″5.4.4″. *2.1.2.2.*	Q 4.08 or 3.89 ab 20.44 an 29.47 di 18.47 hy 17.32 mt 2.78 il 3.19	Limekiln Bay, Boothbay quadrangle, Maine.	M. W. Adams.	I. H. Ogilvie, An. N. Y. Ac. Sc., XVII, p. 550, 1907.	Diabase.	
8	(II)III.5.4.5. *1.3.2.2.*	or 1.67 ab 20.96 an 36.70 ne 1.09 di 16.35 ol 15.94 mt 3.02 il 1.67	Green Point, Monhegan Island, Maine.	E. C. E. Lord.	E. C. E. Lord, Am. G., XXVI, p. 340, 1900.	Gabbro-diorite.	6 specimens. In W. T., p. 329.
9	III.5.4.5.⊙ *2.3.2.3.*	or 1.11 ab 18.34 an 36.42 di 19.10 hy 2.36 ol 16.10 mt 3.71 il 2.16	Monhegan Island, Maine.	E. C. E. Lord.	E. C. E. Lord. Am. G., XXVI, p. 346, 1900.	Beerbachite.	6 specimens. In W. T., p. 329.
10	III.4.4(5).(4)5. *2.2.2.2.*	or 1.67 ab 11.53 an 37.53 di 18.78 hy 11.40 ol 11.37 mt 4.41 il 2.74	Monhegan Island, Maine.	E. C. E. Lord.	E. C. E. Lord, Am. G., XXVI, p. 346, 1900.	Malchite.	5 specimens. In W. T., p. 329.

CLASS III. SALFEMANE—Continued.

RANG 4. DOCALCIC. AUVERGNASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
11	44.79	15.18	4.13	8.21	7.93	14.10	2.18	0.30	1.33		1.84				99.99	3.04
A3. III	.747	.148	.025	.114	.198	.251	.035	.003			.022					
12	46.59	17.55	1.68	10.46	7.76	10.64	3.31	0.72	0.07	0.10	1.41				100.29	3.047
A3. III	.777	.172	.011	.145	.194	.190	.053	.008			.018					
13	51.78	12.79	3.59	8.25	7.63	10.70	2.14	0.39	0.63		1.41	0.14	0.44		99.89	3.03
A2. II	.863	.125	.023	.115	.191	.191	.034	.004			.018	.001	.006			
14	48.61	17.81	0.25	8.46	7.76	11.16	2.77	0.47	1.63		1.35		0.20		100.47	3.01
A2. II	.810	.175	.002	.118	.194	.199	.045	.005			.017		.003			
15	49.98	17.65	3.48	4.85	7.78	9.42	2.75	0.17	2.23	1.06	0.87	trace	0.15	BaO none	100.19	
A2. II	.833	.173	.022	.068	.195	.168	.045	.002			.011	——	.002			
16	49.90	14.64	4.65	7.52	6.06	9.14	2.73	0.46	1.98	0.46	1.98	0.38	0.18	S 0.02 BaO 0.02	100.12	
A2. II	.832	.144	.029	.104	.152	.163	.044	.005			.025	.003	.003			
17	49.28	15.76	1.86	6.94	8.21	10.51	2.58	0.76	1.10	0.57	0.87	0.11	0.20	CO_2 0.36 SO_3 none FeS_2 0.99 $CuFeS_2$ 0.13 Cr_2O_3 0.03 NiO 0.09 BaO trace SrO none Li_2O none	100.25	
A1. I	.821	.155	.012	.096	.205	.188	.042	.008			.001	.001	.003			
18	47.63	15.49	2.60	8.70	8.40	10.04	3.09	0.36	1.78	0.35	1.93	0.11	0.22	BaO none	100.70	
A2. II	.794	.151	.016	.121	.210	.179	.050	.004			.024	.001	.003			
19	44.97	15.38	2.29	12.39	10.89	7.50	3.02	0.56	0.65	0.10	1.18	0.14	0.22	CO_2 0.23 S 0.06 Cr_2O_3 trace V_2O_3 0.02 NiO 0.02 BaO trace SrO trace	99.64	
A1. I	.750	.150	.014	.172	.272	.134	.048	.006			.015	.001	.003			
20	52.48	14.98	1.13	9.25	7.75	10.83	1.87	0.43	0.23	0.18	1.30	0.13	0.27		100.83	3.110
A2. II	.875	.147	.007	.129	.194	.193	.031	.005			.016	.001	.004			
21	51.88	14.53	1.35	9.14	7.78	9.98	2.06	0.93	0.97	0.12	1.35	0.14	0.10		100.33	2.98
A2. II	.865	.142	.009	.127	.195	.179	.033	.010			.017	.001	.001			
22	51.84	15.11	1.78	8.31	7.27	10.47	1.87	0.34	1.33	0.56	1.22	0.13	0.09		100.32	2.93
A2. II	.864	.148	.011	.115	.182	.188	.031	.004			.015	.001	.001			
23	51.14	12.99	1.50	9.14	11.58	10.08	1.72	0.52	0.59	0.14	1.13	0.06	0.16		100.75	3.057
A2. II	.852	.127	.009	.127	.290	.180	.028	.005			.003	——	.002			
24	51.03	11.92	1.52	10.85	12.08	9.22	1.50	0.39	0.54	0.17	0.93	0.08	0.15		100.38	3.122
A2. II	.851	.117	.009	.151	.302	.164	.024	.004			.012	——	.002			

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 4-5. PRESODIC. AUVERGNOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
11	III.5″.4.″5. *2.2.2.2.*	or 1.67 di 31.84 ab 12.58 ol 9.45 an 30.58 mt 5.80 ne 3.12 il 3.39	Seal Ledge, Monhegan Island, Maine.	E. C. E. Lord.	E. C. E. Lord, Am. G., XXVI, p. 340, 1900.	Hornblende gabbro.	In W. T., p. 329.
12	″III.5(6).4.4(5). *1.3.1.3.*	or 4.45 di 18.02 ab 16.77 ol 18.92 an 30.86 mt 2.55 ne 5.96 il 2.74	Salem Neck, Essex County, Massachusetts.	H. S. Washington.	H. S. Washington, J. G., VII, p. 285, 1899.	Camptonite.	In W. T., p. 329.
13	III.(4)5.4.4(5). *2.1.2.3.*	Q 5.34 di 22.78 or 2.22 hy 18.60 ab 17.82 mt 5.34 an 24.19 il 2.78	West Rock, New Haven, Connecticut.	G. W. Hawes.	G. W. Hawes, A. J. S., IX, p. 186, 1875.	Dolerite.	Complete in A. J. S., XXII, p. 231, 1881. Not in W. T.
14	(II)III.5.4.(4)5. *1.3.2.3.*	or 2.78 di 16.78 ab 23.58 ol 18.00 an 34.75 mt 0.46 il 2.58	Maltby Park, New Haven, Connecticut.	G. W. Hawes.	G. W. Hawes, A. J. S., XI, p. 124, 1876.	Metadiabase.	Not in W. T.
15	III″.5.4.5. *2.1.2.2.*	Q 1.50 di 9.29 or 1.11 hy 19.96 ab 23.58 mt 5.10 an 35.03 il 1.67	Bet. Preston and Griswold, Connecticut.	G. Steiger.	G. F. Loughlin, U. S. G. S. B. 492, p. 114, 1912.	Norite.	
16	(II)III.(4)5.″4.(4)5. *2.1.2.3.*	Q 5.70 di 10.79 or 2.78 hy 16.98 ab 23.06 mt 6.73 an 26.41 il 3.80 ap 1.01	Near Preston, Connecticut.	G. Steiger.	G. F. Loughlin, U. S. G. S. B. 492, p. 114, 1912.	Quartz diorite.	
17	″III.5.″4.4″. *2.2.2.2.*	or 4.45 di 17.95 ab 22.01 hy 11.30 an 29.19 ol 7.35 mt 2.78 il 1.67 ap 0.34	Prospect Hill, Litchfield, Connecticut.	W. F. Hillebrand.	W. H. Hobbs, Ros. Fests., p. 32, 1906.	Hornblende norite.	
18	III.5.(3)4.″5. *2.3.2.2.*	or 2.22 di 17.76 ab 26.20 hy 2.27 an 26.97 ol 15.37 mt 3.71 il 3.65 ap 0.34	Prospect Hill, Preston, Connecticut.	G. Steiger.	G. F. Loughlin, U. S. G. S. B. 492, p. 114, 1912.	Amphibolite.	Dike.
19	III.5.(3)4.″5. *2.4.1.3.*	or 3.34 di 7.94 ab 20.96 ol 31.20 an 26.69 mt 3.25 ne 1.99 il 2.16 ap 0.34	Elizabethtown, Essex County, New York.	W. F. Hillebrand.	J. F. Kemp, U. S. G. S. B. 168, p. 37, 1900.	Norite.	In W. T., p. 331.
20	III.5.4.4(5). *1.1.2.3.*	Q 3.24 di 17.96 or 2.78 hy 25.12 ab 16.24 mt 1.62 an 30.86 il 2.43 ap 0.34	Palisades, Weehawken, New Jersey.	R. B. Gage.	J. V. Lewis, N. J. G. S. A. R. (1907), p. 121, 1908.	Diabase.	
21	III.5.4.4.⊙ *1.1.2.3.*	Q 2.10 di 17.49 or 5.56 hy 24.40 ab 17.29 mt 2.09 an 27.52 il 2.58 ap 0.34	Weehawken, New Jersey.	R. B. Gage.	J. V. Lewis, N. J. G. S. A. R. (1907), p. 121, 1908.	Basaltic diabase.	
22	III.″5.4.(4)5. *1.1.2.3.*	Q 5.04 di 16.32 or 2.22 hy 22.11 ab 16.24 mt 2.55 an 31.41 il 2.28 ap 0.34	Scotch Plains, New Jersey.	R. B. Gage.	J. V. Lewis, N. J. G. S. A. R. (1907), p. 159, 1908.	Diabase.	Upper layer. Cf. No. 13, III.5.3.4.
23	III″.5.4.4(5) *1.1.2.2.*	or 2.78 di 19.08 ab 14.67 hy 29.92 an 26.13 ol 2.98 mt 2.09 il 1.98	Englewood, New Jersey.	R. B. Gage.	J. V. Lewis, N. J. G. S. A. R. (1907), p. 121, 1908.	Diabase.	
24	III(IV).5.4.4(5). *1.1.2.2.*	or 2.22 di 16.16 ab 12.58 hy 39.82 an 24.74 mt 2.09 il 1.82 ap 0.34	Englewood, New Jersey.	R. B. Gage.	J. V. Lewis, N. J. G. S. A. R. (1907), p. 121, 1908.	Diabase.	

CLASS III. SALFEMANE—Continued.

RANG 4. DOCALCIC. AUVERGNASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
25	51.09	14.23	2.56	7.74	7.56	10.35	1.92	0.42	1.01	1.66	1.30	0.16	0.25		100.25	2.936
A2. II	.852	.139	.016	.107	.189	.185	.031	.004			.016	.001	.003			
26	50.19	14.65	3.41	6.96	7.95	9.33	2.64	0.75	2.38	0.66	1.13	0.18	0.07		100.30	2.92
A2. II	.836	.144	.021	.097	.199	.166	.043	.008			.014	.001	.001			
27	50.40	15.60	3.65	6.30	6.08	10.41	2.57	0.62	1.67	1.02	1.35	0.16	0.06		99.89	2.89
A2. II	.840	.153	.023	.088	.152	.186	.042	.007			.017	.001	.001			
28	49.17	13.80	4.90	10.61	5.04	9.87	2.21	0.54	0.73	1.04	1.50	0.24	0.07	SrO 0.03	99.75	2.997
A2. II	.820	.135	.031	.147	.126	.177	.035	.006			.019	.002	.001			
29	48.68	14.39	4.00	10.09	6.32	9.23	2.31	0.47	2.03	0.46	1.69	0.29	0.22	CO_2 none S trace Cr_2O_3 none NiO trace BaO trace SrO none	100.18	
A1. I	.811	.141	.025	.140	.158	.164	.037	.005			.021	.002	.003			
30	46.79	14.22	5.10	9.42	5.86	10.14	2.38	0.77	2.98	0.54	1.66	0.35	0.18	CO_2 none	100.39	
A2. II	.780	.139	.032	.131	.147	.181	.039	.008			.021	.002	.003			
31	51.68	15.87	1.46	8.43	7.84	11.08	1.86	0.34	0.15	0.16	0.72	0.12	0.15		99.86	
A2. II	.861	.155	.009	.117	.196	.198	.030	.003			.009	.001	.002			
32	47.67	15.93	1.96	6.80	8.99	12.32	1.68	0.79	1.80	0.12	0.85	0.13	1.51	S 0.16	100.71	
A2. II	.795	.156	.012	.094	.225	.220	.027	.008			.011	.001	.021			
33	49.62	15.87	1.75	7.90	7.29	12.86	2.17	0.40	1.59	0.27	0.58	0.11	0.20	SO_3 0.08	100.69	
A2. II	.827	.156	.011	.110	.182	.230	.035	.004			.007	.001	.003			
34	52.11	13.70	1.22	9.86	8.08	12.16	1.31	0.16	0.53	0.06	0.32	0.05	0.20	ZrO_2 none S trace NiO 0.03 BaO none SrO none Li_2O trace	99.79	
A1. I	.869	.134	.008	.137	.202	.217	.021	.002			.004	—	.003			
35	46.91	15.85	2.86	9.95	7.01	9.62	2.65	0.69	1.62	0.24	0.03	0.26	0.22	ZrO_2 none S none Cr_2O_3 0.01 V_2O_3 0.03 NiO 0.03 BaO trace SrO trace	99.98	
A1. I	.782	.155	.018	.139	.175	.171	.043	.007			.025	.002	.003			
36	47.90	15.60	3.69	8.41	8.11	9.99	2.05	0.23	2.34	0.15	0.82	0.13	0.17	CO_2 0.38 Cr_2O_3 trace NiO 0.10 BaO 0.05	100.12	
A2. II	.798	.153	.023	.117	.203	.178	.033	.002			.010	.001	.002			
37	47.69	16.02	2.41	8.70	8.31	10.54	2.44	none	2.04	0.44	1.38	0.06	0.26	CO_2 none ZrO_2 none S none BaO none SrO none	100.29	
A1. I	.795	.157	.015	.121	.208	.188	.039	—			.018	—	.003			
38	49.56	17.81	2.76	9.48	5.93	9.70	2.87	none	0.50		0.48	0.67	0.06		99.82	2.967
A2. II	.826	.175	.017	.133	.148	.173	.047	—			.006	.005	—			

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 4-5. PRESODIC. AUVERGNOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
25	III.(4)5.4.(4)5. *2.1.2.2.*	Q 5.34 di 17.59 or 2.22 hy 20.66 ab 16.24 mt 3.71 an 28.91 il 2.43 ap 0.34	Hartshorne's quarry, Springfield, New Jersey.	R. B. Gage.	J. V. Lewis, N. J. G. S. A. R. (1907), p. 159, 1908.	Basalt.	Middle layer.
26	III.5.(3)4.4″. *2.1.2.2.*	Q 0.84 di 15.56 or 4.45 hy 20.77 ab 22.53 mt 4.87 an 25.85 il 2.13 ap 0.34	Hartshorne's quarry, Springfield, New Jersey.	R. B. Gage.	J. V. Lewis, N. J. G. S. A. R. (1907), p. 159, 1908.	Basalt.	Lower layer.
27	(II)III.5.″4.4(5). *2.1.2.2.*	Q 3.72 di 16.78 or 3.89 hy 13.59 ab 22.01 mt 5.34 an 28.91 il 2.58 ap 0.67	Jersey City, New Jersey.	R. B. Gage.	J. V. Lewis, N. J. G. S. A. R. (1907), p. 121, 1908.	Basaltic diabase.	
28	III.(4)5.4.4(5). *2.1.2.3.*	Q 5.16 di 17.48 or 3.34 hy 16.88 ab 18.34 mt 7.19 an 26.13 il 2.89 ap 0.67	Millington, New Jersey.	R. B. Gage.	J. V. Lewis, N. J. G. S. A. R. (1907), p. 159, 1908.	Basalt.	
29	III.5.4.(4)5. *2.1.2.3.*	Q 2.88 di 13.23 or 2.78 hy 22.10 ab 19.39 mt 5.80 an 27.52 il 3.19 ap 0.67	Roberts road, Bryn Mawr, Pennsylvania.	W. F. Hillebrand.	F. Bascom, B. G. S. A., XVI, p. 319, 1905.	Metagabbro.	
30	III.5.″4.4″. *2.1.2.3.*	Q 0.24 di 18.64 or 4.45 hy 16.26 ab 20.44 mt 7.42 an 25.58 il 3.50 ap 0.67	Green Ridge quadrangle, South Mountain, Pennsylvania.	G. Steiger.	F. Bascom, U. S. G. S. rec. lab.	Metabasalt.	
31	III.5.4.″5. *1.1.2.3.*	Q 2.94 di 16.56 or 1.67 hy 24.86 ab 15.72 mt 2.09 an 33.92 il 1.37 ap 0.34	Rocky Ridge, Maryland.	E. A. Schneider.	J. S. Diller, U. S. G. S. B. 148, p. 90, 1897.	Diabase.	In W. T., p. 331.
32	III.5.4.4.⊙ *1.2.2.2.*	or 4.45 di 21.57 ab 14.15 hy 9.87 an 33.64 ol 9.42 mt 2.78 il 1.67 ap 0.34	Near James River Gap, Virginia.	W. M. Thornton.	T. L. Walker, pers. com.	Gabbro.	
33	III.5.4.(4)5. *1.1.2.3.*	or 2.22 di 24.98 ab 18.34 hy 12.32 an 32.53 ol 4.53 mt 2.55 il 1.06 ap 0.34	Copper Hill, Ducktown, Tennessee.	C. Palmer.	F. B. Laney, U. S. G. S. rec. lab.	Gabbro.	
34	III.″5.4″.″5. *1.1.1.3.*	Q 4.38 di 24.21 or 1.11 hy 25.18 ab 11.00 mt 1.86 an 30.86 il 0.61	Near Cranberry, North Carolina.	W. F. Hillebrand.	A. Keith, U. S. G. S. B. 168, p. 52, 1900.	Diabase.	In W. T., p. 311.
35	″III.5.″4.4(5). *2.2.2.3.*	or 3.89 di 13.44 ab 22.53 hy 10.29 an 29.19 ol 10.09 mt 4.18 il 3.90 ap 0.67	Hump Mountain, Mitchell County, North Carolina.	W. F. Hillebrand.	A. Keith, U. S. G. S. B. 168, p. 52, 1900.	Diorite.	In W. T., p. 331.
36	III.5.4.5.⊙ *2.1.2.2.*	Q 0.36 di 12.85 or 1.11 hy 25.41 ab 17.29 mt 5.34 an 32.80 il 1.54 ap 0.34	Penokee-Gogebic Region, Michigan.	T. M. Chatard.	C. R. Van Hise, U. S. G. S. Mon. 19, p. 357, 1892.	Diabase.	In W. T., p. 331.
37	III.5.4.5.⊙ *2.2.2.2.*	ab 20.44 di 15.82 an 32.80 hy 15.48 ol 6.99 mt 3.48 il 2.74	Greenstone Cliff, Keweenaw Point, Michigan.	G. Steiger.	A. N. Winchell, J. G., XVI, p. 772, 1908.	Olivine diabase.	
38	(II)III.5.4.5. *2.1.2.3.*	Q 0.12 di 6.43 ab 24.63 hy 26.14 an 35.58 mt 3.94 il 0.91 ap 1.68	Sec. 26, T. 64 N., R. 8 W., Minnesota.	W. H. Melville.	W. S. Bayley, J. G., III, p. 10, 1895.	Gabbro.	In W. T., p. 333.

CLASS III. SALFEMANE—Continued.

RANG 4. DOCALCIC. AUVERGNASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
39	48.88	16.39	5.51	7.21	5.80	9.11	2.08	0.47	2.15	0.19	1.84	0.10	0.15	CO_2 0.09 S 0.05 Cr_2O_3 none BaO 0.02 SrO none CuO 0.02	100.06	2.974
A1. I	.815	.161	.034	.100	.145	.163	.034	.005			.019	.001	.002			
40	48.27	16.29	4.55	10.09	4.94	8.42	2.14	0.77	1.67	0.64	2.46	0.14	0.17	CO_2 0.05 S 0.04 Cr_2O_3 none BaO 0.04 CuO 0.03	100.71	2.986
A1. I	.805	.160	.029	.140	.124	.150	.034	.008			.031	.001	.002			
41	45.66	16.44	0.66	13.90	11.57	7.23	2.13	0.41	0.83	0.07	0.92	0.05	trace	Cr_2O_3 trace NiO 0.16	100.03	
A2. II	.761	.161	.004	.193	.289	.129	.034	.004			.012	—	—			
42	43.50	18.06	7.52	7.64	3.47	13.39	2.00	1.30	1.22		2.10				100.20	
A3. III	.725	.177	.047	.106	.087	.239	.032	.014			.025					
43	50.36	13.63	2.22	8.38	8.67	11.50	2.54	0.75	0.71	0.05	0.90	0.07	0.20		99.98	
A2. II	.869	.134	.014	.117	.217	.205	.041	.008			.011	—	.003			
44	47.87	16.34	3.59	7.17	7.80	10.33	2.43	0.92	1.25	0.28	1.02	0.41	0.14	CO_2 0.44 NiO 0.02 BaO 0.03	100.04	
A2. II	.798	.160	.023	.100	.195	.184	.039	.010			.013	.003	.002			
45	45.71	10.80	4.43	9.35	13.75	10.48	1.58	0.85	0.97		1.83	0.11	0.17	Cr_2O_3 0.10	100.13	
A2. II	.762	.106	.028	.130	.344	.187	.025	.009			.023	.001	.002			
46	52.00	11.59	2.72	7.18	12.87	10.49	1.06	0.92	0.37	0.18	0.99	trace	trace	CO_2 none S trace Cr_2O_3 trace NiO 0.04 BaO trace	100.41	
A2. II	.867	.114	.017	.100	.322	.188	.017	.010			.012	—	—			
47	47.54	16.73	6.69	6.67	6.38	8.74	2.81	1.10	0.36		2.76	0.51	0.19	BaO 0.03	100.51	
A2. II	.792	.164	.042	.093	.160	.156	.045	.012			.034	.004	.003			
48	49.00	16.87	2.09	8.50	6.70	10.21	2.57	0.66	1.00	0.72	1.11	0.13	0.10	ZrO_2 0.02 Cl 0.05 S none Cr_2O_3 0.02 V_2O_3 trace BaO trace SrO none	99.75	
A1. I	.817	.165	.013	.118	.168	.182	.042	.007			.014	.001	.001			
49	47.41	16.35	3.37	7.72	8.55	10.45	2.50	0.75	0.11	0.08	1.54	0.49	0.27	CO_2 none SO_3 none Cl trace BaO 0.04 SrO trace	99.63	2.95
A1. I	.790	.160	.021	.107	.214	.187	.040	.008			.019	.003	.004			
50	47.76	13.98	1.99	8.72	9.07	12.71	1.65	0.20	2.06	0.22	1.48	0.12	0.14	CO_2 none ZrO_2 none SO_3 none S 0.04 BaO trace SrO none	100.14	
A1. I	.796	.137	.013	.121	.227	.227	.027	.002			.019	.001	.002			
51	50.36	15.83	2.29	8.11	7.90	9.25	3.05	0.86	0.27	0.06	1.33	0.21	0.24	CO_2 none SO_3 none S none NiO none BaO trace SrO trace	99.75	
A1. I	.839	.155	.014	.113	.193	.165	.049	.009			.017	.002	.003			
52	50.56	14.49	1.78	10.20	5.90	10.13	2.91	0.38	1.50	0.20	1.67	trace	0.25	ZrO_2 none FeS_2 0.28 NiO trace BaO trace SrO none	100.25	
A1. I	.843	.142	.011	.142	.148	.180	.047	.004			.021	—	.004			

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 4-5. PRESODIC. AUVERGNOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
39	(II)III.(4)5.4.4(5). *2.1.2.3.*	Q 6.30, or 2.78, ab 17.82, an 33.92; di 8.53, hy 16.85, mt 7.89, il 2.89, ap 0.34	Taylors Falls, Minnesota.	F. F. Grout.	F. F. Grout, J. G., XVIII, p. 644, 1910.	Diabase.	
40	(II)III.″5.4.4. *2.1.1.3.*	Q 4.92, or 4.45, ab 17.82, an 32.80; di 6.64, hy 19.94, mt 6.73, il 4.71, ap 0.34	Pine City, Minnesota.	F. F. Grout.	F. F. Grout, J. G. XVIII, p. 647, 1910.	Diabase.	
41	III.5.4.(4)5. *1.4.1.3.*	or 2.22, ab 17.82, an 34.19; di 1.36, hy 9.99, ol 31.07, mt 0.93, il 1.69	Birch Lake, Minnesota.	H. N. Stokes.	W. S. Bayley, J. G., I, p. 173, 1893.	Olivine gabbro.	In W. T., p. 333.
42	″III.5.4.4. *2.1.2.3.*	or 7.78, ab 12.05, an 36.42, ne 2.56; di 24.29, ol 1.04, mt 10.90, il 3.80	Magnet Cove, Arkansas.	W. A. Noyes.	J. F. Williams, Ign. R. Ark., p. 295, 1891.	Amphibole monchiquite.	In W. T., p. 333.
43	III.5.(3)4.4″. *1.2.2.2.*	or 4.45, ab 21.48, an 23.63; di 27.10, hy 8.57, ol 9.07, mt 3.25, il 1.67	Bootleg Basin, St. Mary River, East Kootenay, British Columbia.	M. F. Connor.	S. Schofield, Can. G. S., rec. lab.	Hypersthene gabbro.	
44	″III.5.4.4. *2.2.2.2.*	or 5.56, ab 20.44, an 30.86; di 14.12, hy 12.30, ol 6.58, mt 5.34, il 1.98, ap 1.01	Haystack Stock, Park County, Montana.	G. Steiger.	W. H. Emmons, J. G., XVI, p. 218, 1908.	Olivine gabbro.	
45	III(IV).5.″4.4. *2.2.2.2.*	or 5.00, ab 13.10, an 20.02; di 24.86, hy 7.12, ol 18.72, mt 6.50, il 3.54, ap 0.34	Conical Peak, Crazy Mountains, Montana.	L. G. Eakins.	J. P. Iddings, U. S. G. S. B. 148, p. 146, 1897.	Hornblende picrite.	In W. T., p. 333.
46	″III.5.4.(3)4. *1.1.2.2.*	Q 2.22, or 5.56, ab 8.91, an 24.19; di 22.40, hy 30.90, mt 3.94, il 1.82	Cow Creek, n. Bridger Peak, Wyoming.	E. T. Allen.	A. C. Spencer, U. S. G. S. P. P. 25, p. 32, 1904.	Norite.	
47	(II)III.5.(3)4.4. *3.1.2.2.*	Q 1.20, or 6.67, ab 23.58, an 29.75; di 7.91, hy 14.91, mt 9.74, il 5.17, ap 1.34	Near Grants, Mount Taylor Region, New Mexico.	T. M. Chatard.	J. S. Diller, U. S. G. S. B. 148, p. 185, 1897.	Basalt.	In W. T., p. 333.
48	″III.5.4.4(5). *2.2.2.3.*	or 3.89, ab 22.01, an 32.25; di 14.35, hy 14.80, ol 5.18, mt 3.02, il 2.13, ap 0.34	Near Black Peak, Globe District, Arizona.	W. F. Hillebrand.	F. L. Ransome, U. S. G. S. P. P. 12, p. 84, 1903.	Olivine diabase.	
49	″III.5.4.4″.	or 4.45, ab 20.96, an 31.14; di 14.55, hy 8.21, ol 11.23, mt 4.87, il 2.89, ap 1.01	Kendrick Peak, San Francisco Mountains, Arizona.	H. H. Robinson.	H. H. Robinson, U. S. G. S. P. P. 76, p. 152, 1913.	Basalt.	
50	III.5.4.″5.	or 1.11, ab 14.15, an 30.02; di 26.12, hy 16.14, ol 4.09, mt 3.02, il 2.89, ap 0.34	Treadwell mine, Douglas Island, Alaska.	G. Steiger.	A. C. Spencer, U. S. G. S. B. 287, p. 63, 1906.	Diorite.	
51	″III.5.(3)4.4″. *2.2.2.3.*	or 5.00, ab 25.68, an 26.97; di 14.19, hy 13.98, ol 7.02, mt 3.25, il 2.58, ap 0.67	Naches Pass, Snoqualmie quadrangle, Washington.	G. Steiger.	Smith and Calkins, U. S. G. S. Fol. 139, p. 9, 1906.	Basalt.	
52	III.5.(3)4.″5. *2.1.2.3.*	Q 0.48, or 2.22, ab 24.63, an 25.30; di 20.44, hy 19.20, mt 2.55, il 3.19	Cedar Creek, n. Ophir, Port Orford quadrangle, Oregon.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. Fol. 89, p. 4, 1903.	Basalt.	

CLASS III. SALFEMANE—Continued.

RANG 4. DOCALCIC. AUVERGNASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
53	50.14	15.26	1.19	8.75	7.21	9.34	2.76	0.95	2.22	0.23	1.42	0.24	trace	CO_2 none S 0.04 Cr_2O_3 trace BaO 0.03 SrO none Li_2O none	99.78	
A1. I	.836	.150	.008	.122	.180	.167	.045	.010			.018	.002	—			
54	50.01	15.25	2.72	5.35	9.35	10.44	1.50	0.60	1.35	2.61	0.68	0.03	0.12	CO_2 none ZrO_2 none S none BaO none SrO none	100.01	
A1. I	.833	.150	.017	.075	.234	.187	.024	.006			.009	—	.002			
55	51.32	15.28	0.47	8.59	7.25	11.58	2.92	0.22	0.95	0.06	1.23	0.25	0.16	BaO none SrO trace Li_2O trace	100.28	
A2. II	.855	.150	.003	.120	.181	.207	.047	.002			.015	.002	.002			
56	50.89	16.76	3.86	4.69	8.49	11.72	2.61	0.32	0.41		0.79	0.09	0.13	BaO trace	100.76	
A2. II	.848	.164	.024	.065	.212	.209	.042	.003			.010	—	.002			
57	47.93	18.51	2.07	7.25	9.03	11.14	2.28	0.24	0.76		0.73	0.11	0.20	CO_2 none	100.25	
A2. II	.799	.181	.013	.101	.226	.199	.037	.003			.009	.001	.003			
58	44.77	17.82	5.05	6.95	8.22	10.36	2.13	0.92	2.64		0.53	0.72	trace		100.11	
A2. II	.746	.175	.032	.097	.206	.185	.034	.010			.006	.005	—			
59	50.10	16.10	4.50	4.77	8.47	11.70	1.16	0.51	1.84		1.89	trace			100.04	
A3. III	.835	.157	.028	.067	.212	.209	.019	.005			.001	—				
60	48.71	18.40	3.70	5.33	10.30	10.11	2.34	0.43	0.25		1.08	0.06			100.71	
A2. II	.812	.180	.023	.074	.258	.180	.038	.004			.014	—				
61	53.16	15.01	1.27	8.29	7.45	10.36	2.22	1.16	0.56		0.16	0.08	0.15	Cl trace S trace NiO 0.01 BaO 0.15 PbO 0.02 CuO 0.01	100.12	
A1. I	.886	.147	.008	.115	.186	.185	.035	.012			.002	—	.002			
62	52.78	13.66	2.40	8.64	7.95	9.52	2.34	0.20	1.89		0.23	none	0.11	CO_2 none S none	99.72	
A2. II	.880	.134	.015	.120	.199	.169	.037	.002			.003	—	.002			
63	52.00	17.29	2.90	8.26	6.95	8.80	2.81	0.18	0.35		0.53	0.01	0.05	CO_2 0.06 FeS_2 trace CaO none CuO trace PbO none	100.14	3.07
A2. II	.867	.170	.018	.115	.174	.157	.045	.002			.007	—	—			
64	51.74	14.26	3.67	10.08	6.86	8.78	2.65	0.26	0.16		0.78	0.03	0.14	CO_2 0.18 S trace PbO trace	99.59	
A2. II	.862	.140	.023	.140	.172	.157	.043	.003			.010	—	.002			
65	51.50	10.89	1.75	6.84	13.91	10.19	1.18	0.24	2.40		0.20	trace	trace	CO_2 none ZrO_2 none Cl 0.11 S none CoO none BaO 0.65 Cu,Pb trace	99.86	
A1. I	.858	.107	.011	.095	.348	.182	.019	.002			.003	—	—			
66	51.37	13.90	4.55	9.86	6.64	10.36	2.42	0.06	0.50		0.32	trace	0.12	CO_2 0.10 S trace CoO trace CuO trace PbO none	100.20	3.00
A2. II	.856	.136	.029	.137	.166	.185	.039	.001			.004	—	.002			
67	51.19	15.80	3.08	11.20	5.63	9.58	2.09	0.60	0.30		0.40	0.01	trace	CO_2 none FeS_2 trace CoO trace CuO trace PbO trace	99.88	
A2. II	.853	.155	.019	.156	.141	.171	.034	.006			.005	—	—			

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 4-5. PRESODIC. AUVERGNOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
53	″III.5.(3)4.4″.	or 5.56 di 14.78 ab 23.58 hy 17.86 an 26.41 ol 4.08 mt 1.86 il 2.74 ap 0.67	Bald Mountain, Port Orford quadrangle, Oregon.	H. N. Stokes.	J. S. Diller, U. S. G. S. Fol. 89, p. 4, 1903.	Gabbro.	
54	III.5.4.4.⊙	Q 3.66 di 14.85 or 3.34 hy 23.05 ab 12.58 mt 3.94 an 33.36 il 1.37	Umpqua River, Riddles quadrangle, Oregon.	G. Steiger.	G. F. Kay, U. S. G. S. B. 419, p. 167, 1910.	Augite andesite.	
55	III.5.″4.5. *1.1.2.3.*	or 1.11 di 22.53 ab 24.63 hy 15.17 an 28.08 ol 4.11 mt 0.70 il 2.28 ap 0.67	Near Hornitos, Mariposa County, California.	W. F. Hillebrand.	H. W. Turner, J. G., III, p. 403, 1895.	Diabase.	Also in U. S. G. S. A. R. 17 (1), p. 694, 1896. In W. T., p. 333.
56	(II)III.5.4.″5. *2.1.2.2.*	Q 0.30 di 19.82 or 1.67 hy 16.17 ab 22.01 mt 5.57 an 33.08 il 1.52	Inskip Crater, n. Lassen Peak, California.	Hillebrand and Chatard.	J. S. Diller, U. S. G. S. B. 148, p. 200, 1897.	Basalt.	In W. T., p. 333.
57	(II)III.5.4.″5. *1.3.2.2.*	or 1.67 di 12.58 ab 19.39 hy 8.47 an 39.20 ol 13.65 mt 3.02 il 1.37 ap 0.34	Paines Creek, n. Lassen Peak, California.	T. M. Chatard.	J. S. Diller, U. S. G. S. B. 148. p. 200, 1897.	Basalt.	In W. T., p. 333.
58	(II)III.5.4.4. *2.3.2.2.*	or 5.56 di 8.25 ab 17.82 hy 6.85 an 36.42 ol 12.66 mt 7.42 il 0.91 ap 1.68	Kosk Creek, Shasta County, California.	L. G. Eakins.	J. S. Diller. A. G., XIX, p. 255, 1897.	Hornblende basalt.	In W. T., p. 333.
59	″III.(4)5.4″.4. *2.1.2.2.*	Q 6.54 di 16.71 or 2.78 hy 17.01 ab 9.96 mt 6.50 an 36.97 il 1.67	Gué de L'Alma, Martinique, West Indies.	Pisani.	A. Lacroix, Mont Pelée, p. 573, 1904.	Inclusion in dacite.	
60	(II)III.5.4.″5. *2.2.1.2.*	or 2.22 di 9.23 ab 19.91 hy 15.28 an 38.36 ol 7.87 mt 5.34 il 2.13	Chateaubelair, St. Vincent, West Indies.	Pisani.	A. Lacroix, Mont Pelée, p. 598, 1904.	Basalt.	
61	III.5.″4.4. *1.1.2.3.*	Q 1.56 di 19.35 or 6.67 hy 23.23 ab 18.34 mt 1.86 an 27.80 il 0.30	Cuyuni River, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Br. Gui., p. 95, 1908.	Diabase.	
62	III.″5.4.5. *1.1.2.3.*	Q 4.74 di 16.78 or 1.11 hy 25.43 ab 19.39 mt 3.48 an 26.41 il 0.46	Urinambo, Barama River, British Guiana.	J. B. Harrison.	J. B. Harrison, G. N. W. Dist., II, p. 11, 1898.	Epidiorite.	In W. T., p. 333.
63	(II)III.5.4.5. *1.1.2.3.*	Q 2.46 di 7.72 or 1.11 hy 25.50 ab 23.58 mt 4.18 an 34.19 il 1.06	Essequibo River, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Br. Gui., p. 95, 1908.	Diabase.	New analysis of hessose, No. 36. W. T., p. 291.
64	III.5.″4.5. *2.1.2.3.*	Q 3.24 di 14.38 or 1.67 hy 24.52 ab 22.53 mt 5.34 an 26.13 il 1.52	Essequibo District, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Br. Gui., p. 49, 1908.	Epidiorite.	
65	III.5.4.(4)5. *1.1.2.2.*	Q 2.10 di 21.32 or 1.11 hy 35.32 ab 9.96 mt 2.55 an 23.91 il 0.46	Mazaruni River, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Br. Gui., p. 78, 1908.	Diorite.	
66	III.″5.4.5. *2.1.2.3.*	Q 3.78 di 20.37 or 0.56 hy 20.54 ab 20.44 mt 6.73 an 26.69 il 0.61	Essequibo River, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Br. Gui., p. 95, 1908.	Diabase.	New analysis of hessose, No. 37. W. T., p. 291.
67	″III.5.4.4(5). *1.1.2.3.*	Q 3.24 di 12.96 or 3.34 hy 25.06 ab 17.82 mt 4.41 an 31.97 il 0.76	Potaro River, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Br. Gui., p. 95, 1908.	Diabase.	New analysis of diabase, No. 34. W. T., p. 439

CLASS III. SALFEMANE—Continued.

RANG 4. DOCALCIC. AUVERGNASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
68	51.09	15.70	1.68	8.57	7.74	9.11	2.38	1.55	0.35		1.70	trace	0.41		100.28	
A2. II	.852	.154	.011	.119	.144	.163	.039	.017			.026		.006			
69	43.47	17.30	6.87	7.09	8.60	6.09	2.53	0.74	3.46		2.68	0.27	0.07	Cl 0.18 S 0.12	99.60	
A2. II	7.25	.170	.043	.099	.215	.109	.040	.008			.034	.002	.001			
70	52.50	16.02	1.70	6.58	8.70	10.18	2.34	1.08	0.19		0.62	0.11	0.15	Cr_2O_3 0.05 BaO 0.02	100.24	
A2. II	.875	.157	.011	.092	.218	.182	.038	.012			.008	.001	.002			
71	46.97	13.87	8.27	5.76	4.76	14.46	1.75	0.45	n. d.		1.99		1.20		99.48	
B2. III	.783	.136	.052	.080	.119	.258	.028	.005			.025		.017			
72	48.05	15.35	1.86	7.53	12.53	11.02	1.26	0.19	0.45	0.15	0.49		0.28	CO_2 0.44 S 0.20 Cr_2O_3 0.14 NiO 0.11 CuO 0.05	100.10	
A1 I	.801	.150	.012	.104	.313	.196	.020	.002			.006		.004			
73	46.46	15.48	3.63	10.23	6.80	9.05	3.01	0.68	1.43	0.89	2.07	0.30	0.48	S 0.08 Cr_2O_3 0.02 V_2O_3 0.05 NiO 0.02 BaO 0.02	100.70	
A1. I	.774	.152	.023	.142	.170	.162	.048	.007			.026	.002	.007			
74	47.64	14.15	5.18	7.96	7.38	11.71	2.38	0.71	1.44	0.19	1.27	0.09	0.33	S 0.03 Cr_2O_3 0.01 V_2O_3 0.06 NiO trace	100.53	3.01
A1. I	.794	.139	.033	.111	.185	.209	.039	.008			.016	——	.005			
75	46.61	15.14	3.49	7.71	8.66	10.08	2.43	0.67	2.07	1.10	1.81	0.10	0.13	CO_2 trace Cr_2O_3 0.04 V_2O_3 0.04 NiO trace	100.08	2.87
A2. II	.777	.148	.022	.107	.217	.180	.039	.007			.023	.001	.002			
76	44.01	12.69	3.62	8.75	12.86	10.57	1.68	0.49	2.73	0.89	1.66	0.17	0.21	CO_2 trace S 0.11 Cr_2O_3 trace NiO trace	100.44	2.95
A2. II	.733	.125	.023	.122	.322	.189	.027	.005			.021	.001	.003			
77	45.37	15.16	3.38	11.58	6.72	8.11	2.90	0.44	1.96	1.18	2.87	0.29	0.31	S none NiO none BaO none	100.27	
A2. II	.756	.148	.021	.161	.168	.145	.047	.005			.036	.002	.004			
78	43.94	14.03	1.95	11.65	10.46	8.99	2.68	0.33	2.31	0.85	2.45	0.20	0.32	CO_2 0.16 FeS_2 0.04 Fe_1S_8 0.06 Cr_2O_3 trace NiO none BaO none SrO none Li_2O none	100.42	
A1. I	.732	.137	.012	.162	.262	.161	.044	.004			.031	.001	.005			
79	42.49	13.85	2.59	9.32	11.21	9.76	2.39	0.87	3.35	0.47	2.51	0.61	0.29	CO_2 0.22 S none BaO 0.04	100.06	
A2. II	.708	.136	.016	.129	.280	.174	0.39	.009			.031	.004	.004			
80	49.87	14.61	5.21	7.65	5.90	8.70	2.78	0.66	1.23		2.96	0.36	trace	CO_2 0.14 Cl trace S 0.04 Cr_2O_3 0.03 BaO 0.23 SrO 0.02	100.49	
A1. I	.831	.143	.033	.107	.148	.155	.045	.007			.037	.003	——			
81	46.37	16.87	3.01	7.86	6.66	10.68	2.44	0.74	3.12		1.63	0.27		CO_2 0.29 Cl 0.02 S trace Cr_2O_3 0.01 NiO 0.01 BaO 0.06 SrO 0.03	100.07	
A1. I	.773	.165	.019	.109	.167	.191	.039	.008			.020	.002				

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 4-5. PRESODIC. AUVERGNOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
68	″III.5.(3)4.4. (1)2.1.2.3.	Q 1.08 or 9.45 ab 20.44 an 27.24 di 14.87 hy 19.34 mt 2.55 il 3.19	Akyma, British Guiana.	J. B. Harrison.	J. B. Harrison, G. Mag., (V) VIII, p. 121, 1911.	Diabase.	
69	″III.5.″4.″4.	or 4.45 ab 20.96 an 28.36 C 2.04 hy 23.50 ol 0.73 mt 9.98 il 5.17 ap 0.67	Masafuera, Juan Fernandez Islands.	N. Sahlbom.	P. D. Quensel, B. G. Un. Ups., XI, p. 280, 1912.	Basanite.	
70	III.5.″4.4. 1.1.2.2.	or 6.67 ab 19.91 an 29.75 di 16.16 hy 23.03 ol 0.62 mt 2.55 il 1.22 ap 0.34	Cerro Payne, Patagonia, Chile.	R. Mauzelius.	P. D. Quensel, B. G. Inst. Ups., XI, p. 55, 1911.	Bronzite-orthoclase gabbro.	
71	III.(4)5.4.(4)5. 2.1.3.3.	Q 5.10 or 2.78 ab 14.67 an 28.63 di 30.66 wo 1.86 mt 12.06 il 3.80	Randholar Volcano, Reykjanes Peninsula, Iceland.	Hauser.	M. Komorowicz, Vulk. Stud. Ins. Atl., p. 25, 1912.	Basalt.	MnO high?
72	III.5.4(5).″5. 1.2.2.2.	or 1.11 ab 10.48 an 35.58 di 15.17 hy 23.47 ol 8.95 mt 2.78 il 0.91	Allival, Rum Island, Scotland.	W. Pollard.	A. Harker, G. S. Scot., Mem. Sh. 45, p. 98, 1908.	Eucrite.	
73	III.5.(3)4.4(5). 2.3.2.3.	or 3.89 ab 25.15 an 26.97 di 13.20 hy 6.27 ol 12.78 mt 5.34 il 3.95 ap 0.67	Orval, Rum Island, Scotland.	W. Pollard.	A. Harker, G. S. Scot., Mem. Sh. 45, p. 57, 1908.	Olivine basalt.	
74	III.5.4.″4. 2.2.2.3.	or 4.45 ab 20.44 an 25.58 di 26.29 hy 5.75 ol 6.41 mt 7.66 il 2.43	Loch a' Bhasteir, Skye, Scotland.	W. Pollard.	A. Harker, Rocks of Skye, p. 370, 1904.	Dolerite.	
75	III.5.″4.4(5). 2.2.2.2.	or 3.89 ab 20.44 an 28.36 di 16.74 hy 9.44 ol 9.12 mt 5.10 il 3.50 ap 0.34	Drynoch, Skye, Scotland.	W. Pollard.	A. Harker, Rocks of Skye, pp. 31, 249, 1904.	Olivine basalt.	
76	II.5.4.(3)4. 2.3.2.2.	or 2.78 ab 14.15 an 25.85 di 20.70 hy 2.99 ol 21.53 mt 5.34 il 3.19 ap 0.34	Ciche na Beinne Dirge, Skye, Scotland.	W. Pollard.	A. Harker, Rocks of Skye, p. 325, 1904.	Olivine dolerite.	
77	III.5.(3)4.(4)5. 2.2.2.3.	or 2.78 ab 24.63 an 26.69 di 9.58 hy 11.48 ol 10.90 mt 4.87 il 5.47 ap 0.67	Pennycross House, Mull, Scotland.	E. G. Radley.	G. S. G. B., Sum. Prog. (1912), p. 70, 1913.	Basalt.	
78	III.5.″4.″5. 2.3.2.3.	or 2.22 ab 18.86 an 24.74 ne 2.27 di 15.60 ol 25.45 mt 2.78 il 4.71 ap 0.34	Sloc na Sgarth, Inverhodge, Jura Island, Scotland.	E. G. Radley.	J. S. Flett, G. S. Scot. Mem. sh. 35, p. 46, 1911.	Crinanite (analcite dolerite).	Fresh?
79	III.5″.(3)4.4. 2.2.2.2.	or 5.00 ab 14.15 an 24.46 ne 3.41 di 16.31 ol 22.72 mt 3.71 il 4.71 ap 1.34	Hillhouse quarry, Linlithgow, Scotland.	E. G. Radley.	J. S. Flett, G. S. Scot. Mem. sh. 28, p. 118, 1911.	Analcite basalt.	Fresh?
80	(II)III.(4)5.(3)4.4(5). 2.1.2.3.	Q 5.88 or 3.89 ab 23.58 an 25.30 di 12.01 hy 13.93 mt 7.66 il 5.62 ap 1.01	North Queensferry, n. Edinburgh, Scotland.	Harrison and Reid.	J. B. Harrison, pers. com.	Dolerite.	
81	(II)III.5.4.4″ 2.2.2.3.	or 4.45 ab 20.44 an 32.80 di 14.87 hy 8.20 ol 7.65 mt 4.41 il 3.04 ap 0.67	Corstorphine Hill, n. Edinburgh, Scotland.	Harrison and Reid.	J. B. Harrison, pers. com.	Dolerite.	

CLASS III. SALFEMANE—Continued.

RANG 4. DOCALCIC. AUVERGNASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
82	44.62	10.80	5.00	8.26	15.51	6.29	1.50	0.23	5.50		1.64	0.29	0.20	CO_2 0.04 S trace Cr_2O_3 0.07 V_2O_3 0.01 NiO 0.01 BaO 0.13 SrO 0.03	100.23	
A1. I	.744	.106	.031	.116	.388	.113	.024	.002			.021	.002	.003			
83	45.41	16.85	4.14	8.86	7.27	9.43	3.38	0.64	2.63		1.41	0.18		CO_2 0.09	100.29	
A2. II	.757	.165	.026	.123	.182	.168	.055	.007			.018	.001				
84	42.86	13.81	1.93	11.64	7.33	12.84	2.03	0.13	2.81	0.13	3.30	0.30	0.44	CO_2 0.22 FeS_2 0.80 BaO none	100.66	3.17
A2. II	.714	.135	.012	.162	.183	.229	.032	.001			.041	.002	.006			
85	51.30	18.20	1.28	5.10	9.35	12.79	1.80	0.25	0.31		0.32				100.70	
A3. III	.855	.178	.008	.071	.234	.229	.029	.003			.004					
86	48.70	17.95	0.76	6.48	8.20	13.36	1.90	0.47	0.70		1.18				99.70	
A3. III	.812	.176	.005	.090	.205	.239	.031	.005			.015					
87	45.55	14.86	3.20	8.55	11.70	9.38	2.16	1.47	1.88		1.75	0.24			100.74	
A2. II	.759	.146	.020	.119	.263	.168	.035	.016			.022	.002				
88	44.50	13.10	0.45	9.47	14.60	10.11	1.83	0.86	3.25		2.09	trace			100.26	
A3. III	.742	.128	.003	.132	.365	.180	.029	.009			.026	——				
89	47.28	13.24	4.44	10.50	5.94	11.04	2.62	0.31	2.00		1.48		0.40		99.25	
B2. III	.788	.130	.027	.146	.149	.197	.042	.003			.018		.006			
90	47.00	15.20	5.69	6.59	8.76	12.60	1.45	0.66	0.30		2.30	trace	0.26		100.81	
B2. III	.783	.149	.035	.092	.219	.225	.024	.007			.029	——	.004			
91	47.89	15.34	6.29	6.01	7.53	10.18	2.66	0.44	2.92		0.62		0.34		100.22	
A2. II	.798	.150	.039	.083	.188	.182	.043	.005			.008		.005			
92	45.85	16.86	2.70	11.00	7.92	7.37	2.44	0.89	2.00	0.50	1.37	0.29	0.18	CO_2 0.05 BaO trace	99.51	
A2. II	.764	.165	.017	.153	.198	.132	.039	.010			.017	.002	.003			
93	45.64	15.61	2.17	14.97	7.60	7.04	1.68	1.29	0.58	0.14	1.84	0.42	0.28	ZrO_2 none Cl 0.06 F 0.19 S 0.19 Cr_2O_3 none NiO none BaO 0.02 SrO none	99.72	
A1. I	.761	.153	.014	.208	.190	.126	.027	.014			.023	.003	.004			
94	52.03	15.28	3.59	8.73	5.37	7.59	2.46	1.12	1.34		1.59	0.19	0.30	FeS_2 0.14 BaO 0.05	99.79	
A2. II	.867	.150	.023	.121	.134	.136	.040	.012			.020	.001	.004			
95	51.00	16.87	2.16	5.93	8.75	11.37	2.13	0.48	0.43		0.60	trace	0.65		100.37	
A2. II	.850	.166	.014	.082	.219	.204	.034	.005			.008	——	.009			
96	48.55	14.69	2.92	9.60	5.88	10.68	2.40	0.56	2.41		1.40	0.11	0.47		99.67	
A2. II	.809	.144	.018	.133	.150	.191	.039	.006			.018	.001	.007			

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 4-5. PRESODIC. AUVERGNOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
82	III(IV).5.4.″5. *2.2.1.2.*	or 1.11 di 5.53 ab 12.58 hy 34.14 an 22.24 ol 7.76 mt 7.19 il 3.19 ap 0.67	Burntisland, n. Edinburgh, Scotland.	Harrison and Reid.	J. B. Harrison, pers. com.	Picrite.	Fresh?
83	(II(III.5.(3)4. (4)5. *2.3.2.2.*	or 3.89 di 14.00 ab 23.06 ol 15.85 an 28.63 mt 6.03 ne 3.12 il 2.74 ap 0.34	Nant Llwyngwern, Berwyn Hills, Wales.	M. Dittrich.	Jensen and Jevons, Pr. R. Soc. N. S. W., XLV, p. 523, 1912.	Dolerite.	
84	III.5.4.5.⊙ *2.2.2.3.*	or 0.56 di 27.39 ab 14.67 ol 14.67 an 28.36 mt 2.78 ne 1.14 il 6.23 ap 0.67	Tregaddeck, St. Malyn, Cornwall.	E. G. Radley.	C. Reid, G. S. Eng. Mem., Sh. 335, p. 46, 1910.	Proterobase.	
85	″III.5.4″.″5. *1.1.2.2.*	Q 0.30 di 18.41 or 1.67 hy 21.09 ab 15.20 mt 1.86 an 40.59 il 0.61	Les Rondellieres, Brittany, France.	Pisani.	L. Vandernotte, C. R., CXLVIII, p. 1204, 1909.	Gabbro.	Also in Mass. Armor., p. 85, 1913.
86	″III.5.4.4(5). *1.2.2.2.*	or 2.78 di 22.18 ab 16.24 hy 6.48 an 38.92 ol 9.08 mt 1.16 il 2.28	Ernée, Brittany, France.	Pisani.	L. Vandernotte, C. R., CXLVIII, p. 1204, 1909.	Olivine gabbro.	Also in Mass. Armor., p. 97, 1913.
87	III.5.(3)4.″4. *1.3.2.2.*	or 8.90 di 14.74 ab 17.55 ol 21.16 an 26.41 mt 4.64 ne 0.43 il 3.34 ap 0.67	Eglazines Volcano, n. Rozier, Aveyron, France.	Pisani.	A. Michel-Levy, C. R., CXLVIII, p. 1530, 1909.	Basalt.	Al_2O_3 corrected for P_2O_5.
88	III.5.4.4.⊙ *1.3.2.2.*	or 5.00 di 20.08 ab 10.48 ol 29.12 an 25.02 mt 0.70 ne 2.56 il 3.95	Marcigny, Loire, France.	Pisani.	A. Michel Levy, C. R., CXLVIII, p. 1530, 1909.	Basalt.	
89	III.5.(3)4.″5. *2.1.2.3.*	or 1.67 di 25.66 ab 22.01 hy 12.47 an 23.63 ol 2.86 mt 6.26 il 2.77	Cape Flora, Franz Josef Land, Arctic.	J. J. H. Teall.	J. J. H. Teall, Q. J. G. S., LIV, p. 647, 1898.	Basalt.	In W. T., p. 335.
90	III.5.4.4.⊙ *2.1.2.2.*	Q 0.18 di 23.53 or 3.89 hy 15.01 ab 12.58 mt 8.12 an 32.80 il 4.41	Sölvsberget, Gran, Norway.	G. Särnström.	W. E. Brögger, Q. J. G. S., L, p. 19, 1894.	Essexite.	In W. T., p. 335.
91	III.5.″4.(4)5. *2.1.2.2.*	or 2.78 di 17.73 ab 22.53 hy 15.13 an 28.36 ol 0.45 mt 9.05 il 1.22	Stadsberg, Ragunda Massif, Jemtland, Sweden.	H. Santesson.	A. G. Högbom, Afh. Sv. G. Und., No. 182, p. 45, 1899.	Olivine melaphyre.	Not in W. T.
92	(II)III.5.4.4. *2.3.1.3.*	or 5.56 di 2.04 ab 20.44 hy 14.47 an 32.25 ol 14.98 mt 3.94 il 2.58 ap 0.67	Norrsand, N. Ulfön, Nordingra, Sweden.	N. Sahlbom.	J. E. Sobral, G. Nord. Reg., p. 137, 1913.	Basalt.	
93	III.5.4.″4. *2.2.1.3.*	or 7.78 di 0.92 ab 14.15 hy 23.64 an 31.14 ol 13.32 mt 3.25 il 3.50 ap 1.01	Hamnberget, N. Ulfön, Nordingra, Sweden.	N. Sahlbom.	J. E. Sobral, G. Nord. Reg., p. 95, 1913.	Olivine diabase.	
94	(II)III.(4)5.(3)4.4. *2.1.2.3.*	Q 6.30 di 8.66 or 6.67 hy 19.98 ab 20.96 mt 5.34 an 27.24 il 3.04	Källsholm, Föglö, Alands Islands. Finland.	W. Wahl.	W. Wahl, Rosenb. Fests., p. 409, 1906.	Diabase.	Also in T. M. P. M., XXVI, p. 124, 1907.
95	III.5.4.4(5). *1.1.2.2.*	or 2.78 di 17.24 ab 17.82 hy 22.07 an 35.31 ol 0.45 mt 3.25 il 1.22	Arvolas quarry, Hyvinge, Finland.	N. Sahlbom.	V. Hackman, B. C. G. Fin., No. 15, p. 62, 1905.	Gabbro.	
96	III.5.4.4(5). *″2.1.2.3.*	or 3.34 di 20.37 ab 20.44 hy 18.21 an 27.52 ol 0.34 mt 4.18 il 2.74 ap 0.34	Kanin Peninsula, Russia.	F. Tegenren.	W. Ramsay, Fennia, XXXI, No. 4, p. 24, 1911.	Diabase.	

CLASS III. SALFEMANE—Continued.

RANG 4. DOCALCIC. AUVERGNASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
97	46.55	13.71	4.44	11.80	7.09	10.16	2.04	0.37	0.17		2.22	1.52	0.29		100.36	
A2. II	.776	.134	.028	.164	.177	.182	.032	.004			.028	.011	.004			
98	50.76	16.17	3.32	5.09	9.98	9.55	2.15	0.27	1.75	0.02	0.55	0.28		CO_2 0.05 SO_3 0.11	100.05	
A2. II	.846	.158	.021	.071	.250	.171	.035	.003			.007	.002				
99	49.39	17.15	3.10	6.22	9.86	8.84	1.80	0.29	2.09	0.21	0.75	0.75		CO_2 none SO_3 0.11	100.56	
A2. II	.823	.168	.019	.086	.247	.158	.029	.003			.010	.005			(100.05)	
100	48.60	16.38	3.01	9.65	6.04	10.18	2.71	0.53	0.59	0.11	1.43	0.12		CO_2 0.12 FeS_2 0.21	99.68	
A2. II	.810	.161	.019	.134	.151	.182	.044	.006			.018	.001				
101	41.03	11.07	4.65	7.05	15.75	10.59	1.71	0.94	2.85	1.36	2.43	0.41	trace		99.84	
A2. II	.684	.109	.029	.098	.394	.189	.027	.010			.030	.003	——			
102	49.97	16.55	1.82	8.75	5.58	12.59	2.09	0.27	0.63	0.17	0.76			CO_2 0.31 FeS_2 0.12	99.61	
A3. III	.833	.162	.011	.122	.140	.225	.034	.003			.010					
103	47.45	14.99	2.93	9.75	7.61	10.23	2.06	1.55	1.19	0.34	1.29	0.54		SO_3 0.52	100.50	
A2. II	.791	.147	.018	.136	.190	.182	.033	.017			.016	.004				
104	44.39	18.08	6.67	6.90	6.33	10.43	1.70	0.32	0.83		1.36	1.41		CO_2 0.28 SO_3 1.00	99.70	
A2. II	.740	.177	.042	.096	.158	.186	.027	.003			.017	.010				
105	44.77	13.13	3.83	6.34	12.66	9.98	1.87	1.68	1.19	1.05	2.54	0.66		CO_2 0.08 SO_3 none	99.78	
A2. II	.746	.129	.024	.088	.317	.179	.030	.018			.032	.005				
106	47.72	18.49	0.68	4.54	12.88	11.59	2.81	0.41	1.30		0.24	0.04	trace	CO_2 none Cl trace SrO trace Li_2O trace	100.76	2.916
A2. II	.795	.181	.004	.063	.322	.207	.045	.004			.003	——	——			
107	50.64	14.92	4.99	9.21	6.64	8.53	2.23	0.55	1.06		1.43	0.42		SO_3 0.19	100.81	3.043
A2. II	.844	.146	.031	.128	.166	.152	.035	.006			.018	.003				
108	50.62	16.09	0.85	7.21	13.11	8.50	1.52	0.64	1.33		0.43	trace		SO_3 0.15	100.45	2.993
A3. III	.844	.158	.005	.100	.328	.152	.024	.007			.005	——				
109	48.68	18.46	1.23	2.83	11.24	14.01	1.09	0.75	1.37		trace	0.08		SO_3 0.35	100.09	2.932
A3. III	.811	.181	.008	.039	.281	.250	.018	.008			——	——				
110	49.32	18.50	0.89	5.57	7.94	12.30	2.02	0.94	1.96		0.38	trace		SO_3 0.20	100.02	2.928
A2. II	.822	.181	.006	.078	.199	.220	.032	.010			.005	——				
111	46.43	13.62	1.16	9.08	15.15	8.60	1.88	0.84	2.36		1.04	0.22		SO_3 0.17	100.55	3.041
A2. II	.774	.134	.007	.126	.379	.154	.031	.009			.013	.002				
112	45.82	17.63	2.01	6.20	13.53	10.94	1.34	0.72	1.41		0.38	0.08		SO_3 0.13	100.11	2.994
A2. II	.764	.173	.013	.086	.338	.195	.022	.008			.005	——			(100.19)	

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 4-5. PRESODIC. AUVERGNOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
97	III.5.4.(4)5. *2.1.2.3.*	Q 1.68 di 10.73 or 2.22 hy 27.21 ab 16.77 mt 6.50 an 27.24 il 4.26 ap 3.70	Near Laanila, Enare, Finland.	N. Sahlbom.	V. Hackman, B. C. G. Fin., No. 15, p. 69, 1905.	Trapp. (diabase).	
98	"III.5.4."5. *2.1.2.2.*	Q 2.40 di 9.91 or 1.67 hy 25.98 ab 18.34 mt 4.87 an 33.36 il 1.06 ap 0.67	Burg Frankenstein, Odenwald.	G. Butzbach.	G. Klemm, Nb. Ver. Erdk. (4), XXVII, p. 25, 1906.	Odinite.	
99	"III.5.4."5. *2.1.1.2.*	Q 3.00 di 1.11 or 1.67 hy 31.69 ab 15.20 mt 4.41 an 37.81 il 1.52 ap 1.68	Frankenstein, Odenwald.	G. Butzbach.	G. Klemm, Nb. Ver. Erdk. (4), XXVII, p. 25, 1906.	Odinite.	
100	"III.5."4.(4)5. *2.1.2.3.*	or 3.34 di 15.55 ab 23.06 hy 17.54 an 30.86 mt 4.41 il 2.74 ap 0.34	Near Ober Ramstadt, Odenwald.	K. M. Jene.	G. Klemm, Nb. Ver. Erdk. (4), XXVII, p. 25, 1906.	Diorite.	
101	III(IV).5(6)."4.4. *2.3.2.2.*⊙	or 5.56 di 22.54 ab 6.29 ol 24.06 an 21.13 mt 6.73 ne 4.26 il 4.56 ap 1.01	Platzerkuppe, Rhöngebirge.	M. Dittrich.	J. Soellner, N. J. B. B., XXIV, p. 515, 1907.	Hornblende basalt.	
102	III.5.4."5. *1.1.2.3.*	Q 0.60 di 23.01 or 1.67 hy 17.24 ab 17.82 mt 2.55 an 34.75 il 1.52	Klein-Zimmer, Hesse.	K. M. Jene.	G. Klemm, Erl. G. Kt. Hes., Bl. Messel, p. 8, 1910.	Diorite.	
103	III.5.4."4. *2.2.2.3.*	or 9.45 di 16.35 ab 17.29 hy 9.56 an 26.97 ol 10.85 mt 4.18 il 2.43 ap 1.34	Ober-Absteinach, Hesse.	Surv. lab.	G. Klemm, Erl. G. Kt. Hes., Bl. Birkenau, p. 26, 1905.	Diorite.	
104	(II)III."5.4"."5. *3.1.2.3.*	Q 4.14 di 1.33 or 1.67 hy 20.05 ab 14.15 mt 9.74 an 40.87 il 2.58 ap 3.36	Waschenbach, Bl. Rossdorf, Hesse.	Stadler.	G. Klemm, Erl. G. Kt. Hes., Bl. Rossdorf, p. 29, 1912.	Gabbro.	
105	III.5.(3)4.(3)4. *2.3.2.2.*	or 10.01 di 17.72 ab 15.72 ol 19.56 an 22.52 mt 5.57 il 4.86 ap 1.68	Londorf, Giessen, Hesse.	K. M. Jene.	W. Schottler, Abh. G. L.-A. Darm., IV (3), p. 460, 1908.	Basalt.	
106	"III.5".4."5. *1.3.2.2.*	or 2.22 di 16.55 ab 15.20 ol 22.65 an 36.70 mt 0.93 ne 4.54 il 0.46	Hohenberg, n. Bühne, Westphalia.	P. Jannasch.	F. Rinne, Sb. Pr. Ak. W., 1891, p. 980.	Olivine gabbro.	Inclusion in basalt. In W. T., p. 335.
107	"III.(4)5.4.4(5). *2.1.2.3.*	Q 6.36 di 8.37 or 3.34 hy 22.94 ab 18.34 mt 7.19 an 29.19 il 2.74 ap 1.01	Klein Rabental, Brocken, Harz.	Fischer.	O. H. Erdmannsdörfer, Jb. Pr. G. L.-A., XXVII, p. 365, 1906.	Gabbro.	Inclusion in granite.
108	III.5.4.4.⊙. *1.2.1.2.*	or 3.89 di 5.56 ab 12.58 hy 33.64 an 35.31 ol 6.04 mt 1.16 il 0.76	Molkenhaus, Brocken, Harz.	Klüss.	O. H. Erdmannsdörfer, Jb. Pr. G. L.-A., XXVII, p. 366, 1906.	Mica norite.	
109	"III.5.4(5).4. *1.2.2.1.*	or 4.45 di 20.81 ab 9.43 hy 9.59 an 43.09 ol 9.10 mt 1.86	Baste, Brocken, Harz.	Eyme.	O. H. Erdmannsdörfer, Jb. Pr. G. L.-A., XXVII, p. 367, 1906.	Norite.	
110	(II)III.5.4.4. *1.2.2.2.*	or 5.56 di 18.17 ab 16.77 hy 8.11 an 38.64 ol 8.56 mt 1.39 il 0.76	Radautal, Brocken, Harz.	Klüss.	O. H. Erdmannsdörfer, Jb. Pr. G. L.-A., XXVII, p. 365, 1906.	Augite norite.	
111	III.5.4.4.⊙ *1."4.1.2.*	or 5.00 di 11.83 ab 16.24 hy 5.15 an 26.13 ol 29.54 mt 1.62 il 1.98 ap 0.67	Molkenhaus, Brocken, Harz.	Fischer.	O. H. Erdmannsdörfer, Jb. Pr. G. L.-A., XXVII, p. 368, 1906.	Olivine gabbro.	
112	"III.5.4".4. *1.3.1.2.*	or 4.45 di 11.52 ab 11.53 hy 3.59 an 39.75 ol 24.10 mt 3.02 il 0.76	Radautal, Brocken, Harz.	Eyme.	O. H. Erdmannsdörfer, Jb. Pr. G. L.-A., XXVII, p. 369, 1906.	Olivine. norite.	

CLASS III. SALFEMANE—Continued.

RANG 4. DOCALCIC. AUVERGNASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
113	44.57	13.06	6.84	17.90	6.53	6.29	1.60	0.45	1.03		1.87	0.65		CO_2 trace SO_3 trace	100.79	2.996
A2. II	.743	.128	.043	.249	.163	.113	.026	.005			.023	.005				
114	45.34	19.35	1.35	8.79	10.84	9.45	2.66	0.60	1.15		1.20				100.73	
A3. III	.756	.190	.009	.122	.271	.169	.043	.006			.015					
115	44.16	12.96	8.07	3.10	10.83	12.26	1.92	0.72	2.41	0.46	2.06	1.03			99.98	2.965
A2. II	.736	.127	.050	.043	.271	.219	.031	.008			.026	.007				
116	46.14	14.74	6.45	4.72	8.81	10.57	2.88	0.61	1.84		1.77	0.71			99.23	
A2. III	.769	.145	.040	.065	.220	.189	.047	.007			.022	.005				
117	48.87	16.24	5.30	5.21	7.65	8.92	3.03	0.96	2.20		0.82	0.31			99.51	
A2. II	.815	.159	.033	.072	.191	.159	.048	.010			.010	.002				
118	48.60	16.33	3.08	5.72	7.55	9.07	3.13	0.51	2.67	0.05	2.59	0.34	0.17		99.81	2.99
A2. II	.810	.160	.019	.079	.189	.163	.050	.005			.032	.002	.002			
119	39.84	19.71	7.73	8.89	7.33	13.52	1.59	0.53	0.86		0.08	trace	trace		100.08	3.182
A3. III	.664	.193	.049	.124	.183	.241	.026	.006			.001	—	—			
120	48.84	14.62	2.08	9.00	7.15	9.33	2.86	0.89	0.49	0.07	3.57	0.36	0.04	CO_2 none ZrO_2 none SO_3 0.05 Cl 0.42 NiO 0.08 BaO none SrO 0.04 CuO none	99.89	
A1. I	.814	.143	.013	.125	.179	.166	.045	.010			.045	.003	—			
121	51.73	17.52	1.11	3.84	10.02	13.36	1.61	0.48	0.34		0.24	trace	trace		100.25	
A3. III	.862	.172	.007	.053	.250	.239	.026	.005			.003	—	—			
122	48.55	14.69	2.92	9.60	5.88	10.68	2.40	0.56	2.41		1.40		0.47		99.67	
A2. II	.809	.144	.018	.133	.147	.191	.039	.006			.018		.007			
123	50.52	14.84	1.02	9.20	7.80	11.92	2.20	0.47	1.60		0.66				100.23	
A3. III	.942	.146	.006	.128	.195	.213	.035	.005			.008					
124	49.76	14.60	1.89	11.44	5.43	11.04	2.38	0.51	1.77		1.70				100.52	
A3. III	.829	.143	.012	.159	.136	.197	.039	.006			.021					
125	49.40	17.00	3.05	9.25	5.04	11.20	2.05	0.51	2.20		1.08				100.78	
A3. III	.823	.167	.019	.129	.126	.200	.033	.006			.014					
126	47.68	11.43	0.16	8.90	14.81	12.48	1.01	0.52	2.22		0.59		0.07		99.87	
A2. II	.795	.112	.001	.124	.370	.223	.016	.006			.007		.001			
127	47.48	12.00	4.86	8.73	9.89	11.02	2.32	0.48	2.16		0.79				99.73	
A3. III	.791	.118	.030	.121	.247	.196	.037	.005			.010					

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 4-5. PRESODIC. AUVERGNOSE—Continued.

No.	Symbol.	Norm.		Locality.	Analyst.	Reference.	Rock name.	Remarks.
113	III.5.4.4″. 2.1.1.2.	Q 1.04 or 2.78 ab 13.62 an 26.97	hy 40.46 mt 9.98 il 3.50 ap 1.68	Kunstmannstal, n. Harzburg, Brocken, Harz.	Steffen.	O. H. Erdmannsdörfer, Jb. Pr. G. L.-A., XXVII, p. 367, 1906.	Olivine gabbro.	Norm and mode.
114	(II)III.5.4.(4)5. 1.4.1.2.	or 3.34 ab 16.50 an 39.20 ne 3.27	di 6.27 ol 26.78 mt 2.09 il 2.28	Schluckenau, Bohemia.	C. v. John,	C. v. John, Jb. G. R.-A., Wien, LI, p. 150, 1913.	Gabbro.	Inclusion in basalt.
115	III.5.4.4.⊙ 2.2.2.2.	or 4.45 ab 16.24 an 24.46	di 23.33 hy 5.70 ol 7.42 mt 3.94 il 3.95 hm 5.28 ap 2.35	Dobernberg, n. Tetschen, Bohemia.	R. Pfohl.	J. E. Hibsch, T. M. P. M., XV, p. 255, 1896.	Leucite basalt.	Leucite is analcite? In W. T., p. 461.
116	III.5.(3)4.(4)5. 2.2.2.2.	or 3.89 ab 24.63 an 25.30	di 17.53 hy 6.13 ol 5.63 mt 9.28 il 3.34 ap 1.68	Rekettyes, Lake Balaton, Hungary.	K. Emszt.	J. Vitalis, Erf. Bal. Secs., I (1), No. 2, p. 85, 1911.	Limburgite.	
117	(II)III.5.(3)4.4″. 2.1.2.2.	or 5.56 ab 25.15 an 28.08	di 11.24 hy 16.14 ol 1.04 mt 7.66 il 1.52 ap 0.67	Fitz am Berg, Salzkammergut, Tyrol.	C. v. John.	C. v. John, Jb. G. R.-A. Wien, XLIX, p. 254, 1899.	Diabase.	In W. T., p. 335.
118	″III.5.″4.″5. 2.1.2.2.	or 2.78 ab 26.20 an 29.19	di 11.31 hy 16.66 ol 1.53 mt 4.41 il 4.86 ap 0.67	Isla Persa, Bernina District, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Gabbro-diorite.	
119	III.5(6).4″.4. 2.3.2.3.	or 3.34 ab 0.52 an 44.76 ne 6.82	di 18.11 ol 13.93 mt 11.37 il 0.15	Pavone, n. Ivrea, Piedmont.	M. Dittrich.	F. R. van Horn, T. M. P. M., XVII, p. 414, 1898.	Hornblende gabbro.	TiO_2 low? In W. T., p. 347.
120	III.5.(3)4.4. 2.1.2.3.	Q 1.44 or 5.56 ab 20.44 an 26.13	di 13.90 hy 20.03 mt 3.02 il 6.84 ap 1.01	Monte Ponente, Linosa Island.	H. S. Washington.	H. S. Washington, J. G., XVI, p. 17, 1908.	Basalt.	
121	III.5.4.4″. 1.1.2.2.	Q 0.30 or 2.78 ab 13.62 an 39.20	di 21.62 hy 20.16 mt 1.62 il 0.46	Kivakka, Oulangansuu, Karelia, Russia.	G. Aminoff.	V. Hackman, B. C. G. Fin., No. 15, p. 58, 1905.	Diabase.	
122	III.5.″4.4(5). 2.1.2.3.	or 3.34 ab 20.44 an 27.52	di 21.09 hy 17.55 ol 0.34 mt 4.18 il 2.74	Mount Pae, Kanin Peninsula, Russia.	F. Tegengren.	W. Ramsay, Fennia, XXXI, No. 4, p. 24, 1911.	Diabase.	
123	III.5.4.(4)5. 1.1.2.3.	or 2.78 ab 18.34 an 29.47	di 24.36 hy 16.76 ol 4.28 mt 1.39 il 1.22	Kwarkouche, Wichera, North Ural Mountains.	Not stated.	Duparc, Pearce, and Tikanovitch, Oural Nord, III, p. 66, 1909.	Diabase.	
124	III.5.″4.4(5). 2.1.2.3.	Q 0.12 or 3.34 ab 20.44 an 27.24	di 22.82 hy 18.80 mt 2.78 il 3.19	Pelia River, Wichera, North Ural Mountains.	Not stated.	Duparc, Pearce, and Tickanovitch, Oural Nord, III, p. 67, 1909.	Diabase.	
125	″III.5.4.4(5). 2.1.2.3.	Q 2.34 or 3.34 ab 17.29 an 35.58	di 16.54 hy 17.08 mt 4.41 il 2.13	Near Kwarkouche, Wichera, North Ural Mountains.	Not stated.	Duparc, Pearce, and Tickanovitch, Oural Nord, III, p. 66, 1909.	Diabase.	
126	III(IV).5.4.4. 1.2.2.2.	or 3.34 ab 8.38 an 25.02	di 29.75 hy 8.61 ol 21.29 mt 0.23 il 1.06	Tagil District, Ural Mountains.	Not stated.	Duparc and Pamfil, B. Soc. Min. Fr., XXXIII, p. 358, 1910.	Olivine gabbro.	
127	III.5.4.(4)5. 2.2.2.2.	or 2.78 ab 19.39 an 21.13	di 26.88 hy 9.30 ol 9.47 mt 6.96 il 1.52	Kamenouchki, South Ural Mountains.	Not stated.	Duparc and Pamfil, B. Soc. Min. Fr., XXXIII, p. 366, 1910.	Issite (feldspathic hornblendite).	Also in C. R., CLI, p. 1137, 1910.

CLASS III. SALFEMANE—Continued.

RANG 4. DOCALCIC. AUVERGNASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
128	45.30	13.40	7.25	6.26	11.53	10.34	2.17	0.23	0.18		2.50	0.39	0.34		99.89	
A2. II	.755	.131	.045	.087	.288	.184	.037	.002			.031	.003	.005			
129	44.06	15.10	5.23	7.93	9.84	12.56	2.20	0.93	0.30		1.80	0.53	0.36		100.84	
A2. II	.734	.148	.032	.110	.246	.224	.035	.010			.023	.004	.005			
130	45.04	16.41	6.02	7.30	3.93	11.42	3.09	0.93	1.41		3.67	0.47		CO_2 0.36 S 0.13	100.18	3.003
A2. II	.751	.161	.038	.101	.098	.204	.050	.010			.046	.003				
131	44.50	13.23	4.11	7.76	13.19	11.20	1.69	0.74	1.36		1.72	0.22	trace	CO_2 0.36 SO_3 trace S 0.10	100.18	3.072
A2. II	.742	.130	.026	.108	.330	.200	.027	.008			.022	.002	—			
132	43.30	14.07	5.53	7.17	9.62	10.87	2.41	1.12	2.52		2.83	0.65		S 0.10	100.19	2.997
A2. II	.722	.138	.034	.100	.241	.195	.039	.012			.035	.005				
133	42.39	15.77	5.89	8.66	7.44	9.40	2.05	1.24	3.55		2.61	0.78		S trace	99.78	2.967
A2. II	.707	.155	.037	.120	.186	.168	.033	.013			.033	.006				
134	41.96	15.85	7.64	7.24	8.45	9.54	2.05	1.17	3.07		2.16	0.88		S 0.02	100.03	2.902
A2. II	.699	.155	.048	.100	.211	.170	.033	.013			.027	.006				
135	41.43	13.18	6.95	7.31	11.91	10.74	1.60	0.93	2.15		2.67	0.66		S 0.05	99.65	3.043
A2. II	.691	.128	.044	.101	.298	.192	.026	.010			.033	.005				
136	42.08	16.04	5.93	8.75	6.95	12.66	1.88	0.93	2.76		2.26	0.34	0.32		100.90	
A2. III	.701	.157	.037	.122	.174	.226	.030	.010			.028	.002	.005			
137	53.30	15.11	2.40	6.66	6.05	9.55	2.68	0.94	1.61		1.21	0.08	0.07		99.66	
A2. II	.888	.148	.015	.093	.151	.171	.044	.010			.015	.001	.001			
138	52.80	13.40	1.80	7.38	9.30	11.05	2.16	1.01	0.70		1.20	0.10			100.90	
B2. III	.860	.131	.011	.103	.233	.197	.035	.011			.015	.001				
139	51.30	17.80	1.29	3.35	10.10	12.90	1.53	0.27	n. d.		0.27	0.30			99.11	
B?2. III	.855	.174	.008	.047	.253	.230	.024	.003			.003	.002			(100.11)	
140	51.21	12.36	3.29	6.16	13.26	10.66	1.60	0.41	0.36	0.14	0.70	0.11			100.26	
A2. II	.854	.121	.021	.086	.332	.190	.026	.004			.009	.001				
141	50.20	10.71	2.55	6.60	16.20	10.10	1.71	0.71	0.60		0.71	0.09	0.18	Cr_2O_3 0.09	100.45	
A2. II	.837	.105	.016	.092	.405	.180	.027	.008			.009	.001	.002		(100.46)	

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 4-5. PRESODIC. AUVERGNOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
128	III.5.4.5.⊙ *2.2.2.2.*	or 1.11 di 17.87 ab 19.39 hy 12.56 an 25.58 ol 7.13 mt 10.44 il 4.71 ap 1.01	Punta Delgada, San Miguel, Azores.	C. v. John.	C. v. John, Jb. G. R.-A. Wien, XLVI, p. 291, 1896.	Basalt.	In W. T., p. 337.
129	III.5″.4.4. *2.3.2.2.*	or 5.56 di 24.03 ab 11.00 ol 15.08 an 28.63 mt 7.42 ne 3.98 il 5.30 ap 1.34	Punta Delgada, San Miguel, Azores.	C. v. John.	C. v. John, Jb. G. R.-A. Wien, XLVI, p. 291, 1896.	Basalt.	In W. T., p. 337
130	(II)III.5.(3)4.4″. *3.1.2.3.*	or 5.56 di 20.54 ab 25.15 ol 1.64 an 28.08 mt 8.82 ne 0.57 il 6.99 ap 1.01	Ribeiradas Voltas, Madeira.	Eyme.	C. Gagel, Z. D. G. G., LXIV., p. 399, 1912.	Essexite.	
131	III.5.4.4.⊙ *2.3.2.2.*	or 4.45 di 21.65 ab 14.15 ol 21.58 an 26.41 mt 6.03 il 3.34 ap 0.67	Barranco del Almendrero, La Palma Caldera, Madeira.	Eyme.	C. Gagel, Z. D. G. G., LXIV, p. 399, 1912.	Essexite.	
132	III.5.(3)4.4. *2.3.2.2.*	or 6.67 di 19.98 ab 16.24 ol 13.34 an 24.19 mt 7.89 ne 2.27 il 5.32 ap 1.68	Ribeira Frio, Madeira.	Eyme.	C. Gagel, Z. D. G. G., LXIV, p. 429, 1912.	Basalt.	
133	″III.5.4.4. *2.2.2.3.*	or 7.23 di 8.68 ab 17.29 hy 7.81 an 30.30 ol 9.51 mt 8.58 il 5.02 ap 2.02	Chapanna, north Funchal, Madeira.	Eyme.	C. Gagel, Z. D. G. G., LXIV, p. 429, 1912.	Trachydolerite.	
134	″III.5.4.4. *3.3.2.2.*	or 7.23 di 8.99 ab 17.29 hy 5.26 an 30.30 ol 10.59 mt 11.14 il 4.10 ap 2.02	Eira de Serrado, Madeira.	Eyme.	C. Gagel, Z. D. G. G., LXIV, p. 429, 1912.	Trachydolerite.	
135	III.5.4.4.⊙ *2.3.2.2.*	or 5.56 di 18.12 ab 13.62 hy 1.13 an 25.58 ol 16.50 mt 10.21 il 5.02 ap 1.68	Calheta, Madeira.	Eyme.	C. Gagel, Z. D. G. G., LXIV, p. 429, 1912.	Trachydolerite.	
136	III.5.4.4.⊙ *2.2.2.3.*	or 5.56 di 22.93 ab 9.96 ol 10.47 an 32.53 mt 8.58 ne 3.12 il 4.26 ap 0.67	Mindello, Sao Vicente, Cape Verde Islands.	C. v. John.	C. v. John, Jb. G. R.-A. Wien, XLVI, p. 285, 1896.	Basalt.	In W. T., p. 337.
137	(II)III.″5.(3)4.4. *2.1.2.3.*	Q 5.22 di 16.68 or 5.56 hy 15.44 ab 23.06 mt 3.48 an 26.13 il 2.28 ap 0.34	Conacry-Niger Railway, French Guinea.	Pisani.	A. Lacroix, N. Arch. Mus., III, p. 114, 1911.	Quartz diabase.	Also in B. Soc. Fr. Min., XXXV, p. 32, 1912.
138	III.5.(3)4.4. *1.1.2.2.*	or 6.12 di 24.40 ab 18.34 hy 20.64 an 23.63 ol 0.76 mt 2.55 il 2.28 ap 0.34	Kilometer 177, Conakry-Niger Railway, French Guinea.	Pisani.	A. Lacroix, N. Arch. Mus., III, p. 114, 1911.	Hypersthene diabase.	Also in B. Soc. Fr. Min., XXXV, p. 32, 1912.
139	III.5.4″.(4)5. *1.1.2.2.*	Q 2.04 di 16.71 or 1.67 hy 22.16 ab 12.58 mt 1.86 an 40.87 il 0.46 ap 0.67	Kakoulima, French Guinea.	Pisani.	A. Lacroix, N. Arch. Mus., III, p. 144, 1911.	Gabbro.	Summation? Also in B. Soc. Fr. Min., XXXV, p. 32, 1912.
140	III″.5.4.4(5). *1.1.2.2.*	Q 0.48 di 21.19 or 2.22 hy 30.54 ab 13.62 mt 4.87 an 25.30 il 1.37 ap 0.34	Mount Bougourou, French Guinea.	Boiteau.	A. Lacroix, pers. com.	Olivine diabase.	
141	III(IV).5.″4.4. *1.2.2.2.*	or 4.45 di 23.62 ab 14.15 hy 18.73 an 19.46 ol 14.02 mt 3.71 il 1.37 ap 0.34	Kilometer 110.5, Conakry-Niger Railway, French Guinea.	Pisani.	A. Lacroix, N. Arch. Mus., III, p. 114, 1911.	Olivine diabase.	Also in B. Soc. Fr. Min., XXXV, p. 32, 1912.

CLASS III. SALFEMANE—Continued.

RANG 4. DOCALCIC. AUVERGNASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
142	46.75	16.05	1.10	7.53	17.20	9.15	1.54	0.45	0.27		0.20	0.11		Cr_2O_3 0.05	100.40	
A2. II	.779	.157	.157	.104	.430	.164	.025	.005			.003	.001			(100.49)	
143	47.87	16.60	5.84	4.52	7.85	10.48	2.15	0.37	1.65		2.28	0.08	0.11	CO_2 0.20	100.00	
A2. II	.796	.163	.036	.063	.196	.188	.035	.004			.029		.002			
144	49.95	15.52	3.88	9.91	5.42	9.53	2.01	1.22	0.53	0.36	1.53	0.48			100.44	
A2. II	.833	.152	.024	.138	.136	.170	.032	.013			.019	.003				
145	47.06	15.03	2.46	8.65	7.27	9.88	2.38	1.28	2.12	1.07	2.25	0.34			99.79	
A2. II	.784	.147	.015	.120	.182	.177	.039	.014			.028	.002				
146	46.30	18.48	1.66	5.63	10.13	13.51	2.18	0.26	0.99	0.21	0.70	0.09			100.14	
A2. II	.772	.181	.010	.078	.253	.241	.035	.003			.009	——			(100.17)	
147	45.40	18.60	0.77	6.70	7.45	13.20	2.31	1.25	1.00		2.82				99.50	
A3. III	.757	.182	.005	.093	.186	.236	.037	.013			.035					
148	43.39	13.86	2.71	9.54	9.82	11.98	2.23	1.14	1.55	0.20	3.42	0.58			100.16	
A2. II	.723	.136	.017	.132	.246	.214	.035	.012			.043	.004				
149	43.09	16.46	4.59	6.18	8.34	12.87	1.36	0.82	1.47	1.04	3.31	0.39			99.92	
A2. II	.718	.161	.029	.086	.209	.230	.022	.009			.043	.003				
150	42.54	14.37	3.13	9.07	9.12	12.42	2.06	1.06	2.15	0.34	3.31	0.50			100.21	
A2. II	.709	.141	.019	.126	.228	.221	.033	.012			.043	.004			(100.18)	
151	48.68	15.70	1.81	9.75	6.08	11.64	2.32	0.88	0.10		2.68	0.46			100.10	
A2. II	.811	.154	.011	.136	.152	.208	.037	.009			.034	.003				
152	48.64	14.13	3.01	8.92	7.01	12.34	2.25	0.81	0.08		2.61	0.35			100.15	
A2. II	.811	.138	.019	.124	.175	.220	.036	.009			.033	.003				
153	48.52	14.28	2.06	9.60	7.03	12.54	2.40	0.80	n. d.		2.71	0.29			100.23	
A2. II	.809	.140	.013	.133	.176	.224	.039	.009			.034	.002				
154	48.41	14.82	1.72	9.83	7.11	12.02	2.16	0.85	n. d.		2.87	0.39			100.18	
A2. II	.807	.145	.011	.136	.178	.214	.035	.009			.036	.003				
155	48.26	14.74	2.49	8.95	6.76	12.39	2.38	0.90	0.15		2.81	0.44			100.27	
A2. II	.804	.145	.016	.125	.169	.221	.039	.010			.045	.003				

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 4-5. PRESODIC. AUVERGNOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
142	III.5.4.4″. *1.4.1.2.*	or 2.78, ab 13.10, an 35.31, di 7.53, hy 6.78, ol 32.25, mt 1.62, il 0.46, ap 0.34	Sokotoro, French Guinea.	Pisani.	A. Lacroix, N. Arch. Mus., III, p. 114, 1911.	Olivine gabbro.	Al_2O_3 incorrect in B. Soc. Fr. Min., XXXV, p. 32, 1912.
143	″III.5.4.(4)5. *2.1.2.2.*	Q 3.42, or 2.22, ab 18.34, an 34.47, di 13.82, hy 12.93, mt 8.35, il 4.41	Mount Bubandjida, Adamawa, Kamerun.	M. Dittrich.	W. Edlinger, In. Diss. Erl., p. 79, 1908.	Gabbro.	
144	″III.″5.4.4. *2.1.2.3.*	Q 3.90, or 7.23, ab 16.77, an 29.75, di 12.15, hy 20.14, mt 5.57, il 2.89, ap 1.01	Tanilehy, Sakalave District, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVII, p. 20, 1913.	Labradorite (basalt).	
145	III.5.(3)4.4. *2.2.2.3.*	or 7.78, ab 20.44, an 26.13, di 17.16, hy 7.54, ol 9.07, mt 3.48, il 4.26, ap 0.67	Bersevo, Sakalave District, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVII, p. 20, 1913.	Basalt.	
146	″III.5.4.″5. *1.3.2.2.*	or 1.67, ab 12.58, an 39.75, ne 3.12, di 21.78, ol 16.26, mt 2.32, il 1.37	Mount Fonjay, Sakalave District, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVII, p. 14, 1913.	Gabbro.	
147	″III.5(6).4.4. *2.2.2.2.*	or 7.23, ab 8.62, an 36.70, ne 5.82, di 23.20, ol 10.41, mt 1.16, il 5.32	Nosy Komba, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., I, p. 13, 1902.	Olivine gabbro.	
148	III.5(6).(3)4.4. *2.3.2.2.*	or 6.67, ab 9.96, an 24.74, ne 4.54, di 25.02, ol 15.89, mt 3.94, il 6.54, ap 1.34	Katsaoka, Ankaratra, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVI, p. 177, 1913.	Basalt.	
149	III.5.4.4.⊙ *2.2.2.2.*	or 5.00, ab 11.53, an 36.14, di 19.60, hy 5.20, ol 5.93, mt 6.73, il 6.54, ap 1.01	Tsiafakafo, Ankaratra, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVI, p. 177, 1913.	Basalt.	
150	III.5(6).″4.4. *2.2.2.2.*	or 6.67, ab 8.38, an 26.69, ne 4.83, di 24.99, ol 14.05, mt 4.41, il 6.54, ap 1.34	Ambodivahita, Madagascar.	Boiteau.	A. Lacroix, pers. com.	Basalt.	
151	III.5.4.4.⊙ *2.1.2.3.*	or 5.00, ab 19.39, an 30.02, di 20.56, hy 13.97, ol 2.28, mt 2.55, il 5.17, ap 1.01	Reunion Island.	Boiteau.	A. Lacroix, C. R., CLIV, p. 253, 1912.	Basalt.	Glassy bomb.
152	III.5.″4.4. *2.1.2.3.*	or 5.00, ab 18.86, an 25.85, di 26.36, hy 12.26, ol 1.42, mt 4.41, il 5.02, ap 1.01	Lava of 1909, Plaine des Osmondes, Reunion Island.	Boiteau.	A. Lacroix, C. R., CLIV, p. 253, 1912.	Basalt.	
153	III.5.(3)4.4. *2.2.2.3.*	or 5.00, ab 20.44, an 25.58, di 28.31, hy 4.08, ol 8.05, mt 3.02, il 5.17, ap 0.67	Enclos Fouqué, Reunion Island.	Boiteau.	A. Lacroix, C. R., CLIV, p. 253, 1912.	Basalt.	
154	III.5.4.4.⊙ *2.1.2.3.*	or 5.00, ab 18.34, an 28.08, di 23.34, hy 11.72, ol 4.70, mt 2.55, il 5.47, ap 1.01	Lava of 1909, Plaine de Osmondes, Reunion Island.	Boiteau.	A. Lacroix, C. R., CLIV, p. 253, 1912.	Basalt.	
155	III.5.″4.4. *2.2.2.3.*	or 5.56, ab 20.44, an 26.97, di 25.86, hy 6.31, ol 4.71, mt 3.71, il 6.84, ap 1.01	Lava of 1863, Reunion Island.	Boiteau.	A. Lacroix, C. R., CLIV, p. 253, 1912.	Basalt.	

CLASS III. SALFEMANE—Continued.

RANG 4. DOCALCIC. AUVERGNASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
156	47.97	14.57	1.90	9.65	7.03	12.23	2.25	0.94	0.09		2.87	0.34			99.84	
A2. II	.800	.143	.012	.134	.176	.218	.036	.010			.036	.002				
157	47.70	14.84	1.77	9.89	8.33	11.88	2.06	0.93	n. d.		2.40	0.37			100.17	
A2. II	.795	.146	.011	.138	.208	.213	.033	.010			.030	.003				
158	47.63	14.83	3.13	8.48	6.77	13.04	2.26	1.04	0.08		2.81	0.28			100.35	
A2. II	.794	.145	.020	.118	.169	.233	.036	.011			.035	.002				
159	46.91	13.30	2.14	9.56	9.19	11.39	1.84	0.92	1.44		2.75	0.36			99.80	
A2. II	.782	.130	.013	.133	.230	.204	.030	.010			.034	.003				
160	46.77	14.55	1.94	6.70	12.74	13.34	1.47	0.54	0.74		1.46	0.18			100.43	
A2. II	.780	.143	.012	.093	.319	.238	.024	.006			.018	.001				
161	45.36	13.56	1.88	7.34	14.58	14.17	1.01	0.20	1.18		0.74	0.04			100.06	
A2. II	.756	.133	.012	.102	.365	.254	.016	.002			.009	—				
162	44.73	13.30	5.42	6.95	9.12	14.16	1.66	0.60	1.71		2.49	0.16			100.30	
A2. II	.746	.130	.034	.097	.228	.253	.027	.006			.031	.001				
163	43.28	13.58	5.43	8.03	7.63	13.19	2.04	0.66	1.82		3.81	0.41			99.88	
A2. II	.721	.133	.034	.111	.191	.236	.033	.007			.048	.003			(99.86)	
164	49.72	16.84	2.77	9.34	6.62	9.88	1.83	0.68	0.62	0.13	1.63	0.07	0.26	NiO 0.09 BaO trace	100.48	
A2. II	.829	.165	.017	.130	.166	.177	.030	.007			.020	—	.004			
165	51.32	16.84	0.65	12.14	4.22	10.85	1.52	0.41	1.00		1.01		0.29	ZrO_2 trace	100.25	
A2. II	.855	.165	.004	.168	.106	.194	.024	.004			.013		.004			
166	51.13	17.75	0.95	11.58	4.40	10.83	1.30	0.36	0.95		1.01	trace	0.25		100.51	
A2. II	.852	.174	.006	.161	.110	.193	.021	.004			.013	—	.004			
167	49.08	17.83	0.73	5.38	9.05	12.63	2.47	0.51	1.56	0.22	0.65		0.05		100.16	2.81
A2. II	.816	.175	.005	.075	.226	.225	.040	.050			.008		—			
168	50.24	16.59	2.72	8.35	5.14	8.70	3.54	0.40	1.84	1.02	0.72	0.41	0.29		99.96	2.87
A2. II	.837	.163	.017	.116	.129	.155	.057	.004			.009	.003	.004			
169	48.96	16.58	1.95	8.62	7.97	8.75	3.08	0.91	1.18	0.66	0.81	0.34	0.14		99.95	2.87
A2. II	.816	.163	.012	.119	.199	.156	.050	.010			.010	.002	.002			
170	50.09	11.31	1.91	3.09	13.83	15.63	1.92	trace	1.06	0.61	0.95		0.06	CO_2 0.16 Cr_2O_3 0.21	100.83	
A2. II	.835	.111	.012	.043	.346	.279	.031	—			.012		0.01			

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 4-5. PRESODIC. AUVERGNOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
156	III.5.″4.4. *2.2.2.3.*	or 5.56 ab 18.86 an 26.97 di 25.84 hy 6.18 ol 7.40 mt 2.78 il 5.47 ap 0.67	Enclos Fouqué, Reunion Island.	Boiteau.	A. Lacroix, C. R., CLIV, p. 253, 1912.	Basalt.	
157	III.5.4.4.⊙ *2.2.2.3.*	or 5.56 ab 17.29 an 28.63 di 22.62 hy 6.24 ol 11.90 mt 2.55 il 4.56 ap 1.01	Enclos Fouqué, Reunion Island.	Boiteau.	A. Lacroix, C. R., CLIV, p. 253, 1912.	Basalt.	
158	III.5.″4.4. *2.2.2.3.*	or 6.12 ab 18.86 an 27.24 di 28.77 hy 1.76 ol 6.89 mt 4.64 il 5.32 ap 0.67	Lava of 1905, Plaine des Osmondes, Reunion Island.	Boiteau.	A. Lacroix, C. R., CLIV, p. 253, 1912.	Basalt.	
159	III.5.4.4.⊙ *2.2.2.2.*	or 5.56 ab 15.72 an 25.02 di 23.36 hy 10.40 ol 9.17 mt 3.02 il 5.17 ap 1.01	Reunion Island.	Boiteau.	A. Lacroix, C. R., CLIV, p. 253, 1912.	Basalt.	Pelé's hair.
160	III.5.4.4.⊙ *1.2.2.2.*	or 3.34 ab 12.58 an 31.41 di 24.80 hy 5.26 ol 16.55 mt 2.78 il 2.74 ap 0.34	Riviere du Mat, Reunion Island.	Boiteau.	A. Lacroix, C. R., CLV, p. 539, 1912.	Olivine gabbro.	
161	III.5.4(5)4. *1.3.2.2.*	or 1.11 ab 6.81 an 31.97 ne 0.85 di 30.82 ol 23.28 mt 2.78 il 1.37	Riviere du Mat, Reunion Island.	Boiteau.	A. Lacroix, C. R., CLV, p. 539, 1912.	Olivine gabbro.	
162	III.5.4.4.⊙ *2.2.2.2.*	or 3.34 ab 13.36 an 26.97 ne 0.43 di 33.66 ol 7.91 mt 7.89 il 4.71 ap 0.34	Vallée du Mat, Reunion Island.	Boiteau.	A. Lacroix, C. R., CLV, p. 540, 1912.	Microgabbro.	
163	III.5.4.4.⊙ *2.2.2.2.*	or 3.89 ab 15.20 an 25.85 ne 1.14 di 29.27 ol 6.47 mt 7.89 il 7.30 ap 1.01	Vallée du Mat, Reunion Island.	Boiteau.	A. Lacroix, C. R., CLV, p. 540, 1912.	Microgabbro.	
164	″III.5.4.4. *2.1.2.3.*	Q 2.58 or 3.89 ab 15.72 an 35.58 di 10.69 hy 24.16 mt 3.94 il 3.04	Kusjkin Island, Siberia.	H. Backlund.	H. Backlund, Mem. Ac. Sc. St. P., XXI, No. 6, p. 22, 1910.	Diabase.	
165	″III.″5.4″:4(5). *1.1.2.3.*	Q 5.70 or 2.22 ab 12.58 an 38.09 di 13.40 hy 24.27 mt 0.93 il 1.98	Mihara Volcano, Oshima, Seven Izu Islands, Japan.	Tokayanagi.	S. Kozu, pers. com.	Andesitic basalt.	Eruption of 1912.
166	(II)III.(4)5.4(5). 4″. *1.1.2.3.*	Q 6.24 or 2.22 ab 11.00 an 41.42 di 10.30 hy 25.07 mt 1.39 il 1.98	Mihara Volcano, Oshima, Seven Izu Islands, Japan.	Tokayanagi.	S. Kozu, pers. com.	Andesitic basalt.	
167	(II)III.5.4.(4)5. *1.3.2.2.*	or 2.78 ab 20.44 an 37.53 ne 0.28 di 20.38 ol 15.31 mt 1.16 il 1.22	Watoe Belah, Loh-oelo, Java.	N. Sahlbom.	G. Niethammer, T. M. P. M., XXVIII, p. 246, 1909.	Gabbro-norite.	
168	(II)III.5.(3)4.″5. *2.1.2.3.*	Q 0.06 or 2.22 ab 29.87 an 28.36 di 9.87 hy 20.43 mt 3.94 il 1.37 ap 1.01	Coopers Plains, Queensland.	G. R. Patten.	A. R. Agric. Chem. Qld., 1912.	Basalt.	H. C. Richards, pers. com.
169	(II)III.5.(3)4.4″. *1.3.2.3.*	or 5.56 ab 26.20 an 28.63 di 10.42 hy 7.07 ol 15.18 mt 2.78 il 1.52 ap 0.67	Chinghee Creek, Queensland.	A. T. Jefferis.	A. R. Agric. Chem. Qld.,1913.	Basalt.	H. C. Richards, pers. com.
170	III(IV).5.4.5. *1.2.2.1.*	ab 16.24 an 22.24 di 43.33 hy 1.53 ol 10.90 mt 2.78 il 1.82	Dundas, n. Sydney, New South Wales.	W. N. Benson.	W. N. Benson, Pr. R. Soc. N. S. W., XLIV, p. 530, 1910.	Pyroxenite.	

CLASS III. SALFEMANE—Continued.

RANG 4. DOCALCIC. AUVERGNASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
171	47.88	16.65	2.45	7.08	7.91	9.25	2.64	1.17	1.38	1.02	1.74	0.36	0.22	CO_2 0.04 ZrO_2 trace SO_3 0.03 Cl 0.05 S none Cr_2O_3 0.01 V_2O_3 0.01 NiO 0.05 BaO 0.10 SrO trace Li_2O none CuO trace	100.04	2.858
A1. I	.798	.163	.015	.099	.198	.165	.043	.013			.022	.003	.003			
172	44.38	16.18	1.94	8.54	10.30	9.20	2.55	1.50	1.99	0.74	1.94	0.31	0.26	CO_2 0.04 ZrO_2 none SO_3 0.05 Cl 0.01 F none S none Cr_2O_3 0.01 V_2O_3 trace NiO 0.04 BaO 0.07 SrO trace Li_2O none CuO trace	100.05	2.927
A1. I	.740	.159	.012	.118	.258	.164	.041	.016			.024	.002	.004			
173	45.15	13.40	2.97	13.19	4.23	9.79	2.47	0.49	2.41	0.39	5.04	0.12	0.19		99.84	
A2. II	.753	.131	.019	.183	.106	.175	.040	.005			.063	.001	.003			
174	44.57	15.30	3.20	7.83	10.04	10.00	1.94	1.39	3.21	1.09	1.01	0.41	0.29	CO_2 0.01 ZrO_2 none SO_3 none Cl 0.01 S none Cr_2O_3 0.01 V_2O_3 0.02 NiO 0.05 BaO 0.05 SrO trace Li_2O trace CuO trace	100.43	2.907
A1. I	.743	.150	020	.108	.251	.179	.032	.015			.013	.003	.004			
175	43.31	16.68	2.31	9.00	10.56	7.95	2.94	0.97	1.72	0.88	2.20	0.65	0.43	CO_2 0.03 ZrO_2 none SO_3 0.05 Cl 0.02 S trace Cr_2O_3 0.11 V_2O_3 trace NiO trace BaO trace SrO none Li_2O none	99.81	2.995
A1. I	.722	.163	.014	.125	.264	.142	.047	.010			.028	.005	.006			
176	54.92	14.27	1.28	5.25	10.32	6.42	2.50	0.64	2.96	0.12	0.90		trace	CO_2 0.38 FeS_2 0.22	100.18	
A2. II	.915	.140	.008	.073	.258	.114	.040	.007			.011		——			
177	52.72	17.37	1.73	5.53	7.42	10.94	2.93	0.65	0.22	0.09	0.61		0.30	CO_2 0.04	100.55	2.96
A2. II	.879	.170	.011	.076	.186	.195	.047	.007			.008		.004			
178	50.55	17.16	1.04	3.40	9.97	14.77	1.62	0.11	0.36	0.12	0.05		0.19	FeS_2 0.17	99.51	2.95
A2. II	.843	.168	.006	.047	.249	.264	.026	.001			——		.003			
179	47.80	14.30	1.25	12.09	7.40	10.17	2.54	0.60	1.87	0.44	1.23		0.40	CO_2 0.24 S trace	100.38	3.02
A2. II	.797	.140	.008	.168	.185	.182	.041	.007			.015		.006			
180	50.72	13.93	1.93	6.27	10.16	13.18	1.04	0.18	1.55	0.16	0.39	0.18	0.41	CO_2 0.18 ZrO_2 none FeS_2 0.15 Cr_2O_3 0.04 V_2O_3 0.11 BaO none	100.58	3.07
A1. I	.845	.137	.012	.088	.254	.236	.017	.002			.005	.001	.006			
181	50.12	14.90	1.66	7.01	10.00	13.04	1.95	0.08	0.03	0.13	0.26		0.29	CO_2 0.03	99.63	3.02
A2. II	.835	.146	.010	.097	.250	.233	.032	.001			.003		.004			
182	49.42	14.95	1.38	10.76	6.16	9.85	2.70	0.72	0.77	0.09	1.95	0.55	0.47	CO_2 none FeS_2 0.26	100.03	3.01
A2. II	.824	.147	.009	.150	.154	.176	.044	.008			.024	.004	.007			

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 4-5. PRESODIC. AUVERGNOSE—Continued.

No.	Symbol.	Norm.		Locality.	Analyst.	Reference.	Rock name.	Remarks.
171	(II)III.5.(3)4.4. *2.2.2.2.*	or 7.23 ab 22.53 an 29.75	di 12.98 hy 6.65 ol 10.89 mt 3.48 il 3.34 ap 1.01	Gulgong, New South Wales.	H. P. White.	Mingaye and White, Rec. G. S. N. S. W., VII (4), p. 304, 1904.	Olivine basalt.	
172	(II)III.5.(3)4.4. *2.4.2.2.*	or 8.90 ab 21.48 an 28.36	di 10.75 hy 0.43 ol 19.84 mt 2.78 il 3.65 ap 0.67	Mount Apsley, n. Bathurst, New South Wales.	H. P. White.	Mingaye and White, Rec. G. S. N. S. W., VII (4), p. 304, 1904.	Olivine basalt.	
173	III.5.(3)4.4(5). *2.1.2.(3)4.*	Q 0.90 or 2.78 ab 20.96 an 23.91	di 19.76 hy 14.35 mt 4.41 il 9.58 ap 0.34	Brogo, New South Wales.	A. Pain.	W. N. Benson, pers. com.	Quartz gabbro.	
174	III.5.″4.″4. *2.3.2.2.*	or 8.34 ab 15.72 an 28.63 ne 0.57	di 14.77 ol 20.09 mt 4.64 il 1.98 ap 1.01	Robertson Flow, Kiama, New South Wales.	H. P. White.	Jaquet, Card, and Harper, Rec. G. S. N. S. W., VIII (1), p. 32, 1905.	Olivine basalt.	Fresh?
175	″III.5.(3)4.4″. *2.4.1″.2″.*	or 5.56 ab 19.91 an 29.47 ne 2.56	di 4.26 ol 26.07 mt 3.25 il 4.26 ap 1.68	Woodlands, Mittagong, New South Wales.	D. Mawson.	Taylor and Mawson, Pr. R. Soc. N. S. W., XXXVII, p. 341, 1903.	Basalt.	
176	(II)III.(4)5.″4.4(5). *1.1.1.2.*	Q 6.84 or 3.89 ab 20.96 an 25.85	di 4.67 hy 30.70 mt 1.86 il 1.67	Nullagine, Pilbara, West Australia.	Not stated.	A. G. Maitland, W. Aust. G. S. B. 20, p. 32, 1905.	Diabase.	Fresh?
177	(II)III.5.″4.4(5). *1.1.2.2.*	or 3.89 ab 24.63 an 32.25	di 17.67 hy 17.48 ol 0.48 mt 2.55 il 1.22	Norseman, West Australia.	E. S. Simpson.	W. D. Campbell, W. Aust. G. S. B. 21, p. 119, 1906.	Norite.	
178	III.5.4″.5. *1.1.2.2.*	or 0.56 ab 13.62 an 39.20	di 27.15 hy 14.24 ol 2.57 mt 1.39	Norseman, West Australia.	E. S. Simpson.	W. D. Campbell, W. Aust. G. S. B. 21, p. 119, 1906.	Norite.	
179	III.5.″4.4(5). *1″.3.2.3.*	or 3.89 ab 21.48 an 25.58	di 20.72 hy 5.04 ol 17.05 mt 1.86 il 2.28	Norseman, West Australia.	E. S. Simpson.	W. D. Campbell, W. Aust. G. S. B. 21, p. 119, 1906.	Dolerite.	
180	III.″5.4(5).(4)5. *1.1.2.2.*	Q 3.18 or 1.11 ab 8.91 an 32.80	di 26.26 hy 22.64 mt 2.78 il 0.76 ap 0.34	Somerville, Kalgoorlie, West Australia.	H. Bowley.	E. S. Simpson, W. Aust. G. S. B. 42 (1), p. 61, 1912.	Epidiorite.	
181	III.5.4.5.⊙ *1.2.2.2.*	or 0.56 ab 16.77 an 31.41	di 26.91 hy 13.42 ol 7.38 mt 2.32 il 0.46	Cue, West Australia.	E. S. Simpson.	C. G. Gibson, W. Aust. G. S. B. 14, p. 15, 1904.	Norite.	
182	III.5.(3)4.4″. *″2.1.2.3.*	or 4.45 ab 23.06 an 26.41	di 15.65 hy 18.50 ol 4.06 mt 2.09 il 3.65 ap 1.34	Irregully Creek, Ashburton Gold-field, West Australia.	Not stated.	J. A. Thompson in A. G. Maitland, W. Aust. G. S. B. 33, p. 164, 1909.	Quartz dolerite.	

CLASS III. SALFEMANE—Continued.

RANG 4. DOCALCIC. AUVERGNASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
183	49.06	14.30	3.14	9.13	6.05	10.86	2.38	0.18	1.71	0.10	1.40	0.32	0.46	CO_2 none ZrO_2 0.02 FeS_2 0.56 Cr_2O_3 0.02 V_2O_3 0.25 BaO 0.03	99.97	3.04
A1. I	.818	.140	.020	.126	.151	.194	.039	.002			.018	.002	.007			
184	48.86	13.47	2.18	8.92	7.65	12.19	2.58	0.19	1.51	0.04	1.49	0.11	0.90	CO_2 none ZrO_2 none FeS_2 0.17 Cr_2O_3 0.06 V_2O_3 0.08 BaO 0.01	100.41	3.08
A1. I	.814	.132	.014	.124	.191	.218	.042	.002			.019	.001	.013			
185	52.49	16.44	2.60	5.30	6.18	11.71	2.06	1.09	1.42	0.15	0.62	trace	trace		100.06	
A3. III	.875	.161	.016	.074	.155	.209	.033	.012			.008	—	—			
186	50.82	16.58	0.44	8.27	8.31	7.80	2.34	1.89	1.89		1.12		0.25	CO_2 0.35 Cr_2O_3 0.08	100.14	
A2. II	.847	.163	.003	.115	.208	.139	.038	.020			.014		.004			
187	50.07	13.32	1.92	9.28	8.01	10.64	2.16	0.45	0.49	0.22	2.70	0.26	0.16	CO_2 none ZrO_2 trace SO_3 none Cl 0.08 F none S 0.11 Cr_2O_3 0.05 V_2O_3 none NiO 0.04 BaO none SrO trace CuO none MoO_3 trace	99.96	
A1. I	.835	.131	.012	.129	.200	.190	.035	.005			.034	.002	.002			
188	50.03	12.10	2.10	9.97	9.57	10.58	2.01	0.44	0.32	0.16	2.57	0.21	0.16		100.22	
A2. II	.834	.119	.013	.139	.239	.189	.032	.005			.032	.001	.002			
189	49.20	14.90	4.51	12.75	3.90	9.20	1.96	0.95	0.10		1.72	0.42	0.28		99.89	
A2. II	.820	.146	.028	.177	.098	.164	.032	.010			.021	.003	.004			
190	48.82	15.22	5.72	9.65	4.55	10.40	2.10	0.90	none		1.16	trace	0.67		99.19	3.01
B2. III	.814	.149	.036	.134	.114	.186	.034	.010			.015	—	.010			
191	48.99	13.73	1.60	10.46	13.53	7.34	1.62	0.27	0.27	0.10	1.73	0.13	0.20	CO_2 0.24 ZrO_2 none SO_3 none S 0.04 Cr_2O_3 0.02 V_2O_3 0.06 NiO 0.05 BaO trace? SrO none Li_2O none	100.38	
A1. I	.817	.134	.010	.145	.338	.131	.026	.003			.022	.001	.003			
192	45.48	11.87	1.98	9.87	13.28	10.97	2.21	0.77	0.74	0.23	1.90	0.25	0.16	CO_2 none ZrO_2 none FeS_2 0.03 Cr_2O_3 0.08 V_2O_3 0.04 NiO 0.04 BaO 0.04 Li_2O none	99.94	
A1. I	.758	.117	.013	.137	.332	.196	.035	.008			.024	.002	.002			
193	44.75	13.22	1.20	10.50	10.85	11.50	1.95	1.27	1.62		3.45	0.38			100.71	
A2. II	.740	.130	.008	.146	.271	.205	.032	.014			.043	.003			(100.69)	
194	43.98	17.69	5.97	6.68	7.83	11.71	1.34	0.64	1.77	0.95	1.20	0.32	trace	CO_2 trace Cl trace S none Cr_2O_3 0.05 BaO none SrO none	100.13	2.95
A1. I	.733	.173	.038	.093	.196	.209	.022	.007			.015	.002	—			
195	54.17	14.90	1.09	7.75	10.66	8.79	1.27	0.54	0.53	0.17	0.64	trace	0.15	CO_2 trace	100.65	
A2. II	.903	.146	.007	.108	.267	.157	.020	.006			.008	—	.002			

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 4-5. PRESODIC. AUVERGNOSE—Continued.

No.	Symbol.	Norm.		Locality.	Analyst.	Reference.	Rock name.	Remarks.
183	III.5.4.5.⊙ *2.1.2.3.*	Q 2.40 or 1.11 ab 20.44 an 27.52	di 20.10 hy 17.75 mt 4.64 il 2.74 ap 0.67	Somerville, Kalgoorlie, West Australia.	H. Bowley.	Simpson and Gibson, W. Aust. G. S. B. 42, p. 61, 1912.	Quartz epidiorite.	
184	III.5.″4.5. *2.2.2.3.*	or 1.11 ab 22.01 an 24.46	di 28.87 hy 8.00 ol 7.81 mt 3.25 il 2.89 ap 0.34	Boulder, Kalgoorlie, West Australia.	H. Bowley.	Simpson and Gibson, W. Aust. G. S. B. 42, p. 61, 1912.	Epidiorite.	MnO high.
185	(II)III.″5.4.4. *2.1.2.2″.*	Q 4.50 or 6.67 ab 17.29 an 32.25	di 20.83 hy 12.06 mt 3.71 il 1.22	Launceston, Tasmania.	M. Dittrich.	A. Osann, N. J. Cb., 1907, p. 710.	Diabase.	
186	(II)III.5.(3)4.(3)4. *1″.2.1″.2(3).*	or 11.12 ab 19.91 an 29.19	di 7.69 hy 18.36 ol 8.85 mt 0.70 il 2.13	Supply Creek, Mikonui, New Zealand.	J. S. Maclaurin.	P. G. Morgan, N. Z. G. S. B. 6, p. 141, 1908.	Hornblende campto- nite.	
187	III.5.4.(4).5. *2.1.2.(2)3.*	Q 2.16 or 2.78 ab 18.34 an 25.30	di 20.83 hy 21.06 mt 2.78 il 5.17 ap 0.67	Halemaumau, Kilauea, Hawaii, Hawaiian Islands.	J. B. Ferguson.	Day and Shepherd, B. G. S. A., XXIV, p. 586, 1913.	Basalt.	Also cf. J. B. Fergu- son, A. J. S., XXXVII, p. 400, 1914.
188	III″.5.″4.4(5). *2.1.2.2.*	Q 0.54 or 2.78 ab 16.77 an 22.80	di 23.42 hy 25.21 mt 3.02 il 4.86 ap 0.34	Crater, Kilauea, Hawaii, Hawaiian Islands.	G. Steiger.	W. Cross, U. S. G. S. P. P. 88, p. 48, 1915.	Basalt.	Fragment in tuff.
189	III.″5.4.4. *2.1.2.4.*	Q 4.80 or 5.56 ab 16.77 an 28.91	di 11.73 hy 21.30 mt 6.50 il 3.19 ap 1.01	Lava of May, 1883, Kilauea, Hawaii, Hawaiian Islands.	O. Silvestri.	O. Silvestri, B. C. G. It., XIX, p. 135, 1888.	Basalt.	In W. T., p. 337.
190	III.5.4.4.⊙ *2.1.2.3.*	Q 3.12 or 5.56 ab 17.82 an 29.19	di 18.65 hy 14.42 mt 8.35 il 2.28	Crater, Kilauea, Hawaii, Hawaiian Islands.	O. Silvestri.	O. Silvestri, B. C. G. It., XIX, p. 185, 1888.	Basalt.	MgO low? In W. T., p. 337.
191	III.5.4.(4)5. *1.2.1.2.*	or 1.67 ab 13.62 an 29.19	di 5.16 hy 37.08 ol 6.90 mt 2.32 il 3.34 ap 0.34	Olokele Canyon Kauai Island, Hawaiian Islands.	W. T. Schaller.	W. Cross, U. S. G. S. P. P. 88, p. 11, 1915.	Basalt.	
192	III″.5″.(3)4.4″. *2.3.2.2.*	or 4.45 ab 13.36 an 20.57 ne 2.70	di 25.70 ol 24.73 mt 3.02 il 3.65 ap 0.67	Makaweli Canyon, Kauai, Hawaiian Islands.	W. F. Hille- brand.	W. Cross, U. S. G. S. P. P. 88, p. 11, 1915.	Basalt.	
193	III.5″.(3)4.4. *2.3.2.2.*	or 7.78 ab 10.48 an 23.35 ne 3.41	di 24.88 ol 19.99 mt 1.86 il 6.54 ap 1.01	Papenoo Valley, Tahiti, Society Islands.	Pisani.	A. Lacroix, B. Soc. G. Fr., X, p. 118, 1910.	Olivine basalt.	
194	″III.5.4″.4. *2.1.″2.2″.*	or 3.89 ab 11.53 an 40.03	di 12.85 hy 13.90 ol 3.48 mt 8.82 il 2.28 ap 0.67	Fatmalapa, Efaté, New Hebrides.	D. Mawson.	D. Mawson, Pr. Linn. Soc. N. S. W., XXX, p. 470, 1905.	Basalt.	
195	III.(4)5.4″.4. *1.1.1.2.*	Q 6.48 or 3.34 ab 10.48 an 33.36	di 8.31 hy 35.22 mt 1.62 il 1.22	Cape Royds, Ross Island, S. Victoria Land, Antarctica.	W. N. Benson.	W. N. Benson, pers. com.	Quartz dolerite.	Erratic block.

CLASS III. SALFEMANE—Continued.

RANG 4. DOCALCIC. AUVERGNASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
196	54.16	15.08	0.79	8.08	7.14	10.57	1.60	1.11	0.36	0.20	0.70	trace	0.14	CO_2 trace	99.93	
A2. II	.903	.148	.005	.113	.179	.189	.026	.012			.009	—	.002			
197	53.26	15.64	0.24	7.44	8.64	12.08	1.25	0.58	0.41	0.35	0.70	0.04	0.11		100.74	
A2. II	.888	.153	.002	.103	.216	.216	.020	.006			.009	—	.002			

RANG 5. PERCALCIC. KEDABEKASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	40.68	19.83	4.68	6.49	7.67	17.64	1.10	0.27	0.27	0.08	2.04		0.10		100.85	3.14
A2. II	.678	.194	.029	.090	.192	.315	.018	.003			.026		.001			
2	46.69	14.23	2.00	12.86	8.15	13.32	0.98	none	0.08		1.28	0.19	0.11	S 0.12	99.97	3.24
A2. II	.778	.139	.013	.179	.204	.238	.016	—			.016	.001	.002			
3	48.02	20.01	1.13	7.29	10.05	11.42	0.51	0.05	0.57	0.10	0.23	trace	0.18	CO_2 0.25 ZrO_2 none FeS_2 0.11 Cr_2O_3 0.03 V_2O_3 0.02 NiO 0.01 BaO none SrO none	99.98	2.980
A1. I	.800	.196	.007	.101	.251	.203	.008	.001			.003	—	.003			
4	46.85	20.02	2.30	4.60	10.16	13.84	1.32	trace	0.88		0.30	trace	trace		100.27	2.996
A3. III	.781	.196	.014	.064	.254	.247	.021	—			.004	—	—			
5	44.76	18.82	2.19	4.73	11.32	14.58	0.89	0.11	2.36	0.17	0.13	none	0.15	Cr_2O_3 0.08 Li_2O trace	100.29	
A2. II	.746	.184	.014	.065	.283	.260	.014	.001			.002	—	.002			
6	46.36	16.88	2.23	6.29	8.15	15.66	1.17	0.10	1.48	0.21	1.29	trace	0.10	CO_2 none ZrO_2 none S 0.01 BaO none SrO none	99.93	
A1. I	.773	.165	.014	.088	.204	.280	.019	.001			.016	—	.001			
7	44.60	15.38	8.50	8.03	6.82	14.50	0.33	0.01	0.56		0.92				99.65	3.059
A3. III	.743	.151	.053	.111	.171	.259	.005	—			.012					
8	50.76	16.83	4.16	4.45	10.09	11.30	0.97	0.06	0.14		0.46	none	0.69	CO_2 none S none CoO trace	99.91	
A2. II	.846	.165	.026	.062	.252	.202	.016	.001			.006	—	.010			
9	49.06	18.87	1.89	4.49	10.95	11.70	0.97	0.06	0.43		0.88	trace	0.34	FeS_2 0.02	99.66	
A2. II	.818	.185	.012	.063	.274	.209	.016	.001			.011	—	.005			
10	42.20	17.56	1.20	6.23	20.38	9.61	1.11	0.11	1.13	0.06	0.09		0.18	CO_2 trace S 0.02 Cr_2O_3 0.06 NiO 0.13 CuO 0.04	100.21	
A1. I	.703	.172	.008	.088	.508	.171	.018	.001			.001		.003			
11	47.40	16.29	1.57	5.55	8.13	17.57	0.71	0.51	0.87	0.05	0.50	0.58		CO_2 0.07 SO_3 0.49	100.34	
A2. II	.790	.160	.010	.077	.203	.314	.011	.005			.006	.004				
12	44.23	19.01	3.47	1.65	8.09	16.91	1.22	0.35	2.65	0.37	0.05	1.61		SO_3 0.35	99.96	
A2. II	.737	.186	.022	.023	.202	.302	.019	.004			—	.011				

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG 4-5. PRESODIC. AUVERGNOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
196	″III.(4)5.4.4″. *1.1.2.3.*	Q 5.76 di 17.96 or 6.67 hy 22.44 ab 13.62 mt 1.16 an 30.58 il 1.37	Cape Royds, Ross Island, S. Victoria Land, Antarctica.	W. N. Benson.	W. N. Benson, pers. com.	Quartz dolerite.	Erratic block.
197	III.″5.4″.4. *1.1.2.2.*	Q 4.74 di 20.08 or 3.34 hy 24.24 ab 10.48 mt 0.46 an 35.31 il 1.37	Knob Head, S. Victoria Land, Antarctica.	G. T. Prior.	G. T. Prior, Nat. Ant. Exp., I, p. 137, 1907.	Dolerite.	

SUBRANG. NOT NEEDED.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.5(6).(4)5.0. *2.3.2.2.*	an 48.09 di 21.89 lc 1.31 ol 9.77 ne 5.11 cs 3.78 mt 6.73 il 3.95	Rougemont, Rouville County, Quebec.	M. F. Connor.	J. J. O'Neil, Can. G. S. Mem. 43, p. 76, 1914.	Rougemontite (augite anorthosite).	
2	III.5.(4)5.0. *1.1.2.3.*	ab 8.38 di 25.73 an 34.19 hy 20.46 ol 5.34 mt 3.02 il 2.43 ap 0.34	Sudbury District, Ontario.	J. A. Horton.	A. P. Coleman, J. G., XV, p. 775, 1907.	Norite.	
3	″III.5.5.0. *1.1.1.2.*	Q 0.66 di 3.59 or 0.56 hy 35.78 ab 4.19 mt 1.62 an 51.99 il 0.46	McKinsey's mill, Cecil County, Maryland.	W. F. Hillebrand.	A. G. Leonard, A. G., XXVIII, p. 151, 1901.	Norite.	In W. T., p. 337.
4	(II)III.5.(4)5.0. *1.2.2.2.*	ab 11.00 di 15.90 an 48.65 hy 9.85 ol 10.05 mt 3.25 il 0.61	Pikesville, Baltimore County, Maryland.	L. McCay.	G. H. Williams, U. S. G. S. B. 28, p. 37, 1886.	Gabbro-diorite.	In W. T., p. 337.
5	III.5.″5.0. *1.3.2.2.*	or 0.56 di 20.11 ab 7.34 hy 3.03 an 46.98 ol 16.04 mt 3.25 il 0.30	Wetheredville, Baltimore County, Maryland.	W. F. Hillebrand.	G. H. Williams, U. S. G. S. A. R. 15, p. 673, 1895.	Hypersthene gabbro.	In W. T., p. 337.
6	III.5.(4)5.0. *1.2.2.2.*	or 0.56 di 30.12 ab 9.96 hy 6.22 an 40.31 ol 5.41 mt 3.25 il 2.43	Riddle's quadrangle, Oregon.	G. Steiger.	G. F. Kay, U. S. G. S. B. 419, p. 167, 1910.	Dioritic greenstone.	
7	III.(4)5.5.0. *2.1.2.3.*	Q 5.46 di 25.18 ab 2.62 hy 11.10 an 40.59 mt 12.30 il 1.82	Beef Island, West Indies.	P. Peterson.	P. T. Cleve, Sv. Vet. Ak. Hdl., IX, No. 12, p. 38, 1871.	Olivine gabbro.	Cf. A. G. Hogbom, B. G. Inst. Ups., VI. p. 230, 1905.
8	III.″5.(4)5.0. *2.1.2.2.*	Q 6.24 di 11.88 or 0.56 hy 24.86 ab 8.38 mt 6.03 an 41.14 il 0.91	Arakaka District, Barima River, British Guiana.	J. B. Harrison.	J. B. Harrison, Rep. G. N. W. Dist., II, p. 6, 1898.	Diabase.	In W. T., p. 337.
9	″III.5.″5.0. *1.1.1.2.*	Q 1.20 di 9.05 or 0.56 hy 29.05 ab 8.38 mt 2.78 an 46.70 il 1.67	Issorora Hill, Aruka River, British Guiana.	J. B. Harrison.	J. B. Harrison, G. Goldf. Br. Gui., p. 48, 1908.	Epidiorite.	
10	III.5.(4)5.0. *1.5.1.2.*	or 0.56 di 3.95 ab 4.19 ol 42.60 an 42.53 mt 1.86 ne 2.84 il 0.15	Allival, Rum Island, Scotland.	W. Pollard.	A. Harker, G. S. Scot., Mem. Sh. 60, p. 80, 1908.	Allivalite.	
11	III.5.(4)5.0. *1.1.3.2.*	or 2.78 di 35.00 ab 5.76 hy 8.24 an 40.03 ol 2.42 mt 2.32 il 0.91 ap 1.[illegible]4	Lohberg, n. Nieder Ramstadt, Hesse.	Stadler.	G. Klemm, Erl. G. Kt. Hes., Bl. Rossdorf, p. 29, 1912.	Gabbro.	
12	″III.5.(4)5.0. *2.2.3.1.*	or 2.22 di 22.06 ab 9.96 hy 3.70 an 45.31 ol 4.48 mt 5.10 ap 3.70	Felsberg, Hesse.	Surv. lab.	C. Chelius, Erl. G. Kt. Hes., Bl. Neunkirchen, p. 19, 1901.	Diorite.	TiO_2 and P_2O_5 interchanged?

CLASS III. SALFEMANE—Continued.

RANG 5. PERCALCIC. KEDABEKASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
13	42.38	17.31	7.69	6.61	3.62	19.01	0.83	trace	0.91		1.95				100.31	3.260
A3. III	.706	.170	.048	.092	.091	.339	.013	—			.024					
14	34.68	17.94	11.47	5.71	12.52	14.82	0.35	0.23	1.00		0.82				99.54	
A3. III	.578	.178	.072	.079	.313	.264	.006	.002			.010					
15	43.43	14.71	2.23	12.45	7.88	17.65	0.10	0.08	1.10	0.17	0.07	0.02			99.89	
A2. II	.724	.144	.014	.173	.197	.315	.002	.001			.001	—				
16	46.09	12.76	2.65	4.50	14.42	16.65	0.60	none	2.43		0.45				100.55	
A3. III	.768	.125	.017	.063	.361	.297	.010	—			.006					
17	51.55	18.85	0.32	6.77	7.09	14.04	0.63	0.08	0.11	0.04	0.53	trace	0.13	CO_2 none S none	100.14	
A2. II	.859	.185	.002	.094	.177	.251	.010	.001			.007	—	.002			
18	35.34	13.36	6.24	5.18	6.61	27.34	—	none	4.03		1.54			CO_2 none Cr_2O_3 none NiO 0.02 CuO 0.05	99.71	
A2. II	.589	.131	.039	.072	.165	.488	—	—			.019					
19	33.42	14.34	10.32	2.44	4.66	29.40	0.14		3.63		0.30		0.75	CO_2 none Cr_2O_3 none	99.40	
A2. II	.557	.141	.064	.034	.117	.525	.002				.004		.011			
20	50.47	14.92	1.33	5.10	17.69	9.07	0.75	0.18	0.92		0.14	0.02	0.12		100.71	
A2. II	.841	.146	.008	.071	.442	.163	.012	.002			.002	—	.002			

CLASS III. SALFEMANE.

RANG 1. PERALKALIC. WYOMINGASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	50.23	11.22	3.34	1.84	7.09	5.99	1.37	9.81	1.72	0.93	2.27	1.89	0.05	SO_3 0.74 Cl 0.03 F 0.50 Cr_2O_3 0.10 BaO 1.23 SrO 0.24 Li_2O trace $(Ce,Di)_2O_3$ 0.03	100.62	2.779
A1. I	.837	.110	.021	.025	.177	.107	.023	.104			.028	.013	—			

RANG 1. PERALKALIC. WYOMINGASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	48.90	7.85	11.46	13.32	0.38	1.95	7.40	3.23	1.80			none	1.11	ZrO_2 1.96 Cl 0.03	99.39	3.12
B2. III	.815	.077	.072	.185	.010	.035	.119	.034				—	.015			
2	47.88	12.10	3.53	4.80	8.64	9.35	2.94	5.61	1.52	0.70	0.77	1.11	0.15	CO_2 0.12 ZrO_2 0.03 SO_3 none Cl trace F 0.05 S 0.03 Cr_2O_3 0.04 V_2O_3 0.04 NiO trace BaO 0.46 SrO 0.13 Li_2O none	100.00	
A1. I	.798	.119	.022	.067	.216	.167	.047	.060			.010	.008	.002			

ORDER 5. PERFELIC. GALLARE—Continued.

SUBRANG. NOT NEEDED—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
13	III.5.″5.0. *2.1.3.3.*	Q 1.26 ab 6.81 an 43.65 di 24.62 wo 8.24 mt 11.14 il 3.65	Schwarzbrunn, n. Gablonz, Bohemia.	R. Reinisch?	R. Reinisch, T. M. P. M., XXV, p. 536, 1906.	Augitite.	Border of dike. Cf. No. 3, III.8.3.4.
14	III.5.5.0.⊙ *2.5.2.2.*	an 47.26 lc 0.87 ne 1.70 di 3.24 ol 20.86 cs 6.88 mt 16.01 il 1.52 hm 0.48	Ostraia Sopka, Tschistop Mountains, Ural Mountains.	Not stated.	L. Duparc, B. Soc. Min. Fr., XXXV, p. 20, 1913.	Ostraite (spinel pyroxenite).	
15	III″.5.5.0. *1.2.2.3.*	an 39.20 lc 0.44 ne 0.57 di 39.15 ol 15.57 cs 0.34 mt 3.25 il 0.15	Insizwa, Mount Ayliff, Griqualand.	W. Versfeld.	A. L. Du Toit, A. R. G. Com. Cape G. H., XV, p. 126, 1910.	Augite picrite.	
16	III(IV).5.″5.0. *1.2.2.2.*	ab 5.24 an 31.97 di 39.89 hy 0.93 ol 15.37 mt 3.94 il 0.91	Torricelli Mountains? Kaiser Wilhelm Land, New Guinea.	E. Ludwig.	S. Richarz, N. J. B. B., XXIX, p. 445, 1910.	Hornblende gabbro.	Pebble at Tumleo.
17	(II)III.(4)5.5.0. *1.1.2.2.*	Q 6.24 or 0.56 ab 5.24 an 48.37 di 17.43 hy 20.68 mt 0.46 il 1.06	Cavanagh Range, West Australia?	G. J. Burrows.	J. A. Thompson, Pr. R. Soc. N. S. W., XLV, p. 308, 1912.	Diabase.	
18	III(IV).5.5.0. *2.4.3.2.*	an 36.42 di 12.90 ol 8.69 CS 25.63 mt 9.05 il 2.89	Roding River, Dun Mountains, Nelson, New Zealand.	J. S. Maclaurin.	J. M. Bell, N. Z. G. S. B. 12, p. 33, 1911.	Rodingite (diallage garnet rock).	
19	III″.5.5.0. *2.5.4.0.*	an 38.64 ne 0.57 di 5.18 ol 6.58 CS 31.13 mt 9.51 il 0.61 hm 3.68	Lee Valley, Dun Mountains, Nelson, New Zealand.	J. S. Maclaurin.	J. M. Bell, N. Z. G. S. B. 12, p. 33, 1911.	Rodingite.	
20	III.5.(4)5.0. *1.1.1.2.*	or 1.11 ab 6.29 an 36.70 di 7.03 hy 40.57 ol 6.06 mt 1.86 il 0.30	New Caledonia.	Boiteau.	A. Lacroix, C. R., CLII, p. 819, 1911.	Norite.	

ORDER 6. LENDOFELIC. PORTUGARE. (C. I. P. W., 1902.)

SUBRANG 1. PERPOTASSIC. WYOMINGOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(II)III.(5)6.1.1.(2). *2.2.2.1.*	or 50.60 lc 5.67 ne 1.70 th 1.28 ac 3.70 di 15.34 ol 7.42 il 5.80 hm 2.08 pf 0.41 ap 4.37	Boar's Tusk, Leucite Hills, Wyoming.	W. F. Hillebrand.	W. Cross, A. J. S., IV, p. 130, 1897.	Wyomingite.	In W. T., p. 339.

SUBRANG 3. SODIPOTASSIC. MONTANOSE. (L. V. PIRSSON, 1905.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III(IV).6.1.3. *1.2.2.5.4.*	or 18.90 ab 7.86 ne 7.95 Z 2.93 ac 33.26 ns 0.49 di 8.68 ol 17.75	Kringlerne, Kangerdluarsuk, Ilimausak Region, Greenland.	C. Detlefsen.	N. V. Ussing, G. Julhb., p. 182, 1911.	Kakortokite (black).	In W. T., p. 339.
2	III.6.1(2).3. *2.2.2.2.*	or 32.53 an 3.34 lc 0.66 ne 13.35 di 28.91 ol 9.12 mt 5.10 il 1.52 ap 2.69	Shonkin Sag, Highwood Mountains, Montana.	W. F. Hillebrand.	Weed and Pirsson, A. J. S., XII, p. 14, 1901.	Shonkinite.	Also in U. S. G. S. B. 237, p. 113, 1905.

CLASS III. SALFEMANE—Continued.

RANG 1. PERALKALIC. WYOMINGASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	50.70	13.72	6.07	7.64	0.04	0.86	12.32	1.91	4.84				1.42	ZrO_2 1.04	100.56	
A2. II	.845	.134	.038	.106	.001	.015	.198	.020					.020			
2	51.88	14.13	6.45	0.94	3.44	10.81	6.72	4.57	0.18		0.33	0.96			100.41	
A2. II	.865	.138	.040	.013	.086	.193	.108	.049			.004	.007				
3	48.39	11.64	4.09	3.57	12.55	7.64	4.14	3.24	2.56	0.28	0.73	0.45	trace	CO_2 none SO_3 0.08 Cl trace Cr_2O_3 0.07 NiO none BaO 0.32 SrO 0.15 Li_2O trace		
A1. I	.807	.114	.025	.049	.314	.137	.067	.034			.009	.003	—			
4	45.72	14.25	4.10	5.56	2.67	10.41	5.52	3.62	4.80		3.25	0.20			100.10	2.766
A2. II	.762	.140	.026	.077	.067	.186	.089	.038			.041	.001				
5	51.35	11.45	9.40	2.41	0.54	3.27	10.80	2.52	3.20		2.75		1.25	ZrO_2 0.54	99.48	
A2. II	.856	.112	.059	.033	.014	.059	.174	.027			.034		.018			

RANG 2. DOMALKALIC. MONCHIQUASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	46.04	12.40	3.54	5.58	12.60	8.38	1.62	4.87	3.55		2.20				100.78	
A3. III	.767	.122	.022	.078	.315	.150	.026	.052			.028					

RANG 2. DOMALKALIC. MONCHIQUASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	49.59	14.51	3.51	5.53	6.17	9.04	3.52	5.60	1.95		0.36	0.15	trace	SO_3 0.02 Cl 0.13 BaO 0.49 SrO 0.21	100.78	
A1. I	.827	.142	.022	.076	.154	.160	.056	.060			.005	.001	—			
2	46.73	10.05	3.53	8.20	9.27	13.22	1.81	3.76	1.24		0.78	1.51	0.28	Cl 0.18	100.56	
A2. II	.779	.099	.022	.114	.232	.236	.030	.040			.010	.011	.004			
3	48.98	12.29	2.88	5.77	9.19	9.65	2.22	4.96	0.56	0.26	1.44	0.98	0.08	F 0.22 Cr_2O_3 trace BaO 0.43 SrO 0.08	99.99	
A1. I	.816	.120	.018	.081	.230	.172	.035	.053			.018	.007	.001			
4	48.81	16.64	2.65	6.28	6.15	9.87	2.85	5.79	0.05		1.01	0.66		Cl 0.34	101.10	
B2. III	.814	.163	.017	.088	.154	.177	.046	.062			.013	.005				
5	49.65	14.39	4.21	3.48	6.27	10.12	3.21	5.46	2.37		0.25	0.79	0.25		100.19	
A2. II	.828	.141	.026	.049	.157	.180	.051	.059			.003	.006	.004			
6	46.30	9.87	7.43	5.40	7.18	14.26	1.74	3.81	1.85		1.37	1.01	trace		100.22	3.011
A2. II	.772	.097	.046	.075	.180	.255	.028	.040			.016	.007	—			

ORDER 6: LENDOFELIC. PORTUGARE—Continued.

SUBRANG 4. DOSODIC. PILANDOSE. (H. S. WASHINGTON, 1914.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(II)III.6″.1.4(5). *1.2.1.5.3.*	or 11.12 ac 17.56 ab 26.72 ns 5.73 ne 17.89 di 3.72 Z 1.65 ol 11.39	Kangerdluarsuk, Greenland.	C. Detlefsen.	H. Rosenbusch, Elem. Gest., p. 215, 1898.	Arfvedsonite-analcite tinguaite.	Not in N. V. Ussing, G. Julhb. In W. T., p. 339.
2	III.6(7).1.(3)4. *2.1.3.2.*	or 27.24 ac 8.78 ab 7.86 di 18.38 ne 21.02 wo 9.74 mt 2.09 il 0.61 hm 1.92 ap 2.35	Pooh-bah Lake, Rainy River District, Ontario.	W. C. Blasdale.	A. C. Lawson, B. Dep. G. Un. Cal., I, p. 356, 1896.	Garnet-pyroxene malignite.	In W. T., p. 347.
3	III.6.1″.″4. *″2.(2)3.2.(1)2.*	or 18.90 di 24.78 ab 14.15 ol 15.37 an 3.61 mt 5.80 ne 11.36 il 1.37 ap 1.01	Bandbox Mountain, Little Belt Mountains, Montana.	W. F. Hillebrand.	L. V. Pirsson, U. S. G. S. A. R. 20 (III), p. 545, 1900.	Analcite basalt.	In W. T., p. 339.
4	″III.6(7).1″.4. *2.1.3.3.*	or 21.13 di 16.95 ab 10.48 wo 11.14 an 3.61 mt 6.03 ne 19.60 il 6.23	Fohberg, Kaiserstuhl, Baden.	K. Gruss.	K. Gruss, Mt. Bad. G. L.-A., IV, p. 115, 1901.	Monchiquite.	In W. T., p. 339
5	III.6.1.4.⊙ *1.1.2.5.4.*	or 15.01 ac 27.26 ab 21.48 ns 3.66 ne 12.50 di 7.24 Z 0.73 wo 3.25 il 5.17	Tusschenkomst, Pilandsberg, Transvaal.	F. Pisani.	H. A. Brouwer, C. R., CXLIX, p. 1008, 1909.	Lujavrite.	Also in Transv. Nephsy., p. 130, 1910.

SUBRANG 2. DOPOTASSIC. KAJANOSE. (H. A. BROUWER, 1909.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.6.2(3).2″. *2.3.2.2.*	or 24.46 di 23.19 an 12.23 ol 17.20 lc 3.49 mt 5.10 ne 7.38 il 4.26	Oeloe Kajan, East Borneo.	Pisani.	H. A. Brouwer, Pr. K. Ak. Wet. Amst., XII (1), p. 151, 1909.	Mica-leucite basalt.	

SUBRANG 3. SODIPOTASSIC. SHONKKIOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″III.6.″2.3. *2.2.2.2.*	or 33.36 di 29.32 ab 0.52 ol 5.58 an 7.23 mt 5.10 ne 15.62 il 0.76 ap 0.34	East Peak, Highwood Mountains, Montana.	E. B. Hurlbut.	L. V. Pirsson, U. S. G. S. B. 237, p. 109, 1905.	Leucite shonkinite.	In W. T., p. 341.
2	III(IV).6.2.″3. *2.2.2.2″.*	or 22.24 di 38.19 ab 1.05 ol 11.54 an 8.06 mt 5.10 ne 7.95 il 1.67 ap 3.70	Square Butte, Highwood Mountains, Montana.	L. V. Pirsson.	Weed and Pirsson, B. G. J. A., VI, p. 414, 1895.	Shonkinite.	Corrected in L. V. Pirsson, U. S. G. S. B. 237, p. 102, 1905. In W. T., p. 341.
3	III.(5)6.2.(2)3. *2.2.2.2.*	or 29.47 di 26.56 ab 6.02 ol 11.75 an 8.90 mt 4.18 ne 6.67 il 2.74 ap 2.35	Yogo Peak, Little Belt Mountains, Montana.	W. F. Hillebrand.	Weed and Pirsson, A. J. S., L, p. 474, 1895.	Shonkinite.	Also in U.S.G.S. A. R. 20 (III), p. 484, 1900. In W. T., p. 341.
4	(II)III.6″.2″.″3. *2.2.2.2.*	or 26.13 di 24.50 an 15.29 ol 8.11 lc 6.54 mt 3.94 ne 13.06 il 1.98 ap 1.68	Lava of 1906, Mount Vesuvius. Italy.	Pisani.	A. Lacroix, N. Arch. Mus. (4) IX, p. 153, 1907.	Leucite tephrite.	
5	″III.6.2.3. *2.1.3.2.*	or 32.80 di 28.47 ab 3.14 ol 4.11 an 8.62 mt 6.03 ne 12.78 il 0.46 ap 2.02	Bet. Choi and Marand, n. Lake Urmia, Persia.	V. Steinecke.	V. Steinecke, Zs. Nw. Halle (4), VI, p. 12, 1887.	Leucitophyre.	P_2O_5 given as 1.08 H_3PO_4. In W. T., p. 341.
6	III(IV).″6.2.″3. *2.1.3.2.*	or 22.24 di 42.11 ab 2.88 wo 1.16 an 8.06 mt 10.67 ne 6.39 il 2.43 ap 2.35	Regatta Point, Port Cygnet, Tasmania.	R. Pohl.	F. P. Paul, T. M. P. M., XXV, p. 302, 1906.	Nephelinite.	

CLASS III. SALFEMANE—Continued.

RANG 2. DOMALKALIC. MONCHIQUASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive:	Sum.	Sp. gr.
1	48.35	13.27	4.38	3.23	8.36	9.94	3.35	3.01	2.89	0.90	0.52	0.40	0.19	CO_2 0.30 F 0.25 Cr_2O_3 trace NiO 0.04 BaO 0.54 SrO 0.09	100.01	
A1. I	.806	.130	.027	.044	.209	.177	.054	.032			.007	.003	.003			
2	47.82	13.56	4.73	4.54	7.49	8.91	4.37	3.23	3.37		0.67	1.10	trace	SO_3 trace Cl 0.04 BaO 0.50 SrO 0.14	100.20	
A1. I	.797	.133	.029	.062	.187	.159	.071	.034			.008	.008	—			
3	45.59	12.98	4.97	4.70	8.36	11.09	4.53	1.04	3.40	0.51	1.32	0.91	0.14	ZrO_2 0.03 Cl 0.05 BaO 0.13 SrO 0.12 Li_2O trace	99.87	
A1. I	.760	.127	.031	.065	.209	.198	.072	.011			.016	.006	.002			
4	49.09	11.98	6.22	7.94	7.62	10.59	3.93	2.00	n. d.		0.58	0.50			100.45	2.33
A2. II	.818	.117	.039	.110	.191	.189	.063	.021			.007	.004				
5	46.48	16.16	6.17	6.09	4.02	7.35	5.85	3.08	4.27		0.99			CO_2 0.45	100.91	2.723
B3. IV	.775	.158	.039	.085	.101	.131	.095	.033			.012					
6	47.03	15.36	3.38	7.35	5.10	8.47	4.32	3.00	2.60	0.22	2.64	0.73	0.14	CO_2 none NiO trace BaO 0.08 SrO 0.05	100.67	
A2. III	.784	.151	.021	.102	.128	.152	.069	.032			.033	.005	.002			
7	45.26	15.74	2.33	7.12	5.23	8.86	5.01	2.51	2.94	0.68	3.01	0.90	0.22	CO_2 trace BaO none SrO trace	99.81	
A2. II	.754	.154	.015	.099	.131	.158	.081	.027			.038	.006	.003			
8	44.55	12.48	2.81	8.54	10.85	7.99	4.04	2.57	0.56	0.18	4.32	0.70		CO_2 none SO_3 0.05	99.64	
A2. II	.743	.122	.018	.118	.271	.143	.065	.028			.108	.005				
9	43.64	13.12	6.40	5.52	9.36	9.52	3.89	2.18	0.49	0.16	4.55	0.74		CO_2 none SrO 0.03	99.60	
A2. II	.727	.129	.040	.077	.234	.170	.063	.023			.057	.005				
10	45.88	13.52	2.48	7.74	9.09	8.55	4.53	2.52	0.74	0.17	2.87	1.19	0.21	CO_2 trace Cr_2O_3 0.01 NiO 0.14	99.64	
A2. II	.765	.133	.016	.107	.227	.153	.073	.027			.036	.008	.003			
11	45.12	13.63	3.20	7.84	9.37	8.93	4.68	2.05	0.43	0.36	2.69	0.93	0.23	CO_2 trace Cr_2O_3 0.01 NiO 0.48	99.95	
A2. II	.752	.134	.020	.109	.234	.159	.076	.022			.034	.007	.003			
12	44.66	12.97	3.84	7.55	9.35	8.82	4.24	2.78	0.69	0.48	2.76	1.10	0.20	CO_2 none Cr_2O_3 0.01 NiO 0.26	99.71	
A2. II	.744	.127	.024	.105	.234	.157	.068	.030			.035	.008	.003			
13	43.84	12.82	8.99	5.11	2.39	13.57	3.52	2.90	3.12		3.55				99.81	2.859
A3. III	.731	.125	.056	.071	.060	.242	.056	.031			.044					
14	42.80	12.49	4.32	6.06	7.62	10.43	4.33	2.75	4.92		2.36	1.77			99.85	
A2. II	.713	.123	.027	.084	.191	.186	.069	.029			.042	.012				
15	44.39	13.12	4.19	7.38	9.54	9.55	4.17	2.22	1.96		2.40	0.93		CO_2 0.16 SO_3 0.17	100.18	
A2. II	.740	.129	.026	.103	.238	.170	.068	.023			.030	.007				

ORDER 6. LENDOFELIC. PORTUGARE—Continued.

SUBRANG 4. DOSODIC. MONCHIQUOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.(5)6.2″.(3)4. *2.2.2.2.*	or 17.79 di 27.44 ab 15.46 ol 6.91 an 12.23 mt 6.26 ne 6.96 il 1.06 ap 1.01	Big Baldy Mountain, Little Belt Mountains, Montana.	W. F. Hillebrand.	L. V. Pirsson, U. S. G. S. A. R. 20 (III), p. 548, 1900.	Analcite basalt.	In W. T., p. 341.
2	III.6.2.″4. *2.2.2.2.*	or 18.90 di 23.49 ab 16.77 ol 7.77 an 7.78 mt 6.73 ne 11.08 il 1.22 ap 2.69	Highwood Gap, Highwood Mountains, Montana.	H. W. Foote.	L. V. Pirsson, U. S. G. S. B. 237, p. 156, 1905.	Analcite basalt (monchiquite).	In W. T., p. 341.
3	III.6.2″.4(5). *2.2.2.2.*	or 6.12 di 29.32 ab 19.12 ol 9.76 an 12.23 mt 7.19 ne 10.08 il 2.43 ap 2.02	The Basin, n. Cripple Creek, Colorado.	W. F. Hillebrand.	W. Cross, J. G., V, p. 689, 1897.	Analcite basalt.	In W. T., p. 341.
4	III.(5)6.2.4. *2.2.2.2.*	or 11.68 di 32.11 ab 20.96 ol 8.67 an 9.17 mt 9.05 ne 6.53 il 1.37 ap 1.34	Santa Maria, n. Atlixco, Puebla, Mexico.	A. Hoppe.	A. Hoppe in Felix and Lenk, Btr. G. Mex., II, p. 220, 1899.	Vitrophyric basalt.	In W. T., p. 341.
5	(II)III.6″.2.4. *2.1.2.3.*	or 18.35 di 22.65 ab 14.15 ol 2.64 an 8.34 mt 9.05 ne 19.31 il 1.82	Cabo Frio, n. Rio de Janeiro, Brazil.	M. Hunter.	Hunter and Rosenbusch, T. M. P. M., XI, p. 454, 1890.	Monchiquite.	In W. T., p. 341.
6	(II)III.″6.2″.″4. *2.2.2.3.*	or 17.79 di 19.13 ab 17.82 ol 7.34 an 13.90 mt 4.87 ne 9.94 il 5.02 ap 1.68	Craigleith, n. Berwick, Scotland.	W. Pollard.	E. B. Bailey, G. S. Scot. Mem. Sh. 33, p. 117, 1910.	Essexite.	
7	(II)III.6.2.4. *2.2.2.3.*	or 15.01 di 20.67 ab 14.41 ol 6.93 an 12.79 mt 3.48 ne 15.19 il 5.78 ap 2.02	Bellow Water, Lugar, Ayrshire, Scotland.	A. Scott.	G. W. Tyrrell, pers. com.	Teschenite.	
8	III.6.2.4.⊙ *2.3.2.3.*	or 15.57 di 21.40 ab 11.00 ol 16.42 an 8.06 mt 4.18 ne 12.50 il 8.21 ap 1.68	Llora, n. Gerona, Spain.	H. S. Washington.	H. S. Washington, A. J. S., XXIV, p. 239, 1907.	Nephelite basanite.	
9	III.6.2″.4. *2.2.2.2.*	or 12.79 di 23.76 ab 12.58 ol 8.68 an 11.95 mt 4.64 ne 11.08 il 8.68 hm 3.20 ap 1.68	La Garrinada, Olot, Spain.	H. S. Washington.	H. S. Washington, A. J. S., XXIV, p. 239, 1907.	Nephelite basanite.	
10	III.6.2.4.⊙ *2.3.2.2.*	or 15.01 di 20.73 ab 14.15 ol 14.86 an 9.17 mt 3.71 ne 13.06 il 5.47 ap 2.69	Sverres Fjeld Volcano, Wood Bay, Spitzbergen.	M. Dittrich.	V. Goldschmidt, Skr. Vids. Krist., 1911, No. 9, p. 16.	Basalt (trachydolerite).	
11	III.6.2.4⊙ *2.3.2.2.*	or 11.95 di 22.30 ab 12.58 ol 15.20 an 10.01 mt 4.64 ne 14.77 il 5.17 ap 2.35	Sverres Fjeld Volcano, Wood Bay, Spitzbergen.	M. Dittrich.	V. Goldschmidt, Skr. Vid. Krist., 1911, No. 9, p. 16.	Basalt (trachydolerite).	
12	III.6.2.4.⊙ *2.2.2.2″.*	or 16.68 di 23.12 ab 9.96 ol 13.66 an 7.51 mt 5.57 ne 13.92 il 5.32 ap 2.69	Sverres Fjeld Volcano, Wood Bay, Spitzbergen.	M. Dittrich.	V. Goldschmidt, Skr. Vid. Krist., 1911, No. p. 9, 16.	Basalt (trachydolerite).	
13	III.6.2.(3)4. *2.3.3.3.*	or 17.24 di 12.96 ab 12.05 ol 16.70 an 10.56 mt 6.26 ne 9.37 il 6.69 ap 4.64	Blankenhornberg, Kaiserstuhl, Baden.	K. Gruss.	K. Gruss, Mt. Bad. G. L.-A., p. 126, 1901.	Leucite basanite.	Leucite-analcite?
14	III.6″.2.4. *2.2.2.2.*	or 16.12 di 26.46 ab 7.86 ol 6.81 an 6.95 mt 6.26 ne 15.34 il 6.38 mt 4.03	Hertinghausen, Hesse-Nassau.	M. Dittrich.	R. Bernges, N. J. B. B., XXXI, p. 633, 1911.	Leucite basalt.	Vitrophyric. Fresh?
15	III.6.2.4.⊙ *2.2.2.2.*	or 12.79 di 24.12 ab 10.74 ol 13.25 an 10.56 mt 6.03 ne 13.49 il 4.56 ap 2.35	Friedrichstollen, Meissner, Prussia.	Not stated.	F. Beyschlag, Erl. G. Kt. Pr., Bl. Allendorf, p. 47, 1886.	Basalt.	In W. T., p. 341.

CLASS III. SALFEMANE—Continued.

RANG 2. DOMALKALIC. MONCHIQUASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
16	44.87	14.05	2.03	7.79	8.87	9.76	4.65	2.31	0.62		4.71	0.27	0.07	S 0.23	100.23	
A2. II	.748	.138	.013	.108	.222	.174	.075	.024			.059	.002	.001			
17	47.83	16.09	4.32	3.62	5.53	10.68	4.46	4.05	0.24	0.05	2.27	1.33	trace	SrO none Li_2O none	100.47	2.858
A2. II	.797	.158	.027	.050	.138	.191	.072	.043			.028	.009	—			
18	44.52	14.28	6.36	5.39	7.13	10.20	3.76	2.59	3.53		2.04	0.56			100.36	
A2. II	.742	.140	.040	.075	.178	.182	.061	.028			.026	.004				
19	46.34	13.03	11.18	6.48	6.44	9.89	4.39	1.83	0.11		0.54		trace		100.23	
A3. III	.772	.128	.070	.090	.161	.177	.071	.020			.007		—			
20	49.78	13.37	2.16	7.51	7.61	7.95	4.72	2.37	0.34	0.08	3.11	0.72			99.71	
A2. II	.830	.131	.014	.104	.190	.142	.076	.025			.039	.005				
21	46.54	12.68	3.41	5.29	10.09	8.00	5.11	1.64	2.35	0.25	3.98	0.91			100.25	
A2. II	.772	.124	.021	.074	.252	.143	.082	.017			.050	.006				
22	40.80	14.77	7.91	7.33	5.09	11.63	4.38	2.14	1.05		3.44	0.88	trace	CO_2 0.05 SO_3 trace S 0.18	99.65	3.065
A2. II	.680	.145	.049	.101	.127	.207	.071	.022			.043	.006	—			
23	48.44	16.18	1.36	6.24	7.13	8.68	5.18	3.84	1.82		1.39	0.21			100.47	
A2. II	.807	.159	.009	.087	.178	.155	.084	.040			.017	.001			(100.87)	
24	39.30	13.66	7.42	4.45	4.46	11.37	5.78	1.44	4.53		3.62	0.85	0.08	CO_2 0.15 SO_3 2.17 Cl 0.48	99.76	2.79
A2. II	.655	.134	.046	.062	.112	.203	.093	.016			.045	.006	.001			
25	44.98	15.56	5.15	7.30	3.31	9.20	5.34	1.29	3.77		2.89	0.43	0.23	S 0.04	99.49	2.947
A2. II	.750	.153	.032	.101	.083	.164	.086	.014			.036	.003	.003			
26	45.58	11.60	3.12	7.31	8.71	7.98	4.02	2.67	4.39		2.97	1.98	0.04		100.37	
A2. II	.760	.114	.019	.101	.219	.143	.065	.029			.036	.014	—			
27	42.54	11.52	7.30	7.28	8.89	9.28	4.25	1.07	4.82	0.72	1.04	0.95	0.17	CO_2 0.16 ZrO_2 none SO_3 trace Cl 0.08 S none Cr_2O_3 0.01 V_2O_3 0.11 NiO none BaO 0.06 SrO trace	100.25	2.698
A1. I	.709	.113	.046	.101	.222	.166	.069	.012			.013	.007	.002			
28	43.76	11.58	4.39	7.57	12.97	9.64	3.03	1.84	0.47		3.41	0.45		CO_2 0.38 SO_3 0.14 S 0.15	99.78	3.032
A2. II	.729	.104	.028	.106	.324	.172	.048	.020			.043	.003				

ORDER 6. LENDOFELIC. PORTUGARE—Continued.

SUBRANG 4. DOSODIC. MONCHIQUOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
16	III.6(7).2.4. *2.2.2.2.*	or 13.34 ab 7.07 an 10.84 ne 17.46 di 28.23 ol 9.78 mt 3.02 il 8.97 ap 0.67	Haselbuch, Passau, Bavaria.	G. Vervuet.	A. Frentzel, Geog. Jhft., XXIV, p. 162, 1911.	Essexite.	
17	(II)III.6.2.(3)4. *2.1.2.2.*	or 23.91 ab 8.38 an 11.95 ne 15.90 di 25.49 ol 1.40 mt 5.10 il 4.26 hm 0.80 ap 3.02	Falkenberg, n. Tetschen, Bohemia.	R. Pfohl.	J. E. Hibsch, T. M. P. M., XIV, p. 105, 1894.	Leucite tephrite.	In W. T., p. 343.
18	III.6.2(3).″4. *2.2.2.2.*	or 15.57 ab 10.48 an 14.18 ne 11.64 di 25.68 ol 4.93 mt 9.28 il 3.95 ap 1.34	Jesserken Berg, Mittelgebirge, Bohemia.	C. F. Eichleiter.	G. Irgang, T. M. P. M., XXVIII, p. 57, 1909.	Nephelite basanite.	
19	III.6.2.4.⊙ *2.1.2.2.*	or 11.12 ab 18.34 an 10.29 ne 10.22 di 30.59 ol 2.44 mt 16.24 il 1.06	Falucska, Abanytorna, Hungary.	P. Rozlozsnik.	B. V. Horvath, Jb. Ung. L.-A. (1910), p. 369, 1912.	Glaucophane diabase.	Altered?
20	″III.(5)6.2.4. *2.2.2.2.*	or 13.90 ab 20.72 an 8.34 ne 7.10 di 21.16 ol 11.21 mt 3.25 il 5.93 ap 1.68	Monte Cuccurudu, n. Keremule, Sardinia.	H. S. Washington.	H. S. Washington, C. R. Cong. G. Int., XII, p. 231, 1914.	Basalt.	
21	III.6.2.4″. *2.2.2.2.*	or 9.45 ab 24.10 an 6.95 ol 10.22 di 21.20 ol 11.05 mt 4.87 il 7.60 ap 2.02	Bonorva, Sardinia.	H. S. Washington.	H. S. Washington, B. Soc. G. It., XXXIII, p. 153, 1914.	Analcite basalt.	Also in J. G., XXII, p. 748, 1914. In refs. mol number of K_2O= .028 norm and symbol incorrect.
22	III.6(7).2(3).4. *3.1.3.3.*	or 12.23 ab 4.19 an 14.46 ne 17.89 di 29.45 mt 11.37 il 6.54 ap 2.02	Barranco del Agua Agria, La Palma Caldera, Madeira.	Eyme.	C. Gagel, Z. D. G. G., LXIV, p. 399, 1912.	Essexite.	
23	″III.6(7).2.4. *1.2.2.2″.*	or 22.24 ab 4.45 an 9.73 ne 21.44 di 26.23 ol 9.53 mt 2.09 il 2.58 ap 0.34	Tahiré, Rouma, Los Islands, French Guinea.	Lassieur.	A. Lacroix, N. Arch. Mus., III, p. 86, 1911.	Microtheralite.	Center of dike. Cf. No. 16, I.6.2.4.
24	III.6.2″.4(5). *3.1.3.2.*	or 8.90 ab 11.53 an 16.40 ne 10.51 hl 0.82 th 3.83 di 24.19 wo 1.39 mt 4.18 il 6.84 hm 4.48 ap 2.02	Etinde Volcano, Kamerun.	M. Dittrich.	E. Esch, Sb. Pr. Ak. W., 1901, p. 299.	Hauynophyre.	In W. T., p. 349.
25	(I)III.6.2(3).4(5). *2.1.2.3.*	or 7.78 ab 23.06 an 14.73 ne 11.93 di 22.81 ol 1.42 mt 7.42 il 5.47 ap 1.01	Tsao-shi-err, Yingé-Men, Manchuria.	Shimidzu and Ohashi.	B. Koto, J. Col. Sci. Un. Tok., XXXII, p. 11, 1912.	Nephelite basalt.	
26	III.(5)6.″2.4. *2.3.2.2.*	or 16.12 ab 22.01 an 5.56 ne 6.53 di 16.84 ol 14.28 mt 4.41 il 5.47 ap 4.70	Kozaki, Bungo Province, Japan.	K. Yokoyama.	S. Kozu, pers. com.	Monchiquite.	
27	III.6.2.4(5). *2.2.2.2.*	or 6.67 ab 17.82 an 8.90 ne 9.94 di 24.56 ol 11.68 mt 10.67 il 1.98 ap 2.35	South Bulli, New South Wales.	W. A. Greig.	N. S. W. Dep. Min. A. R. (1912), p. 198, 1913.	Monchiquite.	
28	III(IV).6.2(3).4. *2.3.2.2.*	or 11.12 ab 9.43 an 10.01 ne 8.52 di 27.60 ol 17.04 mt 6.50 il 6.54 ap 1.01	Matavuna Volcano, Savaii, Samoa.	Heuseler.	A. Klautzch, Jb. Pr. G. L.-A., XXVIII, p. 174, (1907), 1910.	Nephelite basalt.	Lava of 1905–6.

CLASS III. SALFEMANE—Continued.

RANG 2. DOMALKALIC. MONCHIQUASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	44.85	12.55	3.33	5.30	10.27	8.32	4.77	0.72	2.01	0.95	5.07	1.17	0.07	NiO 0.23	99.60	
A2. II	.748	.123	.021	.074	.257	.148	.077	.008			.064	.008	.001			
2	48.90	13.80	5.77	6.84	8.85	7.27	5.32	0.96	1.65		0.71	0.04	trace	CO_2 trace	100.11	2.803
A2. II	.815	.135	.036	.095	.221	.130	.085	.010			.009	—	—			

RANG 3. ALKALICALCIC. LIMBURGASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	47.61	16.12	0.91	6.22	7.27	12.45	1.76	4.75	1.50		1.26	0.38			100.23	
A2. II	.794	.158	.006	.086	.182	.222	.028	.051			.016	.003			(100.38)	
2	43.98	12.28	3.49	7.70	8.00	11.19	1.33	5.06	1.61	0.12	2.24	1.81	0.51	ZrO_2 none Cl 0.12 F 0.15 S 0.10 BaO 0.16 SrO 0.12	99.97	
A1. I	.733	.120	.022	.107	.200	.200	.021	.054			.028	.013	.007			

RANG 3. ALKALICALCIC. LIMBURGASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	42.96	13.41	3.13	7.78	11.42	10.03	2.82	2.75	0.86	0.74	2.32	1.21		CO_2 0.42 SO_3 0.20	100.05	
A2. II	.716	.131	.019	.108	.286	.179	.045	.030			.029	.009				
2	46.80	14.90	2.42	9.19	7.24	11.67	2.82	2.79	0.99	0.12	1.47				100.41	3.07
A3. III	.780	.146	.015	.128	.181	.209	.045	.030			.018					
3	48.10	15.31	3.20	5.45	7.55	12.45	1.98	4.22	0.87		1.15	0.12			100.40	
A2. II	.802	.150	.020	.076	.189	.222	.032	.045			.014	.001				
4	43.69	16.08	6.95	7.02	4.55	8.87	3.34	3.75	1.48		3.59	0.80		SO_3 0.26	100.32	2.913
A2. II	.728	.158	.044	.097	.114	.159	.054	.040			.045	.006				
5	42.65	14.03	5.67	9.67	6.54	10.28	3.05	3.52	0.70		2.74	0.87		SO_3 trace S 0.07	99.79	3.005
A2. II	.711	.138	.036	.135	.164	.184	.049	.037			.034	.006				

RANG 3. ALKALICALCIC. LIMBURGASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	42.45	16.36	3.20	9.85	7.92	9.57	2.61	2.29	0.29	0.16	4.12	0.49		CO_2 none S trace BaO 0.19 SrO 0.05	99.55	
A2. II	.708	.160	.020	.137	.198	.171	.042	.024			.052	.004				
2	45.11	12.44	2.67	9.36	11.56	10.61	3.05	1.01	0.78	0.16	2.34	0.51	0.22	Cl 0.11 S 0.01 V_2O_3 0.04 NiO 0.04 BaO trace SrO trace Li_2O none	100.02	
A1. I	.752	.122	.017	.130	.289	.189	.049	.011			.029	.004	.003			
3	44.64	12.82	3.64	8.34	10.05	10.09	3.39	1.76	1.20	0.36	1.99	0.90	0.16	CO_2 trace SO_3 none S none BaO 0.14 SrO 0.09	99.57	
A1. I	.744	.126	.023	.116	.251	.180	.055	.019			.025	.006	.002			
4	42.35	12.29	3.89	7.05	13.09	12.49	2.74	1.04	1.50	0.32	1.82	0.99	0.21	ZrO_2 none SO_3 0.05 Cr_2O_3 0.10 V_2O_3 0.04 NiO 0.03 BaO 0.10 SrO 0.09 Li_2O trace	100.19	3.122
A1. I	.706	.120	.024	.098	.327	.223	.043	.011			.023	.007	.003			

ORDER 6. LENDOFELIC. PORTUGARE—Continued.

SUBRANG 5. PERSODIC. SCANOSE. (H. S. WASHINGTON, 1914.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.(5)6.2.″5. *2.3.2.2.*	or 4.45 di 17.93 ab 28.30 ol 12.18 an 10.56 mt 2.32 ne 6.53 il 9.73 hm 1.76 ap 2.69	Scano Monte Ferru, Sardinia.	H. S. Washington.	H. S. Washington, B. Soc. G. It., XXXIII, p. 153, 1914.	Analcite basalt.	Also in J. G., XXII, p. 748, 1914.
2	III.(5)6.2.(4)5. *2.3.2.2.*	or 5.56 di 19.98 ab 30.65 ol 13.73 an 11.12 mt 8.35 ne 7.52 il 1.37	Palagonia, Val di Noto, Sicily.	G. Ponte.	G. Ponte, At. Ac. Gioen. (5), III, No. X, p. 7, 1910.	Basalt glass. (palagonite).	

SUBRANG 2. DOPOTASSIC. OTTAJANOSE. (A. LACROIX, 1907.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″III.6.3.2″. *1.2.2.2.*	or 17.79 di 29.82 an 21.96 ol 8.67 lc 8.28 mt 1.39 ne 7.95 il 2.43 ap 1.01	Above Ottajano, Monte Somma, Italy.	Pisani.	A. Lacroix, C. R., CXLI, p. 1192, 1905.	Leucotephrite.	Also in N. Arch. Mus. (4), IX, p. 28, 1907.
2	III.6.(2)3.2. *2.2.2.2.*	or 23.63 di 25.05 an 12.51 ol 11.82 lc 5.01 mt 5.10 ne 5.96 il 4.26 ap 4.37	Near Baleangin, Gentungen River, Pic de Maros, Celebes.	E. W. Morley.	J. P. Iddings, Ign. Rocks, II, p. 627, 1913.	Marosite (shonkinite).	Also in Iddings and Morley, J. G., XXIII, p. 233, 1915.

SUBRANG 3. SODIPOTASSIC. OUROSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.6.″3.3(4). *2.3.2.2.*	or 16.68 di 20.50 ab 2.62 ol 19.12 an 15.57 mt 4.41 ne 11.36 il 4.41 ap 3.02	Bet. Lich and Butzbach, Giessen, Hesse.	Stadler.	W. Schottler, Abh. G. L.-A. Darm., IV (3), p. 464, 1908.	Leucite basanite.	Fresh?
2	III.6.3.3(4). *2.2.2.3.*	or 16.68 di 31.31 ab 3.14 ol 11.20 an 19.74 mt 3.48 ne 11.08 il 2.74	Tremola, St. Gotthard, Switzerland.	K. M. Jene.	P. Waindziok, In. Diss. Zur., p. 39, 1906.	Vogesite-spessartite.	
3	III.6.3.″3. *2.2.2.2.*	or 21.41 di 32.36 an 20.29 ol 6.36 lc 2.83 mt 4.64 ne 9.09 il 2.13 ap 0.34	Lapilli of 1906, Ottajano, Mount Vesuvius.	Pisani.	A. Lacroix, C. R., CXLIII, p. 16, 1906.	Leucite tephrite.	Also in N. Arch. Mus. (4), IX, p. 28, 1907.
4	(II)III.6.(2)3.3″. *3.2.2.3.*	or 22.24 di 16.36 ab 7.70 ol 3.39 an 17.79 mt 10.21 ne 11.22 il 6.84 ap 2.02	Namlagira, Lake Kivu District, German East Africa.	Eyme.	L. Finckh, D. Zent. Afr. Exp., I (1), p. 18, 1912.	Leucite basanite.	
5	III.6.(2)3.3″. *2.2.2.3.*	or 20.57 di 25.21 ab 0.52 ol 9.25 an 14.46 mt 8.35 ne 13.63 il 5.17 ap 2.02	Kisi, Lake Kivu District, German East Africa.	Eyme.	L. Finckh, D. Zent. Afr. Exp., I (1), p. 18, 1912.	Leucite basanite.	

SUBRANG 4. DOSODIC. LIMBURGOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.(5)6.3″.(3)4. *2.3.2.3.*	or 13.34 di 14.33 ab 8.38 ol 15.50 an 26.13 mt 4.64 ne 7.38 il 7.90 ap 1.34	Buchanan, n. Peekskill, New York.	G. S. Rogers.	G. S. Rogers, Ann. N. Y. Ac. Sci., XXI, p. 61, 1911.	Diorite.	
2	III.″6.3.4″. *2.3.2.2.*	or 6.12 di 26.13 ab 13.10 ol 20.05 an 17.24 mt 3.94 ne 6.82 il 4.41 ap 1.34	Pinto Mountain, Kinney County, Texas.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 168, p. 61, 1900.	Basalt.	In W. T., p. 343.
3	III.″6.″3.4. *2.3.2.2″.*	or 10.56 di 23.30 ab 13.62 ol 17.01 an 14.46 mt 5.34 ne 8.24 il 3.80 ap 2.02	Rattlesnake Butte, Apishapa quadrangle, Colorado.	G. Steiger.	W. Cross, U.S.G.S. P.P.90, p. 27, 1914.	Basalt.	
4	III(IV).6.3.4. *2.3.2.2.*	or 6.12 di 29.55 ab 3.93 ol 18.41 an 18.35 mt 5.57 ne 10.08 il 3.50 ap 2.35	Ciruella, Colfax County, New Mexico.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 168, p. 171, 1900.	Nephelite basanite.	In W. T., p. 343.

CLASS III. SALFEMANE—Continued.

RANG 3. ALKALICALCIC. LIMBURGASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
5	44.82	13.68	2.76	7.57	10.11	12.76	2.83	0.89	2.81		1.35	0.15			99.73	3.016
A2. II	.747	.134	.017	.106	.253	.227	.045	.009			.017	.001				
6	45.03	14.82	2.77	8.81	7.79	9.83	4.33	1.51	1.71	0.24	2.30	0.58	0.37	CO_2 0.22 FeS_2 0.15 NiO 0.05 BaO none	100.51	
A1. I	.751	.145	.018	.122	.195	.175	.070	.016			.029	.004	.005			
7	44.69	14.17	3.35	10.86	6.41	10.28	3.64	2.01	2.53	1.05	0.46	0.45	0.31	CO_2 none	100.21	
A2. II	.745	.138	.021	.151	.160	.184	.059	.021			.006	.003	.002			
8	40.2	12.8	4.0	10.4	11.9	10.4	2.7	0.8	3.4		2.9				99.5	
B3. IV	.670	.125	.025	.144	.298	.186	.044	.009			.036					
9	49.10	15.75	1.00	8.80	6.35	8.56	4.47	1.91	0.75		2.92	0.22			99.83	
A2. II	.818	.154	.006	.122	.159	.153	.073	.020			.037	.002				
10	46.31	14.90	1.77	8.98	8.15	9.51	4.06	1.62	1.38		3.00	0.32			100.00	
A2. II	.772	.146	.011	.125	.204	.170	.066	.017			.038	.002				
11	44.82	14.06	4.56	7.27	8.60	9.56	3.69	2.30	0.30	0.05	4.25	0.67	none	CO_2 none	100.13	
A2. II	.747	.138	.029	.101	.215	.171	.060	.024			.053	.005	—			
12	44.80	15.51	2.35	8.52	8.83	9.91	2.99	2.29	0.16	0.09	4.01	0.68	0.08	CO_2 none NiO 0.13	100.35	
A2. II	.747	.152	.015	.118	.221	.177	.048	.024			.050	.005	.001			
13	44.29	12.62	3.61	8.84	10.06	9.23	3.25	1.82	0.21	0.09	4.92	0.57		CO_2 none ZrO_2 0.02 SO_3 0.05 BaO 0.06 SrO 0.04	99.68	
A1. I	.738	.124	.023	.123	.252	.164	.053	.020			.062	.004				
14	44.20	13.96	3.19	8.41	8.03	9.79	3.66	2.35	0.76	0.12	4.10	0.62	0.51	CO_2 none NiO 0.14	99.84	
A2. II	.737	.137	.020	.117	.201	.175	.059	.025			.051	.004	.007			
15	43.65	11.48	6.32	8.00	7.92	14.00	2.28	1.51	1.00		4.00	trace			100.16	
A3. III	.728	.114	.039	.111	.198	.250	.037	.016			.050	—				
16	37.90	13.17	8.83	8.37	9.50	10.75	2.35	2.12	1.40		5.30	trace			99.69	
A3. III	.632	.129	.055	.116	.238	.192	.038	.022			.066	—				
17	43.50	14.74	6.53	5.32	3.19	14.93	3.49	2.11	3.69		2.55	0.61			100.66	2.932
A2. II	.725	.144	.041	.074	.080	.266	.056	.022			.032	.004				
18	43.92	15.87	8.45	5.59	5.20	12.86	4.08	1.41	2.03		0.71				100.12	3.071
A3. III	.732	.155	.053	.078	.130	.230	.066	.015			.009					
19	42.55	13.22	11.13	4.28	11.41	10.20	3.73	1.25	1.44		0.73				99.94	3.07
A3. III	.709	.130	.069	.060	.285	.182	.060	.014			.009					
20	42.24	11.93	12.43	5.30	9.45	11.97	3.35	1.05	1.28		1.08				100.08	3.091
A3. III	.704	.117	.078	.074	.236	.214	.054	.012			.014					

ORDER 6. LENDOFELIC. PORTUGARE—Continued.

SUBRANG 4. DOSODIC. LIMBURGOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
5	III.″6.3(4).4″. 2.2.2.2.	or 5.00 di 31.23 ab 8.12 ol 14.36 an 23.35 mt 3.94 ne 8.38 il 2.58	Las Amolanas, Atacama, Chile.	M. Dittrich.	F. v. Wolff, Z. D. D. G., LI, p. 506, 1899.	Limburgite.	In W. T., p. 343.
6	III.6.″3.4″. 2.2.2.3.	or 8.90 di 23.21 ab 13.62 ol 13.64 an 16.40 mt 4.18 ne 12.50 il 4.41 ap 1.34	Craw, n. Lennoxtown, Glasgow, Scotland.	E. G. Radley.	G. S. G. B., Sum. Prog. (1907), p. 55, 1908.	Essexite.	
7	III.6.″3.4. 2.2.2.3.	or 11.68 di 26.69 ab 8.91 ol 14.30 an 16.12 mt 4.87 ne 11.93 il 0.91 ap 1.01	Howford Bridge, Mauchline, Ayrshire, Scotland.	A. Scott.	G. W. Tyrrell, pers. com.	Essexite-dolerite.	
8	III(IV).6.3″.4″. 2.3.2.2.	or 5.00 di 25.39 ab 2.10 ol 21.60 an 20.02 mt 5.80 ne 11.36 il 5.47	Chesters quarry, East Lothian, Scotland.	F. H. Hatch.	F. H. Hatch, T. R. Soc. Edin., XXXVII, p. 116, 1892.	Limburgite.	Not in W. T.
9	(II)III.(5)6.(2)3.4. 2.3.2.3.	or 11.12 di 19.26 ab 24.10 ol 12.34 an 16.96 mt 1.39 ne 7.67 il 5.62 ap 0.67	Font-des-Vaches, Cantal, France.	Pisani.	A. Lacroix, C. R., CXLIX, p. 546, 1909.	Essexitic gabbro.	
10	III.6.″3.4. 2.3.2.3.	or 9.45 di 22.46 ab 15.98 ol 14.17 an 17.51 mt 2.55 ne 10.08 il 5.78 ap 0.67	Font-des-Vaches, Cantal, France.	Pisani.	A. Lacroix, C. R., CXLIX, p. 546, 1909.	Essexitic gabbro.	
11	III.″6.(2)3.4. 2.2.2.2.	or 13.34 di 21.86 ab 14.15 ol 9.73 an 15.01 mt 6.73 ne 9.37 il 8.06 ap 1.68	Monte Sacopa, Olot, Spain.	H. S. Washington.	H. S. Washington, A. J. S., XXIV, p. 239, 1907.	Nephelite basanite.	
12	III.(5)6.3.″4. 2.3.2.2.	or 13.34 di 17.79 ab 11.53 ol 15.07 an 22.24 mt 3.48 ne 7.38 il 7.60 ap 1.68	Fuente San Roque, Olot, Spain.	H. S. Washington.	H. S. Washington, A. J. S., XXIV, p. 239, 1907.	Limburgite.	
13	III.(5)6.″3.4. 2.3.2.2.	or 11.12 di 22.02 ab 15.20 ol 14.10 an 14.18 mt 5.34 ne 6.82 il 9.42 ap 1.34	Las Planas, n. Olot, Spain.	H. S. Washington.	H. S. Washington, A. J. S., XXIV, p. 239, 1909.	Nephelite basanite.	
14	III.6.(2)3.4. 2.2.2.3.	or 13.90 di 24.28 ab 9.43 ol 11.11 an 14.73 mt 4.64 ne 11.64 il 7.75 ap 1.34	Cruz Cat, n. Olot, Spain.	H. S. Washington.	H. S. Washington, A. J. S., XXIV, p. 239, 1907.	Nephelite basanite.	
15	III(IV).6.3.4. 2.1.3.2.	or 8.90 di 41.33 ab 5.50 ol 2.27 an 16.96 mt 9.05 ne 7.52 il 7.60	Brandberget, Gran, Norway.	L. Schmelck.	W. C. Brögger, Q. J. G. S., L, p. 19, 1894.	Olivine gabbro diabase.	In W. T., p. 343.
16	III″.6(7).3.(3)4. 3.2.2.2.	or 7.23 di 26.57 an 19.18 ol 8.05 lc 3.92 mt 11.60 ne 10.79 il 10.03 hm 0.80	Brandberget, Gran, Norway.	V. Schmelck.	W. C. Brögger, Eg. Kg., III, p. 93, 1899.	Hornblendite.	In W. T., p. 343.
17	III.6.3.4.⊙ 2.1.3.3.	or 12.23 di 17.53 ab 10.48 wo 12.30 an 18.35 mt 9.51 ne 10.22 il 4.86 ap 1.34	Limberg, Kaiserstuhl, Baden.	K. Gruss.	K. Gruss, Mt. Bad. G. L.-A., IV, p. 134, 1901.	Augitite.	In W. T., p. 345.
18	III.6.3.4.⊙ 2.1.3.3.	or 8.34 di 32.04 ab 7.86 ol 1.16 an 20.57 mt 12.30 ne 14.48 il 1.37	Armannsberg, n. Kemnath, Bavaria.	H. Waldeck.	H. Waldeck, In. Diss. Erl., p. 47, 1905.	Nephelite basanite.	
19	III.6.″3.4. 2.2.2.2.	or 7.78 di 27.22 ab 7.86 ol 11.13 an 15.57 mt 11.83 ne 12.78 il 1.37 hm 2.88	Kleine Kulm, n. Kemnath, Bavaria.	H. Waldeck.	H. Waldeck, In. Diss. Erl., p. 37, 1905.	Nephelite basalt.	
20	III(IV).6.″3.4″. 2.2.2.2.	or 6.67 di 35.21 ab 7.86 ol 5.11 an 14.18 mt 13.92 ne 11.08 il 2.13 hm 2.88	Rauhe Kulm, n. Kemnath, Bavaria.	H. Waldeck.	H. Waldeck, In Diss. Erl., p. 35, 1905.	Nephelite basalt.	

CLASS III. SALFEMANE—Continued.

RANG 3. ALKALICALCIC. LIMBURGASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
21	41. 63	12. 40	11. 33	6. 24	10. 61	11. 87	3. 14	0. 72	0. 42		1. 18	0. 35			99. 89	3. 057
A2. II	.694	.121	.071	.087	.265	.213	.051	.008			.015	.002				
22	43. 37	11. 55	9. 27	6. 52	11. 01	12. 99	2. 57	0. 93	0. 12		1. 24				99. 57	
A3. III	.723	.113	.058	.090	.275	.232	.042	.010			.016					
23	43. 10	11. 71	4. 43	8. 28	13. 20	10. 84	2. 78	1. 27	1. 71		1. 88	0. 49		SO_3 0.09	99. 78	3. 088
A2. II	.718	.114	.027	.115	.330	.193	.045	.014			.023	.004				
24	41. 52	13. 99	8. 32	5. 28	7. 74	13. 61	3. 98	1. 63	1. 47		0. 81	2. 01			100. 36	3. 046
A2. II	.692	.137	.052	.074	.194	.243	.065	.017			.010	.014				
25	43. 22	12. 77	7. 09	4. 71	9. 12[1]	10. 82	3. 04	2. 16	3. 38	0. 58	2. 74	0. 32		CO_2 0.28 SO_3 0.33	100. 56	
A2. II	.720	.125	.044	.065	.228	.193	.049	.023			.034	.002				
26	44. 59	13. 28	5. 09	5. 34	11. 87	10. 63	2. 74	1. 70	1. 26	0. 65	1. 96				99. 11	
B3. IV	.743	.130	.032	.074	.297	.189	.044	.018			.025					
27	43. 26	11. 84	3. 97	7. 65	11. 78	11. 36	2. 85	1. 95	2. 97	0. 25	2. 43				100. 31	
A3. III	.721	.116	.025	.107	.295	.203	.046	.021			.030					
28	45. 32	13. 23	3. 71	5. 82	15. 24	9. 05	3. 34	2. 13	1. 43		1. 15	0. 25	0. 08		100. 75	
A2. II	.755	.130	.023	.081	.381	.162	.054	.022			.014	.002	.001			
29	44. 50	15. 97	5. 22	6. 99	7. 31	9. 60	3. 62	2. 85	3. 10		0. 76	0. 63		SO_3 0.52	101. 07	
B2. III	.742	.157	.033	.097	.183	.171	.058	.030			.010	.004				
30	43. 10	15. 18	5. 30	8. 58	7. 50	11. 87	3. 97	2. 51	0. 72		0. 52	1. 52			100. 77	3. 205
A2. II	.718	.149	.033	.119	.188	.213	.065	.027			.007	.011				
31	44. 66	16. 04	4. 37	8. 12	7. 70	9. 90	4. 28	1. 75	2. 15		0. 29	0. 10	0. 15		99. 51	
A2. II	.744	.157	.028	.113	.193	.177	.069	.019			.004	.001	.002			
32	42. 35	16. 24	5. 33	6. 28	8. 97	12. 46	2. 37	2. 01	2. 87		0. 41				99. 29	
B3. IV	.706	.159	.033	.088	.224	.222	.039	.021			.005					
33	47. 11	15. 95	5. 44	9. 54	4. 93	10. 26	4. 41	1. 36	0. 16		1. 26	0. 19	0. 12		100. 71	2. 92
A2. II	.785	.156	.034	.132	.123	.183	.071	.015			.016	.001	.002			
34	46. 86	16. 03	5. 34	9. 31	5. 10	9. 89	4. 52	1. 41	0. 16		1. 17	0. 22	0. 12	NiO 0.10	100. 23	2. 91
A2. II	.781	.157	.033	.129	.128	.177	.073	.015			.015	.002	.002			
35	47. 44	12. 00	6. 23	3. 65	5. 62	15. 85	3. 47	1. 60	2. 29		1. 50		0. 80		100. 45	3. 020
A2. II	.791	.118	.039	.051	.141	.283	.056	.017			.019		.011			
36	42. 71	14. 62	3. 12	9. 34	8. 91	10. 68	3. 11	1. 55	1. 55		3. 38	0. 74		S 0.09	99. 90	3. 027
A2. II	.712	.143	.019	.130	.223	.191	.050	.017			.042	.005				

ORDER 6. LENDOFELIC. PORTUGARE—Continued.

SUBRANG 4. DOSODIC. LIMBURGASE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
21	III″.6.3.4(5). *2.2.2.2.*	or 4.45 di 31.13 ab 9.43 ol 8.54 an 17.51 mt 16.47 ne 9.37 il 2.28 ap 0.67	Auzenberg, n. Kemnath, Bavaria.	H. Waldeck.	H. Waldeck, In. Diss. Erl., p. 17, 1905.	Nephelite basalt.	
22	III(IV).6.3.4. *2.2.2.2.*	or 5.56 di 37.26 ab 7.34 ol 8.59 an 16.96 mt 13.46 ne 7.95 il 2.43	Birstein, Vogelsberg, Hesse.	Hauser.	T. Tannhäuser, Bautech. Gest. Unters., I (1), p. 41, 1910.	Basalt.	
23	III(IV).6.3.4. *2.3.2.2.*	or 7.78 di 27.64 ab 6.29 ol 20.34 an 15.29 mt 6.26 ne 9.37 il 3.50 ap 1.34	Ilmenberg, Rhöngebirge.	Klüss.	H. Proescholdt, Jb. Pr. G. L.-A., XIV, p. 12, 1894.	Basalt.	In W. T., p. 345.
24	III.6(7).(2)3.4. *2.2.3.2.*	or 9.45 di 30.72 ab 4.72 ol 4.68 an 15.29 mt 12.06 ne 15.90 il 1.52 ap 4.70	Sumpf Kuppe, Roth, Rhöngebirge.	P. Schmidt.	P. Schmidt, Ref. N. J., 1905, II, p. 213.	Nephelite basalt.	
25	III.6.″3.″4. *2.2.2.2.*	or 12.79 di 30.24 ab 7.07 ol 6.16 an 14.73 mt 7.19 ne 10.08 il 5.17 ap 0.67	Offenthal, Odenwald.	L. Walter.	G. Klemm, Nb. Ver. Erdk. (4), XXVIII, p. 37, 1907.	Monchiquite.	
26	III.(5)6.3.4. *2.2.2.2.*	or 10.01 di 26.36 ab 9.43 ol 13.83 an 18.90 mt 7.42 ne 7.38 il 3.80	Hohe Warte, Giessen, Hesse.	Hess.	W. Schottler, Abh. G. L.-A. Darm., IV (3), p. 458, 1908.	Basalt.	
27	III(IV).6″.″3.″4. *2.2.2.2.*	or 11.68 di 34.00 an 13.62 ol 14.44 ne 13.06 mt 5.80 il 4.56	Hohe Warte, Giessen, Hesse.	A. Streng.	W. Schottler, Abh. G. L.-A. Darm., IV (3), p. 458, 1908.	Basalt.	
28	III.6.″3.4. *2.3.2.2.*	or 12.23 di 22.17 ab 5.50 ol 23.84 an 15.01 mt 5.34 ne 12.35 il 2.13 ap 0.67	Oberlichtenau, Lausitz.	M. Voigt.	M. Voigt, In. Diss. Leip., p. 29, 1906.	Biotite diabase.	
29	″III.6.3.″4. *2.3.2.2.*	or 16.68 di 18.32 ab 8.65 ol 11.97 an 21.13 mt 7.66 ne 9.80 il 1.52 th 0.99 ap 1.34	Wesseln, Polzen District, Bohemia.	K. H. Scheumann.	K. H. Scheumann, Abh. Sachs. Ges. W., XXXII, p. 758, 1913.	Biotite-hauyne basalt.	Fresh?
30	III.6(7).(2)3.4. *2.2.2.3.*	or 15.01 di 26.82 an 15.85 ol 11.77 ne 18.46 mt 7.66 il 1.06 ap 3.70	Workotsch, Bohemia.	R. Pfohl.	J. E. Hibsch, T. M. P. M., XXIII, p. 338, 1904.	Basalt.	
31	III.6.3.4.⊙ *2.2.2.2.*	or 10.56 di 23.70 ab 7.60 ol 13.60 an 19.18 mt 6.50 ne 15.48 il 0.61 ap 0.34	Eresztreny, Medves Mountains, Hungary.	K. Emszt.	Razlozsnik and Emszt, F. K., XLI, p. 354, 1911.	Nephelite basanite.	TiO_2 low?
32	III.6.3(4).4. *2.2.2.2.*	or 6.67 di 27.31 an 27.52 ol 11.43 lc 3.92 mt 7.66 ne 11.08 il 0.76	Monte Rizzoni, Monzoni, Tyrol.	C. Doelter.	C. Doelter, Anz. Ak. W. Wien, XL, p. 10, 1903.	Rizzonite (limburgite).	TiO_2 low?
33	III.″6.3.4″. *2.2.2.3.*	or 8.34 di 25.20 ab 18.86 ol 8.04 an 19.46 mt 7.89 ne 9.94 il 2.43 ap 0.34	Eruption of 1883. Mount Etna, Sicily.	O. Silvestri.	O. Silvestri, At. Ac. Gioen. (3), XVII, p. 378, 1883.	Basalt.	Not in W. T.
34	″III.″6.3.4″. *2.2.2.3.*	or 8.34 di 23.10 ab 19.65 ol 9.08 an 19.18 mt 7.66 ne 10.08 il 2.28	Eruption of 1886, Mount Etna, Sicily.	B. Gentilecusa?	O. Silvestri, At. Ac. Gioen. (4), VI, Mem. XX, p. 4, 1893.	Basalt.	Not in W. T.
35	III.″6.(2)3.4. *2.1.3.2.*	or 9.45 di 31.45 ab 13.62 wo 10.79 an 12.51 mt 9.05 ne 8.52 il 2.89	Magnitnaja Gora, S. Ural Mountains, Russia.	J. Morozewicz.	J. Morozewicz, Mem. C. G. Russ., XVIII, No. 1, p. 10, 1901.	Augite diorite.	Also in T. M. P. M., XXIII, p. 120, 1904.
36	III.6.3.4.⊙ *2.3.2.2.*	or 9.45 di 21.91 ab 8.38 ol 15.05 an 21.13 mt 4.41 ne 9.66 il 6.38 ap 1.68	Bocca dos Corregos, Madeira.	Eyme.	C. Gagel, Z. D. G. G., LXIV, p. 429, 1912.	Basalt.	

CLASS III. SALFEMANE—Continued.

RANG 3. ALKALICALCIC. LIMBURGASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
37	42.37	13.29	3.79	10.24	10.76	11.17	2.94	1.17	0.56		3.21	0.57		S 0.09	100.16	3.098
A2. II	.706	.130	.024	.142	.249	.200	.047	.013			.040	.004				
38	41.72	11.47	4.04	10.58	12.55	10.82	2.28	1.22	1.11		3.41	0.66		S 0.04	99.90	3.079
A2. II	.694	.112	.025	.147	.314	.193	.037	.013			.043	.005				
39	42.77	15.80	3.34	10.85	9.04	9.77	3.49	1.65	0.27	0.35	3.08		0.18		100.59	
A2. II	.713	.155	.021	.151	.226	.175	.056	.018			.039		.003			
40	41.49	16.27	3.08	8.57	8.97	11.70	3.26	1.24	0.31	0.15	3.50		0.45		99.48	
A2. II	.692	.159	.019	.119	.224	.209	.053	.013			.044		.006			
41	43.04	14.76	4.91	8.52	8.27	13.03	2.70	1.44	0.80		2.50	0.35			100.32	
A2. II	.717	.145	.031	.118	.207	.232	.044	.015			.031	.002				
42	44.96	18.06	4.04	7.82	5.58	8.99	4.56	2.54	0.60	0.13	1.94	0.62	0.26		100.10	
A2. II	.749	.177	.025	.108	.140	.161	.074	.027			.024	.004	.004			
43	43.72	17.32	7.21	6.03	6.01	12.00	3.40	1.57	1.80		0.81	0.32			100.19	
A2. II	.729	.170	.045	.083	.150	.214	.055	.017			.010	.002				
44	46.79	16.47	3.13	6.05	6.60	12.50	3.78	1.14	0.89	0.30	2.12	0.27			100.04	
A2. II	.780	.161	.019	.084	.165	.223	.061	.012			.027	.002				
45	43.16	18.61	2.93	6.73	5.34	11.46	3.98	2.20	1.44	0.05	2.71	1.21			99.82	
A2. II	.719	.182	.018	.093	.134	.205	.065	.023			.034	.008				
46	44.80	17.30	4.90	6.85	5.72	11.70	4.03	2.08	0.35		2.60	0.50			100.83	
A2. II	.747	.170	.031	.095	.143	.209	.065	.022			.033	.004				
47	43.40	15.29	6.65	7.11	4.95	11.23	3.74	2.78	0.09		3.90	1.14			100.28	
A2. II	.723	.150	.042	.099	.124	.200	.060	.023			.049	.008			(99.78)	
48	41.12	11.65	7.29	7.16	7.78	12.07	2.56	2.14	0.70	0.38	6.38	0.92			100.15	
A2. II	.685	.114	.046	.100	.195	.216	.041	.022			.080	.006			(100.18)	
49	42.49	14.23	3.51	8.20	7.69	12.42	2.63	1.21	3.40	0.40	3.31	0.44			99.93	
A2. II	.708	.140	.022	.114	.192	.221	.042	.013			.041	.003				
50	40.10	15.50	6.35	7.29	8.41	12.40	3.37	1.67	0.87		2.98	1.28			100.22	
A2. II	.668	.152	.040	.101	.210	.221	.055	.018			.037	.009				
51	44.66	13.37	2.10	8.01	13.84	8.88	3.15	2.16	1.75	0.23	1.60	0.57		CO_2 0.09	100.41	2.939
A2. II	.744	.131	.013	.111	.346	.159	.051	.023			.020	.004				

ORDER 6. LENDOFELIC. PORTUGARE—Continued.

SUBRANG 4. DOSODIC. LIMBURGOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
37	III.6.3.4.⊙ *2.3.2.2.*	or 7.23 di 26.17 ab 7.34 ol 16.30 an 19.46 mt 5.57 ne 9.37 il 6.08 ap 1.34	Canical, Madeira.	Klüss.	C. Gagel, Z. D. G. G., LXIV, p. 429, 1912.	Limburgite.	
38	III(IV).″6.3.4. *2.3.2.2.*	or 7.23 di 25.36 ab 6.55 ol 21.32 an 17.24 mt 5.80 ne 6.96 il 6.54 ap 1.68	Pico Serrado, Madeira.	Eyme.	C. Gagel, Z. D. G. G., LXIV, p. 429, 1912.	Trachy- dolerite.	
39	III.6.3.4.⊙ *2.3.2.3.*	or 10.01 di 21.20 ab 3.93 ol 17.93 an 22.52 mt 4.87 ne 13.27 il 5.93	Cumbre lava, Esperanza, Teneriffe, Canary Islands.	N. Sahlbom.	H. Preiswerk, N. J. Cb., 1909, p. 396.	Basalt.	Also in Vh. Nf. Ges. Basel, XXI, p. 221, 1910.
40	III.6.3″.4. *2.2.2.2.*	or 7.23 di 25.86 ab 0.52 ol 13.14 an 25.85 mt 4.41 ne 14.77 il 6.69	Anaga Mountains, above Mercedes, Teneriffe, Canary Islands.	N. Sahlbom.	H. Preiswerk, N. J. Cb., 1909, p. 396.	Basalt.	Also in Vh. Nf. Ges. Basel, XXI, p. 221, 1910.
41	III.6.3″.4. *2.2.2.2.*	or 8.34 di 30.98 ab 3.67 ol 9.51 an 23.91 mt 7.19 ne 10.51 il 4.71 ap 0.67	Topsail Point, Tamara Island, Los Islands, French Guinea.	Lassieur.	A. Lacroix, N. Arch. Mus., III, p. 83, 1911.	Monchiquite.	
42	(II)III.6.″3.4. *2.3.2.3.*	or 15.01 di 16.25 ab 9.96 ol 10.48 an 21.13 mt 5.80 ne 15.62 il 3.65 ap 1.34	Mont Caffé, Sao Thomé Island, Guinea Coast.	A. Lindner.	W. Boese, N. J. B. B., XXXIV, p. 264, 1912.	Trachy- dolerite.	3 places.
43	″III.6.3″.4. *2.2.2.2.*	or 9.45 di 24.08 ab 8.91 ol 5.18 an 27.24 mt 10.44 ne 10.79 il 1.52 ap 0.67	Ladder Hill, St. Helena Island.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (7), p. 645, 1912.	Trachy- dolerite.	
44	III.″6.3.4″. *2.2.2.2.*	or 6.67 di 28.42 ab 15.20 ol 5.70 an 24.46 mt 4.41 ne 9.09 il 4.10 ap 0.67	Nosy Komba, Madagascar.	Not stated.	A. Lacroix, pers. com.	Gabbro dissolved in nephelite syenite.	Cf. No. 18, I.6.2.4 and No. 123, II.5.4.4.
45	(II)III.6.3.4. *2.2.2.3.*	or 12.79 di 18.78 ab 6.81 ol 7.04 an 26.13 mt 4.18 ne 14.48 il 5.17 ap 2.69	Nosy Komba, Madagascar.	Not stated.	A. Lacroix, pers. com.	Gabbro dissolved in nephelite syenite.	Cf. No. 18, I.6.2.4 and No. 123, II.5.4.4.
46	″III.6.3.4. *2.2.2.3.*	or 12.23 di 25.11 ab 8.38 ol 4.56 an 23.07 mt 7.19 ne 13.92 il 5.02 ap 1.34	Berondra, Bezavona Mountains, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., II, p. 194, 1903.	Essexite.	Inclosed in No. 18, II.6.3.4.
47	III.″6.3.4. *3.1.2.3.*	or 12.79 di 23.09 ab 13.88 ol 1.88 an 18.63 mt 9.74 ne 9.51 il 7.45 ap 2.69	Antsahondra, Itasy, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVI, p. 179, 1913.	Labradorite (basalt).	
48	III″.6.3.″4. *3.1.2.2.*	or 12.23 di 31.32 ab 7.07 ol 3.50 an 14.18 mt 4.64 ne 7.81 il 12.16 ap 2.02	Andranonatoa, Itasy, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVI, p. 179, 1913.	Limburgite.	
49	III.″6.3(4).4. *2.2.2.2.*	or 7.23 di 28.05 ab 8.38 ol 8.99 an 23.63 mt 5.10 ne 7.38 il 6.23 ap 1.01	Sambirano, Madagascar.	Boiteau.	A. Lacroix, pers. com.	Basalt.	
50	III.6″.3.4. *2.2.2.2.*	or 10.01 di 24.57 ab 1.05 ol 8.92 an 21.96 mt 9.28 ne 15.05 il 5.62 ap 2.96	Ambaliha, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., I, p. 138, 1902.	Ijolite.	
51	III.6.″3.4. *2.3.2.2.*	or 12.79 di 19.73 ab 5.76 ol 25.43 an 15.81 mt 3.02 ne 11.36 il 3.04 ap 1.34	Bald Hills, Hill End, New South Wales.	H. P. White.	A. R. Dep. Min., N. S. W. (1911), p. 198, 1912.	Olivine basalt.	

CLASS III. SALFEMANE—Continued.

RANG 3. ALKALICALCIC. LIMBURGASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
52	44.54	16.44	2.00	9.75	10.82	9.16	3.04	1.23	1.53	0.25	0.80	0.44	0.05	CO_2 0.11 SO_3 0.07 Cl none Cr_2O_3 0.02 V_2O_3 0.06 NiO 0.04 BaO 0.02 SrO trace Li_2O trace CuO trace	100.37	3.000
A1. I	.742	.161	.013	.136	.271	.164	.049	.013			.010	.003	—			
53	43.54	15.61	3.20	8.64	9.16	8.88	3.44	2.10	2.56	0.32	1.81	0.40	0.26	CO_2 0.21 ZrO_2 none SO_3 0.10 Cl trace S none Cr_2O_3 trace V_2O_3 0.01 NiO 0.04 BaO 0.24 SrO trace CuO 0.01	100.53	2.953
A1. I	.726	.153	.020	.120	.229	.158	.055	.022			.023	.003	.004			
54	43.48	16.53	3.42	8.91	7.12	8.88	3.27	2.31	2.69	0.31	2.35	0.44	0.15	CO_2 0.40 SO_3 0.21 Cl 0.03 Cr_2O_3 trace V_2O_3 0.01 NiO trace BaO 0.02 SrO trace CuO trace	100.28	2.943
A1. I	.725	.162	.021	.124	.178	.159	.053	.024			.029	.003	.002			
55	43.39	16.67	3.47	8.80	7.30	8.79	3.30	2.17	2.67	0.29	2.20	0.41	0.19	CO_2 0.39 SO_3 0.19 Cl 0.02 Cr_2O_3 trace V_2O_3 0.01 NiO trace BaO 0.02 SrO trace	100.28	2.943
A1. I	.723	.163	.022	.122	.183	.157	.053	.023			.028	.003	.003			
56	42.52	16.82	2.90	7.56	6.43	9.78	4.02	1.31	5.51	0.47	1.30	1.46	0.15	CO_2 0.07 ZrO_2 none SO_3 none Cl trace Cr_2O_3 none V_2O_3 0.03 NiO none BaO 0.04 SrO trace	100.37	2.812
A1. I	.709	.165	.018	.105	.161	.175	.065	.014			.016	.010	.002			
57	42.10	15.68	3.40	7.11	8.26	9.91	4.20	1.47	4.69	0.66	1.45	1.12	0.14	CO_2 0.08 ZrO_2 none SO_3 0.03 Cl trace S none Cr_2O_3 0.01 V_2O_3 0.03 NiO trace BaO 0.07 SrO trace Cu 0.01	100.42	2.799
A1. I	.702	.154	.021	.099	.207	.008	.068	.016			.018	.008	.002			
58	46.93	14.37	1.37	9.52	9.74	10.04	3.49	1.53	0.52	0.10	2.04	0.46		CO_2 none	100.13	
A2. II	.783	.141	.009	.132	.244	.179	.056	.016			.026	.003				
59	44.25	16.27	1.50	10.30	6.51	10.14	3.24	1.98	2.40		3.65	0.63			100.87	
A2. II	.738	.160	.009	.143	.163	.181	.052	.021			.046	.004				
60	43.76	11.58	4.39	7.57	12.97	9.64	3.03	1.84	0.47		3.41	0.45		SO_3 0.14 S 0.15	99.78	3.032
A2. II	.729	.114	.028	.106	.324	.172	.048	.020			.043	.003				
61	43.01	12.23	3.57	12.07	13.62	10.17	2.26	0.95	0.16		1.51	0.40			99.95	
A2. II	.717	.120	.023	.168	.341	.182	.036	.010			.019	.003				
62	43.92	17.42	4.09	8.83	4.89	9.53	4.60	2.17	0.11	0.06	4.19	0.67	0.09		100.57	
A2. II	.732	.171	.026	.122	.122	.170	.074	.023			.052	.005	.001			
63	42.14	14.95	2.90	9.71	9.47	10.32	3.27	1.80	0.16	0.12	4.90	0.40	0.12		100.26	
A2. II	.702	.147	.018	.135	.237	.184	.053	.019			.061	.003	.002			

ORDER 6. LENDOFELIC. PORTUGARE—Continued.

SUBRANG 4. DOSODIC. LIMBURGOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
52	III.″6.3(4).4. *1.2.2.2.*	or 7.23 di 14.65 ab 10.22 ol 25.34 an 27.52 mt 3.02 ne 8.38 il 1.52 ap 1.01	Rookwood, Sydney, New South Wales.	J. C. H. Mingaye.	Mingaye and White, Rec. G. S. N. S. W., VII (3), p. 230, 1903.	Olivine basalt.	
53	III.6.3.4.⊙ *2.3.2.2.*	or 12.23 di 16.16 ab 8.91 ol 18.54 an 21.13 mt 4.64 ne 10.79 il 3.50 ap 1.01	Luddenham, Sydney, New South Wales.	H. P. White.	Mingaye and White, Rec. G. S. N. S. W., VII (3), p. 230, 1903.	Analcite basalt.	
54	″III.″6.3.″4. *2.3.2.3.*	or 13.34 di 14.59 ab 11.00 ol 14.76 an 23.63 mt 4.87 ne 9.09 il 4.41 ap 1.01	Bondi, Sydney, New South Wales.	J. C. H. Mingaye.	G. W. Card, Rec. G. S. N. S. W., VII (2), p. 97, 1902.	Analcite basalt	Fresh?
55	″III.(5)6.3.4. *2.3.2.3.*	or 12.79 di 13.50 ab 11.27 ol 15.72 an 24.19 mt 5.10 ne 8.94 il 4.26 ap 1.01	Bondi, Sydney, New South Wales.	J. C. H. Mingaye.	G. W. Card, Rec. G. S. N. S. W., VII (2), p. 97, 1902.	Analcite basalt.	Fresh?.
56	(II)III.(5)6.3.4″. *2.3.2.3.*	or 7.78 di 12.64 ab 18.60 ol 14.25 an 23.91 mt 4.18 ne 8.38 il 2.43 ap 3.36	Rixons Pass, South Bulli, New South Wales.	H. P. White.	G. W. Card, pers. com.	Monchiquite.	
57	III.6.3.4.⊙ *2.3.2.2.*	or 8.90 di 17.86 ab 9.96 ol 14.64 an 19.46 mt 4.87 ne 13.92 il 2.74 ap 2.69	South Bulli, New South Wales.	W. G. Stone.	N. S. W. Dep. Min., A. R. (1912), p. 198, 1913.	Monchiquite.	
58	III.(5)6.3.4. *2.3.2.2.*	or 8.90 di 22.50 ab 15.20 ol 19.08 an 19.18 mt 2.09 ne 7.67 il 3.95 ap 1.01	Blue Lake, Mount Gambier, South Australia.	E. R. Stanley.	E. R. Stanley, Tr. R. Soc. S. Aust., XXXIII, p. 87, 1909.	Olivine basalt.	
59	″III.(5)6.3.4. *2.3.2.3.*	or 11.68 di 18.40 ab 11.53 ol 13.82 an 24.19 mt 2.09 ne 8.52 il 6.99 ap 1.34	Papenoo Valley, Tahiti, Society Islands.	Pisani.	A. Lacroix, B. Soc. G. Fr., X, p. 117, 1910.	Basalt.	
60	III.6.(2)3.4. *2.3.2.2.*	or 11.12 di 25.41 ab 8.91 ol 17.78 an 12.79 mt 6.50 ne 18.80 il 6.54 ap 1.01	Matavuna Volcano, Savaii, Samoa.	Heuseler.	A. Klautzsch, Jb. Pr. G. L.-A., XXVII (1907), p. 174, 1910.	Basalt.	
61	III(IV).″6.3(4).4. *2.3.2.2.*	or 5.56 di 22.00 ab 7.34 ol 29.03 an 20.57 mt 5.34 ne 6.25 il 2.89 ap 1.01	North Crater, Heard Island.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (3), p. 258, 1908.	Basalt.	
62	(II)III.6.″3.4. *3.2.2.3.*	or 12.79 di 17.73 ab 11.26 ol 6.93 an 20.57 mt 6.03 ne 14.91 il 7.90 ap 1.68	Sulphur Cones, Ross Island, S. Victoria Land, Antarctica.	G. T. Prior.	G. T. Prior, Nat. Ant. Exp., I, p. 103, 1907.	Hornblende basalt.	
63	III.6.3.4.⊙ *2.3.2.2.*	or 10.56 di 21.99 ab 4.72 ol 14.97 an 20.85 mt 4.18 ne 12.50 il 9.27 ap 1.01	Winter Quarters, Ross Island, S. Victoria Land, Antarctica.	G. T. Prior.	G. T. Prior, Nat. Ant. Exp., I, p. 105, 1907.	Olivine basalt.	

CLASS III. SALFEMANE—Continued.

SUBRANG 3. ALKALICALCIC. LIMBURGASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
64	42.10	14.87	3.26	9.76	8.88	10.63	3.20	1.80	0.12	0.11	4.93	0.58	0.07		100.31	
A2. II	.702	.146	.020	.136	.222	.189	.052	.019			.062	.004	.001			
65	43.3	15.4	1.7	10.3	9.6	9.3	3.7	1.4	3.9		1.9				100.5	
B3. IV	.722	.151	.011	.143	.240	.166	.060	.015			.024					

RANG 3. ALKALICALCIC. LIMBURGASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	45.17	17.18	1.92	7.88	9.95	8.93	4.23	0.27	2.18	0.27	1.63	none	0.15	CO_2 0.21 ZrO_2 none S 0.11 BaO none	100.08	
A2. II	.753	.168	.012	.110	.249	.159	.068	.003			.020	—	.002			
2	44.16	15.94	2.61	9.75	4.62	8.96	5.13	0.72	2.88		3.14	1.50		SO_3 0.24	99.65	
A2. II	.736	.156	.016	.136	.116	.160	.082	.008			.039	.011				
3	45.99	13.42	4.63	6.48	12.29	9.01	4.32	0.61	1.05		1.71	0.40	0.55		100.46	
A2. II	.767	.132	.029	.090	.307	.161	.069	.007			.023	.003	.008			
4	43.52	15.39	4.82	10.83	5.94	9.83	4.04	0.52	1.43		3.92	0.10	0.14		100.48	
A2. II	.725	.151	.030	.150	.149	.175	.065	.006			.049	.001	.002			
5	46.84	13.14	5.75	0.73	10.96	14.38	3.56	0.45	3.38	0.23	0.47				99.89	3.02
A3. III	.781	.129	.036	.010	.269	.257	.057	.005			.006					
6	43.60	13.60	3.95	6.95	10.20	12.10	3.74	0.69	2.75		2.44	0.43			100.45	
A2. II	.727	.133	.025	.097	.255	.216	.060	.007			.031	.003				

RANG 4. DOCALCIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	38.02	14.64	5.69	10.33	10.26	9.11	1.90	1.66	2.35	0.74	4.84	0.09	0.12	CO_2 none	99.75	
A2. II	.634	.144	.036	.143	.257	.163	.031	.018			.060	.001	.002			
2	44.16	14.89	1.19	6.83	14.40	13.01	1.92	0.97	0.89	0.05	0.89		trace		99.30	
B3. IV	.736	.146	.008	.094	.360	.232	.031	.010			.011		—			
3	45.47	19.32	0.50	4.22	10.09	16.70	2.32	0.64	n. d.		0.18	0.35		S 0.21	100.00	
A2. II	.758	.189	.003	.058	.252	.298	.037	.007			.002	.002				
4	43.92	17.62	4.05	3.94	8.16	13.07	2.84	1.33	2.82		1.78	0.15		SO_3 0.47 Cl 0.22	100.37	
A2. II	.732	.173	.025	.055	.204	.234	.046	.014			.022	.001				
5	39.81	18.20	6.87	4.15	8.35	13.83	3.43	0.77	1.76		0.75	1.44	0.22	CO_2 trace SO_3 0.24 Cl 0.18	100.00	
A2. II	.664	.178	.043	.058	.209	.246	.055	.008			.009	.010	.003			
6	36.38	16.08	12.86	6.93	5.01	15.53	2.44	1.15	0.82		2.08	1.12			100.40	
A2. II	.606	.158	.080	.096	.125	.277	.040	.013			.026	.008				

ORDER 6. LENDOFELIC. PORTUGARE—Continued.

SUBRANG 4. DOSODIC. LIMBURGASE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
64	III.6.3.4.⊙ *2.2.2.3.*	or 10.56 di 22.46 ab 5.76 ol 13.44 an 20.85 mt 4.64 ne 11.64 il 9.42 ap 1.34	Winter Quarters, Ross Island, S. Victoria Land, Antarctica.	G. T. Prior.	G. T. Prior, Nat. Ant. Exp., I, p. 105, 1907.	Limburgite.	
65	III.6.3.4.⊙ *2.3.2.2.*	or 8.34 di 20.52 ab 6.81 ol 20.43 an 21.13 mt 2.55 ne 13.35 il 3.65	Doumer Island, Graham Land, Antarctica.	Pisani.	E. Gourdon, Exp. Ant. Charc., Pet. vol., p. 192, 1908.	Hornblende basalt.	

SUBRANG 5. PERSODIC. BEKINKINOSE. (H. S. WASHINGTON, 1917.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″III.(5)6.3.5. *2.3.2.2.*	or 1.67 di 13.87 ab 19.39 ol 20.77 an 26.97 mt 2.78 ne 8.80 il 3.04	Preston, Connecticut.	W. A. Drushel.	G. F. Loughlin, U. S. G. S. B. 492. p. 114, 1912.	Gabbro.	
2	(II)III.(5)6.″3.″5. *2.3.2.3.*	or 4.45 di 13.05 ab 27.25 ol 11.66 an 18.35 mt 3.71 ne 8.52 il 5.93 ap 3.70	Neuwerk, Harz.	Not stated.	O. H. Erdmannsdorfer, N. J. Cb., 1909, p. 40.	Diabase.	Dark facies. Cf. No. 10, II.6.3.4.
3	III.″6.″3.(4)5. *2.3.2.2.*	or 3.89 di 20.90 ab 20.44 ol 19.15 an 15.57 mt 6.73 ne 8.52 il 3.50 ap 1.01	Nieder Putzkau, Lausitz.	M. Voigt.	M. Voigt, In. Diss. Leip., p. 25, 1906.	Olivine diabase.	
4	III.(5)6.3.″5. *3.2.2.3.*	or 3.34 di 20.83 ab 19.65 ol 10.48 an 22.24 mt 6.96 ne 7.81 il 7.45 ap 0.34	Taubenberg, Lausitz.	M. Voigt.	M. Voigt, In Diss. Leip., p. 39, 1906.	Camptonite.	
5	III.6.3.″5. *2.1.2.1.*	or 2.78 di 41.04 ab 11.00 ol 5.53 an 18.63 mt 0.93 ne 10.22 il 0.91 hm 5.12	Bürkelkopf, Lower Engadine, Switzerland.	L. Hezner.	U. Grubenmann, Btr. G. K. Schw., XXIII, p. 226, 1909.	Diallage gabbro.	
6	III.6.3.″5. *2.2.2.2.*	or 3.89 di 30.88 ab 9.96 ol 11.59 an 18.35 mt 5.80 ne 11.64 il 4.71 ap 1.01	Bekinkina, Ambavatovy, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., II, p. 229, 1903.	Ijolite.	Bekinkinite of Rosenbusch.

SUBRANG 4-5. PRESODIC. PAPENOOSE. (LACROIX, 1910.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.(5)6.″4.(3)4. *2.3.2.2.*	or 10.01 di 14.36 ab 3.14 ol 18.12 an 26.41 mt 8.35 ne 7.10 il 9.12 ap 0.34	Prospect Hill, Litchfield, Connecticut.	G. Steiger.	W. H. Hobbs, Rosenb. Fests., p. 41, 1906.	Hornblendite.	
2	III.6.4.4.⊙ *1.3.2.2.*	or 5.56 di 28.13 ab 0.52 ol 23.46 an 29.19 mt 1.86 ne 8.52 il 1.67	Little Falls, Minnesota.	L. Nye.	F. F. Grout, J. G., XVIII, p. 656, 1910.	Gabbro.	
3	III.6.4.4″. *1.2.2.2.*	or 2.22 di 32.33 an 40.31 ol 12.03 lc 1.31 mt 0.70 ne 10.51 il 0.30 ap 0.67	Skeie, n. Bergen, Norway.	Lillejord.	C. F. Kolderup, Berg. Mus. Aarb., 1903, No. 12, p. 99.	Olivine gabbro.	
4	″III.(5)6.″4.4. *2.2.2.2.*	or 7.78 di 24.32 ab 7.34 ol 7.02 an 33.92 mt 5.80 ne 6.53 il 3.34 hl 0.35 th 0.85	Rhöndorferthal, Siebengebirge, Rheinland.	K. Busz.	K. Busz, N. J., 1904, II, p. 91.	Heptorite (hauyne monchiquite).	
5	III.6.(3)4.4(5). *2.2.2.2.*	or 4.45 di 21.30 ab 1.31 ol 8.56 an 31.97 mt 9.98 ne 14.91 il 1.37 ap 3.36	Rossberg, n. Darmstadt, Hesse	Sonne.	C. Chelius, Nb. Ver. Erdk. (IV), XVII, p. 6, 1896.	Basalt.	**Not in W. T.**
6	III.6(7).″4.4 *3.1.3.3.*	an 29.19 di 27.00 lc 5.67 wo 0.93 ne 11.36 cs 1.03 mt 16.24 il 3.85 hm 1.60 ap 2.69	Wertberg, n. Homberg, Hesse.	C. Trenzen.	C. Trenzen, N. J., 1902, II, p. 29.	Nephelite basalt.	

CLASS III. SALFEMANE—Continued.

RANG 4. DOCALCIC—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
7	41.36	15.64	0.38	8.40	12.52	13.68	2.18	1.30	1.28		2.73	0.21	0.31	CO_2 0.16 SO_3 none Cl 0.01 F none	100.16	3.099
A2. II	.689	.153	.002	.117	.313	.245	.035	.014			.034	.002	.004			
8	37.80	12.90	7.09	14.02	7.12	15.02	1.85	0.95	2.46		1.27				100.48	
A3. III	.630	.126	.044	.194	.178	.268	.030	.010			.016					
9	33.00	14.56	9.20	12.39	9.86	15.70	1.39	0.96	1.52		1.25				99.83	
A3. III	.550	.143	.058	.172	.247	.280	.023	.010			.016					
10	43.35	15.52	2.15	8.75	8.78	12.30	2.82	1.04	3.25		2.81	0.32			101.10	
A2. II	.723	.152	.014	.122	.220	.220	.045	.011				.002			(100.80)	
11	38.62	13.90	5.97	8.65	11.21	15.54	2.01	0.57	1.46		1.86	0.60	0.30		100.69	
A2. II	.644	.136	.037	.121	.280	.277	.032	.007			.023	.004	.004			
12	44.98	14.77	3.70	7.69	5.35	15.40	2.51	1.02	1.13		2.19	0.51	0.39	ZrO_2 0.05 SrO trace	99.69	
A2. II	.750	.145	.023	.107	.134	.275	.040	.011			.027	.004	.006			

CLASS III. SALFEMANE.

RANG 1. PERALKALIC. MALIGNASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	47.85	13.24	2.74	2.65	5.68	14.36	3.72	5.25	2.74			2.42			100.65	2.879
A3. III	.798	.130	.017	.037	.142	.256	.060	.056				.017				

RANG 1. PERALKALIC. MALIGNASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	51.38	15.88	1.48	4.37	4.43	8.62	7.57	4.20	0.42		0.12	0.98			99.45	
A2. II	.856	.156	.009	.061	.111	.154	.123	.045			.002	.007				
2	44.65	13.87	6.06	2.94	5.15	9.57	5.67	4.49	2.10	0.96	0.95	1.50	0.17	CO_2 0.11 SO_3 0.61 Cl trace BaO 0.76 SrO 0.37	99.92	
A1. I	.744	.136	.038	.041	.129	.171	.092	.048			.012	.011	.002			
3	42.02	12.05	7.93	5.06	2.18	17.01	4.85	3.15	0.67		2.36	1.66	0.96	S 0.54	100.54	
A2. II	.700	.118	.050	.071	.055	.304	.080	.034			.030	.012	.014			
4	42.12	12.24	5.71	7.83	0.15	8.43	11.97	2.59	0.76	0.80	2.56	4.95			100.11	
A2. II	.702	.120	.036	.108	.004	.150	.194	.028			.032	.035				
5	40.92	11.85	5.72	8.89	0.25	8.12	12.23	2.18	0.95	0.98	2.18	5.43			99.70	
A2. II	.682	.116	.036	.124	.006	.145	.197	.023			.027	.038				

ORDER 6. LENDOFELIC. PORTUGARE—Continued.

SUBRANG 4-5. PRESODIC. PAPENOOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
7	III.6(7).″4.4. *1.3.2.2.*	an 28.91 di 19.83 lc 6.10 ol 23.81 ne 9.94 cs 3.96 mt 0.46 il 5.17 ap 0.67	Grünwald, Bohemia.	F. Hanusch.	J. E. Hibsch, T. M. P. M., XXIX, p. 410, 1910.	Basalt.	
8	III(IV).6″.″4.4. *2.3.2.3.*	an 23.91 di 25.52 lc 4.36 ol 16.75 ne 8.52 cs 6.19 mt 10.21 il 2.43	Tswetli Bor, Iss River, Ural Mountains.	Not stated.	Duparc and Pamfil, B. Soc. Min. Fr., XXXIII, p. 366, 1910.	Issite (hornblendite).	Also in C. R., CLI, p. 1137, 1910.
9	III″.6.4.4. *2.5.2.3.*	an 30.58 ol 27.29 lc 3.49 cs 14.62 ne 6.53 mt 13.46 kp 0.33 il 2.43	Tswetli Bor, Iss River, Ural Mountains.	Not stated.	Duparc and Pamfil, C. R., CLI, p. 1137, 1910.	Issite (hornblendite).	
10	III.″6.(3)4.4. *2.2.2.2.*	or 6.12 di 26.20 ab 6.81 ol 13.13 an 26.69 mt 3.25 ne 9.09 il 5.32 ap 0.67	Diokhone, Cap Verde, Senegal.	Pisani.	J. Chantard, B. Soc. G. Fr. (4), VII, p. 437, 1907.	Limburgitic basalt.	
11	III(IV).6.4.4″. *2.3.2.2.*	an 26.97 di 22.64 lc 3.05 ol 18.48 ne 9.09 cs 5.50 mt 8.58 il 3.50 ap 1.34	Dakar Peak, Cap Verde, Senegal.	C. v. John.	C. v. John, Jb. G. R.-A. Wien, XLVI, p. 288, 1896.	Limburgite.	In W. T., p. 347.
12	III.(5)6.(3)4.4. *2.1.3.3.*	or 6.12 di 38.02 ab 8.38 ol 2.32 an 26.13 mt 5.34 ne 6.82 il 4.10 ap 1.34	Adolf Friedrich Cone, Lake Kivu District, German East Africa.	O. Hauser.	L. Finckh, D. Zent. Afr. Exp., I (1), p. 22, 1912.	Limburgite.	

ORDER 7. LENFELIC. KAMERUNARE. (C. I. P. W., 1902.)

SUBRANG 3. SODIPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.7.1(2).3. *2.1.3.2.*	or 21.96 di 35.63 an 3.89 wo 2.67 lc 7.20 mt 3.94 ne 17.04 ap 5.71	Pooh-bah Lake, Rainy River District, Ontario.	F. L. Ransome.	A. C. Lawson, B. Dep. G. Un. Cal., I, p. 350, 1896.	Nephelite-pyroxene malignite.	In W. T., p. 347.

SUBRANG 4. DOSODIC. MALIGNOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(II)III.7.1.4. *1.1.3.2.*	or 25.02 ac 4.16 ab 5.76 ns 0.37 ne 28.40 di 29.74 ol 3.18 il 0.30 ap 2.35	Pooh-bah Lake, Rainy River District, Ontario.	J. W. Sharwood.	A. C. Lawson, B. Dep. G. Un. Cal., I, p. 359, 1896.	Amphibole malignite.	In W. T., p. 347.
2	III.7.1.(3)4. *2.1.3.2.*	or 26.69 di 27.86 ab 1.57 wo 1.16 ne 23.00 mt 7.19 th 1.14 il 1.82 hm 1.12 ap 3.70	Gordons Butte, Crazy Mountains, Montana.	W. F. Hillebrand.	J. E. Wolff, U. S. G. S. B. 150, p. 201, 1898.	Theralite.	In W. T., p. 347.
3	III″.7.1.4. *2.1.4.0.*	or 18.90 di 13.17 ab 1.05 wo 23.20 an 1.11 mt 11.60 ne 22.15 il 4.56 ap 4.03	As, Alnö, Sweden.	N. Sahlbom.	N. Sahlbom, N. J., 1897, II, p. 99.	Ijolite porphyry.	In W. T., p. 347.
4	III.7.1.4.⊙ *2.1.3.5.3.*	or 15.57 ac 16.63 ab 6.55 ns 8.05 ne 22.58 di 8.12 ol 4.73 il 4.86 ap 11.76	Ankidona, Itasy, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVI, p. 179, 1913.	Limburgitic basalt.	
5	III.7.1.4.⊙ *2.2.3.5.3.*	or 12.79 ac 16.63 ab 8.91 ns 8.30 ne 21.58 di 4.43 ol 8.51 il 4.10 ap 12.77	Mazy, Itasy, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVI, p. 179, 1913.	Limburgitic basalt.	

CLASS III. SALFEMANE—Continued.

RANG 1. PERALKALIC. MALIGNASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	47.18	15.21	4.07	7.26	6.64	8.86	7.61	1.41	0.72		1.09	0.08	0.02		100.15	2.868
B2. III	.786	.149	.026	.101	.166	.158	.123	.015			.014	—	—			

RANG 2. DOMALKALIC. KAMERUNASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	47.30	16.81	2.19	6.91	5.16	10.43	2.33	6.86	0.20	0.16	1.13	0.70	0.09	ZrO_2 none SO_3 0.18 Cl 0.06 BaO 0.23	100.74	
A1. I	.788	.165	.014	.096	.129	.186	.037	.073			.014	.005	.001			
2	47.39	14.79	3.10	5.08	6.77	11.61	1.49	6.93	0.77	0.28	1.41	0.45		CO_2 none ZrO 0.04 SO_3 none S none Ce_2O_3 0.05 BaO 0.15 SrO 0.04	100.35	
A1. I	.790	.145	.019	.071	.169	.207	.024	.073			.018	.003				

RANG 2. DOMALKALIC. KAMERUNASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	46.04	12.23	3.86	4.60	10.38	8.97	2.42	5.77	2.87		0.64	1.14	trace	SO_3 trace Cl 0.11 BaO 0.48 SrO 0.25	99.76	
A2. II	.767	.120	.024	.064	.260	.160	.039	.062			.008	.008	—			
2	43.72	13.85	5.26	7.61	5.64	9.76	4.11	4.77	0.81		3.66	0.76		SO_3 0.18	100.13	2.920
A2. II	.729	.136	.033	.106	.141	.174	.066	.051			.046	.005				
3	45.03	16.59	4.55	6.37	3.95	11.09	3.53	5.29	0.34	0.15	1.10	0.96	0.64	ZrO_2 none Cl 0.26 F 0.11 S 0.05 BaO 0.16 SrO 0.16	100.33	
A1. I	.751	.163	.029	.089	.099	.198	.056	.056			.014	.007	.009			

RANG 2. DOMALKALIC. KAMERUNASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	47.10	16.42	4.63	7.04	5.00	7.64	6.36	3.47	0.40		1.75	0.48	0.36		100.65	
A2. II	.785	.161	.029	.098	.125	.136	.103	.037			.022	.003	.005			
2	45.77	16.16	3.72	6.21	7.03	9.01	6.23	2.28	1.87		1.70	0.29	trace		100.27	
A2. II	.763	.158	.023	.086	.176	.161	.105	.024			.021	.002	—			
3	42.77	14.16	5.05	6.26	2.69	14.34	4.67	2.51	3.60		3.05	0.30			99.40	2.904
B2. III	.713	.139	.032	.087	.067	.255	.075	.027			.038	.002				
4	38.57	14.99	8.31	7.30	5.82	8.35	6.39	3.03	1.56		2.90	1.92	0.32	SO_3 0.37 Cl 0.38 BaO none SrO 0.15	100.36	2.95
A1. I	.643	.147	.052	.101	.148	.149	.103	.032			.036	.013	.005			
5	39.88	15.37	8.67	2.91	7.16	13.83	4.73	2.01	2.17		1.04	2.29	trace		100.06	2.918
A2. II	.665	.151	.054	.040	.179	.246	.076	.021			.013	.016	—			
6	44.42	13.33	9.14	6.35	5.74	10.60	5.60	1.81	1.75		1.63	0.35		S 0.18	100.35	3.008
A2. II	.740	.131	.057	.089	.144	.189	.090	.019			.020	.003				

ORDER 7. LENFELIC. KAMERUNARE—Continued.

SUBRANG 5. PERSODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.7.1″.(4)5. *2.2.3.3.*	or 8.34 di 33.03 ab 12.31 ol 6.27 an 3.06 mt 6.03 ne 28.26 il 2.13	Serravalle, n. Palagonia, Val di Noto, Sicily.	G. Ponte.	G. Ponte, Atti Ac. Gioen., (5), III, No. 4, p. 5, 1910.	Basalt.	Not described. Mode? 3 places.
			SUBRANG 2. DOPOTASSIC. JUGOSE. (H. S. WASHINGTON, 1906.)				
1	(II)III.7.2″.2″. *2.2.2.3.*	or 11.68 di 25.90 an 15.29 ol 6.11 lc 22.67 mt 3.25 ne 10.51 il 2.13 ap 1.68	Bottom of crater, Mount Vesuvius, Italy.	H. S. Washington.	H. S. Washington, unpublished.	Leucite basanite.	Scoria of 1914.
2	III.7(8).2″.2. *″2.1.3.2.*	or 8.06 di 33.01 an 13.34 ol 4.04 lc 25.51 mt 4.41 ne 6.82 il 2.74 ap 1.01	Monte Jugo, n. Montefiascone, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 124, 1906.	Leucitite.	
			SUBRANG 3. SODIPOTASSIC. CASCADOSE. (L. V. PIRSSON, 1905.)				
1	III.7.″2.(2)3. *2.2.2.2.*	or 21.68 di 26.12 an 5.28 ol 12.72 lc 11.03 mt 5.57 ne 11.08 il 1.22 ap 2.69	Arrow Peak, Highwood Mountains, Montana.	H. W. Foote.	L. V. Pirsson, U. S. G. S. B. 237, 1905, p. 145.	Cascadite (minette).	In W. T., p. 347.
2	III.7.(1)2.3. *2.1.3.3.*	or 18.35 di 30.51 an 5.28 ol 2.26 lc 7.85 mt 7.66 ne 18.74 il 6.99 ap 1.68	Mikeno, Lake Kivu District, German East Africa.	Eyme.	L. Finckh, D. Zent. Afr. Exp., I (1), 1912, p. 34.	Leucite basalt.	
3	″III.7.2″.3. *2.2.3.3.*	or 15.57 di 27.30 an 15.29 ol 3.11 lc 12.21 mt 6.73 ne 14.77 il 2.13 hl 0.47 ap 2.35	Near Ragou, Mount Mouriah, Java.	E. W. Morley.	J. P. Iddings, Ign. Rocks, II, p. 622, 1913.	Vicoite (leucite tephrite).	Also in Iddings and Morley, J. G., XXIII, p. 233, 1915,
			SUBRANG 4. DOSODIC. KAMERUNOSE. (C. I. P. W., 1902.)				
1	(II)III.″7.(1)2.4. *2.2.2.3.*	or 20.57 di 23.67 ab 8.91 ol 5.71 an 5.84 mt 6.73 ne 24.42 il 3.34 ap 1.01	Heum, Lougendal, Norway.	V. Schmelck.	W. C. Bröggar, Eg. Kg., III, p. 91, 1899.	Heumite.	In W. T., p. 349.
2	III.7.″2.4. *2.2.2.2.*	or 13.34 di 27.77 ab 7.34 ol 6.88 an 8.06 mt 5.34 ne 25.84 il 3.19 ap 0.67	Kiose Aklungen, Lougendal, Norway.	O. Heidenreich.	W. C. Bröggar, Eg. Kg., III, p. 65, 1899.	Farrisite.	In W. T., p. 349.
3	III.(6)7.2.4. *2.1.4.3.*	or 15.01 di 18.68 ab 4.19 wo 14.73 an 10.29 mt 7.42 ne 19.03 il 5.78 ap 0.67	Kiechlingsberg, Kaiserstuhl, Baden.	K. Gruss.	K. Gruss, Mt. G. L.-A. Bad., IV, p. 113, 1901.	Monchiquite.	In W. T., p. 349.
4	III.7.2.4.⊙ *3.2.2.3.*	or 17.79 di 18.43 ab 1.57 ol 6.03 an 6.12 mt 12.06 ne 25.56 il 5.47 hl 0.59 ap 4.37 th 0.71	Michelsberg, Katzenbuckel, Odenwald.	O. N. Heidenreich.	W. Freudenberg, Mt. G. L.-A. Bad., V, p. 267, 1907.	Shonkinite.	
5	III.7.2(3).4. *2.1.3.2.*	or 6.39 di 30.02 an 15.01 ol 2.80 lc 4.14 mt 6.26 ne 21.58 il 1.98 hm 4.32 ap 5.38	Löbauerberg, Saxony.	J. Stock.	J. Stock, T. M. P. M., IX. p. 466, 1888.	Nephelite dolerite.	In W. T., p. 347.
6	III.(6)7.″2.4″. *2.1.3.3.*	or 10.56 di 34.19 ab 11.53 mt 13.22 an 6.12 il 3.04 ne 19.31 ap 1.01	Flurhübe, Duppau, Bohemia.	H. Tertsch.	F. Bauer, T. M. P. M., XXII, p. 281, 1903.	Theralite.	

CLASS III. SALFEMANE—Continued.

RANG 2. DOMALKALIC. KAMERUNASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
7	40.10	15.27	10.13	1.85	4.59	12.08	4.78	3.34	2.93		3.64	0.87	0.08	CO_2 0.23	99.89	2.91
A2. II	.668	.150	.063	.026	.115	.216	.077	.035			.046	.006	.001			
8	39.97	17.30	7.41	3.05	3.82	10.53	5.14	3.56	4.11		3.34	0.84	0.09	CO_2 0.33 X 0.20 SO_3 0.06 Cl 0.14	99.89	2.86
A2. II	.666	.170	.046	.043	.096	.187	.083	.038			.042	.006	.001			
9	41.04	11.78	6.86	9.52	5.38	10.50	4.36	2.38	4.00		2.37	1.23			99.42	
A2. II	.684	.116	.043	.132	.135	.188	.070	.026			.030	.009				
10	38.99	11.80	8.96	9.48	7.42	11.34	3.92	1.62	1.88		2.99	1.32			99.72	
A2. II	.650	.116	.056	.132	.186	.203	.063	.017			.037	.009				

RANG 2. DOMALKALIC. KAMERUNASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	44.26	16.48	5.01	11.34	5.73	8.03	6.30	0.88	1.59		0.47	trace	trace		100.09	
B2. III	.738	.162	.031	.157	.143	.143	.102	.009			.006	—	—			

RANG 3. ALKALICALCIC. ETINDASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	44.89	12.73	3.31	4.35	13.71	12.95	1.02	3.66	1.59	0.27	0.95	0.23		CO_2 none ZrO_2 trace Cr_2O_3 0.03 BaO 0.08	99.77	
A2. II	.748	.125	.021	.061	.343	.231	.017	.039			.012	.002				

RANG 3. ALKALICALCIC. ETINDASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	40.95	15.37	6.36	4.38	10.46	11.67	3.97	1.26	3.93	0.86	0.25	0.09	trace	Cr_2O_3 0.19 BaO 0.10	99.84	2.932
A2. II	.683	.150	.040	.061	.262	.209	.065	.014			.003	—	—			
2	39.75	13.34	4.00	8.55	14.81	10.90	3.41	0.75	1.26		3.42	0.17			100.36	
A2. II	.663	.131	.025	.119	.370	.195	.055	.008			.043	.001				
3	40.73	12.55	10.72	4.20	11.84	12.03	3.63	1.07	1.13		1.89	0.38			100.17	3.007
A2. II	.679	.123	.067	.058	.296	.214	.058	.012			.024	.003				
4	42.36	15.39	0.48	12.12	10.49	11.25	3.78	1.24	none		0.85	0.88	0.58	CO_2 0.38 SO_3 none Cl 0.13	99.93	
A2. II	.706	.151	.003	.168	.262	.201	.061	.013			.011	.006	.008			
5	41.20	14.83	4.64	7.91	11.17	12.14	2.76	1.51	1.30		2.15	0.13			99.74	
A2. II	.687	.145	.029	.110	.279	.217	.045	.016			.027	.001				
6	40.53	14.53	1.27	11.11	8.58	13.45	3.25	2.67	1.04		2.85	0.69	0.58	CO_2 0.34 SO_3 none Cl none	100.89	3.084
A2. II	.676	.142	.008	.154	.215	.240	.053	.029			.036	.005	.008			

ORDER 7. LENFELIC. KAMERUNARE—Continued.

SUBRANG 4. DOSODIC. KAMERUNOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
7	III.7.2.″4. *3.1.3.2.*	or 12.51 di 24.84 an 10.56 wo 2.67 lc 5.45 il 3.95 ne 21.87 hm 10.13 pf 2.72 ap 2.02	Etinde Volcano, Kamerun.	M. Dittrich.	E. Esch, Sb. Pr. Ak. W., p. 299, 1901.	Leucite nephelinite.	Fresh? In W. T., p. 349.
8	″III.7″.2.″4. *3.1.3.2.*	or 10.01 di 20.74 an 13.62 wo 2.55 lc 8.72 mt 0.23 ne 23.57 il 6.38 hm 7.25 ap 2.02	Etinde Volcano, Kamerun.	M. Dittrich.	E. Esch, Sb. Pr. Ak. W., p. 299, 1901.	Leucite nephelinite.	In W. T., p. 349.
9	III.(6)7.″2.4. *2.1.3.3.*	or 14.46 di 31.15 ab 5.76 ol 4.46 an 5.56 mt 9.98 ne 16.76 il 4.56 ap 3.02	Clarendon, Otago, New Zealand.	P. Marshall.	P. Marshall, Tr. N. Z. Inst., XLIV, p. 307, 1912.	Nephelinite.	
10	III(IV).(6)7.2.4. *2.2.2.″3.*	or 9.45 di 30.33 ab 4.19 ol 6.67 an 10.01 mt 12.99 ne 15.62 il 5.62 ap 3.02	Ponape Island, Caroline Islands.	Eyme.	E. Kaiser, Jb. Pr. G. L.-A., XXIV (1903), p. 112, 1907.	Nephelite basalt.	

SUBRANG 5. PERSODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.(6)7.2″.″5. *2.3.2.3.*	or 5.00 di 21.21 ab 14.15 ol 14.47 an 14.18 mt 7.19 ne 21.30 il 0.91	Gyenes Dias, Platten See, Hungary.	C. Preiss.	C. Preiss, Mt. Nw. Ver. Steierm., XLV, p. 28, 1909.	Basalt.	

SUBRANG 2. DOPOTASSIC. FIASCONOSE. (H. S. WASHINGTON, 1906.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III″.7.3.2. *1.2.2.2.*	or 0.56 di 33.86 an 19.18 ol 15.63 lc 16.57 mt 4.87 ne 4.83 il 1.82 ap 0.63	Fiordine, Montefiascone, n. Lake Bolsena, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 127, 1906.	Leucite basanite.	

SUBRANG 4. DOSODIC. ETINDOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.7.3.4″. *2.2.2.2.*	or 2.22 di 30.13 an 19.74 ol 10.20 lc 4.36 mt 9.28 ne 18.46 il 0.46	Cerro Tacumbu, Paraguay.	A. Lindner.	L. Milch, T. M. P. M., XXIV, p. 214, 1905.	Limburgite.	Fresh?
2	III(IV).7.3.4(5). *2.3.2.2.*	an 18.90 di 24.83 lc 3.49 ol 22.78 ne 15.62 cs 0.95 mt 5.80 il 6.54 ap 0.34	Rougiers, Var, France.	Pisani.	A. Michel Levy, C. R., CXLVIII, p. 1530, 1909.	Nephelinite.	
3	III(IV).″7.″3.4″. *2.2.2.2.*	or 6.67 di 32.62 ab 1.31 ol 10.15 an 14.73 mt 7.89 ne 15.76 il 3.65 hm 5.28 ap 1.01	Schlossberg, Waldeck, Oberpfalz, Bavaria.	H. Waldeck.	H. Waldeck, In. Diss. Erl., p. 26, 1905.	Nephelite basalt.	
4	III.7.3.4″. *1″.3.2.3.*	or 2.78 di 23.74 an 21.41 ol 26.30 lc 3.49 mt 0.70 ne 17.32 il 1.67 ap 2.02	Poratsch, n. Teplitz, Bohemia.	Not stated.	J. E. Hibsch, T. M. P. M., XXVII, p. 55, 1908.	Basalt.	
5	III.7.3″.4. *2.2.2.2.*	or 0.83 di 28.75 an 23.35 ol 15.27 lc 6.32 mt 6.73 ne 12.78 il 4.10 ap 0.34	Lobosch, Mittelgebirge, Bohemia.	C. F. Eichleiter.	G. Irgang, T. M. P. M., XXVIII, p. 53, 1909.	Nephelite basalt.	
6	III.7(8).″3.(3)4. *2.3.2.3.*	an 16.68 di 19.34 lc 12.64 ol 20.11 ne 15.05 cs 6.71 mt 1.86 il 5.47 ap 1.68	Radischken, n. Leitmeritz, Bohemia.	F. Hanusch.	Hibsch and Seeman, T. M. P. M., XXXII, p. 71, 1913.	Leucite basalt.	

CLASS III. SALFEMANE—Continued.

RANG 3. ALKALICALCIC. ETINDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
7	39.33	15.26	6.36	5.99	9.78	14.52	3.47	1.53	2.54		1.01	0.93		CO_2 0.12	100.84	3.082
A2. II	.656	.150	.040	.083	.245	.259	.056	.016			.013	.006				
8	41.28	17.12	3.98	5.63	9.27	12.96	3.19	1.96	3.11		1.64	0.19		CO_2 0.21	100.54	
A2. II	.688	.168	.025	.078	.232	.231	.051	.021			.021	.001				
9	39.11	13.35	3.25	8.65	12.61	14.70	2.82	0.85	2.12		2.51	0.70			100.67	
A2. II	.652	.131	.020	.120	.315	.263	.045	.009			.031	.005			(100.72)	
10	42.61	12.08	4.12	7.73	10.60	13.36	2.78	1.98	0.54	0.17	3.64	0.73			100.34	
A2. II	.710	.118	.026	.107	.265	.239	.045	.021			.046	.005				
11	41.10	14.82	2.35	10.38	9.43	10.56	3.94	1.28	2.31	0.39	3.20	0.19	0.14	CO_2 0.26 SO_3 0.09 Cl trace Cr_2O_3 trace V_2O_3 0.01 NiO trace BaO 0.06 SrO trace	100.50	2.994
A1. I	.685	.145	.015	.144	.236	.189	.064	.014			.040	.001	.002			
12	36.03	15.19	5.94	9.55	8.60	15.52	4.23	1.85	0.58		1.13	1.38	0.17	ZrO_2 0.21	100.38	3.079
A2. II	.601	.149	.037	.133	.215	.277	.068	.020			.014	.010	.002			
13	43.62	16.75	1.83	9.36	7.96	10.23	4.73	1.60	0.84	1.72	0.42	trace	0.22	CO_2 0.28	99.56	2.83
A2. II	.727	.164	.011	.130	.199	.182	.076	.017			.005	—	.003			

RANG 4. DOCALCIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	42.41	16.18	3.94	8.85	7.04	13.56	1.30	3.64	1.36		1.60	0.35		SO_3 trace	100.23	3.048
A2. II	.707	.159	.025	.123	.176	.242	.021	.038			.020	.002				

CLASS III. SALFEMANE.

RANG 1. PERALKALIC. CHOTASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	46.51	11.86	7.59	4.39	4.73	7.41	2.39	8.71	2.45	1.10	0.83	0.80	0.22	CO_2 none SO_3 0.05 Cl 0.04 F trace NiO 0.04 BaO 0.50 SrO 0.16 CuO trace	99.78	
A1. I	.775	.116	.048	.061	.118	.132	.039	.093			.010	.006	.003			
2	45.18	9.31	6.31	4.08	10.77	8.56	1.73	6.93	1.01	0.55	4.36	0.51	trace	CO_2 0.17 ZrO_2 none SO_3 none Cl 0.05 F none Cr_2O_3 0.02 V_2O_3 0.02 NiO none BaO 0.30 SrO trace Li_2O none CuO 0.01	99.87	2.980
A1. I	.753	.091	.039	.057	.264	.153	.028	.074			.055	.004	—			

ORDER 7. LEUFELIC. KAMERUNARE—Continued.

SUBRANG 4. DOSODIC. ETINDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
7	III.7.3.4.⊙ 2.2.2.2.	an 21.68 lc 6.98 ne 15.90 di 23.25 ol 12.44 cs 4.64 mt 9.28 il 1.82 ap 2.02	Grosswöhlen, Bohemia.	R. Pfohl.	J. E. Hibsch, T. M. P. M., XVII, p. 49, 1897.	Nephelite basalt.	In W. T., p. 357.
8	III.7.3″.4. 2.2.2.2.	an 26.69 lc 9.16 ne 14.48 di 24.21 ol 11.36 cs 2.06 mt 5.80 il 3.19 ap 0.34	Ujmaldova, Banat, Hungary.	K. Emszt.	Emszt and Rozlozsnik, F. K., XLIII, p. 497, 1913.	Nephelite basalt.	
9	III(IV).7.3(4).4″. 2.3.2.2.	an 21.41 lc 3.92 ne 12.78 di 21.06 ol 21.89 cs 6.36 mt 4.64 il 4.71 ap 1.68	Cap Manuel, Cap Verde, Senegal.	Pisani.	J. Chantard, C. R., CXLIII, p. 921, 1906.	Linburgitic basalt.	
10	III(IV).″7.3.″4. 2.2.2.2.	or 7.51 an 14.46 lc 3.27 ne 12.78 di 37.36 ol 9.58 mt 6.03 il 6.99 ap 1.68	Tsiafakafo, Ankaratra, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVI, p. 177, 1913.	Tephrite.	
11	III.″7.3.4″. 2.2.2.3.	or 7.23 an 18.90 ne 18.18 di 27.13 ol 16.14 mt 3.48 il 6.08	Fernhill, Canterbury, New South Wales.	H. P. White.	G. W. Card, Rec. G. S. N. S. W., VII, p. 97, 1902.	Analcite basalt.	
12	III.7(8).″3.4. 2.5.3.(2)3.	an 16.96 lc 8.72 ne 19.31 Z 0.37 di 4.94 ol 21.89 cs 13.76 mt 8.58 il 2.13 ap 3.36	Shannon Tier, Hobart, Tasmania.	Heidenreich.	F. P. Paul, T. M. P. M., XXV, p. 312, 1906.	Nephelite-eudialyte basalt.	Cf. No. 1, IV.2.4.2.3.
13	III.″7.″3.4″. 1.3.2.3.	or 9.45 ab 1.05 an 19.74 ne 21.02 di 25.29 ol 16.78 mt 2.55 il 0.76	Adams Island, Auckland Islands.	A. M. Wright.	Speight and Finlayson, Subant. Islds., p. 736, 1909.	Camptonite.	

SUBRANG 1-2. PREPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.7.(3)4.2(3). 2.2.2.3.	an 27.80 lc 16.47 ne 5.96 di 27.29 ol 10.65 cs 1.20 mt 5.80 il 3.04 ap 0.67	Brocken, Harz.	Eyme.	O. H. Erdmannsdoerfer. Jb. Pr. G. L.-A., XXXII (2), p. 339, 1912.	Inclusion in granite.	

ORDER 8. FELDOLENIC. BOHEMARE. (C. I. P. W., 1902.)

ORDER 2. DOPOTASSIC. CHOTOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.8.1.2.⊙ 2.1.3.3.	or 13.90 lc 29.65 ne 6.53 ac 7.39 di 25.42 ol 1.88 mt 7.42 il 1.52 ap 2.02	Bearpaw Peak, Bearpaw Mountains, Montana.	H. N. Stokes.	Weed and Pirsson, A. J. S., II, p. 147, 1896.	Leucitite.	In W. T., p. 351.
2	III(IV).8.1.″2. 2.2.2.2.	or 10.29 lc 24.20 ne 4.83 ac 5.08 di 30.24 ol 8.68 mt 0.46 il 8.36 hm 4.16 ap 1.34	Byerock, New South Wales.	J. C. H. Mingaye.	Mingaye and White, Rec. G. S. N. S. W., VII, p. 302, 1904.	Leucite basalt.	

CLASS III. SALFEMANE—Continued.

RANG 1. PERALKALIC. CHOTASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
3 A1. I	44.68 .745	11.43 .112	7.00 .044	4.67 .065	10.25 .256	9.44 .169	1.56 .025	5.68 .061	2.73	0.77	0.84 .011	0.66 .005	0.11 .002	CO_2 0.20 ZrO_2 none SO_3 none Cl 0.11 F none S none Cr_2O_3 0.02 V_2O_3 0.02 NiO trace BaO 0.02 SrO none Cu none	100.19	2.944

RANG 1. PERALKALIC. CHOTASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A2. II	45.30 .755	16.44 .161	1.82 .011	8.82 .122	2.73 .068	7.85 .140	8.60 .139	4.05 .043	2.96		0.71 .009	1.68 .012			100.96	

RANG 1. PERALKALIC. CHOTASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A2. II	47.16 .786	15.05 .148	0.87 .005	11.00 .153	6.34 .159	9.11 .163	7.73 .124	1.32 .014	0.42		1.01 .013	0.06 —	0.02 —		100.09	2.912

RANG 2. DOMALKALIC. ALBANASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A2. II	46.24 .771	14.42 .141	4.06 .025	4.36 .061	6.99 .175	13.24 .237	1.65 .027	6.37 .068	0.78	0.57	1.17 .015	0.41 .003		CO_2 none ZrO_2 trace SO_3 0.02 BaO 0.13	100.41	
2 A2. II	45.99 .767	16.56 .162	4.17 .026	5.38 .075	5.30 .133	10.47 .188	2.18 .035	8.97 .096	0.45		0.37 .005	0.56 .004		CO_2 none BaO 0.25 SrO none	100.65	
3 A1. I	46.27 .771	17.25 .169	3.94 .025	3.23 .044	5.08 .127	11.40 .204	2.67 .044	8.58 .091	0.37	0.13	1.11 .014	0.39 .003		CO_2 none ZrO_2 0.03 SO_3 trace BaO 0.10 SrO 0.06	100.61	
4 A1. I	47.05 .784	17.08 .167	3.04 .019	4.89 .068	5.67 .142	10.63 .189	1.61 .026	7.52 .080	0.71	0.22	1.15 .014	0.17 .001		CO_2 none ZrO_2 0.02 SO_3 none S none NiO 0.05 BaO 0.09 Cu none	99.90	

RANG 2. DOMALKALIC. ALBANASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 B3. IV	43.22 .720	15.14 .149	9.57 .060	2.62 .036	3.33 .083	14.35 .256	2.94 .047	7.18 .077			2.72 .034				101.07	
2 A2. II	36.36 .606	11.67 .115	6.62 .041	5.36 .075	13.58 .340	9.48 .169	3.59 .058	3.74 .039			6.18 .075	trace —		Cr_2O_3 2.93	99.61	3.078
3 A2. II	40.21 .670	11.86 .116	2.96 .019	5.96 .083	11.80 .295	13.22 .236	2.74 .044	3.17 .034	2.88		3.10 .039	1.98 .014			99.88	
4 A2. II	48.00 .800	16.10 .158	3.35 .021	4.90 .068	6.53 .163	11.35 .203	3.04 .048	5.26 .056	0.25		1.02 .013			Cl 0.49	100.29	

ORDER 8. FELDOLENIC. BOHEMARE—Continued.

SUBRANG 2. DOPOTASSIC. CHOTOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
3	III.8.1.2.⊙ *2.2.2.2.*	or 13.90 an 7.23 lc 15.70 ne 7.10 di 31.11 ol 8.91 mt 10.21 il 1.67 ap 1.68	Lake Cudgellico District, County Darling, New South Wales.	W. A. Greig.	G. W. Card, pers. com.	Leucite basalt.	

SUBRANG 4. DOSODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	"III.8.1.4. *2.2.3.2.*	or 14.46 lc 7.41 ne 33.51 ac 5.08 ns 1.22 di 23.58 ol 7.30 il 1.37 ap 4.03	Omimi, Otago, New Zeland.	P. Marshall.	P. Marshall, Tr. N. Z. Inst., XLIV, p. 307, 1912.	Nephelinite.	

ORDER 5. PERSODIC. TAVOSE. (V. HACKMAN, 1905.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.(7)8.1".(4)5. *1.2.2.3.*	or 7.78 ab 7.34 an 2.78 ne 31.24 di 35.29 ol 11.95 mt 1.16 il 1.98	Serravalle, n. Palagonia, Valdi Noto, Sicily.	G. Ponte.	G. Ponte, At. Ac. Gioen. (5), III, No. X, p. 5, 1910.	Basalt glass (palagonite).	

SUBRANG 2. DOPOTASSIC. ALBANOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.8.2".2. *2.2.3.2.*	an 12.79 lc 29.65 ne 7.67 di 36.22 ol 2.27 cs 1.38 mt 5.80 il 2.28 ap 1.01	Monte Rado, n. Lake Bolsena, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 131, 1906.	Leucitite.	
2	(II)III.8(9).2.2. *2.2(3)."3.2(3).*	an 8.62 lc 41.86 ne 9.94 di 20.14 ol 6.79 cs 4.64 mt 6.03 il 0.76 ap 1.34	Capo di Bove, Alban Hills, Italy.	H. S. Washington.	H. S. Washington, A. J. S., IX, p. 53, 1900.	Cecilite (melilite leucitite).	Also in R. C. R., 1906, p. 139. In W. T., p. 351.
3	(II)III.8".2.2". *2.2.3.2.*	an 9.45 lc 39.68 ne 12.50 di 22.81 ol 1.02 cs 4.64 mt 5.80 il 2.13 ap 1.01	Ticchiena, n. Frosinone, Hernican District, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 135, 1906.	Leucitite.	
4	(II)III.(7)8.2(3).2. *2.1.3.2.*	or 3.89 an 16.96 lc 31.83 ne 7.38 di 27.80 ol 3.96 mt 4.41 il 2.13 ap 0.34	Pofi, Hernican District, Italy.	H. S. Washington.	H. S. Washington, R. C. R., p. 135. 1906.	Leucitite.	

SUBRANG 3. SODIPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.8(9)."2.(2)3. *2.2.4.2.*	an 6.95 lc 33.57 ne 13.35 di 17.93 wo 6.50 cs 7.91 mt 0.46 il 5.17 hm 9.28	Aultivullin, Assynt, Scotland.	A. Gemmell.	A. Gemmell, Tr. Edin. G. Soc., IX, (5), p. 417, 1910.	Borolanite granulite.	
2	III(IV).8(9)."2. 3(4). *2.4.2.2.*	an 5.00 lc 17.00 ne 16.47 di 13.39 ol 19.46 cs 6.02 il 8.51 hm 6.62 cm 3.95 pf 2.58	Neuhöwen, Hegau, Baden.	U. Grubenmann.	U. Grubenmann, In. Diss. Zür., p. 28, 1886.	Melilite basalt.	Ignit.=2.01. In W. T., p. 351.
3	III(IV).8.2".3". *2.2.2.2.*	an 10.56 lc 14.82 ne 12.50 di 29.48 ol 13.43 cs 1.38 mt 4.41 il 5.93 ap 4.76	Güntersberg, Langeberg, Hesse Nassau.	M. Dittrich.	R. Bernges, N. J. B. B., XXXI, p. 627, 1911.	Trachydolerite..	
4	III.8.2".3. *"2.1.3.2.*	or 13.90 an 13.34 lc 13.52 ne 15.34 di 33.01 ol 3.62 mt 4.87 il 1.98	Eruption of 1906, Mount Vesuvius, Italy.	Pisani.	A. Lacroix, C. R., CXLIII, p. 17, 1906.	Leucite tephrite ashes.	Also in N. Arch. Mus. (4), IX, p. 61, 1907.

CLASS III. SALFEMANE—Continued.

RANG 2. DOMALKALIC. ALBANASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	41.75	17.04	6.35	3.41	4.71	14.57	6.17	3.98	0.62	0.28	0.58	1.09	trace	CO_2 none ZrO_2 0.05 S none BaO none	100.60	3.084
A2. II	.696	.167	.040	.047	.118	.260	.098	.042			.007	.008	—			
2	38.89	12.69	7.46	2.96	5.01	18.65	4.90	2.19	0.70	0.36	2.45	1.78	0.16	CO_2 0.66 ZrO_2 0.02 SO_3 0.25 S 0.60 BaO none SrO none	99.73	
A1. I	.648	.125	.047	.041	.125	.333	.079	.023			.031	.013	.002			
3	35.82	18.04	9.92	2.02	0.77	17.18	6.30	3.04	0.82	0.42	4.41	0.08	0.19	CO_2 0.48 ZrO_2 0.05 S 0.03 Cr_2O_3 none V_2O_3 0.05 BaO none SrO none	99.82	3.151
A1. I	.597	.177	.062	.028	.019	.307	.102	.032			.055	—	.003			
4	39.25	16.01	4.31	9.64	4.24	13.42	4.92	2.26	0.80	4.02	0.91	0.35			100.13	
A2. II	.654	.157	.027	.134	.106	.239	.079	.024		.050	.006	.005				
5	37.96	14.36	7.87	6.95	10.21	10.56	5.21	1.89	1.56	2.01	1.61				100.19	
A2. II	.636	.141	.049	.097	.255	.189	.084	.020		.025	.011					
6	38.57	15.69	8.60	9.09	8.62	9.29	5.10	1.81	0.93		1.30	0.47	0.24	CO_2 0.12	99.83	
A2. II	.643	.154	.054	.126	.216	.166	.082	.020			.016	.003	.003			
7	43.07	14.14	3.47	7.21	8.55	12.26	4.60	2.70	1.64		2.00	0.40			100.04	
A2. II	.718	.139	.022	.100	.214	.219	.074	.029			.025	.003				
8	40.80	17.27	3.15	9.32	5.13	10.19	6.97	2.30	1.96		2.02	0.14			99.25	
A2. II	.680	.169	.020	.129	.128	.182	.113	.024			.025	.001				
9	40.15	17.32	7.25	4.00	4.43	11.78	5.99	3.78	1.18		3.21	0.71	0.08	CO_2 0.15 ZrO_2 0.35	100.38	3.01
A2. II	.669	.170	.045	.056	.111	.210	.097	.040			.040	.005	.001			
10	38.39	12.64	7.40	6.15	6.46	14.17	4.35	2.44	1.62		4.44	1.16		CO_2 0.23 SO_3 0.47 Cl 0.37	100.31	3.10
A2. II	.640	.124	.046	.086	.162	.253	.070	.026			.056	.008				
11	35.66	11.97	5.19	9.69	8.35	14.39	3.65	1.89	4.04		3.74	1.37	0.30		100.24	
A2. II	.594	.118	.033	.135	.209	.257	.059	.020			.047	.010	.004			
12	36.00	14.51	7.19	10.28	4.02	12.95	3.61	3.04	4.40		2.50	1.56			100.06	
A2. II	.600	.142	.045	.143	.101	.231	.058	.032			.031	.011			(100.08)	

RANG 2. DOMALKALIC. ALBANASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	46.15	13.25	1.29	8.54	7.82	13.89	5.77	0.93	2.01		0.36	0.15	0.22	CO_2 trace S trace	100.37	
A2. II	.769	.130	.008	.119	.196	.248	.093	.010			.005	.001	.003			

ORDER 8. FELDOLENIC. BOHEMARE—Continued.

SUBRANG 4. DOSODIC. COVOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.		Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.8(9).2.4. *2.2.3.2.*	an 7.51 lc 18.31 ne 27.83	di 25.06 ol 0.14 cs 7.74 mt 9.28 il 1.06 ap 2.69	Magnet Cove, Arkansas.	H. S. Washington.	H. S. Washington, B. G. S. A., XI, p. 399, 1900.	Ijolite.	In W. T., p. 353.
2	III(IV).8″.″2.4. *2.2.3.2.*	an 6.39 lc 10.03 ne 22.44	di 27.00 wo 1.86 cs 12.10 mt 2.78 il 4.71 hm 5.60 ap 4.37	North Beaver Creek, Uncompahgre quadrangle, Colorado.	G. Steiger.	E. S. Larsen, U. S. G. S. B. 591, p. 135, 1915.	Ijolite.	Fresh?
3	III.8.2.4.⊙ *3.3.4.3.*	an 11.95 lc 13.95 ne 28.97	di 4.10 wo 7.08 cs 13.76 il 4.71 hm 9.92 pf 3.26	Iron Hill area, Uncompahgre quadrangle, Colorado.	G. Steiger.	E. S. Larsen, U. S. G. S. rec. lab.	Garnet-nephelite rock.	
4	III.″8.2″.4. *2.2.3.3.*	an 15.01 lc 10.46 ne 22.44	di 28.69 ol 3.35 cs 3.44 mt 6.26 il 7.60 ap 2.02	Ice River, British Columbia.	N. N. Evans.	A. E. Barlow, Ottawa Naturalist, XVI, p. 75, 1902.	Ijolite.	
5	III″.8.2.4. *2.2.2.2.*	or 0.83 an 10.29 lc 8.07 ne 23.86	di 25.16 ol 11.82 mt 11.37 il 3.80 ap 3.70	Küppchen, n. Heiligenberg, Niederhessen.	C. Trenzen.	C. Trenzen, N. J., II, p. 32, 1902.	Nephelite basalt.	
6	III.8.2″.4. *2.2.2.2.*	an 14.16 lc 8.72 ne 23.28	di 23.16 ol 13.15 mt 12.53 il 2.43 ap 1.01	Budikow, Polzen District, Bohemia.	K. H. Scheumann.	K. H. Scheumann, Ab. Sächs. Ges. W., XXXII, p. 758, 1913.	Melilite-nephelite basalt.	
7	III.8.2.4.⊙ *2.2.2.2.*	an 10.01 lc 12.64 ne 21.02	di 36.05 ol 7.99 cs 0.86 mt 5.10 il 3.80 ap 1.01	Coral Island, Los Islands, French Guinea.	Lassieur.	A. Lacroix, N. Arch. Mus., III, p. 81, 1911.	Micro-gabbro.	
8	III.8″.2.4″. *2.2.2.3.*	an 8.90 lc 10.46 ne 32.09	di 26.28 ol 8.04 cs 2.75 mt 4.64 il 3.80 ap 0.34	Topsail Point, Tamara Island, Los Islands, New Guinea.	Lassieur.	A. Lacroix, N. Arch. Mus., III, p. 77, 1911.	Shonkinite.	
9	III.8″.2.4″. *2.2.3.2.*	an 9.17 lc 17.44 ne 27.55	di 23.98 wo 0.58 cs 3.78 mt 3.94 il 6.08 hm 4.48 ap 1.68	Etinde Volcano, Kamerun.	M. Dittrich.	E. Esch, Sb. Pr. Ak. W., p. 415, 1901.	Nephelinite.	In W. T., p. 353.
10	III″.8.2.4. *2.1.3.2.*	an 10.84 lc 11.34 ne 16.76 hl 0.59 th 0.85	di 34.99 wo 0.81 cs 1.55 mt 6.96 il 8.51 hm 2.56 ap 2.69	Etinde Volcano, Kamerun.	M. Dittrich.	E. Esch, Sb. Pr. Ak. W., p. 299, 1901.	Nephelinite.	In W. T., p. 353.
11	III(IV).8.2″.4. *2.3.3.3.*	an 10.84 lc 8.72 ne 16.76	di 20.51 ol 13.57 cs 8.08 mt 7.66 il 7.14 ap 3.36	Nagahama, Iwami Province, Japan.	K. Yokoyama.	S. Kozu, pers. com.	Nephelite basalt.	Fresh?
12	III.″8.2(3).(3)4. *2.2.3.2.*	an 14.46 lc 13.95 ne 16.47	di 22.20 ol 5.73 cs 3.78 mt 10.44 il 4.71 ap 3.70	Lake Waihola, Otago, New Zealand.	P. Marshall.	P. Marshall, Tr. N. Z. Inst., XLIV, 307, 1912.	Nephelinite.	Fresh?

SUBRANG 5. PERSODIC.

No.	Symbol.	Norm.		Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III(IV).8.2.(4)5. *1.1.3.3.*	or 2.50 an 7.51 lc 2.40 ne 26.41	di 49.59 ol 7.08 mt 1.86 il 0.76 ap 0.34	Grenada, West Indies.	J. B. Harrison.	J. B. Harrison, Rocks of Gren., London, p. 10, 1896.	Nephelite tephrite.	Augite andesite in orig. Corr. by J. B. H., pers. com. In W. T., p. 353.

CLASS III. SALFEMANE—Continued.

RANG 3. ALKALICALCIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	39.98	12.47	7.06	6.43	6.59	11.85	1.70	3.80	3.71		5.42	0.73		SO_3 0.14	99.88	2.901
A2. II	.666	.122	.044	.089	.165	.212	.027	.040			.068	.005				

RANG 3. ALKALICALCIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	40.72	15.03	5.52	6.86	8.29	13.95	4.01	2.34	0.32	0.12	0.99	1.75	0.18	CO_2 none	100.08	
A2. II	.679	.147	.034	.095	.207	.249	.065	.024			.012	.012	.003			
2	35.65	13.24	6.68	7.64	14.38	13.17	3.64	1.77	1.02		1.74	0.86	0.29	CO_2 0.47 SO_3 0.23 Cl 0.03	100.81	
A2. II	.594	.130	.042	.106	.360	.236	.059	.019			.022	.006	.004			
3	37.51	14.38	6.33	7.64	12.17	14.36	3.62	1.48	1.08		1.16	0.64			100.37	3.034
A2. II	.625	.141	.040	.106	.304	.256	.058	.016			.015	.005				
4	36.15	15.18	4.87	9.11	13.63	11.40	2.42	1.81	1.95	0.37	2.30	0.26	0.33	SO_3 0.49 Cr_2O_3 0.10 BaO 0.06	100.43	3.205
A1. I	.603	.149	.031	.126	.341	.204	.039	.019			.029	.002	.005			
5	37.84	13.81	6.20	8.01	4.79	14.60	3.73	1.96	4.53	0.38	2.80	1.50	0.11	CO_2 0.02 ZrO_2 none SO_3 none Cl trace Cr_2O_3 none V_2O_3 0.04 NiO none BaO 0.04 SrO none Li_2O none	100.36	2.949
A1. I	.631	.135	.039	.111	.120	.261	.060	.021			.035	.011	.002			

RANG 4. DOCALCIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	39.45	15.51	0.35	10.79	10.69	12.80	3.00	0.65	1.87		1.72	1.65	1.02	CO_2 0.27 SO_3 none Cl 0.04	99.81	
A2. II	.658	.152	.002	.150	.267	.229	.048	.007			.022	.012	.013			

CLASS III. SALFEMANE.

ORDER 1. PERALKALIC. IJOLASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	42.65	9.14	5.13	1.07	10.89	12.36	0.90	7.99	2.18	2.04	1.64	1.52	0.12	SO_3 0.58 Cl 0.03 F 0.47 Cr_2O_3 0.07 BaO 0.89 SrO 0.33 Ce_2O_3 0.11	100.11	2.857
A1. I	.711	.090	.032	.017	.272	.220	.014	.085			.021	.011	.002			

ORDER 1. PERALKALIC. IJOLASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	39.59	17.33	2.53	8.19	3.15	9.79	6.70	7.63	0.43		2.45	1.10		CO_2 0.68 SO_3 0.07 S 0.08	99.72	2.908
A2. II	.660	.170	.016	.114	.079	.175	.108	.081			.031	.008				

ORDER 8. FELDOLENIC. BOHEMARE—Continued.

SUBRANG 3. SODIPOTASSIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III″.″8.3.(2)3. *3.1.3.2.*	or 9.45 an 15.29 lc 10.03 ne 7.67 di 32.40 ol 1.12 mt 4.87 il 10.34 hm 3.68 ap 1.68	Wissoke, Lake Kivu District, German East Africa.	Klüss.	L. Finckh, D. Zent. Afr. Exp., I (1), p. 30, 1912.	Leucitite.	

SUBRANG 4. DOSODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.(7)8.(2)3.4. *2.2.2.2.*	an 16.12 lc 10.46 ne 18.46 di 31.36 ol 9.03 mt 7.89 il 1.82 ap 4.03	Yankee, Colfax County, New Mexico.	G. Steiger.	J. B. Mertie, U. S. G. S. B. 591, p. 151, 1915.	Nephelite basalt.	
2	III(IV).(7)8.(2)3.4. *2.5.2.2.*	an 14.46 lc 8.28 ne 16.76 di 1.76 ol 29.30 cs 14.42 mt 9.74 il 3.34 ap 2.02	Modlibov, Polzen District, Bohemia.	K. H. Scheumann.	K. H. Scheumann, Ab. Sächs. Ges. W., XXXII, p. 759, 1913.	Polzenite (melilite basalt).	
3	III″.8.3.4. *2.2.2.2.*	an 18.63 lc 6.98 ne 16.47 di 10.49 ol 22.90 cs 10.66 mt 9.28 il 2.28 ap 1.68	Schwarzbrunn, Gablonz, Bohemia.	R. Reinisch.	R. Reinisch, T. M. P. M., XXV, p. 536, 1906.	Nephelite basalt.	Center of dike. Cf. No. 13, III.5.5.5.
4	III.″8.3(4).″4. *2.5.2.2.*	an 25.30 lc 8.28 ne 11.08 di 1.76 ol 30.52 cs 8.43 mt 7.19 il 4.41 ap 0.67	Spiegel River, Cape Colony.	J. Lewis.	Rogers and Dutoit, A. R. G. Com. Cape G. H., VIII, p. 51, 1904.	Melilite basalt.	
5	III″.(7)8.(2)3.4. *2.1.3.2.*	an 15.01 lc 9.16 ne 17.04 di 34.70 ol 0.31 cs 1.29 mt 9.05 il 5.32 ap 3.70	Dapto, New South Wales.	H. P. White.	G. W. Card, pers. com.	Nephelinite.	

SUBRANG 4-5. PRESODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.(7)8.(3)4.4(5). *2.3.2.3.*	an 26.97 lc 3.05 ne 13.63 di 20.89 ol 25.40 mt 0.46 il 3.34 ap 4.03	Quickau, n. Teplitz, Bohemia.	Not stated.	J. E. Hibsch, T. M. P. M., XXVII, p. 55, 1908.	Basalt.	

ORDER 9. PERLENIC. FINNARE. (C. I. P. W., 1902.)

SUBRANG 1. PERPOTASSIC. MADUPOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III″.9.1.1(2). *2.3.3.5.*	lc 37.06 ne 1.42 th 0.99 ac 0.92 di 26.14 ol 10.50 cs 6.02 il 2.89 hm 4.80 ap 3.70 pf 0.27	Pilot Butte, Leucite Hills, Wyoming.	W. F. Hillebrand.	W. Cross, A. J. S., IV, p. 130, 1897.	Madupite.	In W: T., p. 353.

SUBRANG 3. SODIPOTASSIC. KIVOSE. (H. S. WASHINGTON, 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″III.9.1.3. *″2.4.3.3.2.*	lc 21.36 ne 25.28 kp 10.11 ac 7.39 ns 0.37 ol 13.99 cs 12.73 il 4.71 ap 2.69	Niragongo, Lake Kivu District, German East Africa.	Klüss.	L. Finckh, D. Zent. Afr. Exp., I (1), p. 28, 1912.	Leucite ijolite.	

CLASS III. SALFEMANE—Continued.

ORDER 1. PERALKALIC. IJOLASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	40.74	18.52	3.66	6.07	3.83	5.61	9.83	4.71	1.46		3.21	1.61			99.25	2.88
B2. III	.679	.182	.023	.085	.096	.100	.158	.050			.040	.011				
2	39.36	13.16	6.39	7.68	6.06	8.55	7.18	3.42	1.43		4.47	1.69			99.39	2.94
B2. III	.656	.129	.040	.107	.152	.153	.116	.036			.056	.012				
3	35.59	12.90	7.68	9.28	5.40	8.46	8.35	2.78	1.63		5.98	2.13			100.18	2.941
A2. II	.593	.126	.048	.129	.135	.151	.135	.030			.075	.015				
4	43.70	19.77	3.35	3.47	3.94	10.30	9.78	2.87	0.89		0.89	1.34	trace		100.30	
A2. II	.728	.195	.021	.049	.099	.184	.158	.030			.011	.009	——			
5	39.26	15.75	4.88	3.14	3.62	16.60	7.50	3.03	0.94		1.66	3.28		SO_3 trace	99.66	2.993
A2. II	.654	.154	.031	.043	.091	.296	.121	.032			.021	.023				

ORDER 1. PERALKALIC. IJOLASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	42.07	18.68	1.68	4.39	3.53	10.83	11.00	1.87	1.20		1.00	2.44			99.66	
A2. II	.701	.183	.011	.061	.088	.193	.177	.020			.013	.017				

CLASS III. SALFEMANE.

SECTION 5. Z EXTREME OVER C.

RANG 1. PERALKALIC. KAKORTOKASE. (H. S. WASHINGTON, 1917.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	49.39	10.39	4.31	7.72	none	5.11	11.45	2.62	1.24	0.22	0.49	none	0.97	ZrO_2 4.89 Cl 0.51 F 0.75 Nb_2O_5 0.30	100.36	2.85
A1. I	.823	.102	.027	.107	——	.091	.185	.028			.006	——	.014			

CLASS IV. DOFEMANE. (C. I. P. W., 1902.)

RANG 1. PERMIRIC. MINNESOTASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	56.98	1.73	4.04	4.18	27.40	3.26	0.59	0.35	2.04		none			Cr_2O_3 0.09	100.66	
A3. III	.950	.017	.025	.058	.685	.058	.010	.004			——					
2	55.27	4.13	0.45	7.17	28.36	2.93	0.86	0.18	0.30	0.04	0.16		0.03	FeS_2 0.17	100.05	3.25
A2. II	.921	.040	.003	.100	.709	.052	.014	.002			.002		——			

RANG 1. PERMIRIC. MINNESOTASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	50.64	7.93	1.41	14.82	18.58	3.41	0.96	0.21	0.87		0.82	0.27	0.16	Cr_2O_3 0.05	100.13	
A2. II	.844	.078	.009	.206	.465	.061	.013	.002			.010	.002	.002			
2	52.27	6.81	2.48	10.01	23.29	2.04	0.87	0.25	0.61	0.14	0.40	trace	trace	CO_2 0.13 S 0.05 Cr_2O_3 0.22	99.57	
A2. II	.871	.067	.016	.139	.582	.037	.014	.003			.005	——	——			

ORDER 9. PERLENIC. FINNARE—Continued.

SUBRANG 4. DOSODIC. IIVAAROSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III(IV).9.1.4. *2.3.2.3.*	lc 21.80, ne 37.49, ac 10.63, ns 0.37, di 4.08, ol 9.86, cs 3.96, il 6.08, ap 3.70	Michelsberg, Katzenbuckel, Odenwald.	G. Latterman.	W. Freudenberg, Mt. G. L.-A. Bad., V (1), p. 279, 1907.	Nephelite-rich schlieren in shonkinite.	
2	III″.9.1.4. *2.2.2.3.2.*	lc 15.70, ne 26.41, ac 10.63, di 18.35, ol 7.22, cs 2.58, mt 3.94, il 8.51, ap 4.03	Michelsberg, Katzenbuckel, Odenwald.	G. Latterman.	W. Freudenberg, Mt. G. L.-A. Bad., V (1), p. 267, 1907.	Shonkinite.	
3	III(IV).9.1.4. *2.3.2.3.2.*	lc 9.59, ne 27.26, kp 2.53, ac 18.02, ol 14.04, cs 8.77, mt 2.09, il 11.40, ap 5.04	Gaffstein, Katzenbuckel, Odenwald.	G. Latterman.	W. Freudenberg, Mt. G. L.-A. Bad., V (1), p. 223, 1907.	Nephelite basalt.	
4	(II)III.(8)9.1.4″. *2.1.3.2.*	or 4.17, an 1.95, lc 10.03, ne 44.87, di 25.60, wo 3.60, mt 4.87, il 1.67, ap 3.02	Iivaara, Kuuosamo, Finland.	N. Sahlbom.	V. Hackman, B. C. G. Fin., No. 11, p. 17, 1900.	Ijolite.	In W. T., p. 353.
5	III.9.1.4.⊙ *2.2.4.2.*	an 0.28, lc 13.95, ne 34.36, di 19.66, wo 8.47, cs 4.64, mt 5.10, il 3.19, hm 1.44, ap 7.73	Kelimassi, German East Africa.	Eyme.	L. Finckh, D. Zent. Afr. Exp., I (1), p. 28, 1912.	Ijolite.	

SUBRANG 5. PERSODIC. IJOLOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″III.9.1.(4)5. *2.1.3.3.2.*	lc 8.72, ne 46.29, cc 1.40, ac 5.08, ns 0.37, di 27.04, ol 1.38, cs 0.34, il 1.98, ap 5.71	Iivaara, Kuuosamo, Finland.	N. Sahlbom.	V. Hackman, B. C. G. Fin., No. 11, p. 17, 1900.	Ijolite.	In W. T., p. 353.

SUBCLASS II. Q+F.+L DOMINANT OVER C+Z.

ORDER 6. LENDOFELIC. ESKIMARE. (H. S. WASHINGTON, 1917.)

SUBRANG 4. DOSODIC. KAKORTOKOSE. (H. S. WASHINGTON, 1917.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	III.(1)II.6(7).1.4. *1.1.2.5.3.*	or 15.57, ab 12.58, ne 14.20, hl 1.64, Z 7.32, ac 12.47, ns 8.54, di 22.57, ol 2.45, il 0.91	Kringlerne, Kangerdluarsuk, Ilimausak District, Greenland.	C. Christensen.	N. V. Ussing, G. Julhb., p. 182, 1911.	Kakortokite (eudialyte lujavrite).	Red sheet.

ORDER 1. PERPOLIC. HUNGARARE. (C. I. P. W., 1902.) SECTION 1. PERPYRIC. MINNESOTIARE. (C. I. P. W., 1902.)

SUBRANG 1. PERMAGNESIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV(V).1″.1.1″.1″.	Q 5.22, or 2.22, ab 5.24, an 0.83, di 11.98, hy 67.26, mt 5.80	Coyote, Santa Clara County, California.	H. E. Kramm.	H. E. Kramm, Pr. Am. Ph. Soc., XLIX, p. 334, 1910.	Enstatite pyroxenite.	
2	IV(V).1.1(2).1.1(2).	or 1.11, ab 7.34, an 6.67, di 6.15, hy 69.10, ol 8.15, mt 0.70, il 0.30	Norseman, Western Australia.	E. S. Simpson.	W. D. Campell, W. Aust. G. S. B. 21, p. 119, 1906.	Hypersthenite.	

SUBRANG 2. DOMAGNESIC. COOKOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.1.1.1.2.⊙	or 1.11, ab 6.81, an 15.01, hy 69.66, ol 1.31, mt 2.09, il 1.52, ap 0.67	New Braintree, Massachusetts.	L. G. Eakins.	B. K. Emerson, U. S. G. S. B. 148, p. 77, 1897.	Wehrlite.	In W. T., p. 355.
2	IV.1.1.1.2.⊙	or 1.67, ab 7.34, an 10.29, C 1.33, hy 72.78, ol 0.62, mt 3.71, il 0.76, cm 0.22	Buckbee Mine, n. Peekskill, New York.	G. S. Rogers.	G. S. Rogers, Ann. N. Y. Ac. Sci., XXI, p. 65, 1911.	Norite.	

CLASS IV. DOFEMANE—Continued.

RANG 1. PERMIRIC. MINNESOTASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
3	46.96	14.13	0.76	14.95	15.97	2.32	0.35	1.68	1.26	0.07	0.62	0.03	0.93	Cr_2O_3 trace NiO 0.06	100.09	3.193
A2. II	.783	.138	.005	.208	.399	.041	.006	.018			.008	—	.013			
4	51.83	7.98	1.48	8.28	24.10	5.26	0.35	0.06	0.29		0.29	0.09	trace	Cr_2O_3 0.31 NiO 0.11	100.43	
A2. II	.864	.078	.009	.115	.603	.094	.006	.001			.004	—	—			
5	52.75	10.29	0.35	11.92	15.61	4.21	1.66	0.81	0.92		1.19	0.40	0.46		100.57	
A2. II	.879	.101	.002	.165	.390	.075	.027	.009			.015	.003	.007			
6	51.55	4.45	0.50	14.50	22.08	2.61	0.64	0.56	1.28		0.58	0.11	0.50		99.36	
A2. II	.859	.044	.003	.201	.552	.046	.010	.006			.007	.001	.007			
7	50.81	8.86	3.17	8.90	16.49	4.40	1.18	0.99	0.95			0.51	0.46	FeS_2 3.88	100.60	
A2. II	.847	.087	.020	.124	.412	.079	.019	.011				.004	.007		(100.14)	
8	50.40	6.01	1.12	9.00	17.74	5.00	0.26	3.44	2.95	0.11	0.93	0.06	0.10	CO_2 none SO_3 0.11 Cr_2O_3 2.44	99.67	
A2. II	.840	.059	.007	.125	.444	.089	.004	.036			.012	—	.001			

RANG 2. DOMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	50.08	6.56	1.56	8.94	12.95	16.14	0.89	0.46	0.32	0.19	1.90	0.19	0.40	S 0.37	100.95	
A2. II	.835	.064	.010	.124	.324	.288	.014	.005			.024	.001	.006			
2	48.04	7.82	2.01	9.32	13.33	13.01	0.69	0.48	2.90	0.17	1.16	trace	none	CO_2 none SO_3 0.23 S 0.90 BaO none	100.06	
A2. II	.801	.077	.013	.129	.333	.232	.011	.005			.015	—	—			
3	51.87	17.56	0.83	7.20	6.82	10.65	2.11	0.87	0.60		0.82	0.62	trace		99.95	
A2. II	.865	.172	.005	.100	.171	.190	.034	.009			.010	.004	—			
4	50.25	5.15	1.01	7.45	15.72	16.75	0.23	trace	2.50		0.23		0.30		99.59	3.10
A2. II	.838	.050	.006	.104	.393	.299	.004	—			.003		.004			
5	48.93	8.79	3.35	7.33	16.12	13.46	0.48	0.20	0.79	0.14	0.59	0.11			100.29	
A2. II	.816	.086	.021	.102	.403	.240	.008	.002			.007	.001				
6	47.74	5.03	5.24	10.58	19.42	11.12	0.21	none	0.10	0.22	0.25	0.08		S 0.21 Cu 0.06	100.22	
A2. II	.796	.049	.033	.147	.486	.198	.003	—			.003	—				
7	51.87	5.28	2.29	7.37	22.52	8.71	0.47	0.31	0.97	0.17	trace	trace	0.10	Cr_2O_3 0.21 NiO 0.21 CuO 0.06	100.54	3.222
A1. I	.865	.052	.014	.103	.563	.155	.008	.003			—	—	.001			
8	48.72	11.75	1.44	6.63	10.92	16.45	0.96	0.10	1.28	0.06	1.04	0.30	0.45	CO_2 none ZrO_2 none FeS_2 0.24 Cr_2O_3 none V_2O_3 0.06 BaO none	100.40	3.12
A1. I	.812	.115	.009	.092	.273	.294	.016	.001			.013	.002	.006			

ORDER 1. PERPOLIC. HUNGARARE. SECTION 1. PERPYRIC. MINNESOTIARE—Continued.

SUBRANG 2. DOMAGNESIC. COOKOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
3	″IV.1.1(2).1.2(3).	or 10.01, ab 3.14, an 11.40, C 7.45, hy 56.30, ol 7.99, mt 1.16, il 1.06	Gunflint Lake, Cook County, Minnesota.	H. N. Stokes.	W. S. Bayley, J. G., III, p. 10, 1895.	Hypersthene gabbro.	In W. T., p. 355.
4	IV.1.1(2).1.2.	or 0.56, ab 3.14, an 19.74, di 5.10, hy 60.48, ol 8.70, mt 2.09, il 0.61	Meadow and Granite creeks, Montana.	L. G. Eakins.	G. P. Merrill, Pr. U. S. Nat. Mus., XVII, p. 658, 1895.	Hornblende pyroxenite (bahiaite).	In W. T., p. 355.
5	(III)IV.1.1.1.2.	or 5.00, ab 14.15, an 18.07, hy 56.87, ol 1.87, mt 0.46, il 2.28, ap 1.01	Romsaas, Norway.	C. Bugge.	C. Bugge, Fh. Vid. Selsk. Christ. (1906), No. 8, p. 18, 1907.	Kugel norite.	Whole rock.
6	IV″.1.1(2).1.2.	or 3.34, ab 5.24, an 7.78, di 3.37, hy 67.15, ol 9.08, mt 0.70, il 1.06, ap 0.34	Romsaas. Norway.	C. Bugge.	C. Bugge, Fh. Vid. Selsk., Christ. (1906), No. 8. p. 18, 1907.	Kugeln in norite.	
7	″IV.1″.1.1.2.	Q 0.60, or 6.12, ab 9.96, an 15.85, di 2.00, hy 54.89, mt 4.64, ap 1.34, pr 3.88	Romsaas, Norway.	C. Bugge.	C. Bugge, Fh. Vid. Selsk. Christ. (1906), No. 8, p. 18, 1907.	Norite.	
8	IV.1(2).1(2).1(2).2.	or 20.02, ab 2.10, an 5.28, di 15.50, hy 39.98, ol 6.47, mt 1.62, il 1.82, cm 3.58	Mawheraiti, Reefton District, New Zealand.	Not stated.	P. G. Morgan, pers. com.	Mica dike rock.	Derived from No. 9, IV.1.1.2.2, by pressure.

SUBRANG 2. DOMAGNESIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.1″.1″.2(3).2.	or 2.78, ab 7.34, an 12.51, di 53.60, hy 13.10, ol 4.48, mt 2.32, il 3.65, ap 0.34	Near James River Gap, Virginia.	W. M. Thornton.	T. L. Watson, pers. com.	Gabbro.	
2	IV.1(2).1.2.2.	or 2.78, ab 5.76, an 16.96, di 38.06, hy 24.84, ol 1.25, mt 3.02, il 2.28, pr 1.46	Coulterville, Mariposa County, California.	G. Steiger.	H. W. Turner, J. G., IX, p. 508, 1901.	Amphibole-pyroxene rock.	
3	(III)IV.1(2).1.″2.2.	Q 2.70, or 5.00, ab 17.82, an 35.86, di 10.88, hy 23.01, mt 1.16, il 1.52, ap 1.34	Romsaas, Norway.	C. Bugge.	C. Bugge, Fh. Vid. Selsk. Christ. (1906), No. 8, p. 18, 1907.	Norite.	
4	IV″.1.1.2″.2.	ab 2.10, an 12.79, di 56.28, hy 20.55, ol 3.51, mt 1.39, il 0.46	Bauerberg, Neurode, Silesia.	O. Hauser.	F. Tannhäuser, Sb. Pr. Ak. W., 1908, II, p. 1071.	Pyroxenite.	
5	IV.1″.1″.2.2.	or 1.11, ab 4.19, an 21.13, di 35.58, hy 26.02, ol 5.11, mt 4.87, il 1.06, ap 0.34	Tongafeno, Madagascar.	Not stated.	A. Lacroix, pers. com.	Pyroxenite.	
6	IV(V).1(2).1(2).2.2.	ab 1.57, an 12.79, di 33.73, hy 33.79, ol 9.59, mt 7.66, il 0.46	Insizwa, Mount Ayliff, East Griqualand.	W. Versfeld.	A. L. Dutoit, A. R. G. Com. Cape G. H., XV, p. 126, 1910.	Olivine gabbro.	
7	IV.1.1″.(1)2.(1)2.	or 1.67, ab 4.19, an 11.40, di 25.13, hy 45.85, ol 7.42, mt 3.25	Dolodrook River, Mount Wellington, North Gippsland, Victoria.	Ampt.	E. O. Thiele, Pr. R. Soc. Vict., XXI (1), p. 257, 1908.	Pyroxenite.	
8	(III)IV.1″.1″.2(3).2.	or 0.56, ab 8.38, an 27.24, di 42.13, hy 11.97, ol 3.71, mt 2.09, il 1.98, ap 0.67	Boulder, Kalgoorlie, Western Australia.	H. Bowley.	Simpson and Gibson, W. Aust. G. S. B. 42, p. 61, 1912.	Gabbro.	

CLASS IV. DOFEMANE—Continued.

RANG 2. DOMIRIC—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
9	52.10	4.41	3.20	6.84	17.75	8.94	0.84	0.44	1.67	0.08	0.89	0.09	0.20	CO_2 none FeS_2 0.60 Cr_2O_3 2.00	100.05	
A2. II	.868	.043	.020	.095	.444	.160	.014	.005			.011	—	.003			

RANG 3. CALCIMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	48.11	5.40	0.54	23.01	2.27	17.80	1.49	0.83	0.45			0.26	trace	S 0.08	100.24	
A3. III	.802	.053	.003	.320	.057	.318	.024	.009				.002	—			

CLASS IV. DOFEMANE.

RANG 1. PERMIRIC. HILASE. (R. A. DALY, 1911.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	49.62	10.51	0.64	12.02	15.98	7.86	1.40	0.55	0.49	0.38	1.01	0.16	0.09		100.71	3.118
A2. II	.827	.103	.004	.167	.400	.140	.023	.006			.013	.001	.001			
2	49.02	10.14	1.54	10.46	17.25	8.29	1.59	0.40	0.59	0.16	0.99	0.11	0.16		100.70	3.152
A2. II	.817	.090	.009	.145	.431	.148	.026	.004			.012	.001	.002			
3	51.23	6.17	1.96	6.95	26.52	4.03	0.29	0.12	0.14	0.10	0.27	none	1.46	S 0.41 Cr_2O_3 0.31 BaO none CuO 0.21	100.17	
A1. I	.854	.060	.012	.097	.663	.071	.005	.001			.003	—	.021			
4	51.76	6.05	1.64	8.01	27.14	3.12	0.79	0.32	0.82			0.07		S 0.17	99.80	3.221
A3. III	.863	.059	.010	.111	.679	.055	.013	.003				—				
5	47.44	5.36	3.13	12.42	19.96	7.60	0.48	0.10	0.08		1.29	0.27	0.15	ZrO_2 none S 0.34 Cr_2O_3 0.07 BaO none	100.69	
A1. I	.791	.053	.019	.172	.499	.136	.008	.001			.016	.002	.002			
6	48.57	10.51	2.19	9.45	17.53	8.06	1.59	0.34	0.37	0.10	1.48	0.19	0.16	CO_2 none Cr_2O_3 0.10 NiO 0.08	100.72	3.065
A1. I	.809	.103	.014	.131	.438	.144	.026	.004			.019	.001	.002			

RANG 2. DOMIRIC. BRUNASE. (J. A. DRESSER, 1909.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	48.63	5.32	2.91	3.90	21.79	13.04	0.34	0.23	2.81		0.47	0.21	0.12	CO_2 trace Cr_2O_3 0.36 BaO trace	100.13	
A2. II	.811	.052	.018	.054	.545	.233	.005	.002			.006	.001	.002			
2	51.51	8.56	2.83	4.75	15.56	11.58	1.99	1.12	0.79	0.04	0.43	0.60		CO_2 0.01 SO_3 0.26	100.03	
A2. II	.859	.084	.018	.066	.389	.207	.032	.012			.005	.004				

RANG 2. DOMIRIC. BRUNASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	45.37	6.21	2.40	8.09	18.67	14.47	0.85	0.37	0.88		1.50		0.15	CO_2 0.62 NiO 0.17	99.75	
A2. II	.756	.061	.015	.113	.467	.259	.014	.004			.019		.002			

ORDER 1. PERPOLIC. HUNGARARE. SECTION 1. PERPYRIC. MINNESOTIARE—Continued.

SUBRANG 2. DOMAGNESIC—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
9	IV.1(2).1.2.″2.	Q 4.32 di 29.86 or 2.78 hy 37.45 ab 7.34 mt 4.64 an 6.67 il 1.67 cm 2.95	Mawheraiti, Reefton District, New Zealand.	Not stated.	P. G. Morgan, pers. com.	Hornblende dike rock.	Cf. No. 8, IV. 1.1.1.2.

SUBRANG 4. DOFERROUS.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.1.1(2).3.4″.	or 5.00 di 70.76 ab 4.72 ol 8.05 an 5.56 mt 0.70 ne 4.26 ap 0.67	Ransko, Eisengebirge, Bohemia.	C. v. John.	Hinterlechner and v. John, Jb. G. R.-A. Wien, LIX, p. 214, 1909.	Pyroxenite.	

ORDER 1. PERPOLIC. HUNGARARE. SECTION 2. DOPYRIC. QUEBECIARE. (J. A. DRESSER, 1909.)

SUBRANG 2. DOMAGNESIC. HILOSE. (R. A. DALY, 1911.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(III)IV. 1.2.1(2). 2.	or 3.34 di 14.15 ab 12.05 hy 29.37 an 20.57 ol 17.38 mt 0.93 il 1.98 ap 0.34	Weehawken, New Jersey.	R. B. Gage.	J. V. Lewis, N. J. G. S. A. R. (1907), p. 121, 1908.	Olivine diabase.	
2	(III)IV.1″.2″.1 (2).2.	or 2.22 di 16.96 ab 13.62 hy 22.87 an 19.18 ol 20.68 mt 2.09 il 1.82 ap 0.34	Englewood, New Jersey.	R. B. Gage.	J. V. Lewis, N. J. G. S. A. R. (1907), p. 121, 1908.	Olivine diabase.	Also in A. J. S., XXX, p. 158, 1908.
3	IV″.1.(1)2.1.(1)2.	or 0.56 di 3.73 ab 2.62 hy 62.89 an 15.01 ol 10.86 mt 2.78 il 0.46	Near Maracas, Bahia, Brazil.	H. S. Washington.	H. S. Washington, A. J. S., XXXVIII, p. 85, 1914.	Bahiaite (hornblende hypersthenite).	Border. Cf. No. 5, IV.1.3.2.2.
4	IV.1.2.1.(1)2.	or 1.67 di 2.62 ab 6.81 hy 57.90 an 11.95 ol 15.74 mt 2.32	Radau, Harz.	Eyme.	O. H. Erdmannsdoerfer, Jb. Pr. G. L.-A., XXV, p. 471, 1907.	Bronzite rock.	
5	IV″.1″.″2.1.2.	or 0.56 di 18.97 ab 4.19 hy 42.35 an 12.23 ol 13.07 mt 4.41 il 2.43 ap 0.67	Pammal Hill, Pallavaram, n. Madras, India.	H. S. Washington.	H. S. Washington, A. J. S., XLI, p. 332, 1916.	Bahiaite (hornblende hypersthenite).	
6	(III)IV.1(2).2″. 1(2).2.	or 2.22 di 15.11 ab 13.62 hy 23.74 an 20.29 ol 18.66 mt 3.25 il 2.89 ap 0.34	Flow of 1852, Mauna Loa, Hawaii, Hawaiian Islands.	G. Steiger.	R. A. Daly, J. G., XIX, p. 296, 1911.	Olivine basalt.	

SUBRANG 1. PERMAGNESIC. BELCHEROSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.1″.(1)2.2.1″.	or 1.11 di 40.25 ab 2.62 hy 23.18 an 12.51 ol 11.63 mt 4.18 il 0.91 cm 0.45 ap 0.34	Belchertown, Massachusetts.	L. G. Eakins.	B. K. Emerson, U. S. G. S. Mon. 29, p. 347, 1898.	Cortlandtite.	In W. T., p. 355.
2	(III)IV.1(2).″2. 2.1(2).	or 6.67 di 33.71 ab 16.77 hy 14.02 an 11.12 ol 10.42 mt 4.18 il 0.76 ap 1.34	Eberstadt, Hesse.	G. Butzbach.	G. Klemm, Erl. G. Kt. Hes., Bl. Rossdorf, p. 29, 1912.	Hornblende gabbro.	

SUBRANG 2. DOMAGNESIC. PALISADOSE. (J. V. LEWIS, 1907.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.1″.2(3).2.2.	or 2.22 di 47.68 ab. 2.62 ol 25.01 an 11.95 mt 3.48 ne 2.56 il 2.89	St. Bruno Mountain, Montergan Hills, Quebec.	M. F. Connor.	J. A. Dresser, A. J. S., XXVIII, p. 72, 1909.	Olivine pyroxenite.	Also in Can. G. S. Mem. 7, p. 17, 1910.

CLASS IV. DOFEMANE—Continued.

RANG 2. DOMIRIC. BRUNASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
2	45.44	5.85	2.84	6.49	16.24	18.16	1.03	0.38	1.15	0.10	1.50		0.24		99.42	3.35
A2. II	.757	.057	.018	.090	.406	.324	.017	.004			.019		.003			
3	50.28	3.94	0.30	9.03	17.40	14.86	1.31	0.26	n. d.		0.49		0.31	FeS_2 1.38 Cr_2O_3 0.25 V_2O_3 0.04 NiO 0.15	100.00	
A1. I	.838	.039	.002	.125	.435	.265	.021	.003			.006		.004			
4	47.87	6.09	1.40	8.14	16.33	14.49	0.87	0.55	1.07	0.26	1.20	0.07	0.20	CO_2 0.75 FeS_2 0.51 Cr_2O_3 0.25 V_2O_3 trace NiO 0.04 BaO none SrO none	100.16	
A1. I	.798	.060	.009	.113	.408	.259	.015	.006			.015	.001	.003			
5	49.95	6.52	1.50	10.41	17.02	11.77	0.98	0.52	0.65	0.16	0.15	none		CO_2 0.25 Cl none S 0.11 Cr_2O_3 0.10	100.09	
A2. II	.833	.064	.009	.144	.426	.211	.016	.005			.002	—				
6	49.73	4.01	0.70	6.66	20.06	16.71	0.63	0.31	0.39	0.07	0.64	0.02	0.19	CO_2 0.26 S 0.35 Cr_2O_3 trace CuO trace	100.73	
A2. II	.829	.039	.004	.093	.502	.298	.010	.003			.008	—	.003			
7	48.91	8.81	1.04	9.52	15.19	14.69	0.64	0.10	0.52	0.07	0.37	trace	0.16	Cr_2O_3 0.15 Li_2O trace	100.17	
A2. II	.815	.086	.007	.133	.380	.262	.010	.001			.005	—	.002			
8	46.06	10.01	3.17	5.61	14.74	10.55	1.31	5.14	1.44		0.73	0.21	trace	SO_3 0.05 Cl 0.03 BaO 0.32 SrO 0.20	99.57	
A1. I	.768	.098	.020	.078	.369	.188	.021	.055			.009	.001	—			
9	42.83	10.92	4.33	8.82	14.02	13.20	3.24	0.64	1.80		0.05	0.39	0.12	CO_2 none S trace	100.36	
A2. II	.714	.107	.027	.122	.351	.235	.052	.007			—	.003	.002			
10	51.64	8.67	2.81	4.73	15.60	11.48	2.01	1.12	0.79	0.04	0.43	0.60		CO_2 0.01 SO_3 0.26	100.19	
A2. II	.861	.085	.018	.065	.390	.205	.032	.012			.005	.004				
11	45.09	10.81	5.83	7.94	13.47	15.21	1.39	0.16	0.46				trace		100.36	
A3. III	.752	.106	.036	.110	.337	.271	.023	.002					—			
12	44.97	5.19	2.94	8.80	17.50	19.09	0.47	0.05	0.40		0.55		0.05		100.01	
A2. II	.750	.051	.018	.122	.438	.341	.008	—			.007		—			
13	48.84	8.30	3.02	5.55	13.69	15.08	2.60	1.08	1.06		1.05	0.25	0.34		100.86	
A2. II	.814	.081	.019	.077	.342	.270	.042	.012			.013	.002	.005			
14	48.40	8.66	0.95	10.12	14.59	14.69	0.54	0.14	0.31	0.13	1.60	0.07			100.20	
A2. II	.807	.085	.006	.140	.365	.263	.009	.001			.020	—				
15	49.78	5.35	3.65	8.88	17.89	11.98	0.90	0.17	1.10		0.58	0.02	0.18		100.48	
A2. II	.830	.052	.023	.124	.447	.214	.015	.002			.007	—	.003			
16	45.43	11.49	3.58	7.10	12.02	15.50	2.16	0.82	0.83		0.91	0.42			100.26	
A2. II	.757	.113	.023	.099	.301	.277	.035	.009			.011	.003			(100.19)	

ORDER 1. PERPOLIC. HUNGARARE. SECTION 2. DOPYRIC. QUEBECIARE—Continued.

SUBRANG 2. DOMAGNESIC. PALISADOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
2	″IV.1″.2.2(3).″2.	an 10.01 lc 1.74 ne 4.83 di 57.18 ol 14.91 cs 2.41 mt 4.18 il 2.89	Rougemont Mountain, Rouville County, Quebec.	M. F. Connor.	J. J. O'Neil, Can. G. S. Mem. 43, p. 67, 1914.	Olivine yamaskite (jacupirangite).	
3	IV″.1.2.2.2.	or 1.67 ab 11.00 an 4.17 di 55.76 hy 5.55 ol 19.54 mt 0.46 il 0.91	South Freeport, Maine.	J. E. Whitfield.	G. P. Merrill, pers. com.	Pyroxenite.	
4	IV.1″.2.2.2.	or 3.34 ab 7.86 an 10.84 di 48.15 hy 3.92 ol 18.66 mt 2.09 il 2.28 ap 0.34	Prospect Hill, Litchfield, Connecticut.	W. F. Hillebrand.	W. H. Hobbs, Rosenb. Fests., p. 40, 1906.	Cortlandtite.	
5	IV.1.2.2.2.⊙	or 2.78 ab 8.38 an 11.95 di 37.57 hy 19.28 ol 16.44 mt 2.09 il 0.30	Montrose Point, n. Peekskill, New York.	G. S. Rogers.	G. S. Rogers, Ann. N. Y. Ac. Sci., XXI, p. 62, 1911.	Pyroxenite.	
6	IV(V).1.2.2″.2.	or 1.67 ab 5.24 an 7.23 di 59.97 ol 23.04 mt 0.93 il 1.22	Dickerson Hill, n. Peekskill, New York.	G. S. Rogers.	G. S. Rogers, Ann. N. Y. Ac. Sci., XXI, p. 62, 1911.	Olivine pyroxenite.	
7	IV.1.2.2.2.⊙	or 0.56 ab 5.24 an 20.85 di 41.86 hy 15.52 ol 13.38 mt 1.62 il 0.76	Orange Grove, Baltimore County, Maryland.	W. F. Hillebrand.	G. H. Williams, U. S. G. S. A. R. 15, p. 674, 1895.	Olivine gabbro.	In W. T., p. 355.
8	(III)IV.1(2).2″.2.″2.	or 0.56 an 6.12 lc 23.54 ne 5.96 di 36.71 ol 18.50 mt 4.64 il 1.37 ap 0.34	Shonkin Creek, Highwood Mountains, Montana.	E. B. Hurlbut.	Weed and Pirsson, A. J. S., II, p. 321, 1896.	Missourite.	Also in L. V. Pirsson, U. S. G. S. B. 237, p. 117, 1905. In W. T., p. 355.
9	″IV.1(2).2(3).2.2.	an 13.34 lc 3.05 ne 14.77 di 38.55 ol 21.17 cs 0.34 mt 6.26 ap 1.01	Grenada, West Indies.	J. B. Harrison.	J. B. Harrison, Rocks of Grenada, p. 10, 1896.	"Olivine basalt."	In W. T., p. 355.
10	(III)IV.1″.″2.2.(1)2.	or 6.67 ab 16.77 an 11.40 di 33.07 hy 14.98 ol 10.07 mt 4.18 il 0.76 ap 1.34	Mühltal, Odenwald.	G. Butzbach.	G. Klemm, Nb. Ver. Erdk. (4), XXVII, p. 11, 1906.	Hornblende gabbro.	Center.
11	″IV.1(2).2.2.2.	or 1.11 ab 5.24 an 22.52 ne 3.69 di 42.13 ol 16.75 mt 8.35	Tilai Mountains, Ural Mountains.	Not stated.	Duparc and Pearce, Ural Nord, II, p. 440, 1905.	Tilaite.	
12	IV(V).1.2(3).2(3).2.	an 11.95 ne 2.27 di 51.45 ol 22.97 cs 5.68 mt 4.18 il 1.06	Sinitzina Gora, Tagil, Ural Mountains.	Not stated.	Duparc and Pamfil, B. Soc. M. Fr., XXXIII, p. 351, 1910.	Koswite.	
13	IV.1(2).″2.2(3).2.	or 6.67 ab 7.07 an 7.51 ne 8.09 di 51.94 ol 11.56 mt 4.41 il 1.98 ap 0.67	Gher, Molibso, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 84, 1909.	Hornblendite.	
14	IV.1.″2.2.2.	or 0.56 ab 4.72 an 20.85 di 42.05 hy 16.25 ol 10.86 mt 1.39 il 3.04	Mount Antkitsika, Madagascar.	Not stated.	A. Lacroix, pers. com.	Diallagite.	
15	IV.1″.(1)2.2.2.	or 1.11 ab 7.86 an 9.73 di 39.72 hy 24.88 ol 9.77 mt 5.34 il 1.06	Thio, New Caledonia.	Boiteau.	A. Lacroix, C. R., CLII, p. 820, 1911.	Diallagite.	
16	(III)IV.1(2).2.2″.2.	or 5.00 ab 2.10 an 19.18 ne 8.80 di 43.89 ol 12.72 mt 5.34 il 1.67 ap 1.01	Possession Island, Crozet Islands.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (4), p. 332, 1908.	Basalt.	

CLASS IV. DOFEMANE—Continued.

RANG 3. CALCIMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	43.90	11.26	2.36	8.78	6.26	24.90	0.98	0.24	0.66	0.10	0.59	0.14			100.17	
A2. II	.732	.110	.015	.122	.157	.445	.016	.003			.007	.001				

CLASS IV. DOFEMANE.

RANG 1. PERMIRIC. WEHRLASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	48.95	5.69	1.20	12.11	23.49	5.33	1.58	0.79	0.18		0.81	0.12	0.08	Cr_2O_3 0.05 NiO 0.16 BaO trace	100.54	3.37
A1. I	.816	.056	.007	.168	.587	.094	.026	.008			.010	.001	.001			
2	46.13	4.69	0.73	16.87	25.17	4.41	0.08	trace	1.38		0.73	0.07	trace	S 0.24 Cr_2O_3 0.04 NiO 0.09 BaO trace	100.63	3.35
A1. I	.769	.046	.004	.234	.629	.078	.001	——			.009	——	——			
3	46.23	6.30	4.30	7.07	25.13	6.08	1.08	0.33	3.78				0.33		100.63	3.04
A3. III	.771	.062	.027	.099	.628	.109	.018	.004					.005			
4	47.25	9.07	1.45	10.41	19.96	7.88	1.38	0.35	0.04	0.08	1.61	0.21	0.13	CO_2 none ZrO_2 none Cr_2O_3 0.12 NiO 0.09 BaO none SrO none	100.03	
A1. I	.788	.089	.009	.144	.499	.141	.022	.004			.020	.001	.002			
5	46.59	7.69	2.20	10.46	21.79	7.41	1.33	0.28	0.37	0.04	1.83	0.11	0.18	ZrO_2 none SO_3 none Cr_2O_3 0.13 NiO 0.12 BaO none SrO none	100.53	3.001
A1 I	.777	.076	.014	.145	.545	.132	.021	.003			.023	.001	.002			

RANG 2. DOMIRIC. ROSSWEINASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	42.76	5.71	3.16	3.30	27.11	10.03	2.24	0.49	4.85		0.17			Cr_2O_3 0.22	100.04	
A2. II	.713	.056	.020	.046	.678	.179	.036	.005			.002					
2	43.17	5.79	6.82	4.90	23.15	8.53	1.20	0.96	5.12		0.38		0.15		100.17	
A2. II	.720	.057	.043	.068	.579	.152	.019	.010			.005		.002			
3	47.35	5.68	4.03	3.06	17.92	8.98	3.41	2.61	3.80		1.45	1.96	0.08	CO_2 0.04	100.37	
A2. II	.789	.056	.025	.043	.448	.161	.055	.028			.018	.014	.001			

RANG 2. DOMIRIC. ROSSWEINASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	44.99	5.91	3.42	8.30	21.02	8.79	0.91	0.74	0.19	0.63	0.97	0.05	trace	CO_2 trace Cr_2O_3 0.25 NiO none	99.17	
A2. II	.750	.058	.021	.115	.526	.157	.014	.008			.012	——	——			
2	45.17	10.02	3.55	5.03	19.84	8.57	3.11	1.61	1.58	0.69	0.54	0.28	0.13	CO_2 none S 0.06 Cr_2O_3 0.11 BaO 0.07 SrO 0.06	100.42	
A1. I	.753	.098	.022	.069	.496	.154	.050	.017			.007	.002	.002			

ORDER 1. PERPOLIC. HUNGARARE. SECTION 2. DOPYRIC. QUEBECIARE—Continued.

SUBRANG 3. MAGNESIFERROUS.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	"IV.1".2.3.3.	an 25.30 di 47.27 lc 1.31 ol 4.14 ne 4.54 cs 12.38 mt 3.48 il 1.06 ap 0.34	Sohasahi, Madagascar.	Not stated.	A. Lacroix, pers. com.	Olivine gabbro.	

ORDER 1. PERPOLIC. HUNGARARE. SECTION 3. PYROLIC. HUNGARIARE. (C. I. P. W., 1902.)

SUBRANG 2. DOMAGNESIC. WEHRLOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.1.3.1".2.	or 4.45 di 15.35 ab 13.62 hy 20.05 an 6.12 ol 37.11 mt 1.62 il 1.52 ap 0.34	Near Red Bluff, Montana.	L. G. Eakins.	G. P. Merrill, Pr. U. S. Nat. Mus., XVII, p. 652, 1895.	Wehrlite.	In W. T., p. 355.
2	IV(V).1.(2)3.1.2.	ab 0.52 di 7.42 an 12.51 hy 42.93 ol 33.03 mt 0.93 il 1.37	North Meadow Creek, Montana.	L. G. Eakins.	G. P. Merrill, Pr. U. S. Nat. Mus., XVI, p. 655, 1895.	Hornblende picrite.	In W. T., p. 355.
3	IV.1".3.1".(1)2.	or 2.22 di 15.12 ab 9.43 hy 21.30 an 11.12 ol 31.64 mt 6.26	Loch Assynt, Sutherland, Scotland.	G. Wilson.	J. J. H. Teall, G.S.U.K.Mem.N.W. High., p. 86, 1907.	Gabbro-picrite.	
4	"IV.1".3.1(2).2.	or 2.22 di 16.65 ab 11.53 hy 18.12 an 17.51 ol 28.17 mt 2.09 il 3.04 ap 0.34	Flow of 1840, Nanawale, Puna, Hawaii, Hawaiian Islands.	G. Steiger.	W. Cross, U. S. G. S. P. P. 88, p. 44, 1915.	Basalt.	
5	IV.1(2).3.1(2).2.	or 1.67 di 17.05 ab 11.00 hy 18.23 an 14.46 ol 30.49 mt 3.25 il 3.50 cm 0.22 ap 0.34	Uwekahana, Kilauea, Hawaii, Hawaiian Islands.	G. Steiger.	R. A. Daly, J. G., XIX, p. 293, 1911.	Olivine gabbro.	

SUBRANG 1. PERMAGNESIC. JAMILLOSE. (H. S. WASHINGTON, 1917.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	"IV.1.3."2.1".	an 4.17 di 35.29 lc 2.18 ol 38.69 ne 10.22 cs 0.52 mt 4.64 il 0.30	Oakhill, n. San José, Santa Clara County, California.	H. E. Kramm.	H. E. Kramm, Pr. Am. Phil. Soc., XLIX, p. 334, 1910.	Pyroxenite peridotite.	
2	IV.1(2). 3. 2". 1(2).	or 5.56 di 26.94 ab 9.96 hy 0.70 an 7.78 ol 33.44 mt 9.98 il 0.76	Schriesheim, Odenwald.	M. Dittrich.	Salomon and Nowomejsky, Vh. Nh. Ver. Heid., VII, p. 648, 1904.	Schriesheimite (amphibole peridotite).	
3	IV.1."3.2.1".	or 15.57 di 24.94 ab 7.34 ac 11.55 ne 3.98 ns 0.24 ol 25.61 il 2.74 ap 4.70	Jumilla, Murcia, Spain.	M. Dittrich.	A. Osann, Rosenb. Fests., p. 305, 1906.	Jumillite.	

SUBRANG 2. DOMAGNESIC. ROSSWEINOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.1(2)."3."2.2.	or 4.45 di 26.65 ab 7.34 hy 12.81 an 10.01 ol 26.88 mt 4.87 il 1.82 cm 0.44	Crystal Falls, Michigan.	H. N. Stokes.	J. M. Clements, J. G., VI, p. 386, 1898.	Peridotite.	Also in U. S. G. S. Mon. 36, p. 259, 1899. In W. T., p. 357.
2	(III)IV.1(2).3. "2.(1)2.	or 9.45 di 25.35 ab 6.03 ol 30.60 an 8.62 mt 5.10 ne 11.22 il 1.06 ap 0.67	Near Blackfoot, Fort Hill Reservation, Idaho.	W. C. Wheeler.	E. S. Larsen, J. Wash. Ac. Sci., V, p. 466, 1915.	Nephelite basalt.	

CLASS IV. DOFEMANE—Continued.

RANG 2. DOMIRIC. ROSSWEINASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
3	50.44	8.18	1.06	6.29	17.63	11.55	2.98	0.50	0.92	0.07			0.21	Cr_2O_3 0.48	100.31	
A3. III	.841	.080	.007	.088	.441	.206	.048	.005					.003			
4	47.75	10.56	0.74	8.34	19.09	9.62	1.32	0.12	2.06	0.05	0.37	0.03	0.10	Cr_2O_3 0.24 NiO 0.07 BaO none SrO trace	100.46	
A1. I	.796	.104	.005	.115	.477	.171	.021	.001			.005	—	.001			
5	44.78	9.38	4.51	7.70	16.85	10.85	2.24	0.20	0.25	0.08	0.74	none	1.90	CO_2 none ZrO_2 none S 0.29 Cr_2O_3 0.24 NiO none BaO none SrO none CuO 0.16	100.07	
A1. I	.746	.092	.028	.107	.421	.194	.036	.002			.009	—	.027			
6	44.18	10.67	0.97	10.03	17.77	9.75	2.37	1.23	0.97	1.30	0.38			CO_2 trace	99.83	3.05
A2. II	.736	.105	.006	.139	.444	.174	.039	.013		.016	.003					
7	48.29	10.00	2.93	5.46	17.22	11.80	2.78	0.45	1.95						100.38	
A3. III	.805	.098	.018	.076	.431	.210	.045	.005								
8	48.15	9.52	2.98	5.46	17.42	11.91	2.34	0.40	2.35						100.53	
A3. III	.803	.093	.019	.076	.436	.212	.038	.004								
9	42.65	12.08	1.77	6.93	15.55	14.18	2.67	0.52	1.65		2.00	0.27	0.28	CO_2 0.11 SO_3 none Cl 0.02	100.68	
A2. II	.711	.118	.011	.096	.389	.254	.044	.006			.025	.002	.004			
10	40.90	10.47	3.43	9.99	14.61	12.63	3.22	1.11	0.68	0.49	0.70	0.92	0.42	CO_2 0.23 SO_3 trace Cl 0.22	100.02	3.136
A2. II	.682	.103	.021	.139	.365	.225	.052	.012			.009	.006	.006			
11	45.40	8.99	2.86	7.00	19.81	7.38	1.51	3.92	1.54	0.08	1.43				99.92	3.00
A2. II	.757	.088	.018	.097	.495	.132	.024	.041			.018					
12	46.54	10.39	3.01	8.80	14.78	11.29	2.21	1.79	1.34		0.60		0.06		100.83	
A2. II	.776	.102	.019	.122	.370	.202	.035	.019			.008		.001			
13	43.56	8.18	2.40	11.15	18.49	10.34	1.65	0.90	1.77	0.15	0.92	0.40	0.19	CO_2 0.04 ZrO_2 none Cl 0.11 F none S none Cr_2O_3 0.01 V_2O_3 0.02 NiO none BaO none SrO none Li_2O none Cu trace	100.28	3.177
A1. I	.726	.080	.015	.155	.462	.185	.027	.010			.012	.003	.003			

RANG 2. DOMIRIC. ROSSWEINASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	40.31	12.24	5.77	10.92	9.10	12.12	7.52	1.08	0.29		0.89	0.45	trace	CO_2 trace Cl trace S trace Cr_2O_3 trace	100.69	3.114
A2. II	.672	.120	.036	.151	.227	.216	.121	.012			.011	.003	—			

ORDER 1. PERPOLIC. HUNGARARE. SECTION 3. PYROLIC. HUNGARIARE—Continued.

SUBRANG 2. DOMAGNESIC. ROSSWEINOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
3	″IV.1.(2)3.2.″2.	or 2.78 ab 17.29 an 7.51 ne 4.26 di 39.68 ol 25.58 mt 1.62 cm 0.67	Knoxville, California.	W. H. Melville.	G. F. Becker, U. S. G. S. Mon. 13, p. 101, 1888.	Pseudo-diorite (gabbro).	In W. T., p. 357.
4	(III)IV.1.″3.(1) 2.2.	or 0.56 ab 11.00 an 22.80 di 19.73 hy 15.86 ol 26.09 mt 1.16 il 0.76	Cathay Hill, Mariposa County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 17 (I), p. 694, 1896.	Diabase.	In W. T., p. 357.
5	″IV.1(2).3.2.2.	or 1.11 ab 11.00 an 15.01 ne 4.26 di 31.04 ol 28.76 mt 6.50 il 1.37	Near Maracas, Bahia, Brazil.	H. S. Washington.	H. S. Washington, A. J. S., XXXVIII, p. 81, 1914.	Hornblendite.	Center. Cf. No. 3, IV.1.2.1.2.
6	(III)IV.1″.3″. ″2.2.	or 7.23 ab 3.67 an 14.73 ne 9.09 di 24.72 ol 34.51 mt 1.39 il 2.43 ap 1.01	Benbeoch, Kyle District, Ayrshire, Scotland.	M. Dittrich.	G. W. Tyrrell, G. Mag. (V), IX, p. 122, 1912.	Kylite (feldspathic peridotite).	
7	(III)IV.1″.(2)3. 2.(1)2.	or 2.78 ab 13.10 an 13.34 ne 5.68 di 35.60 ol 24.14 mt 4.18	Etzdorf, n. Rosswein, Saxony.	Sachsse and Becker.	Sachsse and Becker, Ref. N. J., II, p. 503, 1893.	Gabbro.	In W. T., p. 357.
8	(III)IV.1″.″3. 2.(1)2.	or 2.22 ab 14.67 an 14.18 ne 2.84 di 35.39 ol 24.46 mt 4.41	Etzdorf, n. Rosswein, Saxony.	Sachsse and Becker.	Sachsse and Becker, Ref. N. J., II, p. 503, 1893.	Gabbro.	In W. T., p. 357.
9	(III)IV.1(2).3. 2.2.	an 18.90 lc 2.62 ne 12.50 di 32.30 ol 22.79 cs 2.75 mt 2.55 il 3.80 ap 0.67	Paschkopole, n. Teplitz, Bohemia.	Not stated.	J. E. Hibsch, T. M. P. M., XXVII, p. 55, 1908.	Leucitic basalt.	
10	IV.1(2).3.2.2.	an 10.84 lc 5.23 ne 14.77 di 28.85 ol 27.19 cs 3.10 mt 4.87 il 1.37 ap 2.02	Schanzberg, Bohemia.	F. Hanusch.	J. E. Hibsch, T. M. P. M., XXIII, p. 342, 1904.	Nephelite basalt.	
11	(III)IV.1(2).3″. ″2.″2.	or 15.85 an 6.39 lc 5.45 ne 6.82 di 23.92 ol 32.86 mt 4.18 il 2.74	Piz Tgietschen, Graubünden, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Concretion in syenite.	
12	(III)IV.1″.″3. 2.2.	or 10.56 ab 4.19 an 13.34 ne 7.67 di 34.28 ol 23.89 mt 4.41 il 1.22	Tschauch River, Tagil District, Ural Mountains.	Not stated.	Duparc and Pamfil, B. Soc. M. Fr., XXXIII, p. 358, 1910.	Olivine gabbro.	
13	IV.1″.3.2.2.	or 5.56 ab 4.19 an 11.95 ne 5.40 di 29.41 ol 35.57 mt 3.48 il 1.82 ap 1.01	Mount Elaine, Clarence River, New South Wales.	W. A. Greig.	G. W. Card, pers. com.	Olivine basalt.	

SUBRANG 3. MAGNESIFERROUS.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(III)IV.1(2).3″. 2(3).″3.	lc 5.23 ne 30.67 ac 6.01 di 18.40 ol 21.26 cs 10.75 mt 5.34 il 1.67 ap 1.01	Dreistelz, Rhöngebirge.	H. Lenk.	H. Lenk, Vh. Ph. Ges. Wurz., XXI, p. (60), 1887.	Nephelite basalt.	In W. T., p. 357.

CLASS IV. DOFEMANE.

RANG 1. PERMIRIC. CORTLANDTASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	41.12	3.52	3.31	4.18	37.23	2.96	0.48	0.43	5.82	0.22	trace			Cr_2O_3 0.82 NiO 0.26	100.35	2.96
A2. II	.685	.034	.021	.058	.931	.053	.008	.005			—					
2	40.45	2.51	5.32	4.43	36.49	2.99	0.97	0.36	6.11	0.42				Cr_2O_3 0.23	100.28	2.96
A3. III	.674	.025	.033	.061	.912	.054	.016	.004								

RANG 1. PERMIRIC. CORTLANDTASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	46.03	9.27	2.72	9.94	25.04	3.53	1.48	0.87	0.64			0.17	0.40		100.09	
A2. II	.767	.091	.017	.139	.626	.062	.024	.009				.001	.006			
2	43.37	8.48	2.91	11.00	25.93	5.03	1.33	0.58	0.19		1.03	0.19	0.13	Cl 0.08 S trace	100.25	
A2. II	.723	.083	.018	.153	.648	.089	.021	.006			.013	.001	.002			
3	40.35	3.75	3.53	9.86	25.69	4.64	3.14	0.80	5.28	0.83	2.12	0.25	0.20	CO_2 trace NiO trace BaO 0.06	100.50	
A2. II	.673	.037	.022	.137	.642	.083	.051	.009			.027	.002	.003			
4	39.43	4.47	2.70	23.38	22.46	3.52	0.36	0.30	1.42	0.08	1.22	0.20	0.52	ZrO_2 0.10 S 0.15 Cr_2O_3 none NiO 0.22 CoO 0.07 BaO 0.19	100.79	
A1. I	.657	.044	.017	.325	.562	.063	.006	.003			.015	.001	.007			
5	44.10	9.59	3.11	10.36	20.51	8.21	1.52	0.62	n. d.		2.07	0.26			100.35	
A2. II	.735	.094	.019	.144	.513	.146	.024	.007			.026	.002				
6	43.96	9.84	3.04	10.40	20.70	7.93	1.48	0.62	0.01		2.07	0.25			100.30	
A2. II	.733	.096	.019	.144	.518	.141	.024	.006			.026	.002			(100.28)	
7	41.68	6.28	2.64	9.32	29.65	7.28	0.44	0.46	1.96		0.49	0.06			100.26	
A2. II	.695	.062	.016	.129	.741	.130	.007	.005			.006	—				

CLASS IV. DOFEMANE.

RANG 1. PERMIRIC. LHERZASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	41.50	6.93	2.19	6.69	35.90	5.80	1.37	0.30	0.32				trace	Cr_2O_3 trace	101.00	
B3. IV	.692	.068	.014	.093	.898	.103	.022	.003					—			

RANG 1. PERMIRIC. LHERZASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	40.82	10.66	1.80	8.92	28.08	6.11	0.58	0.21	2.00	0.16	0.16		0.19	CO_2 trace S 0.02 Cr_2O_3 0.25 NiO 0.11 CuO 0.05	100.12	
A1. I	.680	.105	.011	.124	.702	.109	.009	.002			.002		.003			
2	39.25	5.39	2.60	8.90	33.72	4.55	1.18	0.60	2.83		0.77				99.79	
A2. II	.654	.053	.016	.124	.843	.081	.019	.006			.010					

ORDER 1. PERPOLIC. HUNGARARE. SECTION 4. DOMOLIC.

SUBRANG 1. PERMAGNESIC. CORTLANDTOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV(V).1″.4.1.1.	or 2.78 di 6.94 ab 4.19 hy 6.86 an 5.84 ol 61.64 mt 4.87 cm 1.12	Gigestaffel, n. Andermatt, Switzerland.	C. Schneider.	C. Schneider, In. Diss. Zur., p. 30, 1912.	Diallage peridotite.	
2	IV(V).1″.4(5).1.1″.	or 2.22 di 10.64 ab 8.38 ol 63.20 an 1.39 mt 7.66	Gigestellen, n. Andermatt, Switzerland.	C. Schneider.	C. Schneider, In. Diss. Zur., p. 30, 1912.	Diallage peridotite.	

SUBRANG 2. DOMAGNESIC. CUSTEROSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″IV.1″.4.1.2.	or 5.00 hy 16.03 ab 12.58 ol 45.40 an 16.12 mt 3.94 ap 0.34	Cottonwood Gulch, Silver Cliff, Custer County, Colorado.	L. G. Eakins.	W. Cross, Pr. Col. Sci. Soc., II, p. 245, 1887.	Peridotite.	Also in U. S. G. S. A. R. 17, (II), p. 284, 1896. In W. T., p. 357.
2	IV.1″.4″.1.2.	or 3.34 di 6.64 ab 11.00 hy 3.76 an 15.57 ol 53.07 mt 4.18 il 1.98 ap 0.34	Loberia Vieja, Masafuera, Juan Fernandez Islands.	N. Sahlbom.	P. D. Quensel, B. G. Inst. Ups., XI, p. 287, 1912.	Picrite-basalt.	
3	IV(V).1″.4.1″.2.	or 5.00 ac 10.16 ab 3.14 di 10.59 ne 6.25 ol 52.88 il 6.26 ap 0.67	Lugar, Ayrshire, Scotland.	A. Scott.	G. W. Tyrrell, pers. com.	Hornblende peridotite.	
4	IV(V).1″.4.1.2(3).	or 1.67 di 3.40 ab 3.14 hy 17.36 an 9.73 ol 56.32 mt 3.94 il 2.28 ap 0.34	Västra Värnsingen, N. Ulfön, Nordingra, Sweden.	M. Wunder.	J. E. Sobral, G. Nord. Reg., p. 103, 1913.	Peridotite.	
5	″IV.1(2).4″.1(2).2.	or 3.89 di 16.80 ab 12.58 hy 0.63 an 17.51 ol 39.85 mt 4.41 il 3.95 ap 0.67	Lava of 1903, Plaine des Osmondes, Reunion.	Boiteau.	A. Lacroix, C. R., CLIV, p. 253, 1912.	Olivine basalt.	
6	″IV.1(2).4.1(2).2.	or 3.34 di 15.04 ab 12.58 hy 2.23 an 18.35 ol 39.65 mt 4.41 il 3.95 ap 0.67	Piton des Nieges, Reunion.	Boiteau.	A. Lacroix, C. R., CLV, p. 539, 1912.	Feldspathic picrite.	
7	IV.1.4.1″.″2.	or 2.78 di 17.60 ab 1.05 ol 56.86 an 13.90 mt 3.71 ne 1.42 il 0.91	Riviere du Mat, Reunion.	Boiteau.	A. Lacroix, C. R., CLV, p. 539, 1912.	Harrisite, (feldspathic peridotite).	

ORDER 1. PERPOLIC. HUNGARARE. SECTION 5. PEROLIC. PYRENIARE.

SUBRANG 1. PERMAGNESIC. LHERZOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.1.″5.1.1.	an 11.95 di 7.01 lc 1.31 ol 68.58 ne 6.25 cs 2.41 mt 3.25	Caussou, Pyrenees.	Brunet.	A. Lacroix, Ref. N. J., II, p. 267, 1895.	Hornblende lherzolite.	In W. T., p. 357.

SUBRANG 2. DOMAGNESIC. ARGEINOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″IV.1.5.1.(1)2.	or 1.11 di 3.30 ab 4.19 ol 59.48 an 26.13 mt 2.55 ne 0.28 il 0.30 cm 0.45	Dornabac Bridge, n. Harris, Rum Island, Scotland.	W. Pollard.	A. Harker, Mem. G. S. Scot., G. Sm. Islds., p. 80, 1908.	Harrisite (feldspathic peridotite).	
2	IV″.1″.(4)5.1.(1)2.	an 7.78 di 8.55 lc 2.62 ol 66.15 ne 5.40 cs 1.20 mt 3.71 il 1.52	Argein, Pyrenees.	Pisani.	A. Lacroix, Cong. G. Int. VIII, C. R., p. 833, 1901.	Hornblende peridotite.	In W. T., p. 357.

CLASS IV. DOFEMANE—Continued.

RANG 1. PERMIRIC. LHERZASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
3	40.02	8.32	1.51	11.14	27.63	4.04	0.65	0.32	4.30	0.70	0.59		0.85	FeS_2 0.51 Cr_2O_3 trace	100.58	2.99
A2. II	.667	.081	.009	.155	.691	.072	.010	.003			.008		.012			

RANG 3. CALCIMIRIC. VENANZASE. (C. I. P. W., 1902.)

1	41.43	9.80	3.28	5.15	13.40	16.62	1.64	7.40	1.11		0.29	none			100.12	2.758
A2. II	.691	.096	.021	.072	.335	.296	.026	.079			.004	—				

CLASS IV. DOFEMANE.

RANG 1. PERMIRIC.

1	53.05	8.91	3.26	9.52	14.42	6.76	0.66	0.48	0.65		1.77	0.09	0.08		99.65	3.09
A2. II	.884	.087	.020	.133	.361	.121	.011	.005			.022	—	.001			

RANG 2. DOMIRIC. YAMASKASE. (G. A. YOUNG, 1904.)

1	39.97	8.68	8.63	7.99	10.32	15.18	1.19	0.74	0.57		4.05	0.10	0.19	CO_2 1.15 FeS_2 1.01	99.77	
A2. II	.666	.085	.085	.111	.258	.271	.019	.008			.051	.001	.003			

RANG 2. DOMIRIC. YAMASKASE.

1	40.2	9.5	9.7	12.2	8.0	13.1	0.8	0.2	0.5		4.7		0.4	FeS_2 0.4	99.7	3.36
B2. III	.670	.093	.060	.170	.200	.234	.013	.002			.059		.006			

RANG 3. CALCIMIRIC. BRANDBERGASE. (C. I. P. W., 1902.)

1	43.17	9.93	8.78	6.88	6.80	20.96	1.77	0.16	0.31		1.56				100.30	3.28
A3. III	.720	.097	.055	.096	.170	.374	.029	.002			.020					
2	37.35	7.33	11.23	7.33	7.90	21.93	0.96	0.95	n. d.		4.01	2.27			100.80	
A2. II	.623	.072	.070	.102	.198	.392	.016	.010			.050	.016				
3	45.05	6.50	3.83	7.69	12.07	18.82	0.94	0.78	2.40		2.65	0.15			100.88	
A2. II	.751	.064	.024	.107	.302	.336	.015	.009			.033	.001				
4	41.30	5.19	14.39	9.07	10.16	14.73	0.54	1.33	0.84		2.01	trace	0.20	CO_2 0.18	99.94	
A2. II	.688	.051	.090	.126	.254	.263	.009	.014			.025		.003			

RANG 3. CALCIMIRIC. BRANDBERGASE.

1	48.20	8.09	5.32	12.53	5.92	17.20	1.35	0.31	0.43	0.25	0.74	0.14		S 0.03	100.51	
A2. II	.803	.079	.033	.174	.148	.307	.022	.003			.009	.001				

ORDER 1. PERPOLIC. HUNGARARE. SECTION 5. PEROLIC. PYRENIARE—Continued.

SUBRANG 2. DOMAGNESIC. ARGEINOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
3	IV.1.(4)5.1.″2.	or 1.67 di 0.89 ab 5.24 hy 5.59 an 18.90 ol 60.38 mt 2.09 il 1.22	Wommelshansau, n. Dillenburg, Hesse Nassau.	R. Brauns.	R. Brauns, N. J. B. B., XVIII, p. 292, 1904.	Picrite.	

SUBRANG 2. DOMAGNESIC. VENANZOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(III)IV.1.″5.″3.2.	lc 26.16 ac 4.16 ne 4.83 ol 29.16 kp 6.00 cs 25.46 mt 2.78 il 0.61	Pian di Celle, n. San Venanzo, Umbria, Italy.	H. Rosenbusch.	H. Rosenbusch, Sb. Pr. Ak. W., 1899, p. 114.	Euktolite (venanzite).	Cf. A. J. S., VII, p. 399, 1899. In W. T., p. 357.

ORDER 2. DOPOLIC. SCOTARE (C. I. P. W., 1902.) SECTION 1. PERPYRIC.

SUBRANG 2. DOMAGNESIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(III)IV.(1)2.1.1″.2	Q 8.58 di 11.12 or 2.78 hy 42.92 ab 5.76 mt 4.64 an 19.74 il 3.34	Eriyur, South Arcot, India.	P. Brühl.	T. H. Holland, Rec. G. S. Ind., XXX, p. 28, 1897.	Augite norite.	In W. T., p. 355.

SUBRANG 2. DOMAGNESIC. YAMASKOSE. (G. A. YOUNG, 1904.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.2.1″.2(3).2.	or 4.45 di 45.58 ab 2.10 ol 4.05 an 16.12 mt 12.53 ne 4.26 il 7.75 ap 0.34 pr 1.01	Mount Yamaska, Quebec.	G. A. Young.	G. A. Young, Can. G. S. A. R. (1904), p. 33, 1906.	Yamaskite (hornblende jacupirangite).	

SUBRANG 3. MAGNESIFERROUS.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.2″.1.2.3.	Q 0.66 di 34.79 or 1.11 hy 10.84 ab 6.81 mt 13.92 an 21.68 il 8.97	Druin an Eidhne, Skye, Scotland.	J. H. Player.	Geikie and Teall, Q. J. G. S., L, p. 653, 1894.	Gabbro.	Dark band. Cf. No. 73, II.5.4.4.5. In W. T., p. 359.

SUBRANG 2. DOMAGNESIC. BRANDBERGOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.2.1.3″2(3).	or 1.11 di 41.93 ab 2.62 wo 13.57 an 18.35 mt 12.76 ne 6.82 il 3.04	Burnt Head, Monhegan Island, Maine.	E. C. E. Lord.	E. C. E. Lord, Am. G., XXVI, p. 340, 1900.	Gabbro-pyroxenite.	In W. T., p. 359.
2	IV.2.1(2).3″.2″.	an 12.79 di 42.77 lc 4.36 wo 3.60 ne 4.54 cs 5.50 mt 12.06 il 7.60 hm 2.88 ap 5.38	Bad na Achlaise, n. Ledmore, Assynt, Scotland.	A. Gemmell.	A. Gemmell, Tr. Edin. G. Soc., IX (5), p. 417, 1910.	Cromaltite.	
3	IV.(1)2.1″.″3.2.	an 11.12 di 62.19 lc 3.92 ol 5.32 ne 4.26 cs 0.95 mt 5.57 il 5.02 ap 0.34	Brandberget, Gran, Norway.	L. Schmelck.	W. C. Brögger, Q. J. G. S., L, p. 31, 1894.	Pyroxenite.	In W. T., p. 359.
4	IV.2.1.(2)3.2″.	or 7.78 di 51.33 ab 4.72 hy 1.73 an 7.51 ol 1.03 mt 20.88 il 3.95	Malgola, Predazzo, Tyrol.	Dittrich and Pohl.	J. Romberg, Anh. Abh. Pr. Ak. W., 1904, p. 67.	Pyroxenite.	

SUBRANG 3. MAGNESIFERROUS.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.(1)2.1.3.3.	Q 0.90 di 57.78 or 1.67 hy 3.45 ab 11.53 mt 7.66 an 15.01 il 1.37 ap 0.34	Insizwa, Mount Ayliff, East Griqualand.	W. Versfeld.	A. L. Du Toit, A. R. G. Com. Cape G. H., XV, p. 126, 1910.	Gabbro.	

CLASS IV. DOFEMANE.

RANG 1. PERMIRIC. VALBONNASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	46.40	10.80	5.90	5.60	22.20	3.72	0.30	1.21	3.85						100.18	
A3. III	.773	.106	.036	.078	.555	.066	.005	.013								

RANG 1. PERMIRIC. VALBONNASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	50.66	4.42	6.85	6.84	25.77	3.30	1.15	0.35	0.28	0.12	0.33	0.06		S trace	100.13	
A2. II	.844	.043	.043	.095	.644	.059	.019	.004			.004	—				

RANG 2. DOMIRIC. MONTREALASE. (H. S. WASHINGTON, 1917.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	44.66	9.64	4.98	6.65	12.83	13.11	2.07	1.17	0.79	0.11	2.27	0.24	0.19	CO_2 0.37 Cl 0.07 FeS_2 0.22 BaO none SrO 0.03	99.40	
A1. I	.744	.095	.031	.093	.321	.234	.034	.013			.028	.002	.003			
2	40.42	9.98	9.83	10.67	11.56	10.78	1.26	0.60	1.17	0.45	2.51	0.63	0.25	NiO 0.02 BaO 0.05 SrO 0.02 Li_2O trace	100.20	
A1. I	.674	.098	.061	.148	.289	.193	.020	.006			.031	.004	.004			
3	37.33	7.27	13.41	9.24	12.27	16.50	0.45	0.30	1.03	0.10	1.66		0.07		99.63	
A2. II	.622	.071	.084	.128	.307	.295	.007	.003			.021		.001			
4	44.47	7.59	6.25	9.57	11.93	10.24	4.27	1.46	0.73	0.48	2.73	0.54	0.49	CO_2 trace	100.75	
A2. II	.742	.075	.039	.133	.298	.183	.069	.016			.034	.004	.007			
5	43.53	7.24	11.10	8.70	11.51	10.19	2.88	1.39	1.34	0.43	1.90	trace		CO_2 none	100.21	
A2. II	.726	.071	.069	.121	.288	.182	.047	.015			.024	—				
6	38.20	9.16	6.12	5.89	14.69	9.93	3.44	2.20			7.27	trace		CO_2 trace Cr_2O_3 3.01	99.91	2.914
A2. II	.637	.090	.038	.082	.347	.177	.055	.024			.091	—				
7	38.08	11.42	7.18	6.55	12.11	13.08	2.28	1.24	3.98		3.15	0.54		SO_3 0.10	99.73	3.071
A2. II	.635	.112	.045	.091	.303	.234	.037	.014			.039	.004				
8	42.06	12.18	2.67	7.89	11.47	11.29	5.10	1.07	3.08		1.93	0.34		X 0.88 S 0.09	100.05	2.968
A2. II	.701	.119	.017	.110	.287	.201	.082	.012			.024	.002				
9	39.47	11.26	8.74	4.98	14.33	12.08	5.04	1.86	0.63		1.56	0.99	trace		100.94	2.896
B2. III	.658	.110	.054	.070	.358	.216	.080	.020			.019	.007	—			
10	46.47	7.87	1.58	8.63	13.32	15.85	1.81	1.65	0.09		2.70				99.97	
A3. III	.775	.077	.010	.119	.333	.283	.029	.018			.034					
11	43.58	8.08	5.00	5.77	12.91	8.88	0.90	5.99	1.95	1.15	4.64	0.62	0.21	CO_2 0.11 ZrO_2 none Cl trace F none S none Cr_2O_3 0.02 V_2O_3 0.02 NiO 0.08 BaO 0.32 SrO trace Li_2O none CuO 0.01	100.25	2.897
A1. I	.726	.079	.031	.081	.323	.159	.015	.064			.058	.004	.003			

ORDER 2. DOPOLIC. SCOTARE. SECTION 2. DOPYRIC. PAULIARE. (C. I. P. W., 1902.)

SUBRANG 1. PERMAGNESIC. VALBONNOSE. (C. I. P. W., 1902).

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1.	″IV.(1)2.″2.1.1(2).	or 7.23 di 47.92 ab 2.62 ol 9.25 an 18.35 mt 8.35 C 2.24	Vallée de Valbonne, Pyrenees.	Pisani.	A. Lacroix, B. Sv. Ct. G. Fr., XI, No. 71, p. 31, 1900.	Mica hornblendite.	In W. T., p. 359.

SUBRANG 2. DOMAGNESIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV″.(1)2.(1)2.1.(1)2.	or 2.22 di 8.52 ab 9.96 hy 53.45 an 5.56 ol 9.39 mt 9.98 il 0.61	Insizwa, Mount Ayliff, East Griqualand.	W. Versfeld.	A. L. Du Toit, A. R. G. Com. Cape G. H., XV, p. 126, 1910.	Olivine norite.	

SUBRANG 2. DOMAGNESIC. MONTREALOSE. (F. D. ADAMS, 1913.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(III)IV.2.2.2.2.	or 7.23 di 37.52 ab 8.64 ol 13.70 an 13.34 mt 7.19 ne 4.97 il 4.26 ap 0.67	Mount Royal, Montreal, Quebec.	M. F. Connor.	F. D. Adams, Cong. G. Int., XII, Guide 3, p. 39, 1913.	Montrealite (olivine essexite).	
2	(III)IV.2″.2.2.2(3).	or 3.34 di 23.94 ab 10.48 hy 7.82 an 20.02 ol 12.13 mt 14.15 il 4.56 ap 1.34	Big Timber Creek, Crazy Mountains, Montana.	W. F. Hillebrand.	J. E. Wolff, U. S. G. S. B. 148, p. 144, 1897.	Olivine gabbro.	In W. T., p. 359.
3	IV.2.2.2(3).2.	an 16.96 di 41.92 lc 1.31 ol 10.05 ne 1.99 cs 3.61 mt 19.49 il 3.19	Olivine Mountain, Tulameen District, British Columbia.	M. F. Connor.	C. Camsel, Can. G. S. Mem. 26, p. 61, 1913.	Pyroxenite.	
4	IV.″2.2.2.2.	or 8.90 ac 4.62 ab 5.76 di 37.84 ne 13.63 ol 15.69 mt 6.73 il 5.17 ap 1.34	Lugar, Ayrshire, Scotland.	A. Scott.	G. W. Tyrrell, pers. com.	Picrite-theralite.	
5	″IV.2.2.2.2.	or 8.34 di 37.42 ab 13.62 ol 10.57 an 3.06 mt 16.01 ne 5.96 il 3.65	Garabal Hill, n. Loch Lomond, Scotland.	Not stated.	Wyllie and Scott, G. Mag. (V), X, p. 502, 1913.	Davainite (hornblendite).	
6	IV.2″.2″.2.2.	or 7.51 di 30.02 an 3.06 ol 14.56 lc 4.58 il 9.24 ne 15.62 hm 6.08 pf 3.67 cm 4.16	Höwenegg, Hegau, Baden.	U. Grubenmann.	U. Grubenmann, In. Diss. Zur., p. 26, 1886.	Melilite basalt.	Ign.=0.89. In W. T., p. 359.
7	(III)IV.2.2.2.2.	an 16.96 di 32.07 lc 6.60 ol 11.47 ne 10.51 cs 1.03 mt 10.44 il 5.93 ap 1.34	Schafruhe, Rhöngebirge.	Haefcke.	H. Proescholdt, Jb. Pr. G. L.-A., XIV, p. 12, 1894.	Nephelite basalt.	In W. T., p. 359.
8	(III)IV.(1)2.2.2.2.	or 2.22 di 37.56 an 6.95 ol 14.24 lc 3.49 mt 3.94 ne 23.28 il 3.65 ap 0.67	Hahn, n. Holzhausen, Habichtswald, Hesse.	P. Jannasch.	F. Rinne, Sb. Pr. Ak. W., p. 1026, 1889.	Limburgite.	In W. T., p. 355.
9	(III)IV.2.2(3).2.″2.	an 2.78 di 27.65 lc 8.72 ol 16.10 ne 22.72 cs 4.64 mt 11.83 il 2.89 hm 0.48 ap 2.35	Löbauerberg, Saxony.	J. Stock.	J. Stock, T. M. P. M., IX, p. 466, 1888.	Nephelite basalt.	In W. T., p. 363.
10	IV.(1)2.″2.2(3).2.	an 8.34 di 55.79 lc 5.00 ol 11.68 ne 8.24 cs 0.17 mt 2.32 il 7.89	Tatarca River, Jenissei District, Siberia.	Not stated.	A. Munster, Reg. Aurif. Sib., IX, p. 158, 1910.	Hornblende pyroxenite.	
11	(III)IV.2.2(3).2.2.	or 15.57 di 31.97 lc 15.70 ol 17.82 ne 4.26 mt 6.03 il 8.82 hm 0.80 ap 1.34	El Capitan, New South Wales.	H. P. White.	Mingaye and White, Rec. G. S. N. S. W., VII, (4), p. 362, 1904.	Leucite basalt.	

CLASS IV. DOFEMANE—Continued.

RANG 2. DOMIRIC. MONTREALASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
12	41.50	12.31	5.20	8.46	11.29	14.05	2.06	0.48	0.50		4.78	0.06			100.69	
A2. II	.692	.121	.033	.118	.282	.251	.033	.005			.060	—				

RANG 2. DOMIRIC. MONTREALASE.

1	36.77	10.29	10.54	12.11	9.34	12.26	1.16	1.38	1.70	0.36	2.49	1.40	0.23	CO_2 0.18 S 0.33 NiO 0.03 BaO 0.04 SrO 0.02	100.63	3.288
A1. I	.613	.101	.066	.168	.234	.219	.019	.015			.031	.010	.003			
2	38.79	9.39	12.31	11.57	8.10	12.09	2.20	1.53	2.07		1.12	0.19	trace	S 0.60	99.96	3.115
A2. II	.647	.092	.077	.161	.203	.216	.035	.016			.014	.001	—			
3	42.03	10.21	9.05	10.60	9.20	16.45	1.31	0.64	0.99		0.46				100.94	
B3. IV	.701	.100	.057	.147	.230	.294	.021	.007			.006					

RANG 3. CALCIMIRIC. PAULASE. (C. I. P. W., 1902.)

1	38.39	7.05	9.07	6.17	11.58	19.01	0.74	0.75	0.33	0.14	4.54	0.82	0.32	X 0.24 ZrO_2 none S 0.42 BaO trace	99.89	
A1. I	.640	.069	.057	.086	.290	.339	.012	.008			.057	.006	.005			
2	43.50	3.97	3.42	4.41	8.12	24.69	1.55	0.14	0.58	0.34	5.35	3.11	0.19	CO_2 0.66 ZrO_2 none S 0.03 Cr_2O_3 none V_2O_3 none NiO none BaO none SrO 0.13	100.19	3.298
A1. I	.725	.039	.021	.061	.203	.441	.025	.002			.067	.022	.003			
3	58.38	6.15	11.70	8.14	11.47	18.60	0.78	0.13	0.54	0.18	4.32	0.17	0.16	CO_2 none	100.72	
A2. II	.640	.060	.073	.113	.287	.332	.013	.001			.054	.001	.002			

CLASS IV. DOFEMANE.

RANG 1. PERMIRIC. MARQUETTASE. (C. I. P. W., 1902.)

1	45.63	8.83	4.79	5.92	20.30	7.83	0.63	0.34	4.23	0.14	1.44				100.10	3.05
A3. III	.761	.087	.030	.082	.508	.139	.010	.004			.018					

RANG 2. DOMIRIC. UVALDASE. (C. I. P. W., 1902.)

1	40.32	9.46	4.75	7.48	18.12	10.55	2.62	1.10	1.25	0.57	2.66	0.68	0.25	ZrO_2 none SO_3 0.03 Cl 0.05 F 0.04 S 0.01 NiO 0.06 BaO 0.06 SrO 0.03 Li_2O trace	100.09	3.148
A1. I	.672	.091	.030	.104	.453	.188	.042	.012	.057		.033	.005	.004			

ORDER 2. DOPOLIC. SCOTARE. SECTION 2. DOPYRIC. PAULIARE—Continued.

SUBRANG 2. DOMAGNESIC. MONTREALOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
12	(III)IV.2.2.2.2.	or 2.78 di 36.74 ab 3.14 ol 10.08 an 23.07 mt 7.66 ne 7.67 il 9.12	Papenoo Valley, Tahiti, Society Islands.	Pisani.	A. Lacroix, B. Soc. G. Fr., X, p. 104, 1910.	Essexitic gabbro.	

SUBRANG 3. MAGNESIFERROUS.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	"IV.2".2(3).2". "3.	or 8.34 di 26.60 ab 2.62 ol 14.70 an 18.63 mt 15.31 ne 3.98 il 4.71 ap 3.36	Caribou, Boulder County, Colorado.	G. Steiger.	E. S. Bastin, U. S. G. S. rec. lab.	Hornblendite.	
2	"IV.2."2.2".3.	or 8.90 di 38.56 ab 0.52 ol 7.90 an 11.40 mt 17.86 ne 9.66 il 2.13 ap 0.34	Wehrathal, Schwarzwald.	Not stated.	O. H. Erdmannsdoerfer, Mt. Bad. G. L.-A., IV. (2), p. 172, 1901.	Secretion in granite.	
3	IV.2.(1)2.2(3). (2)3.	an 20.02 di 49.87 lc 3.05 ol 7.21 ne 5.94 mt 13.22 il 0.91	Malinverno, Monzoni, Tyrol.	C. Doelter.	C. Doelter, T. M. P. M., XXI, p. 98, 1902.	Pyroxenite.	

SUBRANG 2. DOMAGNESIC. PAULOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.2.2."3.2.	an 13.62 di 44.50 lc 3.49 ol 5.88 ne 3.41 cs 5.50 mt 7.89 il 8.66 hm 3.68 ap 2.02	Magnet Cove, Arkansas.	H. S. Washington.	H. S. Washington, J. G., IX, p. 620, 1901.	Jacupirangite.	In W. T., p. 361.
2	IV".2.2.(2)3.2.	or 1.11 di 43.85 ab 13.10 wo 14.96 an 3.34 mt 4.87 il 6.54 tn 0.78 pf 2.72 ap 7.39	Iron Hill Area, Uncompahgre quadrangle, Colorado.	G. Steiger.	E. S. Larsen, U. S. G. S. rec lab.	Titanite pyroxenite.	
3	"IV.2.(1)2."3.2.	an 12.79 di 50.33 lc 0.44 ol 3.78 ne 3.69 cs 4.30 mt 14.15 il 8.21 hm 1.92 ap 0.34	Jacupiranga, Sao Paulo, Brazil.	H. S. Washington.	H. S. Washington, J. G., IX, p. 620, 1901.	Jacupirangite.	In W. T., p. 361.

ORDER 2. DOPOLIC. SCOTARE. SECTION 3. PYROLIC. TEXIARE.

SUBRANG 2. DOMAGNESIC. MARQUETTOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.(1)2.(2)3 1(2). (1)2.	or 2.22 di 14.39 ab 5.24 hy 22.65 an 20.29 ol 25.29 mt 6.86 il 2.74	Clemgia, Lower Engadine, Switzerland.	L. Hezner.	U. Grubenmann, Btr. G. Kt. Schw., XXIII, p. 223, 1909.	Hornblendite.	

SUBRANG 2. DOMAGNESIC. UVALDOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV."2.3.2.2.	or 3.89 di 28.68 an 11.12 ol 26.75 lc 2.18 mt 6.76 ne 11.93 il 5.02 ap 1.68	Tom Munns Hill, Uvalde County, Texas.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 168, p. 62, 1900.	Nephelite basalt.	In W. T., p. 361.

CLASS IV. DOFEMANE—Continued.

RANG 2. DOMIRIC. UVALDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
2	39.92	8.60	4.40	8.00	20.17	10.68	1.91	1.03	1.45	0.43	2.70	0.51	0.24	ZrO_2 none Cl trace F 0.07 S trace Cr_2O_3 0.14 V_2O_3 0.04 NiO 0.06 BaO 0.06 SrO 0.04 Li_2O trace	100.45	3.200
A1. I	.665	.084	.027	.111	.504	.191	.030	.011			.034	.004	.003			
3	37.96	10.14	3.69	7.59	14.69	16.28	2.18	0.69	1.82	0.39	2.93	1.13	0.22	ZrO_2 none SO_3 0.03 Cl trace F 0.07 S 0.04 Cr_2O_3 0.08 V_2O_3 0.05 NiO 0.04 BaO 0.06 SrO 0.05 Li_2O trace	100.13	3.150
A1. I	.633	.099	.023	.106	.067	.291	.035	.007			.035	.008	.003			
4	37.98	9.30	5.96	5.86	17.13	10.38	3.50	2.03	2.74		2.02	0.31	trace	CO_2 0.36 X 2.40 S 0.09 SrO trace	100.15	3.072
A2. II	.633	.091	.037	.081	.428	.168	.056	.021			.025	.002	—			
5	38.06	9.97	5.59	5.78	15.06	15.22	1.81	0.94	3.55		2.96	0.57	trace	Cr_2O_3 0.05 NiO 0.75	100.31	3.077
A1. I	.634	.098	.035	.081	.377	.271	.029	.010			.037	.004	—			
6	38.87	11.94	4.02	6.00	15.24	10.87	2.59	1.64			4.79	trace		CO_2 trace Cr_2O_3 3.06	99.02	2.946
B2. III	.648	.117	.025	.083	.381	.194	.042	.017			.060	—				
7	37.01	8.71	7.26	6.71	14.83	15.85	2.63	1.84	1.78		3.21	trace		Cr_2O_3 0.14	99.97	
A3. III	.634	.085	.046	.093	.371	.283	.042	.020			.040	—				
8	36.53	9.91	3.84	6.01	18.10	10.31	3.06	1.60			8.38	trace		CO_2 trace Cr_2O_3 2.90	100.64	2.987
A3. III	.609	.097	.024	.083	.453	.184	.049	.017			.105	—				
9	35.56	11.25	6.62	6.67	14.68	8.99	3.86	1.75			8.03	trace		Cr_2O_3 2.66	100.07	3.046
A3. III	.593	.110	.041	.093	.367	.177	.062	.019			.100	—				
10	42.55	10.75	4.92	6.60	15.51	10.80	2.94	1.57	0.57		2.59	0.48	trace	Cr_2O_3 0.42 NiO 0.13	99.83	
A1. I	.709	.105	.031	.092	.388	.193	.047	.017			.032	.003	—			
11	42.47	8.62	3.41	7.73	15.11	10.47	3.61	2.35	0.37		2.61	3.29			100.04	
A2. II	.708	.085	.021	.107	.378	.188	.058	.025			.033	.023				
12	39.39	7.55	6.33	5.64	13.91	13.98	4.88	1.45	4.06		3.01	0.72		CO_2 trace	100.92	
A2. II	.657	.074	.039	.078	.348	.250	.079	.015			.038	.005				
13	42.58	9.58	4.97	10.22	16.97	11.54	2.01	0.54	1.04		0.94	0.41	0.25		101.05	
B2. III	.710	.054	.031	.141	.424	.206	.032	.006			.012	.003	.004			
14	39.02	11.05	3.52	6.65	14.33	15.30	2.24	1.38	1.75	0.36	3.31	1.23			100.14	
A2. II	.650	.108	.022	.093	.358	.273	.036	.015			.041	.009				

ORDER 2. DOPOLIC. SCOTARE. SECTION 3. PYROLIC. TEXIARE—Continued.

SUBRANG 2. DOMAGNESIC. UVALDOSE.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
2	IV.(1)2.3.2.″2.	an 11.95 di 28.24 lc 4.80 ol 31.27 ne 8.52 cs 0.52 mt 6.26 il 5.17 ap 1.34	Black Mountain, Uvalde County, Texas.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 168, p. 63, 1900.	Nephelite basalt.	In W. T., p. 361.
3	IV.″2.3″.2″.2.	an 15.85 di 22.45 lc 3.05 ol 23.34 ne 9.94 cs 9.03 mt 5.34 il 5.32 ap 2.69	Near Uvalde, Uvalde County, Texas.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 168, p. 63, 1900.	Nephelite-melilite basalt.	In W. T., p. 363.
4	″IV.2.3.2.″2.	an 3.89 di 24.35 lc 9.16 ol 24.00 ne 15.90 cs 3.10 mt 8.58 il 3.65 ap 0.67	Hohenburg, n. Bühne, Westphalia.	Biltz.	F. Rinne, Sb. Pr. Ak. W., 1891, p. 988.	Melilite-nephelite basalt.	In W. T., p. 363.
5	IV.2.3.2.2.⊙	an 16.40 di 26.11 lc 4.36 ol 19.74 ne 8.24 cs 6.71 mt 8.12 il 5.62 ap 1.34	Wartenberg, n. Geisingen, Baden.	M. Dittrich.	E. Becker, Z. D. G. G., LIX, p. 274, 1907.	Melilite basalt.	
6	(III)IV.2.″3.2.″2.	an 16.12 di 26.35 lc 7.41 ol 18.20 ne 11.93 cs 1.20 mt 0.70 il 9.12 hm 3.52 cm 4.45	Hohenhöwen, Hegau, Baden.	U. Grubenmann.	U. Grubenmann, In. Diss. Zür., p. 31, 1886.	Melilite basalt.	Ign.=2.82. In W. T., p. 361.
7	IV.2.3″.2(3).2.	an 6.39 di 22.71 lc 8.72 ol 19.27 ne 11.93 cs 13.24 mt 10.67 il 6.08	Neuhöwen, n. Stetten, Hegau, Baden.	L. Hezner.	H. Rosenbusch, Elem. Gest., p. 467, 1910.	Melilite basalt.	
8	″IV.2″.3.2.(1)2.	an 8.62 di 21.38 lc 7.41 ol 24.78 ne 13.92 cs 1.20 il 9.73 hm 3.84 cm 3.95 pf 5.44	Wartenberg, Hegau, Baden.	U. Grubenmann.	U. Grubenmann, In. Diss. Zür., p. 20, 1886.	Melilite basalt.	Ign.=2.47. In W. T., p. 361.
9	(III)IV.2(3).3.2.2.	an 8.06 di 19.22 lc 8.28 ol 19.46 ne 17.61 cs 3.10 il 11.40 hm 6.62 cm 2.74 pf 3.13	Hohenstoffeln, Hegau, Baden.	U. Grubenmann.	U. Grubenmann, In. Diss. Zür., p. 35, 1886.	Melilite basalt.	Ign.=1.72. In W. T., p. 365.
10	(III)IV.2.(2)3.2.2.	or 9.45 di 30.99 ab 1.31 ol 19.76 an 11.40 mt 7.19 ne 12.64 il 4.86 cm 0.62 ap 1.01	Oberbach, Rhöngebirge.	M. Dittrich.	J. Soellner, N. J. B. B., XXIV, p. 511, 1907.	Limburgite.	
11	(III)IV.″2.3.2.2.	or 13.90 di 23.96 ab 7.86 ol 23.82 an 0.56 mt 4.87 ne 12.21 il 5.02 ap 7.73	Wilhelmshöhe, Habichtswald, Hesse Nassau.	M. Dittrich.	K. Schlossmacher, N. J. B. B., XXXI, p. 666, 1911.	Shonkinitic trachy-dolerite.	
12	IV.2.3.2(3).2	lc 6.54 ac 9.24 ne 16.76 di 21.79 ol 19.41 cs 11.18 mt 4.41 il 5.78 ap 1.68	Eisenrüttel, Schwäbischer Alb, Bavaria.	E. Gaiser.	E. Gaiser, In. Diss. Bresl., p. 5, 1904.	Nephelite basalt.	
13	IV.(1)2.3.2.2.	or 3.34 di 31.10 ab 3.14 ol 29.42 an 15.57 mt 7.19 ne 7.38 il 1.82 ap 1.01	Mindello, St. Vincent, Cape Verde Islands.	C. v. John.	C. v. John, Jb. G. R.-A. Wien, XLVI, p. 283, 1896.	Dolerite.	In W. T., p. 363.
14	″IV.2.3(4).2″.2.	an 15.85 di 18.58 lc 6.54 ol 21.95 ne 10.22 cs 8.69 mt 5.10 il 6.23 ap 3.02	Laona, Ankaratra, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVI, p. 177, 1913.	Melilite nephelinite.	

CLASS IV. DOFEMANE—Continued.

RANG 2. DOMIRIC. UVALDASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
15	42.99	10.21	3.01	10.28	14.61	12.54	1.40	0.52	1.10	0.82	2.52	0.29	0.17	CO_2 none ZrO_2 none Cr_2O_3 0.06 NiO 0.06 BaO none SrO none	100.58	
A1. I	.717	.100	.019	.143	.365	.224	.023	.006			.032	.002	.002			
16	37.50	9.12	5.59	8.81	13.72	13.85	2.69	0.63	2.35	1.05	3.21	0.90	0.15	CO_2 0.27 ZrO_2 0.02 Cl 0.05 S trace Cr_2O_3 0.07 V_2O_3 0.05 NiO 0.04 BaO 0.07 SrO 0.05 Li_2O trace	100.19	
A1. I	.625	.089	.035	.122	.343	.247	.043	.006			.040	.006	.002			
17	36.34	10.14	6.53	10.66	10.68	13.10	4.54	1.78	1.00	1.00	2.87	1.02	0.20	CO_2 0.15 S 0.04	100.05	
A2. II	.606	.099	.041	.148	.267	.234	.074	.019			.036	.007	.003			
18	43.51	9.82	6.32	9.62	14.97	11.83	1.30	0.25	0.64		1.02	0.03	0.21		99.52	
A2. II	.725	.096	.039	.133	.374	.211	.021	.003			.013	——	.003			

RANG 3. CALCIMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	38.04	6.34	8.45	5.90	7.81	27.19	2.16	0.12	0.48	0.22	1.98	0.24	0.23	CO_2 0.30 ZrO_2 none S 0.02 Cr_2O_3 none V_2O_3 none NiO none BaO none SrO 0.26	99.74	3.257
A1. I	.634	.062	.053	.082	.195	.486	.035	.001			.025	.002	.003			
2	33.52	7.60	10.69	6.98	6.94	22.82	3.52	1.37			4.51	2.31			100.26	
A2. II	.559	.074	.067	.097	.174	.408	.056	.015			.056	.016				
3	38.74	11.30	4.28	7.71	11.97	14.43	3.02	1.92	1.28	0.60	3.30	1.77			100.32	
A2. II	.646	.111	.027	.107	.299	.257	.048	.020			.041	.012				

CLASS IV. DOFEMANE.

RANG 1. PERMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	38.62	4.71	8.72	4.08	32.32	3.97	0.17	0.20	6.46		0.60	trace		Cr_2O_3 0.43	100.28	2.931
A2. II	.644	.046	.054	.057	.808	.071	.003	.002			.008	——				

RANG 1. PERMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	39.14	7.59	5.26	8.76	22.78	5.91	0.60	1.09	6.30	0.56	1.66	0.38	0.56	NiO 0.11	100.70	
A2. II	.652	.074	.033	.122	.570	.105	.010	.012			.021	.003	.008			
2	39.58	7.25	4.44	10.46	24.75	4.83	0.97	0.32	5.68	1.11	0.99				100.38	2.89
A3. III	.660	.071	.028	.145	.619	.086	.016	.003			.012					
3	43.82	10.10	2.98	10.44	20.89	7.66	1.44	0.62	0.02		2.07	0.21			100.25	
A2. II	.730	.099	.019	.145	.522	.137	.023	.007			.026	.002				

ORDER 2. DOPOLIC. SCOTARE. SECTION 3. PYROLIC. TEXIARE—Continued.

SUBRANG 2. DOMAGNESIC. UVALDOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
15	"IV.(1)2."3.2.2.	or 3.34 di 32.93 ab 5.24 ol 23.82 an 19.74 mt 4.41 ne 3.69 il 4.86 ap 0.67	Haleakala, Maui, Hawaiian Islands.	G. Steiger.	W. Cross, U. S. G. S. P. P. 88, p. 29, 1915.	Basalt.	
16	IV.2."3.2.2.	an 11.12 di 31.90 lc 2.62 ol 18.28 ne 12.21 cs 3.61 mt 8.12 il 6.08 ap 2.02	Kilauea Bay, Kauai, Hawaiian Islands.	W. F. Hillebrand.	W. Cross, U. S. G. S. P. P. 88, p. 17, 1915.	Melilite-nephelite basalt.	
17	"IV.2.3(4).2(3). 2(3).	an 1.67 di 20.30 lc 8.28 ol 19.79 ne 21.02 cs 9.29 mt 9.51 il 5.47 ap 2.35	Moiliili church, Honolulu, Oahu, Hawaiian Islands.	G. Steiger.	W. Cross, U. S. G. S. P. P. 88, p. 22, 1915.	Nephelite-melilite basalt.	
18	"IV."2.3.2.2.	or 1.67 di 30.85 ab 11.00 ol 24.19 an 20.02 mt 9.05 il 1.98	Nakety, New Caledonia.	Boiteau.	A. Lacroix, C. R., CLII, p. 820, 1911.	Hornblendite.	

SUBRANG 2. DOMAGNESIC. (NAKETOSE, A. LACROIX, 1911.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.2.(2)3.3.2.	an 7.23 di 39.07 lc 0.44 ol 1.57 ne 9.94 cs 23.39 mt 12.30 il 3.80 ap 0.67	Iron Hill, Uncompahgre quadrangle, Colorado.	G. Steiger.	E. S. Larsen, U. S. G. S. rec. lab.	Uncompahgrite (melilite rock).	
2	IV.2.3.3(4).2(3).	an 0.83 di 25.49 lc 6.54 ol 3.92 ne 15.90 cs 20.12 mt 9.51 il 8.51 hm 4.16 ap 5.38	Bad na Achlaise, n. Ledmore, Assynt, Scotland.	A. Gemmel.	A. Gemmel, Tr. G. Soc. Edin., IX (5), p. 417, 1910.	Cromaltite.	
3	(III)IV.2."3.(2) 3.2.	an 12.23 di 27.67 lc 8.72 ol 15.64 ne 13.63 cs 4.05 mt 6.26 il 6.23 ap 4.03	Mount Tsiafajavona, Madagascar.	Boiteau.	A. Lacroix, C. R., CLVI, p. 177, 1913.	Nephelinite.	

ORDER 2. DOPOLIC. SCOTARE. SECTION 4. DOMOLIC.

SUBRANG 1. PERMAGNESIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV(V)."2.(3)4. 1.1".	or 1.11 di 6.48 ab 1.57 hy 16.60 an 11.40 ol 42.84 mt 10.67 il 1.22 cm 0.67 hm 1.28	Ehrsberg, Schwarzwald.	J. H. Kloos.	J. H. Kloos, N. J. B. B., III, p. 57, 1885.	Picrite.	Not fresh. In W. T., p. 363.

SUBRANG 2. DOMAGNESIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV."2.4.1"."2.	or 6.67 di 9.42 ab 5.24 hy 5.89 an 14.46 ol 40.33 mt 7.66 il 3.19 ap 1.01	Criffle Mill, Molenich, Cornwall.	E. G. Radley.	J. S. Flett, G. S. Eng. Mem. Sh. 348, p. 101, 1907.	Hornblende picrite.	
2	IV.(1)2.4.1.2.	or 1.67 di 7.50 ab 8.38 hy 6.06 an 14.46 ol 47.18 mt 6.50 il 1.82	Medenbach, n. Dillenburg, Hesse Nassau.	R. Brauns.	R. Brauns, N. J. B. B., XVIII, p. 292, 1904.	Picrite.	
3	(III)IV.(1)2.4. 1(2).2.	or 3.89 di 13.50 ab 12.05 hy 2.00 an 19.18 ol 40.72 mt 4.41 il 3.95 ap 0.67	Lava of 1897, Reunion.	Boiteau.	A. Lacroix, C. R., CLIV, p. 253, 1912.	Olivine basalt.	

CLASS IV. DOFEMANE—Continued.

RANG 2. DOMIRIC. CASSELASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	43.15	9.53	3.40	11.46	16.89	8.58	1.51	0.87	1.28	0.76	2.28	0.13	0.18	CO_2 0.34 ZrO_2 none SO_3 none S 0.04 Cr_2O_3 0.04 V_2O_3 0.03 NiO 0.04 BaO none SrO none	100.61	
A1. I	.719	.093	.021	.159	.422	.154	.025	.009			.026	.001	.003			
2	40.12	7.76	7.35	8.66	23.69	6.53	1.20	0.53	4.03		0.37	0.18		CO_2 trace Cl trace FeS_2 0.20 Cu trace	100.62	2.988
A2. II	.669	.076	.046	.121	.592	.116	.018	.006			.005	.001				
3	38.35	12.02	3.20	8.32	18.70	9.11	3.15	0.84	3.26		3.02	0.43			100.40	
A2. II	.639	.118	.020	.115	.468	.163	.051	.009			.038	.003			(100.37)	
4	39.20	6.24	8.34	7.32	25.65	8.94	1.49	1.16	0.57		0.40		0.45		99.76	
A2. II	.653	.061	.052	.102	.641	.160	.024				.005		.006			

RANG 2. DOMIRIC. CASSELASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	36.17	11.88	11.37	4.17	14.22	11.54	5.38	2.07	n. d.		2.15	0.84	trace		99.79	3.147
A2. II	.603	.117	.071	.058	.356	.206	.087	.022			.028	.006	—			

CLASS IV. DOFEMANE.

RANG 1. PERMIRIC. KALTENASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	34.71	10.74	7.38	14.31	19.09	0.45	0.95	4.97	1.24	0.18	6.12				100.14	3.275
A3. III	.579	.105	.046	.199	.477	.008	.015	.053			.077					

RANG 1. PERMIRIC. KALTENASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	34.98	10.80	1.42	21.33	19.30	0.43	0.17	5.42	1.28		5.18			SO_3 trace	100.31	3.276
A3. III	.583	.106	.009	.296	.483	.007	.003	.058			.065					

RANG 2. DOMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	31.17	6.25	3.22	9.64	19.90	17.76	2.03	2.51	2.05	0.44	2.96	1.69		Cr_2O_3 trace	99.62	3.122
A2. II	.520	.061	.020	.134	.498	.317	.032	.027			.037	.012				

RANG 3. CALCIMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	34.03	8.41	3.13	6.67	14.68	18.20	4.58	1.69	4.02		2.69	1.10		CO_2 trace SO_3 0.94	100.14	
A2. II	.567	.082	.019	.093	.367	.325	.074	.018			.034	.008				

CLASS IV. DO FEMANE.

RANG 1. PERMIRIC. BERGENASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	31.59	8.54	2.36	24.52	10.70	2.25	1.03	0.15	n. d.		18.49	0.02			99.65	
A2. II	.527	.084	.015	.340	.267	.040	.016	.002			.231	—				

ORDER 2. DOPOLIC. SCOTARE—Continued.

SUBRANG 2. DOMAGNESIC. CASSELOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(III)IV.(1)2.(3) 4.(1)2.2.	or 5.00 di 20.51 ab 12.05 ol 34.19 an 16.40 mt 4.87 ne 0.57 il 3.95 ap 0.34	Stony Point. New York.	G. Steiger.	J. P. Iddings, Ign. Rocks, II, p. 337, 1913.	Cortlandite.	
2	IV.″2.4.(1)2.″2.	or 3.34 di 13.40 ab 9.43 ol 44.09 an 14.46 mt 10.67 il 0.76	Highweek, Newton Bushel, Devonshire, England.	K. Busz.	K. Busz, N. J., 1895, I, p. 74.	Picrite.	In W. T., p. 363.
3	(III).IV.″2.″4. (1)2.2.	an 16.12 di 16.46 lc 3.92 ol 23.07 ne 14.48 mt 4.64 il 5.78 ap 1.01	Essay-le-cote, Vosges, France.	Pisani.	A. Michel-Levy, C. R., CXLVIII, p. 1530, 1909.	Nephelinite.	
4	IV.″2.4.(1)2.(1)2.	an 6.95 di 20.52 lc 5.23 ol 43.27 ne 6.82 cs 3.53 mt 12.06 il 0.76	Mount Kjetknjun, Lujavr Urt, Kola, Finland.	W. Petersson.	W. Ramsay, Fennia, XV, No. 2, p. 27, 1898.	Picrite porphyry.	

SUBRANG 3. MAGNESIFERROUS.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(III)IV.2.4.2″. 3(4).	an 2.22 di 12.53 lc 9.59 ol 20.86 ne 24.71 cs 10.32 mt 6.96 il 4.26 hm 6.56 ap 2.02	Shannon Tier, Hobart, Tasmania.	F. P. Paul.	F. P. Paul, T. M. P. M., XXV, p. 305, 1906.	Melilite- nephelite basalt.	Cf. No. 12, III.7.3.4.

ORDER 2. DOPOLIC. SCOTARE. SECTION 5. PEROLIC.

SUBRANG 2. DOMAGNESIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(III)IV.2(3).5.1.2.	or 9.45 ol 41.14 an 2.22 mt 10.67 lc 15.70 il 11.70 ne 4.26 C 2.96	Kaltenthal, Harz.	H. Hirschi.	H. Hirschi, In. Diss. Zür., p. 26, 1901.	Mica peridotite.	

SUBRANG 3. MAGNESIFERROUS. KALTENOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.″2.5.1.(2)3.	an 2.22 ol 56.45 lc 19.62 mt 2.09 ne 0.85 il 9.88 kp 4.11 C 3.88	Upper Kaltenthal, Harz.	Hampe.	M. Koch, Z. D. G. G., XLI, p. 165, 1889.	Mica peridotite.	In W. T., p. 363.

SUBRANG 2. DOMAGNESIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.2.5.2″.2.	an 0.56 ol 38.64 ne 9.09 cs 23.74 kp 8.53 mt 4.64 il 5.62 ap 4.03 (Mg, Fe)O 2.31	Sutherland, Cape Colony.	M. Dittrich.	P. A. Wagner, Diam. Flds. S. Afr., p. 105, 1914.	Melilite basalt.	

SUBRANG 2. DOMAGNESIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.″2.5.″3.2.	an 0.56 di 3.27 lc 7.85 ol 28.69 ne 17.61 cs 24.42 th 1.70 mt 4.41 il 5.17 ap 2.69	Gräbenstetten, n. Urach, Schwäbische Alb, Bavaria.	E. Gaiser.	E. Gaiser, In. Diss. Bres., p. 17, 1904.	Nosean- melilite basalt.	

ORDER 3. POLMITIC. SVERIGARE (C. I. P. W., 1902). SECTION 1. PERPYRIC. BERGENIARE. (C. I. P. W., 1902.)

SUBRANG 3. MAGNESIFERROUS. BERGENOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.3.1″.1.3.	or 1.11 hy 34.32 ab 8.38 ol 3.46 an 11.12 mt 3.48 C 2.65 il 35.11	Storgang, Soggendal, Norway.	C. F. Kolderup.	C. F. Kolderup, Berg. Mus. Aarb., 1896, No. 5, p. 165.	Ilmenite norite.	In W. T., p. 365.

CLASS IV. DOFEMANE—Continued.

RANG 1. PERMIRIC. BERGENASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	41.64	5.86	12.72	19.94	3.97	3.70	1.53	2.53	0.73	0.09	3.88	2.52	1.10		100.21	3.18
A2. II	.694	.057	.079	.276	.099	.066	.024	.027			.049	.018	.014			

RANG 1. PERMIRIC. BERGENASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	24.50	0.48	35.14	32.28	1.25	2.07	n. d.	n. d.	n. d.		1.28	0.01	2.89	S 0.01 Cr_2O_3 0.08 V_2O_3 trace	99.98	
B2. III	.408	.005	.220	.448							.016	—	.041			

RANG 2. DOMIRIC. TUXENASE. (H. S. WASHINGTON, 1917.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	36.70	11.00	14.21	12.24	7.55	11.90	0.95	0.22	1.36		3.85				99.98	
A3. III	.612	.108	.089	.170	.189	.213	.015	.002			048					

RANG 3. CALCIMIRIC. IJUSSASE. (H. S. WASHINGTON, 1917.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	39.43	10.36	13.19	3.98	5.53	15.50	4.23	2.24	0.81		2.27	2.76	trace		100.30	3.058
A2. II	.657	.102	.082	.056	.138	.277	.068	.023			.028	.020	—			

RANG 3. CALCIMIRIC. IJUSSASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	36.24	9.05	10.64	9.58	7.75	14.97	1.05	0.43	0.65		7.12	1.01	0.29	FeS_2 0.97	99.75	
A2. II	.604	.089	.067	.133	.194	.268	.017	.005			.089	007	004			
2	39.48	5.76	8.42	7.55	5.98	12.72	2.08	1.26	2.57	0.42	10.90	1.53	0.27	CO_2 trace Cl none S 0.22 Cr_2O_3 none BaO trace	99.16	3.043
B1. II	.658	.057	.053	.105	.150	.227	034	014			.136	.011	.004			

CLASS IV. DOFEMANE.

RANG 2. DOMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	35.84	10.48	7.25	6.62	12.95	10.90	3.53	1.51			8.85	trace		Cr_2O_3 2.84	100.77	3.051
A2. II	597	.103	.045	.092	.324	.194	.056	.016			.111	—				

RANG 3. CALCIMIRIC. AVEZACASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	31.80	10.96	12.23	9.79	8.40	17.34	0.66	0.27	1.50		3.25	3.32			99.46	
A2. II	.530	.108	076	.137	.210	.310	.011	.003			.041	.023				

CLASS IV. DOFEMANE.

RANG 2. DOMIRIC. ELDORASE. (E. S. BASTIN.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	30.47	9.04	16.37	14.91	7.86	9.33	0.77	2.89	1.32	0.32	2.52	2.87	0.39	CO_2 0.21 S 0.69 CoO 0.03 BaO 0.09 SrO 0.04	100.12	3.374
A1. I	.508	.089	.103	.207	.197	.166	.012	.031			.032	.020	.006			

ORDER 3. POLMITIC. SVERIGARE. SECTION 1. PERPYRIC. BERGENIARE—Continued.

SUBRANG 4. DOFERROUS.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(III)IV.3.1.1(2).4.	Q 6.90 or 15.01 ab 12.58 an 1.67 hy 31.28 mt 18.33 il 7.45 ap 6.05	Boval Road, Bernina District, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Lamprophyre.	Erratic block.

SUBRANG 5. PERFERROUS.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV(V).3(4).1.1.5.	Q 9.30 C 0.48 hy 33.40 mt 51.00 il 2.47	Tucker Lake, Minnesota.	J. T. Singewald.	J. T. Singewald, U. S. Bur. Min. B. 64, p. 105, 1913.	Magnetite ore.	In gabbro. $MgO=MgCO_3$. $CaO=CaCO_3$.

SUBRANG 3. MAGNESIFERROUS. TUXENOSE. (E. GOURDON, 1908.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(III)IV.″3.1″.2.3.	or 1.11 ab 7.86 an 25.30 di 26.93 hy 7.12 ol 2.40 mt 20.65 il 7.30	Cape Tuxen, Graham Land, Antarctica.	Pisani.	E. Gourdon, Exp. Ant. Charc., Pet., p. 159, 1908.	Gabbro.	

SUBRANG 2. DOMAGNESIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(III)IV.(2)3.1.3″.2.	or 12.79 ab 3.14 an 3.06 ne 17.61 di 29.81 wo 7.08 mt 6.50 il 4.26 hm 8.64 ap 6.72	Löbauer Berg, Saxony.	J. Stock.	J. Stock, T. M. P. M., IX, p. 466, 1888.	Nephelite dolerite.	In W. T., p. 359.

SUBRANG 3. MAGNESIFERROUS. IJUSSOSE. (H. S. WASHINGTON, 1916.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.″3.1.(2)3.″3.	or 2.78 ab 5.50 an 18.63 ne 1.85 di 38.45 ol 1.12 mt 11.14 il 13.53 hm 3.04 ap 2.35	Mount Yamaska, Quebec.	G. A. Young.	G. A. Young, Can. G. S. A. R., XVI (1904), p. 40 H, 1906.	Yamaskite.	Incorrect. P_2O_5 on p. 33 H.
2	IV.3.1.3.″3.	Q 1.38 or 7.78 ab 17.82 an 2.50 di 32.40 wo 0.46 hm 8.42 il 16.57 tn 5.29 ap 3.70	Near Siutik, Minassinsk, Jenissei, Siberia.	M. Dittrich.	J. Rakovski, Tr. Mus. Pet. Gr., Ac. Sci. St. Pet., V, p. 256, 1911.	Ijussite (pyroxenite).	

ORDER 3. POLMITIC. SVERIGARE. SECTION 2. DOPYRIC

SUBRANG 2. DOMAGNESIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(III)IV.(2)3.2″.2.2.	or 2.22 an 8.62 lc 5.23 ne 15.90 di 27.22 ol 13.86 il 11.25 hm 7.25 cm 3.74 pf 5.03	Randen, Hegau, Baden.	U. Grubenmann.	U. Grubenmann, In. Diss. Zür., p. 23, 1886.	Melilite basalt.	Ign.=1.92. In W. T., p. 365.

SUBRANG 3. MAGNESIFERROUS. AVEZACOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.(2)3.2.(2)3.(2)3.	an 26.13 lc 1.31 ne 3.12 di 27.13 ol 7.71 cs 1.29 mt 17.63 il 6.23 ap 7.73	Avezac-Prat, Pyrenees, France.	Pisani.	A. Lacroix, Cong. G. Int., VIII, C. R., p. 832, 1901.	Avezacite.	In W. T., p. 365.

ORDER 3. POLMITIC. SVERIGARE. SECTION 3. PYROLIC. UTEIARE. (E. S. BASTIN.)

SUBRANG 3. MAGNESIFERROUS. ELDOROSE. (E. S. BASTIN.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″IV.3.3(4).2.3.	or 13.62 an 12.79 lc 2.83 ne 3.41 di 11.99 ol 17.70 mt 23.90 il 4.86 ap 6.72	Caribou, Boulder County, Colorado.	G. Steiger.	E. S. Bastin, U. S. G. S. rec. lab.	Magnetite gabbro.	

CLASS IV. DOFEMANE.

RANG 1. PERMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	23.16	5.64	17.64	32.78	7.73	2.31	0.96	0.26	0.66	0.15	6.61	0.04	0.78	ZrO_2 0.02 Cl 0.04 F 0.02 S 0.16 Cr_2O_3 0.80 V_2O_3 0.08 NiO 0.20 BaO 0.01 Cu trace	100.05	
A1. I	.386	.055	.110	.455	.193	.041	.016	.003			.083	—	.011			

CLASS IV. DOFEMANE.

RANG 1. PERMIRIC. ARAPAHASE. (WASHINGTON AND LARSEN, 1913.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	19.74	9.72	39.70	15.60	3.70	6.64	0.46	0.66	0.32	0.04	0.58	1.67	0.38	CO_2 none Cr_2O_3 none V_2O_3 0.44 NiO none	99.75	
A1. I	.329	.095	.248	.217	.093	.120	.007	.007			.007	.012	.005			

CLASS IV. DOFEMANE.

RANG 1. PERMIRIC. ADIRONDACKASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	21.42	7.03	30.34	22.81	6.92	3.59	0.53	0.41	0.95		5.21	0.14	trace	CO_2 trace Cl 0.42 S 0.04 Cr_2O_3 none C trace	99.81	
A1. I	.357	.069	.190	.317	.173	.064	.009	.004			.064	.001	—			
2	11.73	6.46	30.68	27.92	3.35	3.95	0.50	0.26	0.64		12.31	0.82		CO_2 0.32 Cl 0.12 F trace S 0.04 V_2O_3 0.04 C 0.05	99.19	4.138
A1. I	.196	.063	.192	.388	.084	.071	.008	.003			.150	.006				
3	20.30	7.60	29.99	25.65	3.68	3.50	n. d.	n. d.	1.70		7.80	0.03	0.34	SO_3 0.10	100.69	
B2. III	.338	.074	.187	.356	.092	.063					.123		.005			

RANG 1. PERMIRIC. ADIRONDACKASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	17.11	2.70	35.61	30.00	1.70	2.50	n. d.	n. d.	n. d.		6.50	trace	1.75	S 0.01 Cr_2O_3 1.11 V_2O_3 1.01	100.00	
B2. III	.285	.026	.223	.417							.081	—	.025			

CLASS IV. DOFEMANE.

RANG 1. PERMIRIC. CHAMPLAINASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	17.90	10.23	15.85	27.95	6.04	2.86	n. d.	n. d.	1.33		15.66	0.04	trace	CO_2 0.10 S 0.14 Cr_2O_3 0.51 V_2O_3 0.55	99.15	4.138
A1. I	.298	.100	.099	.389	.151	.051					.196	—	—			
2	13.35	8.75	20.35	28.82	6.63	2.15	n. d.	n. d.	1.68		16.45	0.02		CO_2 0.17 Cl trace S 0.09 Cr_2O_3 0.55 V_2O_3 0.61 C trace	99.62	
A1. I	.223	.086	.127	.400	.166	.039					.201	—				
3	26.62	11.62	19.50	21.87	2.57	6.47	1.06	0.34	1.30		9.50		0.20		101.05	
B2. III	.444	.115	.122	.304	.064	.116	.017	.003			.119		.003			

CLASS IV. DOFEMANE.

RANG 1. PERMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	21.65	4.89	46.14	21.53	1.20	0.06	n. d.	n. d.	n. d.		none	0.01	2.60	Cr_2O_3 1.01 V_2O_3 0.91	100.00	
B2. III	.361	.048	.288	.299							—	—	.037			

ORDER 3. POLMITIC. SVERIGARE. SECTION 5. PEROLIC.

SUBRANG 4. DOFERROUS.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV″.3.5.1.4.	or 1.67 di 1.18 ab 3.14 ol 40.71 an 10.01 mt 25.52 ne 2.84 il 12.62 cm 1.16	Grunna, S. Ulfön, Nordingra, Sweden.	N. Sahlbom.	J. E. Sobral, G. Nord. Reg., p. 100, 1913.	Titaniferous iron ore.	

ORDER 4. DOMITIC. ADIRONDACKARE. (C. I. P. W. 1902.) SUBORDER 1. PERHEMIC.

SUBRANG 4. DOFERROUS. ARAPAHOSE. (WASHINGTON AND LARSEN, 1913.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.4(5).1.1(2).4.	or 3.89 hy 7.70 ab 3.67 ol 1.12 an 22.24 mt 49.88 C 0.10 il 1.06 hm 5.28 ap 4.03	Pole Mountain, North Park, Colorado.	H. S. Washington.	Washington and Larsen, J. Wash. Ac. Sci., III, p. 450, 1913.	Arapahite (magnetite basalt).	

ORDER 4. DOMITIC. ADIRONRACKARE. SUBORDER 2. DOHEMIC. ADIRONDACKORE. (C. I. P. W., 1902.)

SUBRANG 4. DOFERROUS. ADIRONDACKOSE. (H. S. WASHINGTON, 1917.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.4.″2.1.(3)4.	or 2.22 di 1.11 ab 4.72 hy 9.00 an 15.57 ol 11.64 mt 44.08 il 9.73 ap 0.34	Elizabethtown, Essex County, New York.	W. F. Hillebrand.	J. F. Kemp, U. S. G. S. A. R. 19 (III), p. 408, 1899.	Titaniferous iron ore.	In W. T., p. 365.
2	IV″.4(5).2″.1.4″.	an 14.46 ol 10.57 lc 1.31 mt 44.54 ne 2.27 il 22.80 ap 2.02	Lincoln Pond, Essex County, New York.	W. F. Hillebrand.	J. F. Kemp, U. S. G. S. A. R. 19 (III), p. 407, 1899.	Titaniferous iron ore.	In W. T., p. 365.
3	IV.4.2.1.4.⊙	Q 4.14 hy 15.93 an 17.51 mt 43.38 C 1.12 il 18.70	Joubrechkine, Wichera, Ural Mountains.	Mine analysts.	Duparc et al., Urals Nords, III, p. 187, 1909.	Magnetite rock.	Segregation in gabbro.

SUBRANG 5. PERFERROUS.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV(V).4.2.1.5.	Q 9.24 hy 17.29 C 2.70 mt 51.74 il 12.31 cm 1.57	Iron Lake, Minnesota.	J. T. Singewald.	J. T. Singewald, U. S. Bur. Min. B. 64, p. 106, 1913.	Iron ore.	In gabbro. $MgO=MgCO_3$. $CaO=CaCO_3$.

ORDER 4. DOMITIC. ADIRONDACKARE. SUBORDER 3. TILHEMIC. CHAMPLAINORE. (C. I. P. W., 1902.)

SUBRANG 4. DOFERROUS. CHAMPLAINOSE. (H. S. WASHINGTON, 1917.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.4.3″.1.4.	an 14.18 hy 17.79 C 5.00 ol 5.84 mt 22.97 il 29.79 cm 0.67	Split Rock mine, Essex County, New York.	W. F. Hillebrand.	J. F. Kemp, U. S. G. S. A. R. 19 (III), p. 402, 1899.	Titaniferous iron ore.	In W. T., p. 365.
2	IV″.4.3.1.4.	an 10.84 hy 5.91 C 4.79 ol 14.26 mt 29.46 il 30.55 cm 0.90	Elizabethtown, Essex County, New York.	W. F. Hillebrand.	J. F. Kemp, U. S. G. S. A. R. 19 (III), p. 405, 1899.	Titaniferous iron ore.	In W. T., p. 365.
3	(III)IV.4.(2)3.1.4″.	or 1.67 di 4.89 ab 8.91 hy 5.30 an 26.41 ol 6.46 mt 28.30 il 18.09	Joubrechkine, Wichera, Ural Mountains.	Not stated.	Duparc et al., Urals Nord., III, p. 187, 1909.	Magnetite rock.	Also in C. R., CXLVII, p. 1063, 1908.

ORDER 5. PERMITIC. CORDILLERARE. (E. S. BASTIN.) SUBORDER 1. PERHEMIC.

SUBRANG 5. PERFERROUS.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.″5.1.1.5.	Q 19.20 hy 5.41 C 4.89 mt 66.82 cm 1.57	Iron Lake, Minnesota.	J. T. Singewald.	J. T. Singewald, U. S. Bur. Min. B. 64, p. 106, 1913.	Magnetite ore.	In gabbro.

CLASS IV. DOFEMANE.

RANG 1. PERMIRIC. POMERASE. (E. S. BASTIN.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	10.77	4.61	39.27	21.73	2.34	4.84	0.31	0.24	0.44		13.52	0.02	0.37	S 0.11 V_2O_3 0.52 NiO 0.27 CoO 0.07 BaO 0.07	99.50	
A1. I	.180	.045	.245	.300	.059	.087	.005	.003			.169		.005			
2	10.37	5.01	37.25	28.82	4.23	4.40	0.57	0.12	0.47		8.17	0.09	0.31	S 0.04 Cr_2O_3 0.12 V_2O_3 0.29 NiO 0.26 CoO 0.04	100.66	
A1. I	.173	.049	.233	.400	.106	.079	.009	.001			.102	—	.004			
3	9.60	6.27	44.72	25.31	5.16	3.75	0.15	trace	n. d.	0.51	4.48	0.08			100.03	
A2. II	.160	.062	.279	.352	.129	.067	.002	—			.056	.001				

RANG 1. PERMIRIC. POMERASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	20.67	2.20	41.43	24.05	1.54	0.05	n. d.	n. d.	n. d.		5.75	trace	0.20	Cr_2O_3 1.50 V_2O_3 2.60	99.99	
B2. III	.345	.022	.259	.330							.072	—	.003			

CLASS IV. DOFEMANE.

RANG 1. PERMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	0.99	25.35	24.03	14.26	1.90	19.86	none	none	0.37	0.39	12.50	0.58	0.24	CO_2 0.08 ZrO_2 none S 0.01 Cr_2O_3 none V_2O_3 0.06 NiO none BaO none SrO 0.06	100.68	4.335
A1. I	.017	.249	.150	.198	.048	.355	—	—			.158	.004	.003			

CLASS IV. DOFEMANE. SUBCLASS II. DOPOMIC.

RANG 2. DOMIRIC. ROSELANDASE. (WATSON AND TABER, 1913.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	33.83	5.19	11.38	15.08	8.57	8.22	1.28	0.50	0.75	0.45	10.00	4.84	0.26	CO_2 trace Cl 0.04 F 0.55 S 0.25	101.19	
A1. I	.564	.051	.071	.210	.214	.146	.021	.005			.125	.034	.004		(101.39)	

CLASS IV. DOFEMANE. SUBCLASS II. DOPOMIC.

RANG 2. DOMIRIC. ROSELANDASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	22.02	10.80	8.82	6.44	13.02	13.58	0.70	4.75	2.70	1.51	8.79	6.35	0.15	CO_2 none ZrO_2 none S 0.02 Cr_2O_3 0.01 V_2O_3 0.03 NiO 0.02 BaO 0.48 SrO 0.17	100.36	3.386
A1. I	.367	.106	.055	.089	.326	.243	.011	.051			.110	.045	.002			

CLASS IV. DOFEMANE. SUBCLASS II. DOPOMIC.

RANG 2. DOMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	20.02	2.64	11.75	16.98	5.93	10.27	0.23	0.39	0.71	2.47	20.73	7.34	0.23	CO_2 trace Cl 0.02 F 0.31	100.02	
A2. II	.334	.026	.073	.236	.148	.166	.004	.004			.259	.050	.003			

ORDER 5. PERMITIC. CORDILLERARE. SUBORDER 2. DOHEMIC.

SUBRANG 4. DOFERROUS. POMEROSE. (E. S. BASTIN.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV(V).(4)5.2″. 1(2).4″.	an 11.12 di 5.40 lc 1.31 ol 2.38 ne 1.42 cs 1.89 mt 31.55 il 25.69 hm 17.44	Pine Lake, Victoria County, Ontario.	F. J. Pope.	F. J. Pope, Tr. Am. Inst. M. E., XXIX, p. 380, 1899.	Iron ore.	In gabbro. Not in W. T.
2	IV(V).(4)5.2.1″.4.	an 10.84 di 8.64 lc 0.44 mt 54.06 ne 2.56 il 15.50 MgO 2.64 FeO 4.97	Millbridge, Hastings County, Ontario.	F. J. Pope.	F. J. Pope, Tr. Am. Inst. M. E., XXIX, p. 380, 1899.	Iron ore.	In gabbro. Not in W. T.
3	IV.″5.(1)2.1.″4.	an 16.68 ol 5.02 ne 0.57 cs 0.34 mt 54.73 il 8.51 (MgFe)O 3.41 ap 0.34	Caribou, Boulder County, Colorado.	E. P. Jennings.	E. P. Jennings, Tr. Am. Inst. M. E., XLIV, p. 1054, 1913.	Iron ore.	

SUBRANG 5. PERFERROUS.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.5.(1)2.1.5.	Q 20.67 mt 59.86 C 2.20 il 10.89 cm 2.24 hm 1.28	Iron Lake, Minnesota.	J. T. Singewald.	J. T. Singewald, U. S. Bur. Min. B. 64, p. 106, 1913.	Magnetite ore.	In gabbro. $MgO=MgCO_3$. $CaO=CaCO_3$.

ORDER 5. PERMITIC. CORDILLERARE. SUBORDER 3. TILHEMIC.

SUBRANG 4. DOFERROUS.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.5.(2)3.1.4.	an 2.22 mt 34.80 C 24.58 pf 14.55 ap 1.34 MgO 1.90 CaO 12.71	Iron Hill Area, Uncompahgre quadrangle, Colorado.	G. Steiger.	E. S. Larsen, U. S. G. S. rec. lab.	Iron ore.	In pyroxenite.

ORDER 3. POLMITIC. APPALACHARE. (H. S. WASHINGTON, 1917.) SUBORDER 1. PERPYRIC.

SUBRANG 3. MAGNESIFERROUS. ROSELANDOSE. (WATSON AND TABER, 1913.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV.″II.3″.1.2.3.	Q 7.08 di 1.76 or 2.78 hy 22.94 ab 11.00 mt 16.47 an 6.95 il 19.10 ap 11.42	Roseland, Nelson County, Virginia.	W. M. Thornton.	Watson and Taber, U. S. G. S. B. 430, p. 208, 1910.	Gabbro nelsonite.	Also in Va. G. S. B. III A, p. 140, 1913.

ORDER 3. POLMITIC. APPALACHARE. SUBORDER 5. PEROLIC.

SUBRANG 5. PERFERROUS.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″IV.II.3.5.2.2.	an 12.23 ol 17.92 ne 3.12 cs 4.64 kp 16.12 il 13.53 hm 8.82 pf 2.86 ap 15.12 MgO 2.80	Beaver Creek, Uncompahgre quadrangle, Colorado.	G. Steiger.	E. S. Larsen, U. S. G. S. rec. lab.	Biotite iron ore.	

ORDER 4. DOMITIC. SUBORDER 4. DOTILIC.

SUBRANG 3. MAGNESIFERROUS.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	IV(V).II.4.4.2.3(4).	Q 8.28 hy 14.80 or 2.22 hm 11.75 ab 2.10 il 36.33 C 1.84 ru 1.60 ap 16.80	Nelson County, Virginia.	W. M. Thornton.	Watson and Taber, Va. G. S. B. III. A, p. 135, 1913.	Hornblende nelsonite.	Not fresh.

CLASS V. PERFEMANE. (C. I, P. W., 1902.) SUBCLASS I. P+O+M EXTREME OVER A.

RANG 1. PERMIRIC. MARICASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	55.23	2.08	3.94	6.25	29.29	1.68	n. d.	n. d.	1.12		0.44				100.03	3.297
A3. III	.921	.020	.025	.087	.732	.030	—	—			.006					
2	54.64	2.52	2.10	6.76	30.01	2.51	0.18	0.15	0.58		0.75	0.04	0.25		100.49	
A2. II	.911	.025	.013	.094	.750	.045	.003	.002			.009	—	.004			

RANG 1. PERMIRIC. MARICASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	53.35	1.53	30.18	trace	0.89	1.14	12.61	0.16							99.86	
A3. III	.889	.015	.188	—	.022	.020	.203	.002								

RANG 2. DOMIRIC. WEBSTERASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	53.98	1.32	1.41	3.90	22.59	15.47	n. d.	n. d.	0.83	0.09	0.15	trace	0.21	Cr_2O_3 0.53 NiO trace	100.48	3.301
A2. II	.900	.011	.009	.054	.565	.277	—	—			.002	—	.003			
2	52.55	2.71	1.27	4.90	20.39	16.52	0.27		1.09		0.14	trace	0.24	Cr_2O_3 0.44	100.52	3.304
A2. II	.876	.022	.008	.068	.510	.295	.005				.002	—	.003			
3	55.14	0.66	3.48	4.73	26.66	8.39	0.30	n. d.	0.38		trace	0.23	0.03	Cr_2O_3 0.25 NiO 0.11	100.36	
A2. II	.919	.007	.022	.065	.667	.150	.005	—			—	.002	—			

RANG 2. DOMIRIC. WEBSTERASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	53.21	1.94	1.44	7.92	20.78	13.12	0.11	0.07	0.87	0.14	0.26	trace	0.22	CO_2 0.10 ZrO_2 trace FeS_2 0.03 Cr_2O_3 0.20 V_2O_3 0.03 NiO 0.03 BaO none SrO none	100.47	3.34
A1. I	.887	.019	.009	.110	.520	.134	.002	.001			.003	—	.003			
2	53.25	2.80	0.69	5.93	19.91	16.22	0.19	trace	0.24	0.05			0.09	Cr_2O_3 0.54 NiO 0.07	99.98	
A2. II	.888	.026	.004	.082	.498	.289	.003	—					.001			

RANG 3. CALCIMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	52.29	1.56	0.25	4.53	16.46	23.52	0.11	0.04	1.18		0.29		0.03		100.26	
A2. II	.872	.015	.002	.063	.412	.420	.002	—			.004		—			
2	50.70	1.61	2.02	4.89	17.82	22.45	0.15	0.04	1.16		0.29		0.05		101.18	
B2. III	.845	.016	.013	.068	.446	.401	.002	—			.004		—			

CLASS V. PERFEMANE.

RANG 1. PERMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	46.30	2.58	3.45	3.57	23.18	15.20	0.15		4.77	0.66	trace				99.86	
A3. III	.777	.025	.022	.050	.580	.271	.002				—					

ORDER 1. PERPOLIC. MAORARE. (C. I, P. W., 1902.) SECTION 1. PERPYRIC. CAROLINIARE. (C. I. P. W., 1902.)

SUBRANG 1. PERMAGNESIC. MARICOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	"V.1".1.1.1(2).	Q 4.98 an 5.60 di 2.19 hy 79.56 mt 5.80 il 0.91	Central Mariço District, Transvaal.	J. A. L. Henderson.	J. A. L. Henderson, In. Diss. Leip., p. 39, 1898.	Enstatite pyroxenite.	In W. T., p. 367.
2	"V.1.1.1.1(2).	or 1.11 ab 1.57 an 5.56 di 5.50 hy 80.37 ol 1.46 mt 3.02 il 1.37	New Caledonia.	Boiteau.	A. Lacroix, C. R., CLII, p. 819, 1911.	Bronzitite.	

SUBRANG 5. PERSODIFERROUS. SECTION 5. PERSODIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	"V.1.1.1".'5.5.	Q 0.36 or 1.11 ab 6.81 ac 86.86 di 4.32 hy 0.20	Capo alla Cuculla, Corsica.	J. Deprat.	J. Deprat, B. Sv. Cb. G. Fr., XVII, No. 114, p. 47, 1906.	Aegiritic inclusion in granite.	Cf. No. 1, III.4.1.5.

SUBRANG 1. PERMAGNESIC. WEBSTEROSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	V.1.1.2.1".	Q 0.24 an 3.06 di 58.07 hy 34.25 mt 2.09 il 0.30 cm 0.67	Hebbville, n. Baltimore, Maryland.	T. M. Chatard.	G. H. Williams, A. G., VI, p. 42, 1890.	Websterite.	Complete in U. S. G. S. B. 148, p. 84, 1897. In W. T., p. 367.
2	"V.1.1.2".1(2).	ab 2.62 an 4.73 di 60.95 hy 22.94 ol 4.98 mt 1.86 il 0.30 cm 0.67	Hebbville, n. Baltimore, Maryland.	T. M. Chatard.	G. H. Williams, A. G., VI, p. 42, 1890.	Websterite.	Complete in U. S. G. S. B. 148, p. 84, 1897. In W. T., p. 367.
3	V.1.1."2.1".	Q 2.16 ab 2.62 an 0.56 di 30.72 hy 57.76 mt 5.10 cm 0.45 ap 0.67	Webster, North Carolina.	E. A. Schneider.	G. H. Williams, A. G., VI, p. 44, 1890.	Websterite.	Complete in U. S. G. S. B. 148, p. 92, 1897. In W. T., p. 367.

SUBRANG 2. DOMAGNESIC. CECILOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	V.1.1.2."2.	or 0.56 ab 1.05 an 4.45 di 48.24 hy 41.95 ol 0.41 mt 2.09 il 0.46	Oakwood, Cecil County, Maryland.	W. F. Hillebrand.	A. G. Leonard, A. G., XXVIII, p. 159, 1901.	Websterite.	In W. T., p. 367.
2	"V.1.1.2".(1)2.	ab 1.57 an 6.39 di 58.36 hy 29.08 ol 2.23 mt 0.93 cm 0.67	Bagley Creek, Mount Diablo, California.	W. H. Melville.	W. H. Melville, B. G. S. A., II, p. 406, 1891.	Pyroxenite.	In W. T., p. 367.

SUBRANG 2. DOMAGNESIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	V.1.1.3.(1)2.	an 3.61 ne 0.57 di 88.89 ol 4.74 cs 0.34 mt 0.46 il 0.61	Weresowsky-Ouwal, Iss District, Ural Mountains.	Not stated.	Duparc and Pamfil, B. Soc. Fr. M., XXXIII, p. 354, 1910.	Pyroxenite.	
2	V.1.1(2)."3.(1)2.	an 3.89 ne 0.57 di 81.34 ol 9.27 cs 1.38 mt 3.02 il 0.61	Malai-Pokap River, Iss District, Ural Mountains.	Not stated.	Duparc and Pamfil, B. Soc. Min. Fr., XXXIII, p. 354, 1910.	Pyroxenite.	

ORDER 1. PERPOLIC. MAORARE. SECTION 2. DOPYRIC. MARYLANDIARE. (C. I. P. W., 1902.)

SUBRANG 1. PERMAGNESIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	"V.1.2.1.1".	ab 1.05 an 6.39 di 53.95 hy 6.70 ol 21.69 mt 5.10	Garthby, Wolfe County, Quebec.	M. F. Connor.	J. A. Dresser, Can. G. S. Mem. 22, p. 31, 1913.	Pyroxenite.	

CLASS V. PERFEMANE—Continued.

RANG 2. DOMIRIC. BALTIMORASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	47.00	2.20	3.37	2.92	21.87	16.60	0.07		5.19		0.06		0.56	CO_2 none Cr_2O_3 0.16	100.00	
A2. II	.783	.022	.021	.040	.547	.296	.001				.001		.008			

RANG 2. DOMIRIC. BALTIMORASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	50.80	3.40	1.39	8.11	22.77	12.31	trace	trace	0.52		none	trace	0.17	SO_3 trace Cl 0.24 Cr_2O_3 0.32	100.03	3.318
A2. II	.843	.033	.009	.112	.569	.219	—	—			—	—	.002			
2	45.70	2.54	5.75	6.40	19.45	18.77	0.28	0.06	1.64		0.46		0.02		101.07	
B2. III	.762	.025	.036	.089	.486	.336	.005	.001			.006		—			
3	43.20	4.50	4.80	13.52	13.92	19.88	n. d.	n. d.	0.23						100.05	
A3. III	.720	.044	.030	.188	.348	.355	—	—								

CLASS V. PERFEMANE.

RANG 1. PERMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	47.52	1.18	1.19	9.48	39.20	0.61	0.42		n. d.					Cr_2O_3 0.21	99.81	
A3. III	.792	.011	.008	.132	.980	.011	.007									

RANG 2. DOMIRIC. KOSWASE. (H. S. WASHINGTON, 1917.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	43.71	3.78	4.28	9.70	20.18	17.45	0.34	0.18	0.40		0.57		0.02		100.61	
A2. II	.729	.037	.027	.135	.505	.312	.006	.002			.007		—			

CLASS V. PERFEMANE.

RANG 1. PERMIRIC. GORDUNASE. (U. GRUBENMANN, 1908.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	41.43	0.04	2.52	6.25	43.74	0.55	n. d.	n. d.	4.41				none	Cr_2O_3 0.76 NiO 0.10	99.80	
A2. II	.691	—	.015	.087	1.094	.010	—	—					—			
2	42.99	1.11	1.87	5.91	43.14	0.10	0.29	0.13	4.00	0.51	trace	0.04	0.05	NiO 0.15 BaO none SrO none	100.29	3.075
A2. II	.717	.011	.012	.082	1.079	.002	.005	.001			—	—	—			
3	43.20	2.42	4.45	4.57	38.83	2.75	2.33	0.57	0.77					Cr_2O_3 trace	99.89	
A3. III	.720	.024	.028	.064	.971	.049	.037	.006								
4	40.40	2.63	4.31	4.98	40.37	1.74	n. d.	n. d.	5.33	0.02	trace				99.78	3.073
A3. III	.673	.026	.027	.069	1.009		—	—			—					
5	41.57	1.36	4.04	4.92	37.13	2.71	0.73	0.38	5.90	0.43				Cr_2O_3 0.47	99.64	2.95
A3. III	.693	.013	.025	.068	.928	.048	.012	.004								
6	39.63	0.55	5.01	4.99	43.59	0.06	0.12	0.21	5.58	0.20				Cr_2O_3 0.14	100.08	2.87
A3. III	.661	.005	.031	.069	1.090	.001	.002	.002								

ORDER 1. PERPOLIC. MAORARE. SECTION 2. DOPYRIC. MARYLANDIARE—Continued.

SUBRANG 1. PERMAGNESIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″V.1″.2.2″.1″.	ab 0.52 di 59.82 an 5.84 hy 7.30 ol 16.14 mt 4.87 il 0.15	Dun Mountains, Nelson, New Zealand.	J. S. Maclaurin.	J. M. Bell, G. S. N. Z. B. 12, p. 31, 1911.	Websterite.	

SUBRANG 2. DOMAGNESIC. BALTIMOROSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″V.1.(1)2.2.″2.	an 9.17 di 41.11 hy 34.60 ol 12.11 mt 2.09 cm 0.45	Johnnycake Road, Baltimore County, Maryland.	J. E. Whitfield.	G. H. Williams, A. G., VI, p. 41, 1890.	Pyroxenite.	Complete in U. S. G. S. B. 148, p. 83, 1897. In W. T., p. 367.
2	″V.1(2).2.2(3).(1)2.	an 0.28 di 62.52 lc 2.18 ol 17.90 ne 5.40 cs 2.75 mt 8.35 il 0.91	Near Zakharowna, Tagil, Ural Mountains.	Not stated.	Duparc and Pamfil, B. Soc. M. Fr., XXXIII, p. 351, 1910.	Koswite.	
3	(IV)V.1″.2(3).2(3).2(3).	an 12.23 di 50.62 ol 21.16 cs 7.57 mt 6.96	Koswinsky Kamen, Ural Mountains.	L. Duparc.	Duparc and Pearce, Oural Nord, I, p. 119, 1902.	Koswite.	

ORDER 1. PERPOLIC. MAORARE. SECTION 3. PYROLIC. SAXONIARE. (H. S. WASHINGTON, 1917.)

SUBRANG 1. PERMAGNESIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	V.1.3″.1.1(2).	ab 3.67 di 1.54 an 1.11 hy 37.28 ol 54.14 mt 1.86 cm 0.30	Gaussberg, K. Wilhelm II Land, Antarctica.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (1), p. 84, 1906.	Olivine knolle in basalt.	

SUBRANG 2. DOMAGNESIC. KOSWOSE. (J. P. IDDINGS, 1903.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(IV)V.1(2).3.2.2.	an 8.06 di 45.83 lc 0.87 ol 30.04 ne 1.70 cs 6.54 mt 6.26 il 1.06	Schoulpikha, Tagil, Ural Mountains.	Not stated.	Duparc and Pamfil, B. Soc. M. Fr., XXXIII, p. 351, 1910.	Koswite.	

ORDER 1. PERPOLIC. MAORARE. SECTION 4. DOMOLIC. HELVETIARE. (H. S. WASHINGTON, 1917.)

SUBRANG 1. PERMAGNESIC. GORDUNOSE. (U. GRUBENMANN, 1908.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	V.1.4.1.1″.	di 2.19 hy 19.45 ol 68.96 mt 3.48 cm 1.12	Riddle, Douglas County, Oregon.	F. W. Clarke.	Diller and Clarke, U. S. G. S. B. 60, p. 23, 1890.	Saxonite.	In W. T., p. 369.
2	V.1.4.1.1″.	or 0.56 hy 20.72 ab 2.62 ol 69.27 an 0.28 mt 2.78 C 0.31	Santa Rosa Creek, Rossland Mountains, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38 (1), p. 336, 1912.	Harzburgite.	Fresh.
3	″V.1.4.1.1.	lc 2.62 ac 8.78 ne 5.11 di 10.25 ol 70.19 cs 0.17 mt 2.09	Finkenberg, Rheinland.	Schmidt and Rieke.	F. Zirkel, Abh. Sächs. Ges. W., XXVIII, p. 124, 1903.	Olivine knolle in basalt.	
4	″V.1″.4.1.1″.	an 7.23 di 1.08 hy 17.82 ol 62.02 mt 6.26	Gotthard Tunnel, Tyrol.	L. Hezner.	A. Bodmer-Beder, N. J. B. B., XVI, p. 187, 1903.	Harzburgite.	
5	″V.1″.4.1.1″.	or 2.22 ac 1.39 ab 4.72 di 10.43 hy 9.53 ol 58.91 mt 5.80 cm 0.67	Gigestaffel, n. Andermatt, Switzerland.	C. Schneider.	C. Schneider, In. Diss. Zür., p. 30, 1912.	Diallage peridotite.	
6	V.1″.4.1.1.	or 1.11 hy 16.36 ab 1.05 ol 68.68 an 0.28 mt 7.19	Gigestaffel, n. Andermatt, Switzerland.	C. Schneider.	C. Schneider, In. Diss. Zür., p. 30, 1912.	Diallage peridotite.	

CLASS V. PERFEMANE—Continued.

RANG 1. PERMIRIC. GORDUNASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
7	40.92	1.99	3.82	4.52	39.60	1.59	0.05	0.37	6.55	0.42				Cr_2O_3 0.52	100.35	2.94
A3. III	.682	.020	.024	.063	.990	.029	—	.004								
8	41.65	1.47	2.03	6.49	42.26	1.72	n. d.	n. d.	3.82					Cr_2O_3 trace	99.44	
A4. IV	.694	.014	.013	.090	1.057	.030	—	—								
9	40.77	2.13	4.03	4.48	40.38	0.71	n. d.	n. d.	6.96	0.11	trace			Cr_2O_3 0.66	100.23	2.98
A3. III	.680	.021	.025	.063	1.010	.013	—	—			—					
10	42.73	0.61	3.43	4.99	45.21	0.93	n. d.	n. d.	1.75	0.09	trace			Cr_2O_3 0.54	100.28	3.19
A3. III	.712	.006	.021	.069	1.130	.016	—	—			—					
11	42.42	1.32	4.27	6.96	40.80	1.19	0.72	0.45	0.70		0.30	0.10		S 0.04 Cr_2O_3 0.40	99.67	3.255
A2. II	.707	.012	.027	.097	1.020	.021	.012	.005			.004	.001				
12	43.76	3.31	0.97	7.29	40.67	1.53	0.21	0.09	1.19	0.27	0.06	trace	0.24	ZrO_2 0.02 Cl 0.11 F 0.02 S 0.03 Cr_2O_3 none BaO 0.03 SrO 0.05	99.85	
A1. I	.729	.032	.006	.101	1.017	.027	.003	.001			.001	—	.003			
13	45.22	2.99	0.20	7.17	40.89	1.93	0.55	0.21	0.20	0.05	0.14	0.20	0.28	CO_2 none Cr_2O_3 0.20 NiO 0.14 BaO none SrO 0.04	100.41	3.33
A1. I	.754	.029	.001	.100	1.022	.035	.009	.002			.002	.001	.004			

RANG 1. PERMIRIC. GORDUNASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	42.39	2.26	0.35	10.47	39.19	2.33	n. d.	n. d.	1.54					Cr_2O_3 0.28	99.51	3.152
A3. III	.707	.022	.002	.146	.980	.041	—	—								

CLASS V. PERFEMANE.

RANG 1. PERMIRIC. DUNASE. (C. I. P. W., 1902.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	40.11	0.88	1.20	6.09	48.58	n. d.	n. d.	n. d.	2.74					Cr_2O_3 0.18 Chromite 0.56	100.34	
A4. IV	.669	.009	.007	.085	1.215	—	—	—								
2	38.40	0.29	3.42	6.69	45.23	0.35	0.08	none	4.11	0.24	none	trace	0.24	ZrO_2 none CO_2 1.10 S 0.06 Cr_2O_3 0.07 NiO 0.10 BaO none SrO none	100.38	
A1. I	.640	.003	.021	.093	1.131	.006	.001	—			—	—	.003			
3	39.04	2.89	2.80	7.78	39.99	2.11	0.56	0.09	3.47	0.15	0.36		0.24	S 0.06 Cr_2O_3 0.45 NiO 0.23 CuO 0.02	100.24	
A1. I	.651	.028	.018	.108	1.000	.038	.009	.001			.005		.003			
4	38.82	2.24	3.04	4.90	44.28	none	0.20	—	5.68		none		0.28	CO_2 0.60 Cr_2O_3 0.28	100.32	
A2. II	.647	.021	.019	.068	1.107	—	.003				—		.004			

ORDER 1. PERPOLIC. MAORARE. SECTION 4. DOMOLIC. HELVETIARE—Continued.

SUBRANG 1. PERMAGNESIC. GORDUNOSE—Continued.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
7	″V.1″.4.1.1.	or 2.22 an 4.45 di 2.81 hy 18.92 ol 58.75 mt 5.57 cm 0.67	Gigestellen, n. Andermatt, Switzerland.	C. Schneider.	C. Schneider, In. Diss. Zür., p. 30, 1912.	Diallage peridotite.	
8	V.1.4.1.1″.	an 3.89 di 3.49 hy 15.32 ol 69.87 mt 3.02	Geisspfadpass, Oberwallis, Switzerland.	Hinden.	H. Preiswerk, In. Diss. Basel, p. 16, 1901.	Dunite.	
9	V.1″.″4.1.1.	an 3.61 C 0.82 hy 26.66 ol 55.43 mt 5.80 cm 0.90	Loderio, Switzerland?	L. Hezner.	Cited in C. Schneider, In. Diss. Zür., p. 30, 1912.	Peridotite.	
10	V.1.4.1.1.⊙	an 1.67 di 2.16 hy 18.49 ol 70.66 mt 4.87 cm 0.67	Gorduno Valley, n. Bellinzona, Piedmont.	L. Hezner.	U. Grubenmann, Jh. Nf. Ges. Zür., L (1), p. 13, 1908.	Olivine rock (peridotite).	
11	V.1″.4″.1.1″.	or 2.78 ab 3.67 ac 2.31 di 3.92 hy 8.96 ol 70.72 mt 5.10 il 0.61 cm 0.62 ap 0.34	Porto Moniz, Madeira.	Klüss.	C. Gagel, Z. D. G. G., LXIV, p. 407, 1912.	Olivine bomb.	
12	(IV)V.1.4.1.1″.	or 0.56 ab 1.57 an 7.51 C 0.10 hy 19.31 ol 67.52 mt 1.39	Timor Island, Moluccas.	E. W. Morley.	J. P. Iddings, pers. com.		
13	(IV)V.1.4.1.1″.	or 1.11 ab 4.72 an 5.00 di 3.06 hy 14.28 ol 70.72 mt 0.23 il 0.30 ap 0.34	Mount Gambier, South Australia.	E. R. Stanley.	E. R. Stanley, Tr. R. Soc. S. Aust., XXXIV, p. 65, 1910.	Lherzolite.	

SUBRANG 2. DOMAGNESIC. KAKOULIMOSE. (A. LACROIX, 1911.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″V.1.4.1.(1)2.	an 6.12 di 4.16 hy 15.31 ol 70.79 mt 0.46 cm 0.45	Goose Bay, Magellan Straits, Patagonia.	Not stated.	K. v. Krustchoff, B. Soc. M. Fr., IX, p. 14, 1886.	Peridotite.	In W. T., p. 369.

ORDER 1. PERPOLIC. MAORARE. SECTION 5. PEROLIC. MAORIARE. (C. I. P. W., 1902.)

SUBRANG 1. PERMAGNESIC. DUNOSE. (C. I. P. W., 1902.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	V.1.5.1.1″.	C 0.88 hy 4.60 ol 89.76 mt 1.62 cm 0.56	Corundum Hill, Macon County, North Carolina.	T. M. Chatard.	T. M. Chatard. U. S. G. S. B. 42, p. 55, 1887.	Dunite.	In W. T., p. 369.
2	V.1.5.1.1″.	ab 0.52 an 0.56 di 0.86 hy 4.30 ol 83.50 mt 4.87	Tulameen River, Yale District, British Columbia.	W. F. Hillebrand.	J. F. Kemp, U. S. G. S. B. 193, p. 44, 1902	Peridotite.	In W. T., p. 369.
3	(IV)V.1″.5.1.1(2).	or 0.56 ab 2.62 an 5.00 ne 1.14 di 4.38 ol 77.20 mt 4.18 il 0.76 cm 0.67	Barkevale, Rum Island, Scotland.	W. Pollard.	A. Harker, G. S. Scot., Mem., Sh. 60, p. 80, 1908.	Peridotite.	
4	V.1.4(5).1.1.	ab 1.57 C 1.84 hy 10.13 ol 75.56 mt 4.41 cm 0.45	Mount Bowen, Mikonui, New Zealand.	J. S. Maclaurin.	P. G. Morgan, G. S. N. Z. B. 6, p. 126, 1908.	Dunite.	Not fresh.

CLASS V. PERFEMANE—Continued.

RANG 1. PERMIRIC. DUNASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	39.16	1.11	2.47	11.44	43.64	0.58	0.08	0.16	0.78	0.02	0.11		0.15	CO_2 trace S 0.04 Cr_2O_3 0.61 NiO 0.15 CuO 0.06	100.56	
A1. I	.653	.011	.015	.159	1.091	.010	.001	.002			.001		.002			
2	40.01	2.54	1.00	11.70	39.90	1.68	1.07	0.52	1.10					Cr_2O_3 0.16	99.68	
A3. III	.667	.025	.006	.163	.998	.030	.017	.006								
3	38.32	2.66	4.35	11.78	36.22	2.74	0.16	0.06	3.38		0.28	0.07		Cr_2O_3 0.16	100.18	
A2. II	.639	.026	.027	.164	.906	.049	.003	—			.004	—				

CLASS V. PERFEMANE.

RANG 2. DOMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	48.62	2.66	6.73	6.88	19.44	10.29	0.20	0.06	3.28	0.25	0.57	0.75	0.19	CO_2 trace ZrO_2 none S none Cr_2O_3 0.46 NiO 0.05 BaO none	100.43	
A1. I	.810	.026	.042	.096	.486	.184	.003	.001			.007	.005	.003			

RANG 3. CALCIMIRIC. CEBOLLASE. (H. S. WASHINGTON, 1917.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	40.25	2.74	10.83	7.38	12.04	20.21	0.42	none	0.46	0.46	4.76	0.45	0.16	CO_2 0.07 ZrO_2 none F none S 0.02 Cr_2O_3 none V_2O_3 0.04 NiO none BaO 0.03 SrO trace	100.32	
A1. I	.671	.027	.068	.103	.301	.361	.007	—			.060	.003	.002			
2	37.47	2.86	11.77	7.83	10.12	21.68	0.47	0.93	0.73	0.27	1.07	4.33	0.16	CO_2 0.06 ZrO_2 none F 0.36 S 0.04 V_2O_3 0.12 BaO 0.06 SrO 0.14	100.77	
A1. I	.625	.028	.074	.108	.253	.387	.008	.010			.013	.030	.002			

CLASS V. PERFEMANE.

RANG 2. DOMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	31.77	none	12.97	10.23	15.77	12.20	2.69	0.54	0.60	0.05	12.97	trace	trace		99.79	3.561
A2. II	.530	—	.081	.142	.394	.218	.044	.006			.162	—	—			

CLASS V. PERFEMANE.

RANG 1. PERMIRIC. PERMASE. (H. S. WASHINGTON, 1917.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	31.84	1.37	15.63	14.25	33.10	0.91	n. d.	n. d.	2.49					Cr_2O_3 in Al_2O_3	99.59	
A4. IV	.531	.013	.098	.198	.828	.016	—	—								

CLASS V. PERFEMANE.

RANG 1. PERMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	26.00	0.40	35.00	32.28	1.82	2.24	n. d.	n. d.	n. d.		0.62	0.01	2.26	S none Cr_2O_3 0.01 V_2O_3 trace	100.64	
B2. III	.433	.004	.219	.449							.008	—	.032			
2	24.00	0.51	35.00	32.92	1.20	2.16	n. d.	n. d.	n. d.		1.25	0.01	2.86	S 0.01 Cr_2O_3 0.06 V_2O_3 trace	99.95	
B2. III	.400	.005	.219	.457							.016	—	.041			

ORDER 1. PERPOLIC. MAORARE. SECTION 5. PEROLIC. MAORIARE—Continued.

SUBRANG 2. DOMAGNESIC. GUINEOSE. (A. LACROIX, 1911.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	V.1.5.1.(1)2.	or 1.11, ab 0.52, an 2.22, di 0.43, ol 90.61, mt 3.48, il 0.15, cm 0.90	Abhuin, Rhangail, Rum Island, Scotland.	W. Pollard.	A. Harker, G. S. Scot. Mem., Sh. 60, p. 80, 1908.	Peridotite.	
2	″V.1.5.1.(1)2.	an 0.56, lc 2.62, ne 4.83, di 3.09, ol 84.83, cs 1.20, mt 1.39	Kilometer 86, Conacry-Niger R. R., French Guinea.	Pisani.	A. Lacroix, N. Arch. Mus., III, p. 114, 1911.	Dunite.	
3	″V.1″.(4)5.1.(1)2.	ab 1.57, an 6.39, di 5.72, hy 3.43, ol 72.63, mt 6.26, il 0.61	Kakoulima, French Guinea.	Boiteau.	A. Lacroix, N. Arch. Mus., III, p. 114, 1911.	Wehrlite.	

ORDER 2. DOPOLIC. SECTION 1. PERPYRIC.

SUBRANG 2. DOMAGNESIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(IV)V.(1)2.1.2.″2.	Q 3.84, or 0.56, ab 1.57, an 6.12, di 31.74, hy 39.89, mt 9.74, il 1.06, cm 0.68, ap 1.68	Honeybrook. Pennsylvania.	W. T. Schaller.	F. Bascom, U. S. G. S. rec. lab.	Pyroxenite.	

SUBRANG 2. DOMAGNESIC. CEBOLLOSE. (H. S. WASHINGTON, 1916.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″V.2.1.3.2.	an 5.56, ne 1.99, di 65.02, cs 2.58, mt 9.98, il 9.12, hm 4.00, ap 1.01	Cebolla Springs, Uncompahgre quadrangle, Colorado.	G. Steiger.	E. S. Larsen, U. S. G. S. rec. lab.	Pyroxenite.	
2	(IV)V.2.1.3.2.	an 2.78, lc 4.36, ne 2.27, di 59.49, ol 0.35, cs 0.43, mt 17.17, il 1.98, ap 10.08	Libby, Montana.	G. Steiger.	E. S. Larsen, U. S. G. S. rec. lab.	Apatite pyroxenite.	

ORDER 2. DOPOLIC. SECTION 3. PYROLIC.

SUBRANG 2. DOMAGNESIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	V.2.3.2.2″.	ac 20.33, ks 1.08, di 13.39, ol 23.24, cs 11.70, il 21.58, hm 5.92, pf 2.72	Narsak, Ilimausak, Greenland.	C. Winther.	N. V. Ussing, G. Julhb., p. 205, 1911.	Magnetite pyroxenite.	

ORDER 2. DOPOLIC. SECTION 5. PEROLIC.

SUBRANG 2. DOMAGNESIC. PERMOSE. (J. P. IDDINGS, 1903.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	V.2.(4)5.1.2.	an 3.61, di 0.65, hy 7.06, ol 63.00, mt 22.74	Koswinsky Kamen, Ural Mountains.	Not stated.	Duparc and Pearce, Ural Nord, I, p. 128, 1902.	Dunite.	

ORDER 3. POLMITIC. RHODARE. (C. H. WARREN, 1908.) SECTION 1. PERPYRIC.

SUBRANG 5. PERFERROUS.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(IV).V.3(4).1.1.5.	Q 10.74, C 0.40, hy 33.53, mt 50.81, il 1.22	Tucker Lake, Minnesota.	J. T. Singewald.	J. T. Singewald, U. S. Bur. Min. B. 64, p. 105, 1913.	Magnetite ore.	In gabbro. MgO=$MgCO_3$. CaO=$CaCO_3$.
2	″V.3(4).1.1.5.	Q 8.22, C 0.51, hy 34.72, mt 50.81, il 2.43	Tucker Lake, Minnesota.	J. T. Singewald.	J. T. Singewald, U. S. Bur. Min. B. 64, p. 105, 1913.	Magnetite ore.	In gabbro. MgO=$MgCO_3$. CaO=$CaCO_3$.

CLASS V. PERFEMANE.

RANG 3. CALCIMIRIC. CARDINALASE. (E. S. BASTIN.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	27.71	2.92	21.80	15.70	17.98	6.83	0.19	none	3.51	0.54	2.69	none	0.22	CO_2 0.22 S 0.04 CoO 0.05 BaO trace SrO trace	100.40	3.564
A1. I	.462	.028	.136	.218	.450	.121	.003	—			.034	—	.003			

CLASS V. PERFEMANE.

RANG 1. PERMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	28.65	2.30	21.61	15.93	20.67	3.45	0.63	0.29	3.43		2.55	trace	0.45		99.98	
A2. II	.478	.023	.135	.221	.517	.062	.010	.003			.032	—	.006			

CLASS V. PERFEMANE.

RANG 1. PERMIRIC. RHODASE. (C. H. WARREN, 1908.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	22.35	5.26	14.05	28.84	16.10	1.17	0.44	0.10	...	0.42	10.11	0.02	0.43	CO_2 0.02 S 0.38 Cr_2O_3 trace V_2O_3 0.18 NiO 0.08 Zn 0.71 Cu 0.08 Pb trace	100.74	3.92
A1. I	.373	.052	.088	.401	.403	.021	.006	.001			.126	—	.006			

CLASS V. PERFEMANE.

RANG 1. PERMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	13.81	4.00	35.14	32.40	0.06	0.04	n. d.	n. d.	n. d.		8.25	trace	3.20	S none Cr_2O_3 2.05 V_2O_3 1.03	99.98	
B2. III	.200	.039	.220	.450							.103	—	.045			

CLASS V. PERFEMANE.

RANG 1. PERMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	8.04	0.39	88.41	2.52	0.06	0.23	0.05	0.29	0.17		0.39	trace	0.02	S 0.02	100.59	
A2. II	.134	.004	.553	.035	.002	.004	.001	.003			.005	—	—			

CLASS V. PERFEMANE.

RANG 1. PERMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	7.52	4.45	46.67	22.10	3.13	2.17	0.52	0.22	0.37		10.21	0.07	0.23	S 0.82 Cr_2O_3 0.11 V_2O_3 0.35 NiO 0.31 CoO 0.09	99.34	
B1. II	.125	.044	.292	.307	.078	.039	.008	.002			.127	—	.003			
2	4.08	6.40	33.43	34.58	3.89	0.65	0.29	0.15	1.32		14.25	0.02	0.45	Cr_2O_3 0.20	99.71	
A2. II	.068	.063	.209	.480	.097	.011	.005	.002			.176	—	.006			

RANG 1. PERMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	1.47	0.67	62.39	26.93	0.33	0.72	n. d.	n. d.	0.31		6.41	0.03	0.45	S 0.06 V_2O_3 0.23 NiO 0.22 CoO 0.05	100.27	
A2. II	.025	.006	.390	.374	.008	.013					.080		006			

ORDER 3. POLMITIC. RHODARE. SECTION 3. PYROLIC.

SUBRANG 2. DOMAGNESIC. CARDINALOSE. (E. S. BASTIN.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″V.″3.3″.(1)2.2″.	ab 1.57 di 21.03 an 6.95 ol 29.69 mt 31.55 il 5.17	Caribou, Boulder County, Colorado.	G. Steiger.	E. S. Bastin, U. S. G. S. rec. lab.	Magnetite peridotite.	

ORDER 3. POLMITIC. RHODARE. SECTION 4. DOMOLIC.

SUBRANG 2. DOMAGNESIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(IV)V.″3.4.1″.2.	or 1.67 di 11.42 ab 5.24 hy 2.80 an 2.78 ol 36.49 mt 31.32 il 4.86	Riccoletta, Traversella Valley, Monzoni, Tyrol.	Dittrich and Pohl.	J. Romberg, Anh. Abh. Pr. Ak. W., p. 70, 1904.	Wehrlite.	

ORDER 3. POLMITIC. RHODARE. SECTION 5. PEROLIC.

SUBRANG 3. MAGNESIFERROUS. RHODOSE. (C. H. WARREN, 1908.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(IV)V.3.5.1.3.	or 0.56 ol 47.89 ab 2.10 mt 20.42 an 5.84 il 19.15 ne 0.57 C 2.45	Iron Mine Hill, Cumberland, Rhode Island.	C. H. Warren.	Johnson and Warren, A. J. S., XXV, p. 24, 1908.	Cumberlandite.	

ORDER 4. DOMITIC. SECTION 2. DOHEMIC.

SUBRANG 5. PERFERROUS.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″V.4.2.1.5.	Q 4.32 hy 20.86 C 4.00 mt 51.04 il 15.66 cm 3.14	Iron Lake, Minnesota.	J. T. Singewald.	J. T. Singewald, U. S. Bur. Min. B. 64, p. 106, 1913.	Magnetite ore.	In gabbro. $MgO=MgCO_3$. $CaO=CaCO_3$.

ORDER 5. PERMITIC. SECTION 1. PERHEMIC. SUBSECTION 5. PERHEMATITIC.

SUBRANG 5. PERFERROUS.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	V.5.1.5.1.5.	Q 6.24 di 0.43 or 1.67 wo 0.23 ab 0.52 mt 6.96 il 0.76 hm 83.68	Valerius claim, Kiruna, Lapland, Sweden.	G. Nyblom.	P. Geijer, G. Kir. Dist., p. 177, 1910.	Iron ore.	

ORDER 5. PERMITIC. SECTION 2. DOHEMIC.

SUBRANG 4. DOFERROUS.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	″V.5.2.1.4.	an 9.45 ol 4.34 lc 0.87 cs 0.43 ne 2.27 mt 42.46 il 19.30 hm 17.44 MgO 0.64	Newboro, Leeds County, Ontario.	F. J. Pope.	F. J. Pope, Tr. Am. Inst. M. E., XXIX, p. 380, 1899.	Iron ore.	In gabbro. Not in W. T.
2	″V.5.2(3).1.4″.	an 3.06 ol 2.41 lc 0.87 mt 48.49 ne 1.42 il 26.75 C 4.59 (MgFe)O 9.58	Routivara, Sweden.	W. Petersson.	W. Petersson, G. F. F., XV, p. 49, 1893.	Magnetite spinellite.	In W. T., p. 369.

SUBRANG 5. PERFERROUS.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	V.5.(1)2.1.5.	an 1.67 di 1.51 mt 69.60 il 12.16 hm 14.40	Eagle Lake, Frontenac County, Ontario.	F. J. Pope.	F. J. Pope, Tr. Am. Inst. M. E., XXIX, p. 380, 1899.	Iron ore.	In gabbro. Not in W. T.

CLASS V. PERFEMANE.

RANG 1. PERMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	7.82	3.20	29.40	29.78	5.67	3.42	0.61	0.17	0.38		17.23	0.14	0.22	S 0.06 V_2O_3 0.63 NiO 0.43 CoO 0.10	99.26	
B1. II	.130	.031	.184	.414	.142	.061	.010	.002			.215	—	.003			
2	1.11	6.18	39.18	30.73	4.04	n. d.	n. d.	n. d.	0.26		18.82	0.08	0.46	S 0.02 NiO 0.07	100.95	
B2. III	.018	.060	.245	.427	.101						.235	—	.007			

CLASS V. PERFEMANE.

RANG 1. PERMIRIC. URBAINASE. (H. S. WASHINGTON, 1917.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	2.24	1.65	13.61	24.49	4.04	0.30	n. d.	n. d.	n. d.		53.35		0.30		99.98	
A2. II	.037	.015	.085	.340	.101	.005					.667		.004			
2	0.60	n. d.	22.11	31.11	3.15	0.55	n. d.	n. d.	n. d.		41.75	0.02	0.28		99.57	
A3. III	.010	—	.138	.435	.079	.010					.522	—	.004		(99.95)	

CLASS V. PERFEMANE. SUBCLASS II. DOPOMIC.

RANG 3. CALCIMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	8.43	0.74	19.16	13.68	5.06	19.98	0.35	0.59	0.65	0.35	24.74	5.58	0.26	CO_2 none ZrO_2 0.01 Cl none F 0.19 S 0.04 Cr_2O_3 none V_2O_3 0.20 NiO 0.05 BaO 0.05 SrO 0.12	100.23	
A1. I	.141	.007	.120	.190	.127	.357	.006	.006			.309	.039	.004			

CLASS V. PERFEMANE. SUBCLASS II. DOPOMIC.

RANG 3. CALCIMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	1.24	n. d.	31.45	20.20	0.64	12.73	0.10	0.34	0.97	0.20	15.78	9.40	0.23	Cl trace F 0.23	99.42	4.214
A2. II	.021	—	.197	.281	.016	.227	.002	.003			.197	.066	.003			

CLASS V. PERFEMANE. SUBCLASS II. DOPOMIC.

RANG 2. DOMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	1.65	n. d.	15.59	23.57	0.50	9.03	n. d.	n. d.	0.87	0.53	41.46	7.59	0.26	CO_2 trace Cl trace F 0.17	101.22	
B2. III	.028	—	.098	.328	.013	.161	—	—			.518	.053	.004			
2	0.70	n. d.	11.12	27.93	0.72	8.34	n. d.	n. d.	0.58	0.15	42.84	6.89	0.18	CO_2 trace Cl 0.01 F 0.21	99.67	
A2. II	.012	—	.070	.388	.018	.149	—	—			.536	.049	.003			

ORDER 5. PERMITIC. SECTION 3. TILHEMIC.

SUBRANG 4. DOFERROUS.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	(IV)V.(4)5.″3.1″.4.	an 5.28 ol 6.28 lc 0.87 cs 3.61 ne 2.84 mt 43.38 il 32.68 MgO 2.56 FeO 0.50	Horton Township, Renfrew County, Ontario.	F. J. Pope.	F. J. Pope, Tr. Am. Inst. M. E., XXIX, p. 380, 1899.	Iron ore.	In gabbro. Not in W. T.
2	V.5.(2)3.1.4.	C 6.18 hy 1.80 mt 46.40 il 35.72 hm 7.20 MgO 3.32	Hellevig, Söndfjord, Norway.	Riley.	Cited in J. H. L. Vogt, Zs. Prakt. G., VIII, p. 236, 1900.	Titanomagnetite spinellite.	Not in W. T.

ORDER 5. PERMITIC. SECTION 4. DOTILIC. SUBSECTION 2. DOMILMENIC.

SUBRANG 4. DOFERROUS. URBAINOSE. (H. S. WASHINGTON, 1917.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	V.5.4(5).2″.1.4.	an 1.39 ol 3.78 C 1.02 hm 13.61 il 52.29 ru 25.84 MgO 1.88	St. Urbain, n. Quebec, Quebec.	R. S. Anderson.	C. H. Warren, A. J. S., XXXIII, p. 275, 1912.	Urbainite.	
2	V.5.″4.2.1.4(5).	wo 1.16 mt 32.02 il 45.75 ru 17.68 MgO 3.15	Ankershus, Ekersund, Norway.	A. Tamm.	C. F. Kolderup, Berg. Mus. Aarb., 1896, No. 5, p. 178.	Ilmenitite.	

ORDER 4. DOMITIC. SUBORDER 4. DOTILIC.

SUBRANG 4. MAGNESIFERROUS.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	V.II.4.4.3.3(4).	kp 1.90 ac 2.31 ne 0.28 ol 7.14 cs 9.63 il 29.49 hm 18.40 pf 15.64 ap 13.10 MgO 1.00	Near Cebolla, Uncompahgre quadrangle, Colorado.	G. Steiger.	E. S. Larsen, U. S. G. S. rec. lab.	Perofskite rock.	

ORDER 5. PERMITIC. VIRGINARE. (WATSON AND TABER, 1913.) SUBORDER 3. TILHEMIC.

SUBRANG 5. PERFERROUS.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	V.II.5.3.″3.5.	or 1.67 mt 20.18 ne 0.57 il 29.94 hm 18.08 ap 22.18 MgO 0.64 CaO 0.39	Lovingston, Nelson County, Virginia.	W. M. Thornton.	Watson and Taber, Va. G. S. B. III A, p. 125, 1913.	Magnetite nelsonite.	Not fresh.

ORDER 5. PERMITIC. VIRGINARE. SUBORDER 4. DOTILIC.

SUBRANG 5. PERFERROUS.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	V.″II.5.4.2″.5.	Q 0.90 hy 1.30 il 50.46 hm 15.59 ru 14.88 ap 17.81	Roseland, Nelson County, Virginia.	W. M. Thornton.	Watson and Taber, Va. G. S. B. III A, p. 109, 1913.	Ilmenite nelsonite.	
2	V.″II.5.4(5).″2.5.	hy 0.60 ol 0.84 il 59.44 hm 11.12 ru 11.60 ap 16.46	Roseland, Nelson County, Virginia.	W. M. Thornton.	Watson and Taber, Va. G. S. B. III A, p. 109, 1913.	Ilmenite nelsonite.	

CLASS V. PERFEMANE. SUBCLASS II. DOPOMIC.

RANG 3. CALCIMIRIC. NELSONASE. (WATSON AND TABER, 1913.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A2. II	0. 95 .016	n. d. —	3. 65 .023	7. 95 .111	0. 25 .006	11. 13 .199	n. d. —	n. d. —	0. 35	0. 21	65. 90 .824	8. 14 .057	0. 26 .004	CO_2 trace Cl none F 0. 34 S 1. 61	100. 74	
2 B2. III	0. 57 .010	n. d. —	4. 31 .027	26. 52 .368	1. 11 .028	16. 33 .291	n. d. —	n. d. —	0. 59	0. 09	37. 00 .463	13. 08 .092	0. 38 .005	CO_2 trace Cl trace F 0. 98 S 1. 45	102. 41 . 79 101. 62	4. 073
3 A3. III	n. d. —	n. d. —	2. 70 .017	29. 14 .404	0. 50 .013	16. 05 .287	n. d. —	n. d. —	0. 03		37. 68 .471	12. 48 .087	trace —	Cl trace F 1. 03 S 1. 17	100. 78	

RANG 4. DOCALCIC. VIRGINASE. (WATSON AND TABER, 1913.)

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A2. II	0. 67 .011	n. d. —	2. 87 .018	5. 04 .070	0. 15 .004	12. 16 .217	n. d. —	n. d. —	0. 11	0. 09	69. 67 .871	9. 41 .066		Cl trace F 0. 70 S 0. 34	101. 21	

CLASS V. PERFEMANE. SUBCLASS III. POMAPATIC.

RANG 4. DOCALCIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A3. III	6. 32 .105	2. 10 .021	23. 12 .145	15. 80 .219	1. 92 .048	26. 26 .469	n. d. —	n. d. —	n. d. —		4. 57 .087	16. 47 .116	0. 51 .006	CO_2 trace F 1. 50	99. 57	

CLASS V. PERFEMANE. SUBCLASS III. POMAPATIC.

RANG 5. PERMIRIC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A4. IV	n. d. —	n. d. —	n. d. —	1. 19 .017	n. d. —	21. 23 .379	n. d. —	n. d. —	0. 97		59. 30 .741	16. 15 .114		F 1. 30 S 0. 67	100. 81	

ORDER 5. PERMITIC. VIRGINARE. SUBORDER 5. PERTILIC. VIRGINORE. (WATSON AND TABER, 1913.)

SUBRANG 5. PERFERROUS. NELSONOSE. (WATSON AND TABER, 1913.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	V.II.5.5.3(4).5.	hy 1.92 il 12.16 hm 3.16 ru 59.52 ap 19.15 pr 3.00	Roseland, Nelson County, Virginia.	W. M. Thornton.	Watson and Taber, Va. G. S. B. III A, p. 120, 1913.	Rutile nelsonite.	
2	V.II.5.5.″3.5.	hy 1.00 il 53.35 hm 4.31 ru 8.96 ap 30.91 pr 2.64 MgO 0.72	Rose's mill, Nelson County, Virginia.	W. M. Thornton.	Watson and Taber, Va. G. S. B. III A, p. 109, 1913.	Ilmenite nelsonite.	
3	V.II.5.5.″3.5.	il 58.67 hm 2.70 ru 6.80 pr 2.16 ap 29.23	Rose's Mill, Nelson County, Virginia.	W. M. Thornton.	Watson and Taber, Va. G. S. B. 430, p. 208, 1910.	Ilmenite nelsonite.	Also in Va.G.S.B. III A, p.109,1913.

SUBRANG 5. PERFERROUS. VIRGINOSE. (WATSON AND TABER, 1913.)

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	V.II.5.5.4(5).5.	hy 1.32 il 9.58 hm 2.87 ru 64.64 ap 22.18	Rose's mill, Nelson County. Virginia.	W. M. Thornton.	Watson and Taber, Va. G. S. B. III A, p. 120, 1913.	Rutile nelsonite.	

ORDER 5. PERMITIC. SUBORDER 2. DOHEMIC.

SUBRANG 2. DOCALCIC.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	V.″III.″5.2.(3) 4.″2.	Q 0.90 an 5.84 hy 4.80 mt 32.02 il 13.22 hm 1.12 ap 38.98	Alnö, Sweden.	P. J. Holmquist.	A. G. Högbom, Afh. Sv. G. Und., No. 148, p. 56, 1895.	Magnetite-apatite rock.	Not in W. T.

ORDER 5. PERMITIC. SUBORDER 5. PERTILIC.

SUBRANG 5. PERFERROUS.

No.	Symbol.	Norm.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	V.(II)III.5.5.5.5.	il 2.58 ru 57.92 ap 38.30	Rose's mill, Nelson County, Virginia.	W. M. Thornton.	Watson and Taber, Va. G. S. B. III, p. 208, 1913.	Rutile nelsonite.	

Part II.—INCOMPLETE ANALYSES OF FRESH ROCKS.

GRANITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A3. III	67.76	14.00	n. d.	5.18	1.00	4.28	5.22	1.19	1.01		0.46	0.19	trace		100.29	2.709
2 A4. IV	62.54	14.79	n. d.	8.49	2.08	1.49	6.27	1.12	3.51						100.29	
3 A4. IV	74.78	14.56	3.04	n. d.	trace	0.69	6.02	0.59	0.42						100.10	2.64
4 A3. III	72.97	14.63	n. d.	1.73	0.27	1.48	3.28	5.18	0.33				0.10	CO_2 none S 0.03	100.00	
5 A4. IV	69.56	15.38	2.65	n. d.	trace	1.76	5.38	4.31	1.02						100.06	
6 A4. IV	76.52	12.21	n. d.	2.66	0.13	0.79	2.86	4.68	0.41						100.26	2.633
7 A4. IV	69.47	17.50	2.30	n. d.	0.31	2.57	3.01	4.07	0.74	0.08			trace	S 0.04	100.09	
8 A4. IV	69.33	14.33	n. d.	3.60	2.44	3.21	2.70	2.67	1.22			0.10			99.60	
9 A4. IV	66.92	18.19	3.05	n. d.	1.26	4.95	3.83	2.02	0.46						100.68	
10 A4. IV	66.31	18.27	2.51	n. d.	1.22	2.91	3.69	4.09	0.62						99.61	
11 A4. IV	76.54	13.82	1.62	n. d.	0.01	0.85	4.32	2.31	0.20						99.67	
12 A4. IV	69.34	17.25	2.46	n. d.	1.18	3.43	4.33	0.71	1.17						99.87	
13 A3. III	73.65	14.28	2.65	n. d.	0.81	1.28	2.51	3.95	0.65			0.15	trace	Cl 0.05	99.98	
14 A3. III	68.01	17.34	3.66	n. d.	0.77	2.06	2.05	4.41	0.64		0.83	0.41		Cl 0.07	100.25	
15 A4. IV	70.48	14.24	3.72	n. d.	0.40	1.48	3.66	4.26	1.59						99.83	
16 A4. IV	68.60	16.15	n. d.	2.93	0.66	2.35	5.54	3.34	1.04				trace		100.58	
17 A3. III	69.30	14.40	n. d.	3.02	1.94	2.97	3.30	4.15	1.00		0.84	0.13			100.92	
18 A3. III	67.50	15.65	n. d.	2.43	1.70	1.77	2.95	4.08	3.20		0.26				99.54	
19 A4. IV	70.84	14.53	2.46	n. d.	1.17	1.45	3.04	5.12	1.71						100.32	
20 A4. IV	71.04	15.00	n. d.	2.93	0.39	1.90	3.99	4.59	0.48				trace		100.32	

GRANITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Whitson Lake, near Sudbury, Ontario.	T. L. Walker.	T. L. Walker, Q. J. G. S., LIII, p. 56, 1897.	Granite.	In W. T., p. 225.
2	Lost Lake, Gowganda Lake. District, Ontario.	N. L. Turner.	N. L. Bowen, J. G., XVIII, p. 667, 1910.	Granophyre.	
3	Monhegan Island, Maine.	E. C. E. Lord.	E. C. E. Lord, A. G., XXVI, p. 343, 1900.	Aplite.	In W. T., p. 157.
4	Jonesboro, Washington County, Maine.	Ricketts and Banks.	T. N. Dale, U. S. G. S. B. 313, p. 170, 1907.	Granite.	
5	Barre, Vermont.	W. C. Day.	W. C. Day, U. S. G. S. A. R. 19, VI, p. 224, 1898.	Granite.	In W. T., p. 373.
6	Milford, Massachusetts.	R. C. Sweetzer.	T. N. Dale, U. S. G. S. B. 354, p. 88, 1908.	Granite.	
7	Chester, Massachusetts.	Not stated.	W. C. Day, U. S. G. S. A. R. 18, V, p. 965, 1897.	Granite.	In W. T., p. 373.
8	Near Pierce's mill, Broad Branch, District of Columbia.	R. L. Packard.	G. H. Williams, U. S. G. S. A. R. 15, p. 672, 1895.	Granite.	In W. T., p. 373.
9	Grantville, Coweta County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9A, p. 90, 1902.	Granite.	
10	Camak, Warren County, Georgia.	T. L. Watson.	T. L. Watson, J. G., IX, p. 119, 1901.	Granite.	
11	Granite Heights, near Wausau, Wisconsin.	W. W. Daniells.	E. R. Buckley, G. S. Wisc. B. IV, p. 136, 1898.	Granite.	In W. T., p. 137.
12	Saganaga Lake, Minnesota.	A. D. Meeds.	U. S. Grant, G. S. Minn. A. R. 21, p. 43, 1893.	Granite.	In W. T., p. 193.
13	Ardclach, Scotland.	W. Mackie.	W. Mackie, Tr. Edin. G. Soc., VIII (1), p. 54, 1901.	Granite.	
14	Ruthrie, Aberlour, Scotland.	W. Mackie.	W. Mackie, Tr. Edin. G. Soc., VIII (1), p. 54, 1901.	Granite.	
15	Barnavave, Carlingford, Ireland.	S. Haughton.	W. J. Sollas, Tr. R. Ir. Ac., XXX (XI), p. 491, 1894.	Granite.	In W. T., p. 167.
16	Cevins, Isere Valley, France.	E. Ritter.	E. Ritter, B. Sv. Ct. G. Fr., IX, No. 60, p. 30, 1897.	Protogine.	Not in W. T.
17	Les Halles, Lyonnais, France.	Pisani.	A. Michel-Levy, C. R., CLVI, p. 718, 1913.	Granite.	
18	Violay, Lyonnais, France.	Pisani.	A. Michel-Levy, C. R., CLVI, p. 718, 1913.	Microgranulite.	
19	Pelvoux, Dauphiny, France.	Rüst.	P. Termier, B. Soc. G. Fr., XXVII, p. 404, 1899.	Granite.	Not in W. T.
20	Mont Blanc, France.	E. Ritter.	E. Ritter, B. Sv. Ct. G. Fr., IX, No. 60, p. 30, 1897.	Protogine.	Not in W. T.

GRANITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
21 A4. IV	72.10	15.80	2.71	n. d.	1.27	1.99	3.10	3.12	0.50						100.59	
22 A4. IV	70.54	14.77	3.70	n. d.	0.36	1.68	4.66	4.82	0.44						99.97	
23 A4. IV	73.06	14.46	n. d.	2.35	0.14	0.92	3.27	5.15	1.17						100.52	
24 A3. III	70.08	13.14	n. d.	4.24	0.94	2.92	2.93	3.94	1.00		0.76	0.11	0.12		100.18	
25 A3. III	70.05	14.78	n. d.	3.37	0.44	3.42	3.10	4.13	0.42		0.19		0.22		100.12	
26 A3. III	55.72	21.35	n. d.	8.81	0.63	5.10	5.71	1.23	0.46		0.57		0.36		99.94	
27 A4. IV	56.97	20.96	n. d.	3.28	0.77	6.58	6.63	2.91	1.96		0.68				100.52	
28 A4. IV	70.90	14.32	2.96	n. d.	0.49	0.84	4.16	5.72	0.45	0.10			trace	SO_3 trace	99.94	
29 A4. IV	70.57	16.13	3.52	n. d.	0.99	1.79	2.48	3.74	0.87						100.09	
30 A4. IV	66.88	17.89	3.75	n. d.	1.53	1.44	3.55	3.77	1.93					CO_2 0.08	100.82	2.68
31 A3. III	74.32	10.66	5.31	n. d.	trace	0.50	2.14	5.77	0.35		0.64		0.06	FeS_2 0.06	99.81	
32 A3. III	72.61	13.64	2.81	n. d.	0.60	2.04	3.27	4.82	0.58		0.18	0.12			100.62	2.652
33 A4. IV	69.66	16.98	2.54	n. d.	0.83	1.66	3.95	4.41	0.55					BaO 0.02	100.58	
34 A4. IV	68.58	15.67	2.95	n. d.	1.17	2.10	2.36	5.01	1.30			0.40			99.54	
35 A4. IV	54.73	14.02	2.34	4.92	7.40	10.20	2.98	2.67	1.23		trace	trace			100.49	
36 A4. IV	71.31	15.31	3.82	n. d.	trace	1.68	4.08	3.57	0.40	0.43		trace		Cl 0.14 S none	100.74	
37 A3. III	72.00	12.96	1.98	n. d.	0.41	1.12	5.85	4.06	0.20		1.56		0.30		100.44	

QUARTZ PORPHYRY.

1 A4. IV	77.30	11.08	3.91	n. d.	0.45	0.68	3.44	3.22	0.28						100.36	2.64
2 A4. IV	67.77	17.57	n. d.	1.59	0.49	0.51	6.20	4.56	1.47	0.73					100.89	

GRANITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
21	Querigut, Pyrenees.	Pisani.	A. Lacroix, B. Sv. Ct. G. Fr., XI, No. 71, p. 31, 1900.	Granite.	In W. T., p. 135.
22	Loken, Holmestrand, Norway.	G. Forsberg.	W. C. Brögger, Z. K., XVI, p. 57, 1890.	Aegirite granite.	In W. T., p. 167.
23	Bejby, Sweden.	Gerhard.	Gerhard, In. Diss. Leip., 1887.	Granitite.	Osann, II, p. 14.
24	Tappan, Grangesberg, Sweden.	A. Grabe.	H. Johannsson, G. F. F., XXXII, p. 280, 1910.	Granulite (granite).	
25	Kortfors, Orebro, Sweden.	H. Santesson.	H. Bäckström, G. F. F., XVI, p. 108, 1894.	Kugel granite.	In W. T., p. 167.
26	Kortfors, Orebro, Sweden.	H. Santesson.	H. Bäckström, G. F. F., XVI, p. 108, 1894.	Kugel in granite.	In W. T., p. 409.
27	Slattmosa, Sweden.	H. Bäckström.	H. Bäckström, G. F. F., IX, p. 360, 1887.	Orbicular granite.	In W. T., p. 377.
28	Kullorberg, Pitkäranta, Finland.	A. Poehl.	O. Trüstedt, B. C. G. Fin., No. 19, p. 58, 1907.	Granite.	
29	Near Karppi, Orivesi, Finland.	H. Berghell.	J. J. Sederholm, B. C. G. Fin., No. 6, p. 151, 1897.	Granite.	In W. T., p. 135.
30	Lamersdorf, n. Aachen, Rheinland.	F. H. Hatch.	A. v. Lasaulx, Ref. N. J., I, p. 53, 1886.	Granite.	In W. T., p. 169.
31	Hagendorf, near Waidhaus, Bayrischewald.	Not stated.	K. W. v. Gümbel, G. v. Bayern, II, p. 436, 1894.	Granite.	Not in W. T.
32	Schwarzbrunn, Gablonz, Bohemia.	R. Reinisch.	R. Reinisch, T. M. P. M., XXV, p. 536, 1906.	Granite.	
33	Karlsbad, Bohemia.	A. Schwager.	A. Schwager, Geog. Jhft. Cas., VII, p. 69, 1895.	Granite.	In W. T., p. 169.
34	Adalbertus Rock, Bohemia.	Not stated.	J. E. Hibsch, T. M. P. M., XV, p. 209, 1896.	Granitite.	In W. T., p. 169.
35	Topla, Carinthia.	H. V. Graber.	H. V. Graber, Jb. G. R.-A. Wien, XVLII, p. 278, 1897.	Concretion in granite.	TiO_2 n. d. Cf. No. 275, I.4.2.3. In W. T., p. 323.
36	Castlemaine Goldfield, Victoria.	P. G. W. Bayley.	J. W. Gregory, G. S. Vict. Mem. 2, p. 34, 1903.	Granite.	
37	Snares Island, New Zealand.	B. C. Aston.	B. C. Aston, Subant. Islds., II, p. 769, 1909.	Granite.	

QUARTZ PORPHYRY.

1	Rigaud Mountain, Quebec.	O. E. LeRoy.	O. E. LeRoy, B. G. S. A., XII, p. 389, 1901.	Quartz porphyry.	
2	Preston, Black Hills, South Dakota.	J. Flintermann.	J. D. Irving, An. N. Y. Ac. Sci., XII, p. 277, 1899.	Quartz porphyry.	

QUARTZ PORPHYRY—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
3 A4. IV	71.10	17.80	2.57	n. d.	1.02	0.94	2.32	3.72	1.20						100.67	
4 A4. IV	64.50	18.10	4.12	n. d.	2.07	0.99	2.15	5.35	3.39						100.38	
5 A3. III	74.66	11.49	2.02	n. d.	0.10	0.44	1.69	8.68	0.74			0.07	0.08		99.97	2.598
6 A4. IV	65.82	15.94	5.06	n. d.	trace	1.65	3.54	6.17	1.85				trace		100.03	2.68
7 A4. IV	75.04	13.12	2.12	n. d.	0.34	0.40	2.44	6.32	0.76						100.54	
8 A4. IV	74.64	14.64	1.12	n. d.	0.72	1.01	2.36	4.01	2.12						100.62	
9 A4. IV	74.56	13.52	2.04	n. d.	0.44	0.32	3.48	4.94	0.64						99.94	
10 A4. IV	71.84	16.32	3.32	n. d.	0.52	0.36	2.13	4.32	1.48						100.29	
11 A4. IV	64.08	19.52	4.24	n. d.	1.84	3.40	2.52	3.16	1.76						100.52	
12 A3. III	71.58	13.01	3.13	n. d.	1.14	1.81	3.33	3.63	1.07		0.83				99.53	2.64

RHYOLITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A3. III	72.85	12.92	2.98	n. d.	0.38	0.90	7.08	3.01	0.65			none	none		100.77	
2 A3. III	71.10	11.39	5.33	n. d.	1.54	0.08	3.95	6.37	0.44		0.57	0.05			100.82	
3 A4. IV	73.07	11.78	2.30	n. d.	0.39	2.02	1.19	6.84	2.24						99.83	
4 A4. IV	73.16	11.97	2.23	n. d.	1.08	2.67	3.55	4.56	0.16			0.18			99.56	2.359
5 A4. IV	73.81	13.72	1.59	n. d.	0.23	0.61	5.29	4.09			0.97				100.31	
6 A3. III	73.40	12.90	3.70	n. d.	0.14	2.35	3.83	2.99	0.43		0.43				100.17	
7 A3. III	72.15	13.50	3.12	n. d.	0.16	0.93	4.20	4.54	0.85		0.45				99.90	
8 A4. IV	69.81	13.85	3.21	n. d.	0.43	1.38	5.56	4.40			1.06				99.70	
9	68.40	16.89	2.95	n. d.	trace	1.50	4.25	3.98	1.94						99.91	

QUARTZ PORPHYRY—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
3	Villetelle, La Creuse, France.	Pisani.	L. de Launay, B. Sv. Ct. G. Fr., XI, No. 83, p. 76, 1902.	Porphyry.	
4	La Creuse, France.	Pisani.	L. de Launay, B. Sv. Ct. G. Fr., XI, No. 83, p. 77, 1902.	Quartz porphyry.	
5	Gross Umstadt, Hesse.	Not stated.	C. Vogel, Abh. G. L.-A. Hes., II, p. 49, 1891.	Quartz porphyry.	In W. T., p. 145.
6	Miekinia, near Cracow, Galicia.	R. Zuber.	R. Zuber, Jb. G. R.-A. Wien., XXXV, p. 750, 1885.	Quartz porphyry.	In W. T., p. 169.
7	Brinzio, Lake Lugano, Lombardy.	A. Schwager.	K. v. Gümbel, Geog. Jhft., VII, p. 71, 1894.	Porphyry.	Not in W. T.
8	Maroggio, Lake Lugano, Lombardy.	A. Schwager.	K. v. Gümbel, Geog. Jhft, VII, p. 71, 1894.	Porphyry.	Not in W. T.
9	Figino, Lake Lugano, Lombardy.	A. Schwager.	K. v. Gümbel, Geog. Jhft., VII, p. 71, 1894.	Porphyry.	Not in W. T.
10	Bissone, Lake Lugano, Lombardy.	A. Schwager.	K. v. Gümbel, Geog. Jhft., VII, p. 71, 1894.	Porphyry.	Not in W. T.
11	Bissone, Lake Lugano, Lombardy.	A. Schwager.	K. v. Gümbel, Geog. Jhft., VII, p. 70, 1894.	Porphyry.	Not in W. T.
12	Fosso Mar di Capvisi, Elba Island.	P. Aloisi.	P. Aloisi, Mem. Soc. Tosc., XXVI, p. 17, 1910.	Granite porphyry.	

RHYOLITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Neponset Valley, Massachusetts.	W. H. Walker.	F. Bascom, J. Ac. Sc. Phil., XV, p. 144, 1912.	Soda rhyolite.	
2	Fort Davis, Apache Mountains, Texas.	Not stated.	A. Osann, T. M. P. M., XV, p. 447, 1895.	Liparite.	In W. T., p. 221.
3	McClellan Peak, Washoe, Nevada.	F. A. Gooch.	Hague and Iddings, U. S. G. S. B. 17, p. 33, 1885.	Rhyolite.	In W. T., p 131.
4	Filo de los Corrales, Guamani Volcano, Ecuador.	Tietze.	E. Esch in W. Reiss, Ecuador, I, p. 77, 1901.	Obsidian.	
5	Randhfossafjoll, Iceland.	H. Bäckström.	H. Bäckström. G. F. F., XIII, p. 657, 1891.	Liparite.	In W. T., p. 155.
6	Hlidharfjall, Myvatn, Iceland.	H. Bäckström.	H. Bäckström, G. F. F., XIII, p. 663, 1891.	Obsidian.	In W. T., p. 179.
7	Mafalidh, Snäffels Peninsula, Iceland.	H. Bäckström.	H. Bäckström, G. F. F., XIII, p. 651, 1891.	Granophyre.	In W. T., p. 151.
8	Domadalshraun, Iceland.	H. Bäckström.	H. Bäckström, G. F. F., XIII, p. 643, 1891.	Liparite.	In W. T., p. 155.
9	Maskordshnur, Iceland.	C. W. Schmidt.	C. W. Schmidt. Z. D. G. G., XXXVII, p. 744, 1885.	Liparite.	In W. T., p. 167.

RHYOLITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
10	67.91	15.17	3.92	n. d.	0.55	1.59	5.36	4.52			0.53				99.55	
A4. IV																
11	66.55	16.35	4.00	n. d.	0.38	1.34	5.40	4.97	0.40		0.66				100.05	
A3. III																
12	80.50	11.32	1.74	n. d.	0.69	1.39	1.98	0.57	0.55	0.20		0.83		SrO 0.20	99.97	2.68
A3. III																
13	72.79	13.77	3.32	n. d.	0.62	1.94	4.12	2.99	1.08				trace		100.63	
A4. IV																
14	72.50	11.53	2.06	n. d.	2.72	1.79	3.37	5.24	0.70						99.91	
A4. IV																
15	72.65	10.82	2.30	n. d.	0.65	0.79	5.42	6.96	0.84						100.43	
A4. IV																
16	73.00	14.45	n. d.	3.12	0.82	3.30	1.70	3.18	0.70		trace	trace	trace	CO_2 trace. B_2O_3 trace. SO_3 trace. Cl trace. Li_2O trace.	100.27	2.76
A3. III																
17	69.90	14.73	n. d.	2.90	0.72	1.91	4.30	3.01	2.10						99.57	
A4. IV																
18	74.53	13.60	2.18	n. d.	0.28	1.03	3.43	4.56	0.38						99.99	
A4. IV																
19	74.37	12.65	2.58	n. d.	0.20	1.22	3.87	4.57	0.22	0.02					99.70	
A4. IV																
20	72.19	12.56	3.65	n. d.	0.85	2.52	4.41	3.35	0.40	0.08					100.01	
A4. IV																
21	69.53	15.45	5.08	n. d.	0.04	0.73	3.70	4.24	0.86		0.16				99.79	
A3. III																
22	72.98	14.22	2.86	n. d.	0.33	1.35	1.88	5.61	0.89						100.12	
A4. IV																
23	73.46	12.47	3.64	n. d.	trace	0.32	5.63	4.03	0.44				trace		99.99	
A4. IV					—											
24	79.92	5.61	3.38	n. d.	0.04	2.45	0.30	1.19	7.38				trace		100.27	
A4. IV																
25	73.70	4.99	6.08	n. d.	0.10	4.20	5.20	4.83	0.55						99.65	2.47
A4. IV																
26	71.65	11.96	6.62	n. d.	2.09	3.03	1.76	2.40					0.16		99.67	2.47
A4. IV																
27	73.37	9.69	4.48	n. d.	0.37	1.14	4.38	5.91	0.58		0.08			CO_2 none	100.00	
A3. III																
28	72.50	10.67	4.16	n. d.	0.52	1.58	3.38	4.72	2.40		0.07			CO_2 none	100.00	
A3. III																

RHYOLITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
10	Laugahraun, Iceland.	H. Bäckström.	H. Bäckström, G. F. F., XIII, p. 646, 1891.	Obsidian	In W. T., p. 155.
11	Hvituskridhur, Snäffelsjokull, Iceland.	H. Bäckström.	H. Bäckström, G. F. F., XIII, p. 659, 1891.	Liparite.	In W. T., p. 195.
12	Nant-y-benslog, Carnarvonshire, Wales.	H. W. Greenwood.	C. B. Travis, Pr. Liverp. G. Soc., X (5), p. 315, 1909.	Rhyolite.	
13	Caderidris, Wales.	T. H. Holland.	Cole and Jennings, Q. J. G. S., XLV, p. 435, 1889.	Eurite.	In W. T., p. 385.
14	Tormore, Arran, Scotland.	M. M. Tait.	J. W. Judd, Q. J. G. S., XLIX, p. 558, 1893.	Felsite.	In W. T., p. 387.
15	Jesenje, Croatia.	Not stated.	Kispatic, Schr. Sudslav, Ac., 1909, p. 177.	Liparite.	Osann, III (1), p. 147.
16	Torniella, Roccastrada, Grosseto, Tuscany.	R. V. Matteucci.	R. V. Matteucci, B. Soc. G. It., X, p. 677, 1891.	Nevadite.	In W. T., p. 141.
17	Vincenzo, Campiglia Marittima, Tuscany.	C. Dalmer.	C. Dalmer, N. J., 1887, II, p. 213.	Quartz trachyte.	In W. T., p. 181.
18	Cannetello, Lipari, Aeolian Islands.	F. Glaser.	A. Bergeat, Abh. Bay. Ak. W., XX, p. 118, 1899.	Obsidian.	In W. T., p. 171.
19	Forgia Vecchia, Lipari, Aeolian Islands.	F. Glaser.	A. Bergeat, Abh. Bay. Ak. W., XX, p. 111, 1899.	Obsidian.	In W. T., p. 153.
20	Basiluzzo, Aeolian Islands.	F. Glaser.	A. Bergeat, Abh. Bay. Ak. W., XX, p. 61, 1899.	Obsidian.	In W. T., p. 181.
21	Calasetta, San Antioco, Sardinia.	A. Johnsen.	A. Johnsen, Abh. Pr. Ak. W., Anh. 2, p. 45, 1912.	Liparite.	Also in N. J. Cb., p. 738, 1912.
22	Ben Kassem, near Menerville, Algeria.	Not stated.	Duparc, Pearce, and Ritter, Mem. Soc. Ph. Gen., XXXIII, p. 26, 1900.	Liparite.	In W. T., p. 133.
23	Amba Subhat, Abyssinia.	G. T. Prior.	G. T. Prior, Min. Mag., XII, p. 262, 1900.	Grorudite.	In W. T., p. 155.
24	Near Livan, Persia.	V. Steinecke.	V. Steinecke, Zs. Ges. Nw. Halle (4), VI, p. 70, 1887.	Pitchstone.	In W. T., p. 125.
25	Wimmera, Victoria.	J. C. Newberry.	R. H. Walcott, Pr. R. Soc. Vict., XI, p. 30, 1898.	Obsidian "bomb."	Meteoric? Not in W. T.
26	Kalgoorlie, Western Australia.	E. S. Simpson.	E. S. Simpson, W. Aust. G. S. B. 6, p. 80, 1902.	"Obsidianite."	Meteoric?
27	Waiarewu Creek, Whangaroa, New Zealand.	J. S. Maclaurin.	Bell and Clarke, G. S. N. Z. B. 8, p. 73, 1909.	Obsidian.	
28	Putahi Hill, Whangaroa, New Zealand.	J. S. Maclaurin.	Bell and Clarke, G. S. N. Z. B. 8, p. 73, 1909.	Rhyolite.	

QUARTZ DIORITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A4. IV	56. 69	15. 48	6. 22	n. d.	6. 53	7. 59	3. 41	3. 43			0. 62				99. 97	
2 A4. IV	65. 20	16. 25	5. 45	n. d.	1. 87	7. 55	2. 87	0. 50	0. 65						100. 34	
3 A4. IV	70. 33	15. 59	3. 05	n. d.	1. 30	3. 05	4. 50	1. 29			1. 09				100. 20	
4 A4. IV	64. 35	15. 46	7. 50	n. d.	0. 50	3. 58	3. 28	3. 54			1. 63				99. 84	
5 A4. IV	62. 80	12. 94	10. 57	n. d.	2. 79	4. 99	2. 52	1. 27	1. 13		1. 10				100. 11	2. 83
6 A3. III	64. 02	14. 40	n. d.	8. 98	3. 65	4. 46	3. 00	0. 39			0. 81	0. 30			100. 01	
7 A4. IV	78. 97	1. 79	8. 14	n. d.	2. 11	0. 68	0. 40	2. 61	2. 68	3. 00		trace		CO_2 trace S 0. 22	100. 60	
8 A4. IV	70. 22	14. 88	3. 10	n. d.	0. 86	2. 08	6. 56	1. 66	0. 88				0. 25		100. 46	
9 A4. IV	66. 00	17. 35	2. 57	n. d.	0. 94	2. 40	6. 54	0. 76	2. 48				0. 60		99. 64	
10 A4. IV	65. 22	16. 47	6. 21	n. d.	2. 07	4. 10	3. 25	0. 62	1. 40				0. 24		99. 58	
11 A4. IV	63. 04	17. 65	5. 41	n. d.	1. 43	4. 46	5. 47	1. 20	0. 84				0. 85		100. 35	

DACITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A4. IV	69. 51	15. 75	3. 34	n. d.	2. 09	1. 71	3. 89	3. 34	0. 56			trace			100. 19	
2 A4. IV	68. 20	16. 98	3. 75	n. d.	2. 07	4. 33	2. 98	1. 52	0. 44						100. 27	
3 A4. IV	69. 96	15. 79	2. 50	n. d.	0. 64	1. 73	3. 80	4. 12	1. 53						100. 07	
4 A3. III	67. 03	16. 27	n. d.	3. 97	1. 19	3. 42	2. 71	3. 50	1. 56		1. 07				100. 72	
5 A4. IV	75. 71	13. 73	n. d.	4. 51	0. 45	1. 47	0. 96	0. 61	2. 00						99. 44	2. 385
6 A4. IV	68. 05	17. 95	2. 97	n. d.	1. 40	3. 65	3. 56	1. 25	1. 78			trace	trace		100. 61	
7 A4. IV	67. 79	16. 30	4. 43	n. d.	1. 45	2. 32	3. 49	3. 48	0. 95			0. 27			100. 98	
8 A4. IV	66. 50	18. 20	4. 92	n. d.	0. 90	3. 67	2. 50	2. 52	1. 30						100. 51	

QUARTZ DIORITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Three Rivers, Belchertown, Massachusetts.	W. Orr, jr.	B. K. Emerson, U. S. G. S. Mon. 29, p. 336, 1898.	Tonalite.	In W. T., p. 407.
2	Monte Santo, Sao Paulo, Brazil.	J. Machado.	J. Machado, T. M. P. M., IX, p. 355, 1888.	Quartz diorite.	In W. T., p. 407.
3	Farsund, n. Lister, Norway.	C. F. Kolderup.	C. F. Kolderup, Berg. Mus. Aarb., 1896, No. 5, p. 113.	Hypersthene adamellite.	In W. T., p. 191.
4	Dypvik, n. Farsund, Norway.	C. F. Kolderup.	C. F. Kolderup, Berg. Mus. Aarb., 1896, No. 5, p. 123.	Banatite.	In W. T., p. 407.
5	Mesoncles, Valsavaranche, Graian Alps, Piedmont.	G. Aichino.	V. Novarese, B. C. G. It., XXV, p. 286, 1894.	Quartz diorite.	In W. T., p. 407.
6	Ravin de Grottica, n. Corte, Corsica.	J. Deprat.	J. Deprat, B. Soc. G. Fr. (4), V, p. 762, 1905.	Quartz diorite.	
7	Bolejevici, Montenegro.	G. Manasse.	G. Manasse, Mem. d'Achi., p. 88, 1903.	Quartz diorite.	Altered.
8	Dshugdshura Mountains, Okhotsk, Siberia.	Not stated.	K. E. Bogdanovitch, Fund. Marek., p. 54, 1904.	Granite-diorite.	
9	Wangatschan River, Okhotsk, Siberia.	Not stated.	K. E. Bogdanovitch, Fund. Marek., p. 54, 1904.	Granite-diorite.	
10	Lantar River, Okhotsk, Siberia.	Not stated.	K. E. Bogdanovitch, Fund. Marek., p. 54, 1904.	Granite-diorite.	
11	Wangatschan River, Okhotsk, Siberia.	Not stated.	K. E. Bogdanovitch, Fund. Marek., p. 54, 1904.	Granite-diorite.	

DACITE.

1	Lassen Peak, California.	T. M. Chatard.	J. S. Diller, U. S. G. S. B. 150, p. 218, 1898.	Dacite.	In W. T., p. 177.
2	Lassen Peak, California.	T. M. Chatard.	J. S. Diller, U. S. G. S. B. 150, p. 218, 1898.	Dacite.	In W. T., p. 417.
3	McClellan Peak, Washoe, Nevada.	F. A. Gooch.	Hague and Iddings, U. S. G. S. B. 17, p. 33, 1885.	Dacite.	In W. T., p. 167.
4	South Hill, Eureka District, Nevada.	R. W. Mahon.	A. Hague, U. S. G. S. Mon. 20, p. 264, 1892.	Dacite.	Not in W. T.
5	Alausi, Ecuador.	J. Siemiradzki.	J. Siemiradzki, N. J. B. B., IV, p. 209, 1886.	Dacite.	In W. T., p. 123.
6	Cerro Quimsa Chata, Bolivia.	F. Rudolph.	F. Rudolph, T. M. P. M., IX, p. 311, 1888.	Quartz andesite.	In W. T., p. 417.
7	Ferrieres, Esterel, France.	C. Rüst.	A. Michel-Levy, B. Sv. Ct. G. Fr., No. 97, p. 27, 1897.	Quartz porphyry (dacite).	In W. T., p. 167.
8	Kastro, Lemnos Island, Aegean Sea.	L. de Launay.	L. de Launay, Ann. Mines (9), XIII, p. 223, 1898.	Quartz andesite.	Not in W. T.

DACITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
9	63.00	17.70	3.72	n. d.	1.75	2.78	2.53	3.60	4.70						99.78	
A4. IV																
10	67.62	15.93	4.37	n. d.	1.33	4.44	3.18	2.87	0.99						100.73	
A4. IV																
11	66.55	15.61	2.42	n. d.	0.51	3.49	2.89	4.29	4.81						100.57	
A4. IV																

SYENITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	56.62	16.33	trace	4.21	7.65	5.12	4.34	2.68	2.70		0.26				99.91	
A4. IV																
2	63.02	14.87	6.53	n. d.	0.95	1.12	5.85	5.62	1.45				0.46		99.87	
A4. IV																
3	64.63	18.15	3.05	n. d.	0.50	1.54	5.80	4.79	1.08				1.00		100.54	
A4. IV																
4	68.00	16.49	2.70	n. d.	none	1.32	7.48	3.45	0.76						100.20	
A4. IV																
5	66.13	17.40	2.19	n. d.	0.04	0.81	5.28	5.60	1.22		0.74		0.13		99.54	
A3. III																
6	63.20	17.45	3.60	n. d.	0.75	1.40	6.90	5.88	0.50		0.46				100.14	
A3. III																
7	61.03	18.63	3.66	n. d.	1.04	1.56	7.68	5.57	0.41						99.58	
A4. IV																
8	60.45	20.14	3.80	n. d.	1.27	1.68	7.23	5.12	0.71						100.40	
A4. IV																
9	55.39	14.14	11.64	n. d.	3.21	3.99	3.17	2.99	3.42		1.86			CO_2 trace	99.81	
A3. III																
10	61.97	15.11	6.95	n. d.	4.05	2.87	4.01	2.43	2.98					CO_2 0.08	100.45	
A4. IV																
11	59.46	20.18	4.17	n. d.	0.82	2.83	5.13	6.65	0.55						99.79	
A4. IV																

TRACHYTE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	62.28	19.17	3.39	n. d.	trace	1.44	5.37	5.93	2.33						99.91	2.648
A4. IV																
2	63.89	15.08	4.63	n. d.	1.06	9.00	1.00	3.95	1.45						100.06	2.702
A4. IV																
3	64.38	16.98	4.04	n. d.	0.28	1.08	7.57	4.30	1.64						100.27	
A4. IV																
4	56.41	16.42	8.60	0.02	2.55	1.83	2.56	9.65	0.21		1.17		0.28	CO_2 0.33	100.03	
A3. III																

DACITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
9	Mount Athanasios, Lemnos Island, Aegean Sea.	L. de Launay.	L. de Launay, Ann. Mines (9), XIII, p. 223, 1898.	Dacite.	Not in W. T.
10	Dra zeg Etter, Menerville, Algeria.	Not stated.	Duparc, Pearce, and Ritter, Mem. Soc. Ph. Gen., XXXIII, p. 129, 1900.	Dacite.	In W. T., p. 185.
11	Cap Blanc, Menerville, Algeria.	Not stated.	Duparc, Pearce, and Ritter, Mem. Soc. Ph. Gen., XXXIII, p. 59, 1900.	Dacite.	In W. T., p. 185.

SYENITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Wataybeeg Lake, Abitibi Region, Ontario.	A. G. Burrows.	G. F. Kay, Rep. Bur. Min. Ont., XIII, p. 118, 1904.	Hornblende syenite.	
2	Beekmantown, Clinton County, New York.	E. W. Morley.	H. P. Cushing, B. G. S. A., IX, p. 248, 1898.	Syenite porphyry.	In W. T., p. 389.
3	Fourche Mountain, Arkansas.	R. N. Brackett.	J. F. Williams, Ign. R. Ark., p. 96, 1890.	Quartz syenite.	MnO high? In W. T., p. 201.
4	Lake Borolan, Sutherland, Scotland.	Not stated.	J. Shand, N. J. B. B., XXII, p. 417, 1906.	Quartz syenite.	-
5	Between Thinghoud and Fjelebua, Norway.	R. Mauzelius.	W. C. Brögger, Z. K., XVI, p. 46, 1890.	Quartz syenite.	In W. T., p. 195.
6	Tonsenas, near Christiania, Norway.	G. Forsberg.	W. C. Brögger, Z. K., XVI, p. 54, 1890.	Nordmarkite.	In W. T., p. 197.
7	Aueröd, near Holmestrand, Norway.	G. Forsberg.	W. C. Brögger, Z. K., XVI, p. 57, 1890.	Nordmarkite.	In W. T., p. 211.
8	Aueröd, near Holmestrand, Norway.	G. Forsberg.	W. C. Brögger, Z. K., XVI, p. 54, 1890.	Nordmarkite.	In W. T., p. 203.
9	Rotmurg, Wurttemburg.	Not stated.	K. Regelmann, Erl. G. Kt. Wurt., Bl. 91, p. 39, 1907.	Hornblende syenite.	
10	Rothschönburg, near Deutschenbroda, Saxony.	J. M. Henderson.	J. M. Henderson, Z. D. G. G., XLVII, p. 539, 1895.	Mica syenite.	In W. T., p. 389.
11	Rocov-Kamik, near Sofia, Bulgaria.	L. Dimitrow.	L. Dimitrow, Ds. Ak. W. Wien., LX, p. 497, 1893.	Pyroxene syenite.	In W. T., p. 201.

TRACHYTE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Nashs Point, Burlington, Vermont.	J. F. Kemp.	Kemp and Marsters, U. S. G. S. B. 107, p. 20, 1893.	Bostonite.	In W. T., p. 199.
2	Adler's villa, Santa Cruz, West Indies.	P. T. Cleve.	P. T. Cleve, Sv. Vet. Ak. Hndl., IX, No. 12, p. 34, 1871.	Felsite.	Cf. Högbom, B. G. Inst. Ups., VI, p. 230, 1905.
3	Hamilton Hill, Peebleshire, Scotland.	J. J. H. Teall.	A. Geikie, G. S. G. B. A. R., p. 40, 1897.	Soda felsite.	Not in W. T.
4	Killerton Park, Exeter, England.	J. S. G. Wilson.	J. J. H. Teall, G. S. Eng. Mem. Sh. 325, p. 78, 1902.	Biotite trachyte.	Iron oxides?

TRACHYTE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
5 A4. IV	49.09	16.00	7.14	4.30	5.02	8.27	4.49	4.79	0.77				0.23	SO_3 trace	100.10	
6 A2. II	64.69	18.34	n. d.	3.44	0.50	1.72	4.61	6.46	0.24		0.31	0.18	trace	SO_3 none Cl trace F trace BaO 0.09	100.58	2.57
7 A3. III	71.14	11.14	n. d.	2.73	1.62	3.17	1.40	4.13	1.77		none	trace	trace	X 1.05 SO_3 1.78 Cl trace CO_2 trace LiO_2 trace	99.83	
8 A4. IV	63.63	17.99	5.84	trace	none	4.21	4.25	3.81	0.15				0.69		100.57	2.307
9 A4. IV	68.80	14.95	4.36	n. d.	0.20	0.48	4.90	5.58	0.73					CO_2 none	100.00	2.33
10 A4. IV	58.50	17.67	n. d.	5.64	1.09	3.86	4.17	7.22	1.60						99.75	

MONZONITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A4. IV	48.00	12.52	8.74	n. d.	15.26	7.94	3.11	2.68	1.36		0.22				99.83	2.75
2 A3. III	47.34	19.60	7.15	6.82	4.54	8.00	3.68	1.67	n. d.		trace	0.65		S 0.43	99.88	

DIORITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A3. III	47.32	17.00	3.89	6.48	8.58	10.01	2.36	0.46	3.23	0.34				CO_2 trace	99.67	
2 A3. III	46.23	18.29	6.55	7.07	7.04	9.99	3.07	0.79	1.02	0.05	trace	0.21	0.12	NiO trace SrO trace	100.43	2.98
3 A3. III	45.75	18.51	6.55	6.02	5.06	11.85	3.41	2.35	0.20	0.06		trace			99.76	
4 B3. IV	47.5	15.6	2.6	7.1	11.7	9.8	1.4	1.5	2.4					Cr_2O_3 0.1	97.7	2.96
5 A3. III	59.00	15.50	trace	6.20	5.95	4.08	2.54	3.08	2.00		1.03	0.18			99.58	
6 A3. III	47.14	19.34	4.02	6.12	6.06	13.68	1.61	0.17	2.00			trace	trace	S 0.10	100.24	
7 A3. III	54.07	18.57	3.30	5.71	4.92	8.41	2.93	1.64	0.21						99.76	
8 A4. IV	43.75	18.02	7.50	5.31	10.68	12.40	1.46	0.51	1.21						100.84	
9 A4. IV	47.40	18.17	5.42	6.60	7.17	12.23	2.75	0.20	0.75		trace		trace		100.69	

TRACHYTE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
5	Laacher See, Rheinland.	W. Bruhns.	W. Bruhns, Ref. N. J., II, p. 418, 1892.	"Trachyte" (dark).	TiO_2 n. d. In W. T., p. 341.
6	Algersdorf, Bohemia.	F. Ullik.	J. E. Hibsch, T. M. P. M., IX, p. 247, 1888.	Trachyte.	In W. T., p. 201.
7	Sassoforte, Roccastrada, Tuscany.	R. V. Matteucci.	R. V. Matteucci, B. C. G. It., XXI, p. 285, 1890.	"Trachyte."	In W. T., p. 139.
8	Bondi, near Sydney, New South Wales.	A. Liversidge.	A. Liversidge, J. R. Soc. N. S. W., XX, p. 235, 1887.	Pumice.	Floated block. In W. T., p. 401.
9	Banks Peninsula, New Zealand.	J. S. Maclaurin.	J. S. Maclaurin, N. Z. G. S. A. R. 4, p. 30, 1909.	Trachyte.	
10	Castle Rock, Coromandel, New Zealand.	J. M. Maclaren.	J. M. Maclaren, Tr. N. Z. Inst., XXXII, p. 215, 1900.	Hornblende trachyte.	Al_2O_3 and FeO interchanged in original.

MONZONITE.

1	Kentallen, Loch Limhe, Scotland.	J. J. H. Teall.	A. Geikie, G. S. G. B. A. R., 1897, p. 22.	Olivine monzonite.	Not in W. T.
2	Tveit, Manger, near Bergen, Norway.	Lillejord.	C. F. Kolderup, Berg. Mus. Aarb., No. 12, p. 107, 1903.	Mangerite.	

DIORITE.

1	Keswick, Shasta County, California.	R. C. Wells.	B. S. Butler, U. S. G. S. B. 419, p. 138, 1910.	Diorite.	
2	Pajaro, San Benito County, California.	J. E. Reid.	J. E. Reid, Un. Cal. Dep. G., B. III, p. 185, 1902.	Diorite.	
3	San José, Tamaulipas, Mexico.	G. I. Finlay.	G. I. Finlay, An. N. Y. Ac. Sci., XIV, p. 268, 1904.	Diorite.	
4	Ben Damhain, Loch Garabal, Scotland.	J. H. Player.	Dakyns and Teall, Q. J. G. S., XLVIII, p. 115, 1892.	Diorite.	In W. T., p. 329.
5	Vallée du Lys, Pyrenees.	Pisani.	A. de Romeu, B. Soc. M. Fr., XXX, p. 147, 1907.	Microdiorite.	
6	Zdirec, Eisengebirge, Bohemia.	C. v. John.	Hinterlechner and v. John, Jb. G. R. A. Wien., LIX, p. 174, 1909.	Gabbro-diorite.	
7	Tiszolcz, Gömör, Hungary.	M. Dittrich.	H. Junghann, N. J. B. B., XXXIII, p. 20, 1911.	Diorite.	
8	Bet. Solwa and Supreya, Ural Mountains.	L. Lessing and Kultacheff.	Loewinson-Lessing, Jushno-Saos., p. 166, 1900.	Microdiorite.	In W. T., p. 335.
9	Orepuki, Otago, New Zealand.	R. A. Farquharson.	R. A. Farquharson, Tr. N. Z. Inst., XLIII, p. 465, 1911.	Diorite.	

ANDESITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A2. II	54. 50	17. 97	8. 55	n. d.	3. 37	9. 36	2. 34	1. 62	0. 96	0. 14	0. 94	0. 31	trace	CO_2 none S 0. 63 Cr_2O_3 none NiO none BaO 0. 06 SrO 0. 05 Li_2O trace	100. 80	
2 A3. III	62. 94	18. 14	n. d.	3. 82	3. 06	6. 28	3. 83	1. 22	0. 60		0. 41	0. 10			100. 40	
3 A3. III	62. 00	17. 84	n. d.	4. 40	2. 64	5. 37	4. 29	1. 47	1. 66		0. 17	0. 29	trace		100. 13	
4 A3. III	67. 83	15. 02	n. d.	5. 16	0. 29	3. 07	2. 40	3. 20	1. 11		1. 04	0. 26			99. 38	
5 A3. III	61. 58	16. 34	n. d.	6. 42	2. 85	5. 13	2. 69	3. 65	0. 64		0. 68	0. 28			100. 26	
6 A3. III	57. 25	17. 18	n. d.	6. 60	4. 31	6. 29	4. 71	2. 75	0. 59			0. 25	0. 57		100. 50	2. 71
7 A4. IV	56. 89	19. 72	4. 06	3. 65	1. 91	5. 87	5. 14	1. 96	0. 62		trace	trace		SO_3 trace Cl trace Li_2O trace Ag trace	99. 82	
8 A3. III	47. 25	18. 80	trace	8. 20	4. 81	9. 05	2. 62	2. 38	4. 10		2. 34	0. 50			100. 05	
9 A3. III	53. 59	17. 96	n. d.	7. 74	2. 55	6. 53	4. 54	3. 18			3. 26		0. 68		100. 03	
10 A4. IV	52. 35	17. 90	9. 38	2. 02	1. 90	8. 45	4. 97	0. 76	1. 17			0. 45	trace		99. 35	
11 A4. IV	66. 11	12. 10	7. 74	n. d.	1. 70	4. 09	2. 86	2. 73	2. 11	0. 08					99. 52	
12 A4. IV	59. 31	16. 95	n. d.	8. 07	1. 65	4. 30	1. 59	3. 42	2. 64	2. 10		0. 40			100. 43	
13 A4. IV	61. 90	18. 60	5. 65	n. d.	2. 44	4. 67	3. 05	2. 64	1. 70						100. 65	
14 A4. IV	50. 86	15. 65	10. 85	n. d.	6. 03	11. 76	2. 01	1. 56	0. 20		0. 63	trace	trace		99. 55	3. 01
15 A3. III	61. 65	15. 98	4. 49	n. d.	2. 63	4. 41	5. 69	2. 75	0. 97		0. 67			SO_3 0. 08 Cl 0. 14	99. 46	
16 A3. III	63. 30	14. 52	5. 82	n. d.	1. 66	4. 00	5. 14	1. 43	2. 17		1. 08		0. 23	Soluble 0. 82	100. 17	
17 A3. III	58. 31	12. 01	6. 41	0. 97	2. 47	11. 99	4. 13	2. 00	1. 56						99. 85	2. 645
18 A3. III	52. 63	16. 66	5. 20	3. 18	3. 87	11. 72	5. 15	1. 59	0. 68						100. 68	2. 819

ANDESITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Elkhorn District, Montana.	H. N. Stokes.	J. S. Barrell, U. S. G. S. A. R. 22, II, p. 529, 1901.	Andesite.	
2	Lassen Peak, California.	P. W. Shimer.	Hague and Iddings, A. J. S., XXVI, p. 225, 1883.	Andesite.	In W. T., p. 419.
3	Mount Shasta, California.	P. W. Shimer.	Hague and Iddings, A. J. S., XXVI, p. 230, 1883.	Andesite.	In W. T., p. 235.
4	Hoosac Mountain, Eureka District, Nevada.	R. W. Mahon.	A. Hague, U. S. G. S. Mon. 20, p. 264, 1892.	Andesite.	In W. T., p. 419.
5	Richmond Mountain, Eureka District, Nevada.	T. M. Drown.	A. Hague, U. S. G. S. Mon. 20, p. 264, 1892.	Andesite.	Not in W. T.
6	Tunguragua, Ecuador.	Boehm.	F. Tannhäuser in W. Reiss, Ecuador, II, p. 150, 1904.	Pyroxene andesite.	
7	Cotopaxi, Ecuador.	J. W. Mallet.	J. W. Mallet, Pr. R. Soc., XLII, p. (2), 1887.	Andesite ash.	July 22, 1885. In W. T., p. 281.
8	Piquette deras Lids, Pyrenees.	Pisani.	A. de Romeu, B. Soc. M. Fr., XXX, p. 184, 1907.	Augite andesite.	
9	Temple Bay, Spitzbergen.	H. Bäckström.	H. Bäckström, Sv. Vet. Ak. Hnd., XVI (2), No. 5, p. 39, 1890.	Augite andesite.	Floated block. In W. T., p. 423.
10	Grubehorn, Siebengebirge.	Not stated.	E. Kaiser, Vh. Nh. Ver. Bonn, LIV, p. 176, 1897.	Andesite.	In W. T., p. 285.
11	Pizzo del Corvo, Panaria, Aeolian Islands.	F. Glaser.	A. Bergeat, Sb. Bay. Ak., XX, p. 59, 1899.	Andesite.	In W. T., p. 425.
12	Varesana, Lipari, Aeolian Islands.	F. Glaser.	A. Bergeat, Sb. Bay. Ak., XX, p. 102, 1899.	Cordierite andesite.	In W. T., p. 425.
13	Hagios Pavlos, Lemnos Island, Aegean Sea.	L. de Launay.	L. de Launay, Ann. Mines (9), XIII, p. 223, 1898.	Trachyandesite.	Not in W. T.
14	Perumbakan, South Arcot, Madras, India.	T. H. Holland.	T. H. Holland, Q. J. G. S., LIII, p. 409, 1897.	Augite andesite.	In W. T., p. 429.
15	Una Una Volcano, Tomini Bay, Celebes.	Not stated.	A. Wichmann, Z. D. G. G., LIV, p. 154, 1902.	Volcanic ashes.	
16	Krakatoa Volcano.	A. Renard.	R. D. M. Verbeek, Krakatau, p. 320, 1885.	Andesite ash.	Collected at Batavia. Not in W. T.
17	Merapi Volcano, Sumatra.	A. Clausnizer.	R. D. M. Verbeek, Sum. Westk., p. 518, 1883.	Volcanic ash.	Not in W. T.
18	Manienjoe Volcano, Sumatra.	A. Clausnizer.	R. D. M. Verbeek, Sum. Westk., p. 516, 1883.	Augite andesite.	Not in W. T.

GABBRO.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A3. III	49.84	18.94	1.51	6.40	7.39	10.32	1.99	1.28	2.57						100.24	
2 A3. III	48.02	17.50	1.80	7.83	10.21	13.16	1.48	trace	0.79						100.79	
3 A3. III	46.85	19.72	3.22	7.99	7.75	13.10	1.56	0.09	0.56						100.84	
4 A3. III	46.68	17.12	2.18	7.61	10.34	13.46	1.75	trace	0.88			trace	trace		100.02	3.069
5 A3. III	51.46	14.35	3.90	5.28	9.54	9.08	2.92	0.24	3.30					CO_2 0.20	100.27	
6 A3. III	49.56	20.09	2.32	2.02	7.01	15.62	1.63	0.34	2.25						100.84	
7 A3. III	53.50	15.01	n. d.	9.45	7.05	10.30	2.50	0.52	0.50		1.63				100.46	
8 A4. IV	51.25	19.20	n. d.	7.10	6.05	12.30	1.54	0.60	1.30		1.22				100.56	
9 A4. IV	47.36	14.06	3.23	6.07	11.48	12.80	1.54	1.25	1.56			0.40	trace	S 0.09	99.84	
10 A3. III	47.00	17.72	2.74	5.58	9.62	10.99	2.78	1.51	1.30			0.38			99.62	
11 A3. III	48.42	15.96	3.04	8.73	6.88	12.68	2.00	0.24	1.61						99.56	
12 A3. III	46.56	12.33	6.02	7.09	12.49	13.18	1.75	0.24	0.54				trace		100.20	
13 A3. III	46.37	16.73	9.76	2.48	7.00	12.49	2.08	1.30	0.65				0.53	SO_3 0.84 CuO 0.08	99.55	
14 A3. III	41.91	19.16	10.70	2.91	8.10	14.42	0.47	0.14	1.28			0.07	0.38	SO_3 0.28	99.82	
15 A3. III	44.64	18.54	6.63	4.65	2.52	22.17	0.80	0.05	0.18				0.09		100.27	
16 A3. III	44.11	19.38	5.17	5.44	2.90	21.98	0.50	0.13	0.26						99.87	
17 A4 .IV	46.60	18.20	6.80	n. d.	5.97	13.40	4.42	1.45	0.93		2.98				100.75	
18 A3. III	48.20	15.63	n. d.	8.55	4.55	6.90	5.33	1.56	4.50		4.55	0.38			100.15	

GABBRO.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Cross Lake, Cobalt, Ontario.	Not stated.	W. G. Miller, Rep. Bur. Min. Ont., XIV (II), p. 50, 1906.	Gabbro.	
2	Baltimore area, Maryland.	L. McCay.	G. H. Williams, U. S. G. S. B. 28, p. 39, 1886.	Gabbro-diorite.	19 specimens. In W. T., p. 331.
3	Baltimore area, Maryland.	L. McCay.	G. H. Williams, U. S. G. S. B. 28, p. 39, 1886.	Gabbro.	23 specimens. In W. T., p. 331.
4	Windsor road, Baltimore, Maryland.	L. McCay.	G. H. Williams, U. S. G. S. B. 28, p. 37, 1886.	Gabbro-diorite.	In W. T., p. 331.
5	Sturgeon Falls, Menominee River, Michigan.	R. B. Riggs.	G. H. Williams, U. S. G. S. B. 62, p. 76, 1890.	Gabbro.	In W. T., p. 331.
6	Point Sal, California.	H. W. Fairbanks.	H. W. Fairbanks, B. Dep. G. Un. Cal., II, p. 50, 1896.	Gabbro.	In W. T., p. 291.
7	Ernée, Brittany, France.	Pisani.	L. Vandernotte, C. R., CXLVIII, p. 1204, 1909.	Gabbro-norite.	
8	La Germionniere, Brittany, France.	Pisani.	L. Vandernotte, Mass. Armor., p. 83, 1913.	Gabbro.	
9	Ransko, Eisengebirge, Bohemia.	C. v. John.	Hinterlechner and v. John, Jb. G. R.-A. Wien., LIX, p. 188, 1909.	Gabbro.	
10	Wischkowitz, n. Marienbad, Bohemia.	A. Pelikan.	A. Pelikan, Ref. N. J., 1904, I, p. 48.	Gabbro.	
11	Katechersky, Koswinsky, Ural Mountains.	L. Duparc.	Duparc and Pearce, Oural Nord., I, p. 214, 1902.	Gabbro.	
12	Koswinsky Kamen, Ural Mountains.	L. Duparc.	Duparc and Pearce, Oural Nord., I, p. 157, 1902.	Microgabbro.	
13	Werkh Issetsk, Mursinsk, Ural Mountains.	G. Katerfeld.	W. Nikitin, Mem. C. G. Rus., XXII, p. 78, 1907.	Gabbro.	
14	Werkh Issetsk, Mursinsk, Ural Mountains.	G. Katerfeld.	W. Nikitin, Mem. C. G. Rus., XXII, p. 82, 1907.	Gabbro.	
15	Kedabek, Elizabethpol, Caucasus.	A. Kuppfer.	E. C. Fedorof, An. Inst. Agron. Mosc., VII, 1901.	Kedabekite.	In W. T., p. 339.
16	Kedabek, Elizabethpol, Caucasus.	A. Kuppfer.	E. C. Federof, An. Inst. Agron. Mosc., VII, 1901.	Kedabekite.	In W. T., p. 339.
17	Ampangarinana, Nosy Komba, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., I, p. 39, 1902.	Gabbro.	
18	Pou-tche-ho Valley, Yunnan, China.	Pisani.	J. Deprat, Mem. Sv. G. Ind. Ch., I (1), 1, p. 231, 1912.	Gabbro.	

DIABASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A4. IV	50.48	17.03	1.25	7.81	9.32	10.96	1.95	0.24	0.82	0.22				NiO 0.04	100.12	
2 A3. III	49.90	16.32	n. d.	13.54	6.22	6.58	1.82	2.25	0.76		1.47	0.17	trace		99.03	3.026
3 A4. IV	50.76	12.83	4.98	10.09	6.67	9.88	3.52	0.62	0.87						100.22	
4 A4. IV	51.31	13.64	0.52	8.49	12.73	12.41	1.40	0.32			trace	trace	trace		100.82	
5 A4. IV	50.88	13.17	1.11	9.66	13.05	10.19	1.17	0.31	0.14				trace		99.67	
6 A4. IV	47.66	19.24	1.83	8.67	10.79	9.91	1.14	0.26	0.06					CO_2 none	99.56	
7 B3. IV	47.67	17.55	2.51	12.59	5.65	10.75	2.21	0.65	0.35	0.40		0.17	0.19	CO_2 0.18 Cl 0.05 S 0.18	101.10	3.02
8 A3. III	47.25	18.00	2.21	12.42	6.35	11.45	1.96	0.66				0.16	0.18	Cl 0.02 S 0.09	100.75	3.01
9 A3. III	47.10	17.47	2.66	12.93	6.88	10.27	1.91	0.59				0.16	0.15	Cl 0.09 S 0.11	100.32	3.02
10 A4. IV	46.94	16.91	12.53	4.56	8.20	9.00	2.15	0.54	0.26			0.28			100.75	
11 A3. III	48.93	20.99	2.02	9.36	4.39	8.03	3.06	1.80	1.18			0.15	0.31	S acre	100.22	3.027
12 A4. IV	52.69	18.93	10.99	n. d.	2.56	5.31	4.04	2.11	2.76		0.60	0.80	trace		100.79	
13 A4. IV	50.95	17.50	14.42	n. d.	2.63	6.85	3.38	1.65	2.02		0.50	0.78			100.68	
14 A4. IV	50.65	18.45	13.80	n. d.	2.68	6.22	3.71	1.92	2.02		0.50	0.78	trace		100.73	
15 A4. IV	49.20	19.13	13.60	n. d.	3.08	7.18	3.63	1.89	1.31		0.56	0.75	trace		100.33	
16 A3. III	50.07	16.80	0.84	11.06	10.97	6.46	1.75	1.13	0.10				0.54		99.72	
17 A3. III	49.31	16.93	4.02	5.90	9.36	9.57	2.41	0.47	2.35						100.32	
18 A3. III	49.21	19.81	6.59	2.10	5.27	11.32	2.54	1.81	1.11		trace		trace		99.76	
19 A3. III	54.17	16.15	2.70	8.83	4.81	7.91	3.02	0.65	1.04				0.22	SO_3 0.61	100.11	
20 A3. III	47.39	13.19	6.86	8.17	6.97	11.11	2.62	0.59	1.85			0.32	0.40	S 0.32	99.79	

DIABASE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Cobalt, Ontario.	R. E. Hore.	R. E. Hore, J. G., XVIII, p. 275, 1910.	Quartz diabase.	
2	Blezard Mine, Sudbury, Ontario.	T. L. Walker.	T. L. Walker, Q. J. G. S., LIII, p. 56, 1897.	Diabase.	In W. T., p. 439.
3	Little John Island, Portland, Maine.	E. C. E. Lord.	E. C. E. Lord, A. G., XXII, p. 341, 1898.	Diabase porphyry.	In W. T., p. 327.
4	The Twins, Culpeper County, Virginia.	W. G. Brown.	Campbell and Brown, B. G. S. A., II., p. 346, 1891.	Hypersthene diabase.	In W. T., p. 331.
5	The Twins, Culpeper County, Virginia.	W. G. Brown.	Campbell and Brown, B. G. S. A., II, p. 346, 1891.	Olivine-hypersthene diabase.	In W. T., p. 331.
6	Fairmont, Davidson County, North Carolina.	A. S. Wheeler.	J. E. Pogue, A. J. S., XXVIII, p. 230, 1909.	Diabase.	Also in N.C.G.S B. 22, p. 73, 1910.
7	Lighthouse Point, Marquette, Michigan.	E. E. Ware.	A. C. Lane, J. G., XII, p. 89, 1904.	Diabase.	616 millimeters from contact.
8	Lighthouse Point, Marquette, Michigan.	E. E. Ware.	A. C. Lane, J. G., XII, p. 89, 1904.	Diabase.	4,115 millimeters from contact.
9	Lighthouse Point, Marquette, Michigan.	E. E. Ware.	A. C. Lane, J. G., XII, p. 89, 1904.	Diabase.	7,600 millimeters from contact.
10	Skrainka, Madison County, Missouri.	Technical.	E. Haworth, Mo. G. S. A. R. VIII, p. 113, 1895.	Olivine diabase.	
11	Sugarloaf Hill, Boulder County, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. B. 228, p. 187, 1904.	Diabase.	
12	Kullagarden, Kullen, Sweden.	L. G. Thomé.	A. Hennig, Lunds. Un. Aars., XXXV, No. 5, p. 24, 1899.	Kullaite (diabase).	In W. T., p. 441.
13	Mölle, Kullen, Sweden.	L. G. Thomé.	A. Hennig, Lunds. Un. Aars., XXXV, No. 5, p. 12, 1889.	Konga diabase.	In W. T., p. 441.
14	Bökebolet, Kullen, Sweden.	L. G. Thomé.	A. Hennig, Lunds. Un. Aars., XXXV, No. 5, p. 28, 1899.	Diabase.	In W. T., p. 441.
15	Tanga, Kullen, Sweden.	L. G. Thomé.	A. Hennig, Lunds. Un. Aars., XXXV, No. 5, p. 28, 1899.	Olivine diabase.	In W. T., p. 441.
16	Karlshamn, Blekinge, Scania, Sweden.	H. Santesson.	J. C. Moberg, Afh. Sv. G. Und., No. 158. p. 27, 1896.	Diabase.	In W. T., p. 335.
17	St. Sigismund, Tyrol.	Not stated.	H. v. Foullon, Jb. G. R.-A. Wien, XXXVI, p. 771, 1886.	Quartz-hornblende diabase.	In W. T., p. 335.
18	Leparo, Vicentino, Italy.	L. Maddalena.	L. Maddalena, Z. D. G. G., LIX, p. 392, 1907.	Dike rock (diabase).	
19	Lojo, Finland.	N. W. Slawsky.	P. P. Sustchinsky, Tr. Soc. Nw. St. P., XXXVI, (5), p. 36, 1912.	Metabasite.	
20	Issatschki Hill, Poltawa, Russia.	J. Morozewicz.	J. Morozewicz, Mem. C. G. Rus., No. 7, p. 32, 1903.	Diabase.	

DIABASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
21 A4. IV	52.80	14.60	n. d.	10.25	7.58	10.95	1.90	0.90	0.25		1.46				100.69	
22 A4. IV	51.80	13.77	n. d.	9.80	7.85	11.21	2.27	0.68	0.50		1.56	0.06			99.50	
23 A3. III	55.25	12.12	8.84	4.91	4.84	8.34	2.08	1.62	1.65						99.65	
24 A3. III	51.68	13.88	6.59	4.44	7.87	10.99	2.93	0.81	0.74						99.93	
25 A3. III	49.78	14.49	0.81	7.46	9.53	13.44	1.71	0.68	1.43			0.05			99.38	
26 A3. III	76.22	12.55	3.52	n. d.	0.70	0.66	0.08	2.01	3.72	0.32	0.86		trace	CO_2 none	100.64	2.47
27 A3. III	53.06	13.67	4.83	9.96	5.31	8.62	3.22	1.29	0.38				0.56		100.90	3.07

LAMPROPHYRE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A3. III	52.29	19.38	4.40	6.00	3.54	7.79	2.12	4.12	0.95						100.52	
2 A4. IV	52.70	15.07	8.41	n. d.	7.23	5.33	3.12	4.81	2.38		1.71				100.76	
3 A3. III	51.32	17.84	4.34	6.70	4.18	9.51	3.01	1.52	1.98						100.50	
4 A3. III	46.97	12.98	5.59	9.37	8.54	7.95	2.36	1.29	2.64	0.39	trace		0.63		100.57	3.02
5 A3. III	51.97	8.05	11.66	1.19	15.00	7.21	1.55	1.02	2.25		0.13		0.14		100.16	
6 A3. III	42.49	17.68	5.12	5.90	5.28	15.81	4.29	2.97	0.38						99.92	
7 A3. III	44.43	14.45	8.60	3.21	9.08	12.73	3.45	3.08	0.40				0.56		99.99	

BASALT.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A3. III	52.68	14.14	1.95	9.79	6.38	9.38	2.56	0.87	1.60				0.44		99.79	2.97
2 A3. III	52.42	14.54	1.25	9.84	7.33	10.59	2.23	0.49	0.55				0.51		99.75	3.00
3 A3. III	53.13	13.74	1.08	9.10	8.58	9.47	2.30	1.03	0.90				0.43		99.76	2.96
4 A3. III	51.36	16.25	2.14	8.24	7.97	10.27	1.54	1.06	1.33				0.09	NiO 0.03	100.28	

DIABASE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
21	French Guinea.	Not stated.	Lemoine and Chantard, B. Soc. G. Fr., VIII, p. 35, 1908.	Ophite.	
22	French Guinea.	Not stated.	Lemoine and Chantard, B. Soc. G. Fr., VIII, p. 35, 1908.	Diabase.	
23	Richmond, Cape Colony.	Feder.	E. Cohen, N. J. B. B., V, p. 240, 1887.	Quartz diabase.	In W. T., p. 245.
24	Colesburg, Cape Colony.	Gridmore and Halberstadt.	E. Cohen, N. J. B. B., V, p. 233, 1887.	Olivine diabase.	In W. T., p. 325.
25	Hammong Ommang, Siberia.	Lindström.	Lindström, Ref., N. J., 1885, I, p. 430.	Olivine diabase.	In W. T., p. 445.
26	Leonora, Western Australia.	C. C. Williams.	C. F. V. Jackson, W. Aust. G. S. B. 13, p. 19, 1904.	Greenstone.	Altered.
27	Udandurra Creek, Northampton, Western Australia.	E. S. Simpson.	E. S. Simpson, W. Aust. G. S. A. R. (1897), p. 48, 1898.	Diabase.	Not in W. T.

LAMPROPHYRE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Swastika Area, Ontario.	Not stated.	E. L. Bruce, Rep. Bur. Min. Ont., XXI, p. 263, 1912.	Augite lamprophyre.	
2	Weiler, near Weissenburg, Elsass.	G. Linck.	G. Linck, Abh. G. Kt. Els. Loth., III (I), p. 55, 1884.	Minette.	In W. T., p. 397.
3	Luciberg, Odenwald.	F. Kutscher.	C. Chelius, Nb. Ver. Erdk. (4), XIII, p. 10, 1892.	Luciite.	In W. T., p. 291.
4	Studené, Eule, Bohemia.	Not stated.	H. L. Barvir, Ref., N. J., 1904, I, p. 49.	Malchite.	
5	Gross, Hungary.	K. Emszt.	K. Emszt, Jb. Ung. G. A. (1903), p. 324, 1905.	Hornblende kersantite.	3 decimals. Iron oxides?
6	San José, Tamaulipas, Mexico.	G. I. Finlay.	G. I. Finlay, Ann. N. Y. Ac. Sci., XIV, p. 289, 1904.	Camptonite.	
7	Zakharovka River, Jenissei District, Siberia.	Not stated.	A. Meister, Reg. Aur. Sib., IX, p. 307, 1910.	Camptonite.	

BASALT.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Mount Holyoke, Massachusetts.	G. W. Hawes.	G. W. Hawes, A. J. S., IX, p. 186, 1875.	Dolerite.	Not in W. T.
2	Wintergreen Lake, New Haven, Connecticut.	G. W. Hawes.	G. W. Hawes, A. J. S., IX, p. 189, 1875.	Dolerite.	Not in W. T.
3	Jersey City, New Jersey.	G. W. Hawes.	G. W. Hawes, A. J. S., IX, p. 187, 1875.	Dolerite.	Not in W. T.
4	Watchung Mountain, Orange, New Jersey.	L. G. Eakins.	J. P. Iddings, U. S. G. S. B. 150, p. 255, 1898.	Basalt.	In W. T., p. 331.

BASALT—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
5 A3. III	55.89	20.01	1.77	4.72	4.57	8.12	2.66	2.29	0.19				0.06		100.28	
6 A3. III	51.08	15.55	7.71	8.55	4.48	9.00	3.29	0.53				0.04			100.23	
7 A4. IV	56.54	14.75	n. d.	9.29	6.51	7.80	2.07	2.96			0.55	0.29			100.76	
8 A3. III	47.30	18.27	2.24	6.95	6.78	7.95	5.99	1.00	0.07		(1.47)	1.61			99.63	
9 A3. III	45.11	17.41	12.55	0.20	4.19	9.10	3.13	1.89	1.86		3.34	0.87	0.20	SO_3 0.04 BaO 0.08	99.97	
10 A4. IV	52.60	14.17	11.38	n. d.	6.37	9.17	2.90	1.06	2.08		0.57				100.30	
11 A4. IV	53.78	14.22	9.66	n. d.	7.12	7.44	3.11	0.89	1.73		2.22				100.46	
12 A3. III	50.22	15.31	4.87	6.54	7.13	8.72	3.02	1.68	2.78			0.54		Cl 0.10	100.91	2.92
13 A3. III	49.55	14.97	4.78	6.90	7.36	8.57	3.47	2.27	2.09						99.96	2.91
14 A3. III	46.14	13.10	10.56	n. d.	12.55	9.97	2.61	2.02	1.02		1.07	1.46	trace	CO_2 trace	100.50	
15 A3. III	45.80	13.41	6.89	5.69	12.82	9.91	3.57	1.41				0.46			99.96	
16 A3. III	43.63	14.14	7.72	4.96	9.73	11.83	2.84	1.45	3.22		trace	0.94			100.46	2.934
17 A3. III	41.58	16.96	8.06	4.61	10.76	11.12	4.23	1.23	1.74		trace	0.41			100.70	3.00
18 A3. III	42.71	16.03	9.31	1.83	10.44	14.70	2.71	0.24	2.78						100.75	
19 A3. III	45.52	14.02	8.21	6.64	8.01	13.77	2.60	1.12	0.82						100.71	
20 A3. III	48.48	17.52	2.06	8.73	7.11	12.04	2.42	0.96	1.01						100.33	
21 A3. III	47.96	17.22	6.41	5.21	7.40	12.04	2.53	0.85	0.78						100.40	
22 A3. III	47.68	16.67	6.82	4.56	7.66	12.23	3.01	0.72	0.80						100.15	
23 A3. III	51.79	11.36	11.99	n. d.	13.47	8.37	1.99	0.64	0.16	0.13	0.87	0.28	0.24	SO_3 0.18	101.07	
24 A3. III	48.70	11.51	17.95	n. d.	6.23	10.05	2.80	0.40	0.46	0.13	1.67	trace	0.27	SO_3 0.53 Insol. 0.01	100.71	

BASALT—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
5	Mount Pitt, Oregon.	R. W. Woodward.	A. B. Emmons, B. Cal. Ac. Sci., I, p. 234, 1885.	Basalt.	Not in W. T.
6	Dalles, Columbia River, Oregon.	H. W. Muthmann.	K. Oebbeke, N. J., 1885, I, p. 226.	Basalt.	In W. T., p. 327.
7	Basalt Peak, Eureka District, Nevada.	E. Hart.	A. Hague, U. S. G. S. Mon. 20, p. 264, 1892.	Basalt.	Not in W. T.
8	Pedregal, Tlalpam, near Mexico, Mexico.	P. Krais.	H. Lenk in Felix and Lenk, Btr. G. Mex., I, p. 103, 1890.	Basalt.	In W. T., p. 303.
9	Louchadiere, Puy de Dome, Auvergne.	P. Holland.	Dickson and Holland, Pr. Liv. G. Soc., VIII, p. 412, 1899.	Lava (basalt?).	Not in W. T.
10	Reichshofen, Vogesen.	G. Linck.	G. Linck, Mt. G. Unt. Els., I, p. 52, 1888.	Basalt.	In W. T., p. 449.
11	Schiffenberg, Giessen, Hesse.	A. Streng.	A. Streng, Ber. Oberh. Ges., XXIX, p. 99, 1893.	Anamesite.	In W. T., p. 451.
12	Eisenberg, Knüll District, Hesse.	H. Wolff.	K. Oebekke, Jb. Pr. G. L.-A. (1888), p. 395, 1889.	Basalt.	In W. T., p. 323.
13	Hohebaum, Lottersberg, Hesse.	H. Wolff.	K. Oebekke, Jb. Pr. G. L.-A. (1888), p. 397, 1889.	Basalt.	In W. T., p. 323.
14	Stempel, near Marburg, Hesse Nassau.	F. W. Kuester.	M. Bauer, N. J., 1891, II, p. 159.	Basalt.	In W. T., p. 449.
15	Wostray, near Milleschau, Bohemia.	J. Hanaman.	J. Hanaman, Arch. Landf. Bohm., VII, No. 3, p. 69, 1890.	Basalt.	
16	Bachelsdorf, near Tetschen, Bohemia.	R. Pfohl.	J. E. Hibsch, T. M. P. M., XV, p. 247, 1896.	Basalt.	In W. T., p. 345.
17	Bachelsdorf, near Tetschen, Bohemia.	R. Pfohl.	J. E. Hibsch, T. M. P. M., XV, p. 247, 1896.	Basalt.	In W. T., p. 345.
18	Burberg, near Karlsbad, Bohemia.	J. M. Clements.	J. M. Clements, Jb. G. R.-A. Wien, XL, p. 345, 1890.	Basalt.	In W. T., p. 347.
19	Sete Cidades, Sao Miguel, Azores.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (7), p. 662, 1912.	Basalt.	
20	2,414 meters deep, 114 sea miles northeast of New Amsterdam Island.	R. Reinisch.	R. Reinisch, D. Tiefs. Exp., X (3), p. 73, 1908.	Basalt.	Dredged block. Cf. No. 151, II.5.4.4.
21	New Amsterdam Island.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (5), p. 391, 1909.	Basalt.	
22	Landing Place, New Amsterdam Island.	R. Reinisch.	R. Reinisch, D. Tiefs. Exp., X (3), p. 73, 1908.	Basalt.	
23	Dodbettadahalli, Yelahanka, Mysore, India.	Not stated.	E. W. Wetherell, Mys. G. Dep., Mem. 2, p. 65, 1905?	Enstatite dolerite.	
24	Nundydroog Mine, Mysore, India.	E. W. Wetherell.	E. W. Wetherell, Mys. G. Dep., Mem. 2, p. 54, 1905?	Dolerite.	

BASALT—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
25 A3. III	50.54	19.80	6.45	3.70	3.11	11.75	3.49	1.15	0.36						100.35	2.819
26 A3. III	45.47	17.63	8.16	2.25	8.27	13.04	3.60	0.93	0.99						100.34	2.732
27 A3. III	48.67	18.21	1.27	8.56	9.91	9.80	2.44	0.23	0.86					CO_2 0.05	100.00	2.744
28 A3. III	48.60	17.87	6.20	5.76	4.32	9.11	4.66	2.06	1.78						100.36	2.77
29 A3. III	48.40	13.05	9.02	7.33	7.26	8.30	3.50	0.57	2.84						100.27	
30 A3. III	47.68	17.90	4.48	9.05	8.71	5.65	2.35	2.68	1.16					Cl 0.20	99.86	
31 A3. III	45.89	17.17	2.60	11.77	5.80	10.05	3.60	1.54	1.20						99.63	
32 B3. IV	45.39	9.61	9.27	8.48	10.69	9.25	3.14	0.55	2.81						99.19	
33 B3. IV	44.84	11.92	9.12	8.54	10.34	9.23	1.43	0.68	3.04						99.14	
34 A3. III	50.16	17.97	2.23	6.25	4.70	11.85	3.50	2.80	none		trace	trace	0.30		100.66	
35 B3. IV	49.97	11.68	2.45	10.60	12.84	11.20	1.60	0.25	n. d.			0.33	trace		100.92	
36 A3. III	55.75	15.03	14.76	n. d.	0.54	4.30	5.90	2.23	0.11		0.75	0.77	0.20		100.34	
37 A3. III	45.85	13.10	14.94	n. d.	6.69	9.92	3.45	2.02	0.20		4.10	0.11	0.09		100.56	
38 A?3. III	49.75	15.25	12.67	n. d.	1.33	5.65	7.57	1.61	1.15		3.75		0.60		99.33	
39 A3. III	43.15	15.45	14.85	n. d.	7.10	8.80	4.10	1.25	1.13		3.44	1.08	0.13		100.48	
40 A3. III	41.95	13.40	15.75	n. d.	5.58	9.10	7.74	1.56	0.36		2.25	2.55	0.25		100.49	
41 A3. III	45.61	15.70	13.46	n. d.	4.84	6.34	5.06	2.67	2.34		3.48		trace		99.50	
42 A3. III	45.65	14.10	13.95	n. d.	7.02	9.10	3.82	1.01	1.30		3.70	0.52	0.08		100.25	

BASALT—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
25	Sago Volcano, Sumatra.	A. Clausnitzer.	R. D. M. Verbeek, Sum. Westk., p. 516, 1883.	Basalt.	Not in W. T.
26	Koeliet Manias Volcano, Sumatra.	A. Clausnitzer.	R. D. M. Verbeek, Sum. Westk., p. 516, 1883.	Basalt.	Not in W. T.
27	Paerata, New Zealand.	J. S. Maclaurin.	J. S. Maclaurin, N. Z. G. S. A. R. 41, p. 23, 1908.	Basalt.	
28	Dyers Pass, Canterbury, New Zealand.	R. Speight.	R. Speight, Tr. N. Z. Inst., XXVI, p. 409, 1894.	Dolerite.	In W. T., p. 301.
29	Mount Charles, Dunedin, New Zealand.	P. Marshall.	P. Marshall, Q. J. G. S., LXII, p. 410, 1906.	Dolerite.	
30	Mount Cargill, Dunedin, New Zealand.	J. A. Bartrum.	J. A. Bartrum, Tr. N. Z. Inst., XLIV, p. 176, 1912.	Basalt.	
31	Mount Holmes, Dunedin, New Zealand.	J. A. Bartrum.	J. A. Bartrum, Tr. N. Z. Inst., XLIV, p. 175, 1912.	Basalt.	
32	Papanui, Dunedin, New Zealand.	P. Marshall.	P. Marshall, Q. J. G. S., LXII, p. 410, 1906.	Dolerite.	
33	Papanui, Dunedin, New Zealand.	P. Marshall.	P. Marshall, Q. J. G. S., LXII, p. 410, 1906.	Dolerite.	
34	Kilauea, Hawaii, Hawaiian Islands.	O. Silvestri.	O. Silvestri, B. C. G. It., XIX, p. 191, 1888.	Augite andesite.	In W. T., p. 301.
35	Lat. 32° 36′ S., Long. 137° 43′ W., South Pacific Ocean.	Sipoez.	Murray and Renard, Challenger Rep., Deep Sea Dep., p. 307, 1891.	Volcanic glass.	Dredged block.
36	Camp Cove, Auckland Island.	B. C. Aston.	B. C. Aston, Subant. Islds., II, p. 768, 1909.	Basalt.	
37	Camp Cove, Auckland Island.	B. C. Aston.	B. C. Aston, Subant. Islds., II, p. 768, 1909.	Basalt.	Cf. No. 42.
38	Perseverance Harbor, Campbell Island.	B. C. Aston.	B. C. Aston, Subant. Islds., II, p. 767, 1909.	Basalt.	Sum low.
39	Antipodes Island.	B. C. Aston.	B. C. Aston, Subant. Islds., II, p. 763, 1909.	Basalt.	
40	Antipodes Island.	B. C. Aston.	B. C. Aston, Subant. Islds., II, p. 763, 1909.	Basalt scoria.	
41	Possession Island, Victoria Land, Antarctica.	G. T. Prior.	G. T. Prior, Min. Mag., XII, p. 80, 1899.	Basalt.	
42	Enderby Island, Auckland Islands.	B. C. Aston.	B. C. Aston, Subant. Islds., II, p. 769, 1909.	Basalt.	Cf. No. 37.

NEPHELITE SYENITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A4. IV	55.64	19.81	n. d.	3.90	0.95	2.86	8.21	4.60	3.14	0.35		0.10			99.56	
2 A4. IV	55.59	23.55	n. d.	3.28	0.78	1.87	8.05	5.04	1.21				0.45		99.82	
3 A4. IV	59.70	18.85	4.85	n. d.	0.68	1.34	6.29	5.97	1.88						99.56	2.557
4 A4. IV	59.23	19.98	4.72	n. d.	1.10	2.41	5.47	5.76	1.38						100.05	2.521
5 A4. IV	59.62	18.67	5.07	n. d.	0.84	1.80	6.95	5.65	0.80					Li_2O trace	99.40	
6 A4. IV	58.74	20.85	4.15	n. d.	0.22	0.36	9.72	4.23	1.82						100.09	
7 A4. IV	56.06	20.10	3.82	n. d.	0.83	2.53	7.50	8.78	1.18						100.80	
8 A4. IV	53.10	22.50	5.10	n. d.	0.15	2.15	8.49	6.48	1.65						100.43	
9 A4. IV	52.75	22.55	3.65	n. d.	0.15	1.85	8.10	7.05	3.60						99.70	
10 A3. III	44.85	17.10	10.06	2.71	0.39	14.00	1.67	6.92	1.66		trace	trace	trace		99.36	
11 A4. IV	56.71	22.49	3.40	n. d.	1.19	2.22	7.37	5.87	0.45						99.70	
12 A3. III	54.85	18.33	6.96	n. d.	1.06	1.32	11.43	3.16	1.06		1.44		0.89		100.50	
13 A4. IV	53.54	22.52	3.50	n. d.	0.43	3.01	5.26	8.00	3.30			0.34			100.70	
14 A3. III	38.97	12.44	14.48	1.34	6.28	9.27	4.38	2.44	3.50		4.63	2.18			99.91	2.90

PHONOLITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A4. IV	54.07	21.67	3.55	n. d.	0.36	0.36	8.91	4.76	5.44		0.15				99.27	
2 A3. III	51.35	20.21	4.90	n. d.	1.53	5.75	4.43	6.68			0.80	0.28		SO_3 0.04 NaCl 0.06 FeS_2 4.01	100.04	
3 A4. IV	44.50	22.96	6.84	n. d.	1.65	8.65	6.70	4.83	2.06		1.40				99.59	
4 A4. IV	59.23	21.10	n. d.	4.13	0.47	0.64	8.67	4.49	1.18	0.10					100.01	
5 A4. IV	56.34	21.06	n. d.	4.21	0.71	3.34	9.27	4.08	0.90	0.07					99.98	

NEPHELITE-SYENITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Sturgeon Lake, Ontario.	A. G. Burrows.	W. G. Miller, A. G., XXXII, p. 185, 1903.	Nephelite syenite.	
2	Port Caldwell, Ontario.	E. L. C. Foster.	H. L. Kerr, Rep. Bur. Min. Ont., XIX (I), p. 209, 1910.	Nephelite syenite.	
3	Fourche Mountain, near Little Rock, Arkansas.	W. A. Noyes.	J. F. Williams, Ig. R. Ark., p. 81, 1891.	Nephelite syenite.	In W. T., p. 195.
4	Fourche Mountain, near Little Rock, Arkansas.	W. A. Noyes.	J. F. Williams, Ig. R. Ark., p. 88, 1891.	Nephelite syenite.	In W. T., p. 199.
5	Saline County, Arkansas.	W. A. Noyes.	J. F. Williams, Ig. R. Ark., p. 135, 1891.	Nephelite syenite.	In W. T., p. 197.
6	Saline County, Arkansas.	W. A. Noyes.	J. F. Williams, Ig. R. Ark., p. 139, 1891.	Nephelite syenite.	In W. T., p. 207.
7	Serra de Tingua, Brazil.	E. Hussak.	E. Hussak, N. J., 1892, II, p. 146.	Foyaite.	In W. T., p. 295.
8	Pocos de Caldas, Minas Geraes, Brazil.	J. Machado.	J. Machado, T. M. P. M., IX, p. 345, 1888.	Nephelite syenite.	In W. T., p. 211.
9	Pocos de Caldas, Minas Geraes, Brazil.	J. Machado.	J. Machado, T. M. P. M., IX, p. 334, 1888.	Nephelite syenite.	In W. T., p. 211.
10	Croc-na-Soaine, Sutherland, Scotland.	Not stated.	J. Shand, N. J. B. B., XXII, p. 441, 1906.	Borolanite.	
11	Bratholmen, Norway.	G. Forsberg.	W. C. Brögger, Z. K., XVI, p. 38, 1890.	Ditroite.	In W. T., p. 213.
12	Angwundas, Lujavr-Urt, Kola, Finland.	W. Berghell.	W. Ramsay, Fennia, XV, No. 2, p. 16, 1898.	Lujaurite.	Not in W. T.
13	Harbour Cone, Dunedin, New Zealand.	D. R. Waters.	P. Marshall, Q. J. G. S., LXII, p. 392, 1906.	Hornblende foyaite.	
14	Michelsberg, Katzenbuckel, Odenwald.	G. Latterman.	W. Freudenberg, Mt. Bad. G. L.-A.. VIII, p. 267, 1907.	Shonkinite.	Iron oxides.

PHONOLITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Near Hot Springs, Arkansas.	W. A. Noyes.	J. F. Williams, Ig. R. Ark., p. 370, 1891.	Tinguaite.	In W. T., p. 209.
2	Magnet Cove, Arkansas.	W. A. Noyes.	J. F. Williams, Ig. R. Ark., p. 263, 1891.	Nephelite felsite.	In W. T., p. 297.
3	Magnet Cove, Arkansas.	W. A. Noyes.	J. F. Williams, Ig. R. Ark., p. 261, 1891.	Nephelite porphyry.	In W. T., p. 403.
4	Squaw Creek, Black Hills, South Dakota.	Flintermann.	J. D. Irving, Ann. N. Y. Ac. Sci., XII, p. 272, 1899.	Tinguaite.	In W. T., p. 209.
5	Squaw Creek, Black Hills, South Dakota.	Flintermann.	J. D. Irving, Ann. N. Y. Ac. Sci., XII, p. 272, 1899.	Phonolite.	In W. T., p. 403.

PHONOLITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
6	57.88	20.46	n. d.	3.77	0.28	0.76	8.74	5.11	2.55	0.17					99.72	
A4. IV																
7	58.59	20.77	n. d.	4.35	0.46	1.46	8.17	4.80	0.92	0.09					99.61	
A4. IV																
8	57.21	18.67	n. d.	3.41	1.10	3.07	6.62	4.92	3.61	1.01					99.62	
A4. IV																
9	56.94	21.03	n. d.	3.41	0.33	1.93	9.05	4.66	2.15	0.39					99.89	
A4. IV																
10	56.57	20.74	n. d.	5.66	0.23	1.05	9.36	4.49	1.49	1.11					99.70	
A4. IV																
11	55.94	20.91	n. d.	4.50	0.42	1.73	8.87	5.44	2.43	0.31					100.55	
A4. IV																
12	55.60	19.71	n. d.	5.49	0.86	1.69	8.60	4.88	2.89	0.34					100.06	
A4. IV																
13	55.62	20.46	n. d.	4.06	0.62	1.91	7.64	4.38	4.22	0.57					99.48	
A4. IV																
14	55.73	20.06	n. d.	4.23	1.30	2.18	5.60	7.49	3.32	0.10			0.10		100.11	2.557
A4. IV																
15	58.24	20.45	3.51	n. d.	0.38	1.27	8.76	5.87	1.52			trace		SO_3 trace Cl 0.09	100.39	
A4. IV																

NEPHELITE TEPHRITE, ETC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	46.67	15.90	3.20	7.04	10.17	9.15	3.20	2.54	1.64			0.64	trace	SO_3 trace Cl 0.11	100.26	2.888
A3. III																
2	48.41	16.24	4.89	6.41	7.25	9.38	3.23	2.33	2.11		trace				100.25	
A3. III																
3	44.25	19.26	5.83	6.63	6.98	9.15	4.43	1.00	3.30		trace				100.83	
A3. III																
4	44.81	15.35	3.37	6.69	12.77	9.83	3.03	1.69	2.13			0.48		Cl 0.16	100.31	2.98
B3. IV																
5	44.89	18.43	1.27	7.86	9.07	9.80	3.06	1.81	2.29			1.34			99.82	2.50
B3. IV																
6	41.67	11.39	4.81	9.72	12.37	11.23	3.57	1.06	2.57			1.39			99.78	2.42
B3. IV																
7	39.90	10.02	12.88	4.09	14.84	13.28	2.48	1.77	0.52		trace	0.82	trace		100.60	3.19
A3. III																
8	39.94	14.75	7.68	4.76	12.14	15.37	2.90	1.46	1.84						100.84	3.09
A3. III																
9	44.66	15.42	14.40	n. d.	5.20	9.21	2.44	1.02	1.56		6.60				100.51	
A4. IV																

PHONOLITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
6	Calamity Gulch, Black Hills, South Dakota.	Flintermann.	J. D. Irving, Ann. N. Y. Ac. Sci., XII, p. 272, 1899.	Phonolite.	In W. T., p. 209.
7	Bald Mountain, Black Hills, South Dakota.	Flintermann.	J. D. Irving, Ann. N. Y. Ac. Sci., XII, p. 272, 1899.	Phonolite.	In W. T., p. 209.
8	Whitetail Gulch, Black Hills, South Dakota.	Flintermann.	J. D. Irving, Ann. N. Y. Ac. Sci., XII, p. 272, 1899.	Phonolite.	In W. T., p. 201.
9	Ragged Top Mountain, Black Hills, South Dakota.	F. C. Smith.	J. D. Irving, Ann. N. Y. Ac. Sci., XII, p. 272, 1899.	Phonolite.	In W. T., p. 209.
10	Annie Creek, Black Hills, South Dakota.	Flintermann.	J. D. Irving, Ann. N. Y. Ac. Sci., XII, p. 272, 1899.	Phonolite.	In W. T., p. 209.
11	Annie Creek, Black Hills, South Dakota.	Flintermann.	J. D. Irving, Ann. N. Y. Ac. Sci., XII, p. 272, 1899.	Phonolite.	In W. T., p. 209.
12	Annie Creek, Black Hills, South Dakota.	Flintermann.	J. D. Irving, Ann. N. Y. Ac. Sci., XII, p. 272, 1899.	Phonolite.	In W. T., p. 403.
13	Preston, Black Hills, South Dakota.	Flintermann.	J. D. Irving, Ann. N. Y. Ac. Sci., XII, p. 272, 1899.	Tinguaite.	In W. T., p. 213.
14	Homestake Mine, Lead, South Dakota.	W. J. Sharwood.	W. J. Sharwood, Ec. G., VI, p. 731, 1911.	"Green rock" (tinguaite).	
15	Lindig, Aschaffenburg, Spessart, Bavaria.	Not stated.	K. v. Gümbel, G. v. Bay., II, p. 637, 1894.	Phonolite.	Not in W. T.

NEPHELITE TEPHRITE, ETC.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Elkhead Mountain, Routt County, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. B. 228, p. 187, 1904.	Nephelite tephrite.	
2	Der Sabbel, Hesse.	Krauss.	K. Oebbeke, Jb. Pr. G. L.-A. (1888), p. 410, 1889.	Nephelite basanite.	In W. T., p. 323.
3	Krötenkopf, Hesse.	Krauss.	K. Oebbeke, Jb. Pr. G. L.-A. (1888), p. 406, 1889.	Nephelite basanite.	In W. T., p. 301.
4	Steller's Kuppe, Knüll District, Hesse.	H. Wolff.	K. Oebbeke, Jb. Pr. G. L.-A. (1888), p. 402, 1889.	Nephelite basanite.	3 decimals. In W. T., p. 345.
5	Rimberg, Knüll District, Hesse.	H. Wolff.	H. Wolff, Sb. Ph. Ges. Erl., XXII, p. 135, 1890.	Basanite.	3 decimals. Al_2O_3 and MgO? Not in W. T.
6	Dohnberg, n. Oberaula, Knüll District, Hesse.	H. Wolff.	H. Wolff, Sb. Ph. Ges. Erl., XXII, p. 137, 1890.	Nephelite basalt.	3 decimals. In W. T., p. 351.
7	Löbauer Berg, Saxony.	J. Stock.	J. Stock, T. M. P. M., IX, p. 433, 1888.	Nephelite basalt.	In W. T., p. 359.
8	Scheft, Erzgebirge, Bohemia.	R. Reinisch.	R. Reinisch, N. J. B. B., XXIII, p. 495, 1907.	Nephelite basalt.	
9	Fagasá, Tutuila, Samoa.	Hobein.	M. Weber, Ab. Bay. Ak. W., XXIV, p. 301, 1909.	Nephelite basanite.	

LEUCITE ROCKS.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A3. III	50.96	19.67	7.76	n. d.	0.36	4.38	7.96	6.77	1.38		0.52			SO_3 trace Cl 0.25	100.01	
2 A4. IV	55.06	23.29	3.29	n. d.	trace	1.46	6.76	8.86	1.08						99.80	
3 A4. IV	52.16	20.14	6.45	n. d.	1.54	4.64	5.73	8.12	1.39		trace		trace	CO_2 trace SO_3 trace Cl trace	100.17	
4 A4. IV	53.45	21.28	4.08	n. d.	0.18	1.30	8.37	5.98	5.20					SO_3 0.17 Cl trace	99.95	
5 A3. III	53.80	19.10	6.40	n. d.	1.50	7.16	1.94	6.10	2.12		0.37	0.16	0.45	SO_3 0.51	99.61	
6 A3. III	48.91	10.58	n. d.	12.38	7.64	10.64	3.62	2.68	n. d.		2.96	0.38		SO_3 0.21	100.60	
7 A3. III	50.08	15.48	2.16	5.04	4.65	5.51	2.62	14.37	n. d.						99.91	
8 A3. III	47.77	8.18	4.20	6.13	12.03	14.15	0.61	7.53	n. d.						100.60	

LIMBURGITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A3. III	41.05	14.70	12.49	7.00	6.18	11.19	4.72	0.93	2.23						100.49	2.967
2 A3. III	41.69	14.85	10.39	5.43	9.84	11.20	3.71	1.05	1.06						99.32	2.851

PYROXENITE, ETC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A3. III	42.68	18.36	5.27	7.02	12.89	10.05	1.69	0.51	1.25						99.80	
2 A3. III	47.29	16.93	1.58	2.67	21.01	8.56	1.17	0.39	0.29						99.89	
3 A3. III	47.09	16.99	1.62	3.60	19.92	9.20	0.50	0.25	0.83						100.00	
4 A3. III	44.38	17.60	1.42	3.91	15.14	16.03	0.78	0.15	0.59						100.00	
5 A3. III	42.32	15.41	2.69	5.96	19.25	11.97	1.04	0.24	1.23						100.11	
6 A3. III	38.95	19.80	3.01	4.54	16.42	12.05	0.89	0.37	3.36						99.39	
7 A3. III	38.58	20.42	7.60	5.91	12.93	9.43	2.29	1.39	1.25						99.80	

LEUCITE ROCKS.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Diamond Jo Quarry, Magnet Cove, Arkansas.	W. A. Noyes.	J. F. Williams, Ig. R. Ark., p. 276, 1891.	Leucite syenite (arkite).	In W. T., p. 405.
2	Serra de Tingua, Brazil.	E. Hussak.	E. Hussak, N. J., II, p. 146, 1892.	Leucite tinguaite.	In W. T., p. 207.
3	Pocos de Caldas, Minas Geraes, Brazil.	F. W. Dafert.	E. Hussak, N. J., II, p. 149, 1892.	Leucitophyre.	In W. T., p. 303.
4	Engeler Kopf, near Laacher See, Rheinland.	K. Busz.	K. Busz, Vh. Nh. Ver. Bonn., XLVIII, p. 236, 1891.	Leucite phonolite.	In W. T., p. 211.
5	Tabellario, Monte Mattone, Rocca Monfina, Italy.	A. Galdieri.	A. Galdieri, Rend. Ac. Sci. Nap., XIX, p. 111, 1913.	Hauyne-leucite phonolite.	
6	Namlagira, Lake Kivu District, German East Africa.	O. Hauser.	O. Hauser, D. Zent. Af. Exp., I, p. 50, 1912.	Leucite basanite.	
7	Gaussberg, Kaiser Wilhelm Land, Antarctica.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (1), p. 84, 1906.	Augite-leucite nodule.	In leucite basalt.
8	Gaussberg, Kaiser Wilhelm Land, Antarctica.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (1), p. 84, 1906.	Olivine-leucite augite nodule.	In leucite basalt.

LIMBURGITE.

1	Kleinostheim, Spessart, Bavaria.	Stöhr.	H. Bücking, Abh. Pr. G. L.-A., XII, p. 212, 1892.	Limburgite.	Not in W. T.
2	Doloy Nor, Manchuria.	P. Venukoff.	P. Venukoff, B. Soc. Belg. G., II, p. 446, 1888.	Limburgite.	

PYROXENITE, ETC.

1	Escourgeat, Pyrenees.	Pisani.	A. Lacroix, Cong. G. Int., VIII, C. R., p. 833, 1901.	Ariegite.	In W. T., p. 335.
2	Etang de Lherz, Pyrenees.	Pisani.	A. Lacroix, Cong. G. Int., C. R., VIII, p. 833, 1901.	Ariegite.	In W. T., p. 335.
3	Etang de Lherz, Pyrenees.	Pisani.	A. Lacroix, Cong. G. Int., VIII, C. R., p. 833, 1901.	Ariegite.	In W. T., p. 337.
4	Etang de Lherz, Pyrenees.	Pisani.	A. Lacroix, Cong. G. Int., VIII, C. R., p. 832, 1901.	Ariegite.	In W. T., p. 337.
5	Etang de Lherz, Pyrenees.	Pisani.	A. Lacroix, Cong. G. Int., VIII, C. R., p. 833, 1901.	Ariegite.	In W. T., p. 339.
6	Etang de Lherz, Pyrenees.	Pisani.	A. Lacroix, Cong. G. Int., VIII, C. R., p. 833, 1901.	Ariegite.	In W. T., p. 339.
7	Lherz, Pyrenees.	Pisani.	A. Lacroix, Cong. G. Int., VIII, C. R., p. 833, 1901.	Ariegite.	In W. T., p. 347.

PYROXENITE, ETC.—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
8 A3. III	46.56	13.04	2.83	9.92	15.31	10.10	1.13	0.45	0.42		trace	0.25	0.16	S trace	100.17	
9 A3. III	43.85	9.07	n. d.	10.75	23.40	7.90	1.30	0.54	1.62		1.88	0.38			100.69	

IRON ORES, ETC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A3. III	9.40	7.18	52.93	21.65	1.62	6.00	n. d.	n. d.	0.20		n. d.	0.33	0.20	SO_3 0.12 S 0.05 Cu 0.01	99.69	
2 B2. III	4.24	3.45	43.34	18.61	0.66	5.48	0.15	0.45	1.62	0.51	16.48	4.98	0.12	CO_2 trace Cl trace F 0.26 S trace	100.24	

PYROXENITE, ETC.—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
8	Schollschitz, Brunn, Moravia.	v. John.	v. John and Suess, Jb. G. R.-A. Wien., LVIII, p. 249, 1908.	Hornblendite.	
9	Papenoo Valley, Tahiti, Society Islands.	Pisani.	A. Lacroix, B. Soc. G. Fr., X, p. 119, 1910.	Feldspathic picrite.	

IRON ORES, ETC.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Goroblagodat, Ural Mountains.	D. J. Mendelejeff.	Cited in Beck and Weed, Ore Deposits, I, p. 19, 1905.	Iron ore.	In syenite.
2	Lovingston, Nelson County, Virginia.	W. M. Thornton.	Watson and Taber, Va. G. S. B. III, A, p. 125, 1913.	Biotite nelsonite.	CaO low or P_2O_5 high.

PART III.—SUPERIOR ANALYSES OF ALTERED ROCKS AND TUFFS.

GRANITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 **A3. III**	58.84	11.24	n. d.	0.47	0.35	12.17	6.91	none	0.40		0.26			CO_2 9.84 S 0.13	100.61	
2 **A3. III**	70.18	15.13	0.68	1.54	none	0.84	2.67	8.93	0.22	0.10			0.13		100.42	
3 **A2. II**	67.33	16.20	1.40	2.73	1.31	2.81	3.15	2.14	1.84		0.80	0.16	trace	BaO 0.05	99.92	
4 **A2. II**	73.52	12.86	1.48	1.54	0.57	2.08	4.36	1.41	1.21	0.35	0.51	0.07	0.08	SO_3 none S none NiO 0.02	100.06	
5 **A3. III**	66.82	15.62	1.88	1.69	2.76	3.13	2.58	2.04	3.27						99.79	
6 **A4. IV**	74.53	13.70	1.15	n. d.	trace	0.95	4.41	5.20	0.81						100.75	
7 **A4. IV**	73.48	14.78	1.30	n. d.	trace	0.31	3.43	5.00	2.42						100.72	
8 **A4. IV**	71.67	16.14	1.22	n. d.	0.10	0.29	2.80	4.52	4.03						100.77	
9 **A4. IV**	70.50	16.84	1.53	n. d.	0.18	1.15	4.47	4.52	1.06						100.25	
10 **A4. IV**	67.92	17.55	1.53	n. d.	0.32	0.99	3.57	5.43	3.17						100.48	
11 **A4. IV**	67.87	18.08	1.91	n. d.	0.79	2.28	4.32	4.52	0.63						100.40	
12 **A4. IV**	60.94	23.29	2.44	n. d.	0.43	0.04	2.18	3.57	8.03						100.92	
13 **A4. IV**	56.99	26.02	1.91	n. d.	0.17	0.75	1.91	2.40	9.76						99.91	
14 **A4. IV**	56.40	25.62	3.45	n. d.	0.98	0.37	1.36	2.99	9.18						100.35	
15 **A4. IV**	54.57	25.90	4.69	n. d.	0.21	0.05	2.16	2.87	10.14						100.59	
16 **A4. IV**	51.29	29.69	6.33	n. d.	0.14	0.07	1.12	1.50	10.36						100.50	
17 **A2. II**	68.36	13.76	2.65	2.75	0.68	0.70	3.56	4.48	0.98		1.57	0.33	trace	SO_3 0.66 Li_2O none	100.48	
18 **A1. I**	59.58	16.00	0 30	0.65	0.03	2.03	0.98	11.93	0.81	0.32	0.75	0.32	trace.	CO_2 0.26 SO_3 none F 0.69 FeS_2 4.78 V_2O_3 0.39 BaO 0.11 SrO 0.01 MoO_3 0.01	99.95	

GRANITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	James Township, Nipissing, Ontario.	N. L. Bowen.	R. E. Hore, J. G., XVIII, p. 275, 1910.	Aplitic soda granite.	
2	Mount Kearsarge, New Hampshire.	J. H. Perry.	J. H. Perry, J. G., XI, p. 406, 1903.	Granite.	"Particles" in weathered granite.
3	East Clarendon, Vermont.	H. N. Stokes.	U. S. G. S. B. 148, p. 71, 1897.	Chloritic granite.	
4	Barnes Hill, North Stonington, Connecticut.	G. Steiger.	G. F. Loughlin, U. S. G. S. B. 492, p. 114, 1912.	Granite.	
5	Near Pierce's Mill, Broad Branch, District of Columbia.	R. L. Packard.	G. P. Merrill, B. G. S. A., VI, p. 323, 1895.	Granite.	Decomposed. Cf. No. 8, p. 751.
6	Lithonia, Dekalb County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9 A, p. 140, 1902.	Granite gneiss.	Altered from No. 50, I.4.2.3.
7	Lithonia, Dekalb County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9 A, p. 134, 1902.	Granite gneiss.	Altered from No. 37, I.4.1.3.
8	Lithonia, Dekalb County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9 A, p. 134, 1902.	Granite gneiss.	Altered from No. 37, I.4.1.3.
9	Lexington, Oglethorpe County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9 A, p. 189, 1902.	Granite.	Altered from No. 46, I.4.1.3.
10	Oglesby, Elbert County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9 A, p. 217, 1902.	Granite.	Altered from No. 60, I.4.2.3.
11	Appling, Columbia County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9 A, p. 236, 1902.	Granite.	Weathered from No. 59, I.4.2.3.
12	Oglesby, Elbert County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9 A, p. 217, 1902.	Granite.	Altered from No. 60, I.4.2.3.
13	Newnan, Coweta County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9 A, p. 87, 1902.	Granite.	Weathered from No. 21, I.4.2.4.
14	Camak, Warren County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9 A, p. 228, 1902.	Granite gneiss.	Weathered from No. 10, p. 751.
15	Greenville, Meriwether County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9 A, p. 75, 1902.	Granite.	Weathered from No. 58, I.4.2.3.
16	Greenville, Meriwether County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9 A, p. 75, 1902.	Granite.	Weathered from No. 58, I.4.2.3.
17	Pigeon Point, Minnesota.	J. E. Whitfield.	W. S. Bayley, U. S. G. S. B. 109, p. 90, 1893.	Granite.	Altered. In W. T., p. 147.
18	Ajax Mine, Cripple Creek, Colorado.	W. F. Hillebrand.	Lindgren and Ransome, U. S. G. S. P. P. 54, p. 194, 1906.	Granite.	Altered.

GRANITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
19 A2. II	72.42	10.47	0.83	5.50	0.41	2.53	1.93	2.94	1.11	0.06	0.68	0.11	0.16	CO_2 0.61	99.76	2.728
20 A3. III	72.69	13.42	0.97	0.32	0.26	1.97	0.21	3.36	2.60	2.36	trace	trace	trace	CO_2 0.97 SO_3 none F 0.25 S none	99.38	
21 A3. III	71.38	14.31	0.66	0.28	0.25	2.22	0.15	3.79	3.03	1.60	trace	trace	trace	CO_2 1.42 SO_3 none F 0.17 S none	99.26	
22 A1. I	63.56	11.72	4.90	1.10	3.65	4.12	6.44	2.30	0.81		0.18	trace	0.24	CO_2 0.79 ZrO_2 trace Cl 0.06 S none CoO 0.08 BaO 0.01 Cu 0.03 Pb none	99.99	
23 A3. III	68.99	18.29	2.10	1.62	0.40	4.75	3.15	0.09	0.14		trace	trace	none	CO_2 1.10 S trace Cu none	100.63	
24 A1. I	65.75	15.56	0.64	3.30	1.77	3.75	3.11	4.11	0.69	0.08	0.66	0.06	0.07	CO_2 0.74 ZrO_2 0.06 BaO 0.06	100.41	2.716
25 A2. II	72.51	13.10	2.81	0.90	0.20	1.84	6.76	0.33	0.35	0.04	0.31	0.06	0.20	CO_2 0.76	100.17	
26 B3. IV	65.68	13.49	0.56	0.28	0.31	6.28	0.13	5.85	1.24					CO_2 5.28	99.10	
27 A1. I	71.15	19.41	1.32	0.09	0.45	0.21	0.05	1.44	5.09	0.16	0.16	0.07	0.09	Cl trace F 0.11 Li_2O 0.03 B_2O_3 0.33	100.16	
28 A1. I	65.67	13.72	0.50	1.17	1.52	3.21	6.26	1.68	1.84	0.28	0.19	0.09	0.13	CO_2 4.86 FeS_2 0.03 NiO 0.02 BaO 0.04	100.21	
29 A3. III	71.22	14.92	2.36	0.07	0.68	0.44	4.25	4.10	2.10				0.20		100.34	2.60
30 A4. IV	71.90	18.10	trace	none	0.36	1.53	3.37	2.38	2.25						99.89	
31 A2. II	66.80	16.80	0.40	5.22	1.45	0.39	2.01	3.30	2.60		0.91	0.06			99.94	
32 A3. III	74.66	14.32	1.49	0.24	trace	0.12	1.17	5.89	1.96		trace	trace			99.85	
33 A4. IV	68.40	16.26	1.92	n. d.	0.27	1.15	6.03	4.64	1.62		0.40				100.29	
34 A3. III	63.24	16.63	4.45	0.40	1.50	0.90	1.72	7.73	3.24			0.30		CO_2 0.28	100.39	
35 A3. III	75.65	12.02	0.20	trace	1.04	1.16	3.13	5.60	1.10				trace		99.90	2.60
36 A4. IV	75.26	13.32	2.02	trace	0.34	trace	3.72	4.57	0.79				trace		100.02	2.63

GRANITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
19	Moyie Sill, British Columbia.	M. Dittrich.	R. A. Daly, Can. G. S. Mem. 38, (1), p. 230, 1912.	Granite.	
20	Tonopah, Nevada.	W. F. Hillebrand.	J. E. Spurr, Ec. G., I, p. 375, 1906.	Granite.	Altered.
21	Tonopah, Nevada.	W. F. Hillebrand.	J. E. Spurr, Ec. G., I, p. 375, 1906.	Granite.	Altered.
22	Mazaruni District, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Brit. Gui., p. 40, 1908.	Granite gneiss.	
23	Kumaka, Essequibo River, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Brit. Gui., p. 194, 1908.	Alaskite.	
24	Olavarria, near Buenos Aires, Argentina.	M. Dittrich.	H. Backlund, Minist. Agric. Arg. B. 2 B, p. 26, 1913.	Granite gneiss.	
25	Tayvallich, Argyllshire, Scotland.	E. G. Radley.	Dewey and Flett, G. Mag. (V), VIII, p. 209, 1911.	Soda granite.	
26	Foxdale, England.	A. M. Finlayson.	A. M. Finlayson, Q. J. G. S., LXVI, p. 304, 1910.	Granite.	Cf. No. 176, I.4.2.3.
27	Georgia Works, Lands End, Cornwall.	W. Pollard.	Reid and Flett, G. S. Eng. Mem.,Sh. 351, p. 59, 1907.	Granite.	Kaolinized.
28	Gallentreath, Porthallow, Cornwall.	E. G. Radley.	Dewey and Flett, G. Mag., (V), VIII, p. 209, 1911.	Soda granite.	Also in G. S. Eng. Mem. sh. 359, p. 187, 1912.
29	Fort Regent, St. Helier, Jersey, Channel Islands.	P. Holland.	Holland and Dickson, Pr. Liverp. G. Soc., VII, p. 116, 1897.	Granite.	Weathered. Not in W. T.
30	Gardeolles, Dauphiny, France.	Rüst.	P. Termier, B. Soc. G. Fr., XXVII, p. 407, 1899.	Microgranite.	Not in W. T.
31	Jensserie, Brittany, France.	Pisani.	L. Vandernotte, Mass. Armor., p. 145, 1913.	Granite.	Not fresh.
32	Eisenbach, Schwarzwald.	M. Dittrich.	M. Dittrich, Mt. Bad. G. L.-A.,V (1), p. 8, 1907.	Granite.	Weathered.
33	Altglashütten, Schwarzwald.	Frick.	S. v. Bubnoff, Mt. Bad. G. L.-A., VII, p. 369, 1912.	Granite.	Altered.
34	Heiligkreutz, Neckarthal, Baden.	M. Dittrich.	M. Dittrich, Mt. Bad. G. L.-A., IV (2), p. 204, 1901.	Granite.	Weathered. Cf. No. 32. II.4.2.3.
35	Gottlob, Thuringia.	Müklenberg.	Müklenberg, In. Diss. Halle, 1908.	Granite.	Pebble in conglomerate. Not fresh. Osann, III (1), p. 5.
36	Gottlob, Thuringia.	Müklenberg.	Müklenberg, In. Diss. Halle, 1908.	Granite.	Pebble in conglomerate not fresh. Osaan, III (1), p. 4.

GRANITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
37 A3. III	62.41	16.79	4.54	0.26	2.44	5.39	3.73	2.64	0.80					CO_2 1.57	100.57	
38 B3. IV	72.0	16.0	1.0	0.2	1.9	3.4	2.0	1.9	1.2						99.6	
39 A3. III	60.39	20.51	3.98	3.16	1.11	2.63	2.67	3.84	1.85						100.14	
40 A3. III	57.65	24.59	2.50	3.36	1.93	0.63	1.99	4.71	2.68						100.04	2.77
41 B3. IV	57.42	24.44	3.75	3.08	1.47	0.70	1.22	5.10	2.11						99.29	
42 A3. III	55.79	24.91	3.18	3.62	0.98	0.84	2.40	5.05	2.94						99.71	2.76
43 A3. III	75.13	14.61	0.32	0.54	0.63	1.43	3.77	2.95	0.16		trace		trace		99.54	
44 A3. III	72.99	16.83	1.38	1.22	0.48	0.82	2.38	3.72	0.47		trace				100.29	
45 A3. III	70.53	15.79	2.08	2.15	0.47	1.81	3.47	3.67	0.29						100.26	
46 B3. IV	67.99	12.94	1.47	2.38	0.61	4.42	3.70	3.37	1.15	0.12				CO_2 2.80	100.95	2.656
47 A4. IV	71.60	13.05	1.34	n. d.	3.65	0.90	2.28	3.86	2.09	1.60	0.25	trace		S trace	100.62	
48 A4. IV	70.34	13.64	1.04	n. d.	0.09	0.59	1.23	0.18	12.52		(0.24)			F 0.35	100.22	2.613
49 A2. II	60.98	15.64	4.28	1.80	1.60	4.62	5.25	3.79	1.00		0.41	0.36			99.93	2.659
50 A3. III	69.97	18.74	1.04	0.43	0.81	0.15	0.59	5.82	1.79	0.05	0.64		trace	CO_2 none	100.03	2.69

QUARTZ PORPHYRY.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A3. III	78.06	12.88	0.74	0.73	0.86	0.44	1.55	2.67	1.88	0.25					100.06	
2 A3. III	70.37	11.27	0.80	2.58	2.03	2.31	2.63	1.86	1.96	3.60	0.17				99.58	
3 A1. I	63.00	17.92	0.50	0.90	0.93	1.50	5.93	6.08	0.50	0.06	0.48	0.05	0.03	CO_2 1.15 SO_3 0.03 Cl 0.27 FeS_2 0.50 BaO 0.02	99.85	
4 A3. III	65.22	14.62	3.39	1.14	1.09	3.01	5.66	1.45	1.07					CO_2 2.61 S 0.79	100.05	

GRANITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
37	Schneidermüllers Kopf, Thuringia.	Zschimmer.	Zschimmer, In. Diss. Jena, 1898.	Granite.	Not in W. T. Osaan, III (1), p. 5.
38	Muchow, Isergebirge, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XV, p. 164, 1902.	Granite.	Altered. Cf. No. 14. I.3.3.3.
39	Pulenitz, near Eichberg, Lausitz.	R. Reinisch.	R. Reinisch, Hab. Schr. Leip., p. 27, 1902.	Granite.	Altered.
40	Innozenzidorf, Lausitz.	R. Reinisch.	R. Reinisch, Hab. Schr. Leip., p. 26, 1902.	Granite.	Altered. Cf. No. 35, I.4.3.3.
41	Klotsche, Lausitz.	R. Reinisch.	R. Reinisch, Hab. Schr. Leip., p. 27, 1902.	Granite.	Altered. Cf. No. 254, I.4.2.3.
42	Kohlhaustrasse, Lausitz.	R. Reinisch.	R. Reinisch, Hab. Schr. Leip., p. 26, 1902.	Granite.	Altered. Cf. No. 256, I.4.2.3.
43	Aranyida, Abauj-Torua, Hungary.	P. Rozlozsnik.	B. V. Horvath, Jb. Ung. G. R.-A. (1910), p. 370, 1912.	Granite.	Not fresh.
44	Aranyida, Abauj-Torua, Hungary.	P. Rozlozsnik.	B. V. Horvath, Jb. Ung. G. R.-A. (1910), p. 365, 1912.	Granite gneiss.	Metamorphosed.
45	Reka, Abauj-Torua, Hungary.	P. Rozlozsnik.	B. V. Horvath, Jb. Ung. G. R.-A. (1910), p. 366, 1912.	Granite.	Not fresh.
46	Gasteren, Aarmassif, Switzerland.	L. Duparc.	E. v. Fellenburg, Btr. G. Kt. Schw., XXI, p. 45, 1893.	Granite.	Not in W. T.
47	Cava d'Oggi, San Piero in Campo, Elba.	G. d'Acchiardi.	G. d'Acchiardi, Mem. G. d'Acch., p. 115, 1903.	Granite.	Altered.
48	Kyssyr Dagh, Karabagh District, Armenia.	A. Röhrig.	C. R. Thost, Abh. Senk. Nat. Ges., XVIII, p. 219, 1894.	Granite.	Altered. In W. T., p. 379.
49	Kedabeg, Karabagh District, Armenia.	A. Röhrig.	C. R. Thost, Abh Senk. Nat. Ges., XVIII, p. 221, 1894.	Augite granite.	Not fresh. In W. T., p. 265.
50	Boodalyerri, Pilbara, Western Australia.	E. S. Simpson.	A. G. Maitland, W. Aust. G. S. B. 15, p. 12, 1904.	Granite.	Altered.

QUARTZ PORPHYRY.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Red Islands, Richmond County, Nova Scotia.	F. G. Wait.	F. G. Wait, Can. G. S. A. R. (1900), p. 23R, 1903.	Felsite.	Altered.
2	Suffield, Quebec.	M. F. Connor.	J. A. Dresser, B. G. S. A., XVII, p. 504, 1906.	Quartz porphyry.	Altered. Also in Can. G. S. Rep. 974, p. 23, 1907.
3	Mount Royal, Montreal, Quebec.	M. F. Connor.	F. D. Adams, Cong. G. Int., XII, Guide 3, p. 46, 1913.	Aplite.	
4	Preston East Dome, Porcupine, Ontario.	Not stated.	A. G. Burrows, Rep. Bur. Min. Ont., XXI (1), p. 213, 1912.	Quartz porphyry.	

QUARTZ PORPHYRY—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
5 A2. II	58.84	11.24	n. d.	0.48	0.35	12.17	6.91	0.07	0.40		0.46			CO_2 9.84 S 0.13 BaO none	100.68	
6 B3. IV	52.68	16.29	2.58	3.08	3.31	5.46	8.11	0.87	0.44	0.06	7.72	0.31			101.11	
7 A2. II	68.13	17.49	1.19	1.38	1.00	0.75	3.50	3.00	2.06	0.03	0.74	trace	0.30	S 0.22	99.79	
8 A3. III	66.69	16.69	2.06	0.93	1.15	1.40	2.46	5.23	1.70					CO_2 1.42	99.73	
9 A3. III	80.05	9.73	1.72	0.18	none	0.83	2.19	4.43	1.03				trace		100.16	
10 A1. I	69.68	14.97	0.79	0.34	0.66	2.10	3.38	4.40	0.92	1.10	0.28	0.17	trace	CO_2 0.88 SO_3 trace Cl trace BaO 0.14 SrO 0.06	99.86	
11 A1. I	57.98	19.32	0.44	0.83	1.93	8.87	3.62	4.01	0.67	0.57	0.66	0.17	0.07	CO_2 0.53 ZrO_2 0.04 Cl 0.17 F 0.07 S 0.01 Cr_2O_3 none BaO 0.12 SrO 0.05	100.13	
12 A3. III	70.74	14.68	0.69	0.58	0.28	4.12	2.29	2.59	2.09				0.06	CO_2 2.14 Cl trace BaO 0.03 SrO trace	100.29	2.680
13 A3. III	65.94	16.00	0.60	1.74	1.02	2.87	3.85	4.56	1.13			0.23		CO_2 1.55 FeS_2 0.60	100.26	2.672
14 A1. I	62.92	14.29	0.84	4.66	3.14	2.72	4.30	1.39	2.84	0.22	0.84	0.13	0.15	CO_2 1.24 FeS_2 0.32 NiO trace BaO 0.10 SrO trace	100.10	
15 A3. III	83.73	9.83	none	0.64	0.04	0.21	3.52	0.61	0.85	0.82				CO_2 none	100.25	
16 A3. III	77.63	12.33	0.42	1.26	0.01	0.41	3.88	3.75	0.42	0.13				CO_2 none	100.24	
17 A3. III	76.80	12.27	0.72	1.64	1.17	0.71	4.34	1.26	1.13	0.20				CO_2 0.14	100.38	
18 A3. III	76.47	13.90	0.18	0.40	1.74	0.19	4.76	0.65	1.34	0.29				CO_2 none	99.92	
19 A3. III	72.53	14.90	1.57	1.84	2.56	0.23	0.63	1.91	3.62	0.23				CO_2 none	100.02	
20 A4. IV	73.25	13.25	n. d.	1.74	0.28	2.23	2.69	3.79	1.03	0.07	trace	trace	trace	CO_2 1.05 FeS_2 0.58 BaO trace SrO trace	99.96	
21 A3. III	70.29	11.83	1.30	2.08	1.24	2.30	2.68	3.05	1.35	0.10	0.29	0.07	0.12	CO_2 3.25 BaO 0.07 SrO trace	100.02	
22 A2. II	75.62	14.05	0.33	2.82	0.40	2.79	1.97	0.44	0.26		trace	0.01	trace	CO_2 0.93 FeS_2 0.06	99.68	

QUARTZ PORPHYRY—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
5	James Township, Cobalt, Ontario.	N. L. Bowen.	N. L. Bowen, J. Can. Min. Inst., XII, p. 523, 1910.	Aplite.	Calcite from limestone?
6	Hearst Township, Nipissing District, Ontario.	M. F. Connor.	M. E. Wilson, Can. G. S. Mem. 39, p. 116, 1913.	Aplite.	Altered.
7	Seminole Mine, Lincoln County, Georgia.	E. Everhardt.	S. P. Jones, Ga. G. S. B. 19, p. 57, 1909.	Quartz-albite porphyry.	Altered. Cf. No. 1, II.4.1.5.
8	Upper Quinnesec Falls, Menominee River, Wisconsin.	R. B. Riggs.	G. H. Williams, U. S. G. S. B. 62, p. 121, 1890.	Quartz porphyry.	Altered and schistose. In W. T., p. 161.
9	Mount Houghton, Kewenaw Point, Michigan.	F. P. Burrall.	L. L. Howard, G. S. Mich., VI (II), p. 42, 1898.	Felsite.	Not in W. T.
10	Wolf Butte, Little Belt Mountains, Montana.	W. F. Hillebrand.	L. V. Pirsson, U. S. G. S. A. R. 20 (III), p. 499, 1900.	Granite porphyry.	
11	Foster Creek, Philipsburg quadrangle, Montana.	W. F. Hillebrand.	Emmons and Calkins, U. S. G. S. P. P. 78, p. 124, 1913.	Pyroxene aplite.	Contains much scapolite.
12	Leadville, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. Mon. 12, p. 332, 1886.	Porphyry.	In W. T., p. 139
13	Jefferson Tunnel, Leadville, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 148, p. 176, 1897.	Granite porphyry.	In W. T., p. 163.
14	Bear Creek, Cooks Inlet, Alaska.	W. F. Hillebrand.	G. F. Becker, U. S. G. S. A. R. 18, III, p. 45, 1898.	Quartz porphyry.	In W. T., p. 225.
15	Bully Hill, Shasta County, California.	C. Palmer.	B. S. Butler, U. S. G. S. B. 419, p. 137, 1910.	Granite porphyry.	Altered.
16	Bully Hill District, Shasta County California.	R. C. Wells.	B. S. Butler, U. S. G. S. B. 419, p. 137, 1910.	Granite porphyry.	Altered.
17	Shasta King Mine, Shasta County, California.	C. Palmer.	B. S. Butler, U. S. G. S. B. 419, p. 137, 1910.	Granite porphyry.	Altered. Cf. No. 2, I.3.1.5.
18	Clipper Mine, Shasta County, California.	C. Palmer.	B. S. Butler, U. S. G. S. B. 419, p. 137, 1910.	Granite porphyry.	Silicified.
19	Iron Mountain Mine, Shasta County, California.	C. Palmer.	B. S. Butler, U. S. G. S. B. 419, p. 137, 1910.	Granite porphyry.	Altered.
20	Tower Rock, Grizzly Mountains, Plumas County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 14, II, p. 484, 1894.	Quartz porphyry.	In W. T., p. 165.
21	Buena Vista Park, Amador County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 14, II, p. 484, 1894.	Quartz porphyry schist.	In W. T., p. 133.
22	Mahdiana Workings, Essequibo River, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Br. Gui., p. 195, 1908.	Granophyre.	Altered.

QUARTZ PORPHYRY—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
23 A1. I	71.33	11.18	3.96	1.45	0.88	2.10	3.51	3.49	0.92		0.12	trace	0.32	CO_2 0.74 ZrO_2 none Cl 0.09 FeS_2 0.04 BaO 0.03 Cu, Pb none	100.16	
24 A1. I	68.14	12.39	0.96	3.84	1.38	2.36	3.08	0.59	2.63		0.33	trace	0.44	CO_2 1.56 ZrO_2 none Cl 0.01 FeS_2 2.35 BaO 0.08 CuO trace	100.14	
25 A2. II	57.96	17.43	0.45	1.82	2.34	5.07	5.17	0.45	1.04		1.21	0.20		CO_2 6.32 FeS_2 0.33	99.61	
26 A3. III	75.93	13.26	1.47	0.68	none	1.11	3.13	3.19	0.44		trace		trace	CO_2 0.51	99.72	
27 A2. II	78.39	9.26	3.17	0.57	0.03	1.30	3.52	1.44	0.63		0.47	none	0.30	CO_2 1.06 F none	100.14	
28 A2. II	70.81	14.31	2.06	0.84	0.67	0.85	6.22	2.15	0.55		0.25	0.06	0.03	CO_2 0.88 S 0.02	99.70	
29 A2. II	66.46	15.08	3.09	1.33	0.70	1.76	6.40	2.74	0.65		0.49	0.07	0.04	CO_2 1.22 S 0.04	100.07	
30 A2. II	66.66	14.15	5.10	0.25	0.47	1.40	4.09	6.32	0.36		0.60	0.11	0.06	CO_2 0.62 S 0.04 BaO 0.02	100.25	
31 A2. II	52.55	15.39	5.61	9.10	2.19	5.46	5.80	1.19	1.07	0.40	1.23	0.12	0.22	S 0.10 BaO trace	100.36	
32 A2. II	75.78	11.22	0.56	2.54	0.53	0.95	2.14	4.08	1.26		0.31			CO_2 1.16 SO_3 0.12	100.82	
33 A2. II	70.88	15.15	3.22	0.55	0.53	0.21	0.23	5.51	2.72		0.32	0.26		SO_3 0.17	99.75	2.685
34 A2. II	65.00	13.73	0.44	2.19	0.82	4.43	3.70	4.82	1.08		0.47	0.08	trace	CO_2 3.15 SO_3 0.21	100.12	2.622
35 A2. II	64.55	13.62	1.23	1.24	0.67	5.07	3.48	4.13	1.90		0.29	0.10		CO_2 3.70 SO_3 0.05	100.03	2.593
36 A2. II	60.45	15.93	2.57	2.90	1.62	2.77	4.29	2.77	3.28		1.17	0.21		CO_2 1.77 SO_3 0.10 Org. 0.03	99.86	2.643
37 A2. II	62.20	14.69	3.83	0.43	1.86	2.91	2.82	5.03	2.47		0.52	0.20		CO_2 3.35 SO_3 0.12	100.43	2.631
38 A2. II	66.86	17.41	0.40	1.27	0.51	5.37	1.21	3.69	0.24		0.97	0.51	0.73	CO_2 0.82 SO_3 trace	99.99	6.655
39 B2. III	65.01	15.12	1.84	1.91	1.75	2.97	3.56	3.54	0.64	0.03	0.91	1.02		CO_2 0.75 SO_3 0.88	99.13	
40 B2. III	64.20	10.52	1.48	1.00	2.20	4.39	4.00	3.07	1.96		0.96	0.08	1.32	CO_2 5.92	101.10	
41 A2. II	69.51	12.47	1.57	0.36	0.66	1.74	3.02	6.29	1.93	1.27	1.02	0.06	0.17	F 0.03	100.10	

QUARTZ PORPHYRY—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
23	Mazaruni District, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Br. Gui., p. 60, 1908.	Quartz porphyry.	In W. T., p. 127.
24	Omai, Essequibo River, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Br. Gui., p. 191, 1908.	Aplite.	Altered.
25	Omai, Essequibo River, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Br. Gui., p. 191, 1908.	Aplite.	Much altered.
26	Tamaya, Chile.	C. Schwarz.	v. Groddeck, Z. D. G. G., XXXIX, p. 249, 1887.	Quartz porphyry.	Not fresh. In W. T., p. 133.
27	Konnerud Kollen, n. Christiania, Norway.	O. N. Heidenreich.	V. M. Goldschmidt, Kont. Metam. Krist. Gest., p. 75, 1911.	Quartz porphyry.	
28	Luossavaara, Lapland, Sweden.	G. Nyblom.	P. Geijer, G. Kir. Dist., p. 132, 1910.	Quartz porphyry.	
29	Luossavaara, Lapland, Sweden.	G. Nyblom.	P. Geijer, G. Kir. Dist., p. 132, 1910.	Quartz porphyry.	
30	Kvarnap, Lake Vättern, Smaland, Sweden.	R. Mauzelius.	A. Gavelin, Sv. G. Und., Arsb. 5, No. 3, p. 22, 1912.	Quartz orthophyre.	
31	Norrsand, N. Ulfön, Nordingra, Sweden.	N. Sahlbom.	J. E. Sobral, G. Nord. Reg., p. 167, 1913.	Aplitic dike.	
32	Near Röspe, Westphalia.	Gremse.	O. Mügge, N. J. B. B., VIII, p. 577, 1893.	Quartz porphyry tuff.	In W. T., p. 381.
33	Alvensleben, n. Magdeburg, Russia.	Hampe.	F. Klockmann, Jb. Pr. G. L.-A., XI, p. 196, 1892.	Quartz porphyry tuff.	In W. T., p. 381.
34	Norheim, Nahe Valley, Rhineland.	Hesse.	K. A. Lossen, Z. D. G. G., XLIII, p. 537, 1891.	Quartz porphyry.	In W. T., p. 223.
35	Munster am Stein, Nahe Valley, Rheinland.	Böttcher.	K A. Lossen, Z. D. G. G., XLIII, p. 537, 1891.	Granite porphyry.	In W. T., p. 169.
36	Munster am Stein, Nahe Valley, Rhineland.	Gremse.	K. A. Lossen, Z. D. G. G., XLIII, p. 537, 1891.	Quartz porphyry.	In W. T., p. 181.
37	Near Karlshalle, Kreuznach, Rhineland.	Böttcher.	K. A. Lossen, Z. D. G. G., XLIII, p. 537, 1891.	Quartz porphyry.	In W. T., p. 169.
38	Nieder Modau, Hesse.	F. W. Schmidt.	C. Chelius, Erl. G. Kt. Hes., Bl. Rossdorf, p. 44, 1886.	Granite porphyry.	In W. T., p. 139.
39	Hühnersbusch, n. Rossdorf, Hesse.	F. Stadler.	G. Klemm, Erl. G. Kt. Hes., Bl. Rossdorf, p. 58, 1912.	Granite porphyry.	Center of dike. Cf. No. 33, II.4.2.3.
40	Bistrich Wald, Pfalz, Bavaria.	A. Schwager.	E. Düll, Geog. Jhft., XVII, p. 66, 1906.	Quartz porphyry.	
41	Zalas, n. Cracow, Galicia.	Z. Rosen.	Z. Rosen, B. Ac. Sc. Crac. (2), p. 818, 1909.	Porphyry.	

QUARTZ PORPHYRY—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
42 A2. II	69.32	14.37	2.72	0.35	0.35	0.93	1.11	6.82	1.35	2.11	0.69	0.12	trace	CO_2 trace	100.15	2.583
43 A3. III	82.21	12.58	trace		0.12	0.31	0.34	0.88	2.34		1.06				99.83	
44 A3. III	65.49	14.40	4.19	1.41	0.98	2.93	7.70	0.18	0.19	0.96				CO_2 1.05	99.48	
45 A3. III	76.93	14.35	0.85	0.23	0.12	1.29	2.71	0.60	1.01					CO_2 1.71	99.80	
46 A3. III	76.41	14.42	0.48	0.74	0.24	1.43	0.63	3.88	1.02					CO_2 1.40	100.65	
47 A3. III	67.77	12.30	1.63	1.20	1.07	4.45	0.51	4.93	1.74					CO_2 4.54	100.14	
48 A3. III	71.31	13.82	0.77	1.70	0.51	1.61	3.35	4.14	1.04		trace			CO_2 1.87	100.12	
49 A3. III	90.60	0.07	3.15	1.15	0.58	0.08	0.70	0.16	2.70	0.11					99.30	
50 A3. III	89.49	4.88	4.24	0.05	0.32	0.04	0.25	0.08	1.24	0.22					100.81	
51 A3. III	87.96	3.75	3.89	0.69	0.23	0.08	0.39	0.11	3.18	none					100.28	
52 A1. I	70.40	13.13	1.25	1.75	0.64	2.74	3.47	2.22	1.35	0.15	0.30	0.08	0.04	CO_2 2.83 ZrO_2 none SO_3 trace Cl trace Cr_2O_3 none NiO none BaO 0.04 SrO trace Li_2O trace Cu trace	100.39	2.688
53 A1. I	63.54	15.07	1.90	3.51	2.82	3.10	2.49	3.15	2.40	0.22	0.55	0.13	0.08	CO_2 1.32 ZrO_2 none SO_3 none Cl none Cr_2O_3 none NiO none BaO 0.11 SrO trace	100.39	2.701
54 A2. II	70.92	12.77	trace	4.62	0.33	1.46	3.32	3.92	0.54	0.08	0.56		0.17	CO_2 0.85 FeS_2 0.10	99.64	2.67

RHYOLITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A3. III	74.55	10.75	1.24	2.11	trace	1.50	5.39	2.70	0.61					CO_2 1.30	100.15	
2 A2. II	73.12	14.27	0.51	0.26	0.24	1.10	3.43	4.90	0.73	0.68	0.08	0.03	0.06	CO_2 0.77 BaO trace SrO trace Li_2O trace	100.18	
3 A4. IV	71.01	14.37	0.18	0.26	0.58	0.10	1.56	4.53	n. d.		0.24			FeS_2 4.37	97.20	
4 A3. III	68.68	12.69	1.14	1.17	1.14	1.11	1.23	5.58	7.99						100.73	

QUARTZ PORPHYRY—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
42	Miekinia, n. Cracow, Galicia.	Z. Rosen.	Z. Rosen, B. Ac. Sc. Crac. (2), p. 813, 1909.	Quartz porphyry.	
43	Petroszatatö, n. Kazanesd, Hunyad, Hungary.	K. Emszt.	P. Rozlozsnik, F. K., XXXV, p. 528, 1905.	Quartz porphyry.	Altered. 3 decimals.
44	Hidas, Tur-Toroczko Range, Hungary.	S. v. Szentpetry.	S. v. Szentpetry, Muz. Füz, I, p. 238, 1912.	Aplite.	
45	Schwarzthal, Windgälle Mountains, Switzerland.	Serda.	C. Schmidt, N. J. B. B., IV, p. 432, 1886.	Quartz porphyry.	Schistose. In W. T., p. 123.
46	Käserngrat, Windgälle Mountains, Switzerland.	C. Schmidt.	C. Schmidt, N. J. B. B., IV, p. 432, 1886.	Quartz porphyry.	In W. T., p. 131.
47	Bolshoj Pit River, Jenissei District, Siberia.	Not stated.	A. Meister, Reg. Aurif. Sib., IX, p. 442, 1910.	Quartz porphyry.	
48	Semenow Mountain, Kuké Nor, China.	C. Pfeil.	K. Futterer, Durch Asien, II (2), p. 102, 1909.	Quartz porphyry.	
49	Mancayan, Luzon, Philippine Islands.	L. S. Salinger.	A. J. Eveland, Min. Bur. Manila B. 4, p. 42, 1905.	Quartz porphyry.	Altered.
50	Mancayan, Luzon, Philippine Islands.	L. S. Salinger.	A. J. Eveland, Min. Bur. Manila B. 4, p. 42, 1909.	Quartz porphyry.	Altered.
51	Mancayan, Luzon, Philippine Islands.	L. S. Salinger.	A. J. Eveland, Min. Bur. Manila B. 4, p. 42, 1905.	Quartz porphyry.	Altered.
52	Jenolan Caves, New South Wales.	W. G. Stone.	G. W. Card, pers. com.	Quartz felsite.	
53	Colong, Yerranderrie, New South Wales.	Not stated.	N. S. W. Dep. Min. A. R. (1909), p. 198, 1910.	Quartz felsite.	
54	Bamboo Creek, Pilbara, West Australia.	E. S. Simpson.	A. G. Maitland, W. Aust. G. S. B. 15, p. 12, 1904.	Quartz felsite.	

RHYOLITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Flat Swamp Mountain, Davidson County, North Carolina.	J. E. Pogue.	J. E. Pogue, A. J. S., XXVIII, p. 226, 1909.	Rhyolite.	Also in N. C. G. S. B. 22, p. 54, 1910.
2	Yogo Peak, Little Belt Mountains, Montana.	W. F. Hillebrand.	L. V. Pirsson, U. S. G. S. A. R. 20, III, p. 523, 1900.	Rhyolite porphyry.	In W. T., p. 161.
3	Anaconda Mine, Butte, Montana.	W. F. Hillebrand.	Weed and Tower, U. S. G. S. B. 228, p. 134, 1904.	Rhyolite.	Altered. Analysis "partial only."
4	Gallatin Valley, Gallatin County, Montana.	H. N. Stokes.	J. P. Iddings, U. S. G. S. B. 150, p. 147, 1898.	Rhyolite ash.	In W. T., p. 383.

RHYOLITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
5 A2. II	61.21	15.67	4.06	0.62	1.58	2.18	1.57	2.75	10.20		0.56		0.10	Li_2O trace	100.50	
6 A2. II	89.20	2.39	1.21	none	trace	trace	1.11	0.79	5.09		none	none		SO_3 0.44	100.23	
7 A2. II	87.37	7.44	0.09	0.18	0.12	0.10	0.14	1.79	1.39	0.51	0.09	trace	trace	FeS_2 1.00 NiO none BaO 0.02 SrO none	100.24	2.655
8 A2. II	78.59	12.13	none	0.09	0.41	0.16	0.10	2.55	2.47	0.82	0.12	trace	trace	FeS_2 2.61 NiO none BaO 0.02 SrO none	100.07	2.576
9 B2. III	66.69	15.40	1.84	n. d.	0.85	0.09	0.16	3.50	2.97	0.83	2.11	0.08	trace	SO_3 0.11 FeS_2 3.99 BaO 0.09	98.71	
10 A4. IV	71.02	14.27	1.22	n. d.	trace	1.38	2.28	3.97	6.12						100.26	
11 A2. II	55.25	12.10	1.28	10.71	9.30	0.34	0.28	0.39	6.70	2.49	0.15	trace	1.43	CO_2 0.11 S 0.11 BaO trace	99.64	
12 A3. III	72.32	20.96	0.50	n. d.	none	0.15	0.55	0.93	3.91		1.10				100.42	
13 A3. III	66.38	13.72	2.23	0.80	0.54	5.49	2.50	5.20	0.92			0.08		CO_2 2.52 BaO 0.11	100.49	
14 A2. II	68.22	12.41	1.00	1.36	0.18	0.95	3.38	3.97	4.82	3.42	0.34	0.11			100.16	
15 A2. II	72.12	11.49	2.77	2.30	0.85	0.94	5.28	0.86	0.96	0.06	0.17	0.88	0.10	CO_2 1.15 Cl trace FeS_2 0.03 BaO trace	99.96	
16 A2. II	71.60	11.93	3.00	3.40	1.33	0.52	4.62	1.90	0.55	0.07	0.12	0.62	0.09	CO_2 0.38 SO_3 0.08	100.21	
17 A3. III	71.00	12.70	0.66	2.44	1.39	0.90	6.45	2.99	1.56	0.28					100.37	
18 A3. III	70.40	13.50	1.31	1.61	0.37	0.56	2.11	2.39	7.41	1.05		0.08			100.79	
19 A3. III	70.01	12.61	1.47	0.50	0.72	1.06	1.94	5.12	4.68	2.37		0.04	trace		100.52	
20 A2. II	75.78	10.65	0.68	0.16	none	1.67	0.22	0.96	3.54	1.16	0.12	0.02	none	CO_2 0.76 ZrO_2 0.02 SO_3 4.73 BaO 0.02	100.49	
21 A3. III	74.68	11.15	3.36	1.77	1.52	2.19	1.12	1.31	1.75				0.84	CO_2 0.59	100.28	
22 A2. II	80.67	6.23	0.19	0.45	0.21	2.48	1.38	2.45	1.21		0.65		0.35	CO_2 3.24 FeS_2 1.33	100.84	2.318
23 A2. II	75.64	8.79	3.24	1.61	0.28	1.09	3.67	2.31	1.04		0.68		0.46	CO_2 0.31 FeS_2 1.05	100.17	2.522
24 A3. III	81.00	8.95	2.78	trace	0.75	0.34	1.88	3.56	0.10	0.30	trace	0.03	trace	CO_2 0.81 BaO 0.02 SrO 0.18	100.70	2.755

RHYOLITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
5	Checkerboard Creek, Castle Mountains, Montana.	L. V. Pirsson.	Weed and Pirsson, U. S. G. S. B. 139, p. 128, 1896.	Rhyolite tuff.	In W. T., p. 383.
6	Iron Pot, Lower Basin, Yellowstone National Park.	J. E. Whitfield.	W. H. Weed, U. S. G. S. B. 148, p. 132, 1897.	Rhyolite.	Altered. In W. T., p. 383.
7	De Lamar Mine, Silver City, Idaho.	W. F. Hillebrand.	W. Lindgren, U. S. G. S. A. R. 20, III, p. 179, 1900.	Rhyolite.	Altered. In W. T., p. 383.
8	De Lamar Mine, Silver City, Idaho.	W. F. Hillebrand.	W. Lindgren, U. S. G. S. A. R. 20, III, p. 179, 1900.	Rhyolite.	Altered. In W. T., p. 383.
9	De Lamar Mine, Silver City, Idaho.	H. N. Stokes.	W. Lindgren, U. S. G. S. A. R. 20, III, p. 179, 1900.	Rhyolite.	Altered.
10	Near Blue Mountain, Silver Cliff, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. A. R. 17, II, p. 322, 1896.	Rhyolite tuff.	Lake-bed deposit. In W. T., p. 385.
11	Solomon Mine, Creede, Colorado.	W. C. Wheeler.	W. H. Emmons, U. S. G. S. rec. lab.	Rhyolite.	"Largely altered to chlorite."
12	Frisco District, Utah.	R. C. Wells.	B. S. Butler, U. S. G. S. rec. lab.	Lava (rhyolite?).	Altered.
13	Eightmile Hills, Iron Springs District, Utah.	R. D. Hall.	Leith and Harder, U. S. G. S. B. 338, p. 58, 1908.	Rhyolite.	
14	Belshaw's ranch, John Day Basin, Oregon.	F. C. Calkins.	F. C. Calkins, B. Un. Cal. Dep. G., III, p. 167, 1902.	Rhyolite tuff.	
15	Laundry Farm, n. San Francisco, California.	G. E. Colby.	A. C. Lawson, U. S. G. S. Fol. 193, p. 12, 1914.	Rhyolite.	
16	Laundry Farm, n. San Francisco, California.	G. E. Colby.	A. C. Lawson, U. S. G. S. Fol. 193, p. 12, 1914.	Rhyolite.	
17	Laundry Farm, n. San Francisco, California.	C. P. Richmond.	A. C. Lawson, U. S. G. S. Fol. 193, p. 12, 1914.	Rhyolite.	
18	Hyampom, Trinity County, California.	G. Steiger.	J. S. Diller, U. S. G. S. B. 148, p. 228, 1897.	Rhyolite tuff.	In W. T., p. 385.
19	Willards Creek, Lassen County, California.	G. Steiger.	J. S. Diller, U. S. G. S. B. 148, p. 192, 1897.	Rhyolite tuff.	In W. T., p. 385.
20	Vindicator Mountain, Goldfield District, Nevada.	G. Steiger.	F. L. Ransome, U. S. G. S. P. P. 66, p. 183, 1909.	Rhyolite.	Altered.
21	Kinlochewe, Scotland.	W. Mackie.	W. Mackie, Tr. Edin. G. Soc., VII (4), p. 460, 1899.	Rhyolite.	Fragment in sandstone. MnO high? Not in W. T.
22	Trecastle, Conway, Wales.	A. M. Finlayson.	A. M. Finlayson, Q. J. G. S., LXVI, p. 304, 1910.	Volcanic ash.	Altered.
23	Trecastle, Conway, Wales.	A. M. Finlayson.	A. M. Finlayson, Q. J. G. S., LXVI, p. 304, 1910.	Volcanic ash.	
24	Tal-y-llyn, Ogwen, Carnarvonshire, Wales.	H. W. Greenwood.	C. B. Travis, Pr. Liv. G. Soc., X (5), p. 315, 1909.	Rhyolite.	

RHYOLITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
25 A3. III	76.45	8.50	3.90	0.85	1.87	0.33	0.80	2.77	0.45	0.30		0.01		CO_2 3.64 BaO 0.01 SrO 0.17	100.05	2.67
26 A4. IV	69.00	16.88	0.88	n. d.	0.02	1.04	4.64	3.88	3.21		0.45				100.00	
27 A4. IV	77.26	13.05	1.64	n. d.	0.24	0.72	5.41	0.65	0.55		0.15				99.67	2.637
28 A4. IV	72.68	15.62	0.95	n. d.	trace	0.63	1.17	4.30	2.90					SO_3 0.22 FeS_2 1.55	100.02	2.229
29 A3. III	69.08	17.05	1.64	0.37	0.17	0.15	2.70	5.56	1.56	0.14			trace	SO_3 0.32 S 1.49	100.23	
30 A3. III	72.51	14.19	2.40	none	n. d.	0.40	3.56	4.98	1.83		0.09				99.96	
31 A2. II	78.63	11.82	1.90	0.29	0.22	1.01	2.05	0.86	3.39		0.17	0.06	0.02	CO_2 none	100.42	
32 A4. IV	70.56	12.80	1.96	n. d.	0.50	1.70	2.18	4.28	6.30		0.28		0.06		100.62	
33 A4. IV	61.28	21.94	0.48	n. d.	trace	0.61	3.37	2.58	9.64			trace			99.90	
34 A4. IV	74.29	13.40	1.52	trace	0.88	0.85	5.74	2.14	1.40		trace	trace	trace		100.22	
35 A4. IV	67.25	13.12	0.24	n. d.	1.10	1.23	0.59	4.38	6.11	6.15					100.17	
36 A1. I	74.18	11.15	0.90	1.31	0.62	1.35	1.00	5.86	1.27	0.15	0.25	0.15	0.02	CO_2 2.00 ZrO_2 none SO_3 trace Cl trace S 0.01 Cr_2O_3 none V_2O_3 none NiO 0.10 BaO trace SrO none Cu trace	100.32	2.654
37 B3. IV	71.33	14.77	trace	2.47	0.52	0.81	4.18	0.37	1.25	0.20		0.08	0.04		99.12	
38 A2. II	72.40	14.09	0.48	2.52	0.20	1.15	2.97	4.09	0.86		0.15		0.42	CO_2 0.82	100.15	
39 A2. II	69.30	13.92	0.48	2.81	0.25	2.17	1.44	3.79	2.40		0.18		0.42	CO_2 2.56	99.72	

RHYOLITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
25	Y Trefan, Nant Ffrancon, Carnarvonshire, Wales.	H. W. Greenwood.	C. B. Travis, Pr. Liv. G. Soc., X (5), p. 315, 1909.	Rhyolite.	
26	Dufton Pike, Westmoreland, England.	P. Holland.	F. Rutley, Q. J. G. S., LVII, p. 36, 1901.	Rhyolite tuff.	"H_2O includes CO_2 and loss."
27	Altenshausen, near Magdeburg, Prussia.	Büdlander.	F. Klockmann, Jb. Pr. G. L.-A., XI, p. 200, 1892.	Silicified tuff.	In W. T., p. 387.
28	Nagy Mihaly, Hungary.	K. v. Muraközy.	K. v. Muraközy, F. K., XXII, p. 54, 1892.	Rhyolite.	In W. T., p. 131.
29	Verespatak, Hungary.	R. Lunzer.	G. v. Sgadeczky, F. K., XXXIX, p. 451, 1909.	Rhyolite.	Altered.
30	Birincampo, San Pietro, Sardinia.	A. Johnsen.	A. Johnsen, Anh. Abh. Pr. AK. W., No. 2, p. 53, 1912.	Liparite tuff.	Also in N. J. Cb., 1912, p. 738.
31	Balachany, Baku District, Caucasus.	N. Orlow.	P. Tschirwinsky, Z. Vulk., I, p. 96, 1914.	Volcanic ash.	
32	Urgüb, near Mount Argaeus, Asia Minor.	Schwager.	L. v. Ammon in Oberhummer and Zimmerer, Durch Syrien, p. 334, 1899.	Liparite tuff.	Cf. N. J., 1900, II, p. 61. In W. T., p. 389.
33	Mai Meteré Valley, Adi Ugri, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 113, 1909.	Liparite tuff.	
34	Kuram Tash, W. Kansu, China.	C. Pfeil.	K. Futterer, Durch Asien., III (4), p. 24, 1909.	Silicified tuff.	
35	Muao River, Cebu, Philippine Islands.	H. S. Walker.	H. G. Ferguson, Phil. J. Sci., (A), II, p. 408, 1907.	Rhyolite.	
36	Jenolan Caves, New South Wales.	W. G. Stone.	G. W. Card, pers. com.	Rhyolite.	
37	Tooloom, New South Wales.	W. G. Stone.	Dep. Min. N. S. W. A. R. (1912), p. 198, 1913.	Volcanic tuff.	
38	Coromandel, Hauraki, New Zealand.	J. S. Maclaurin.	Fraser and Adams, N. Z. G. S. B. 4, p. 87, 1907.	Rhyolite.	
39	Omoho Creek, Coromandel, Hauraki, New Zealand.	J. S. Maclaurin.	Fraser and Adams, N. Z. G. S. B. 4, p. 64, 1907.	Rhyolite tuff.	

QUARTZ DIORITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A1. I	64.75	15.45	0.64	3.85	1.47	4.27	3.71	2.48	1.06	0.10	1.11	0.10	0.06	CO_2 0.95 S 0.02 BaO 0.04	100.05	2.682
2 A1. I	69.87	12.02	1.42	3.49	2.30	7.86	0.66	0.11	0.89	0.18	0.69	0.17	0.16	CO_2 0.43 SO_3 none Cl none S none BaO none SrO none	100.25	
3 A2. II	71.22	15.05	trace	1.54	0.33	none	0.42	6.99	1.52	0.32	0.31	0.08	0.05	CO_2 1.50 FeS_2 0.45 BaO none	99.78	2.549
4 A4. IV	66.90	15.83	?	?	trace	0.05	0.08	0.03	3.88	0.87	0.68		none	CO_2 none Fe 4.37 S 5.46	98.15	
5 A2. II	65.14	15.63	2.37	2.13	1.85	3.62	2.63	4.29	0.75	0.37	0.59	0.16	trace	SO_3 0.05 Cl none BaO 0.10 SrO trace	99.68	
6 A2. II	64.81	19.44	1.82	0.16	0.19	0.18	0.21	5.30	5.25	1.41	0.73	0.10	trace	CO_2 none SO_3 0.31 BaO 0.10 SrO trace	100.01	
7 A3. III	62.09	15.49	8.52	n. d.	0.42	0.20	0.37	4.34	3.01	1.20	0.51	0.13	trace	CO_2 none SO_3 none S 5.47 Cr_2O_3 none BaO trace Cu 0.25	102.00 2.05 99.95	
8 A2. II	56.80	21.02	3.06	0.90	1.21	0.35	0.50	4.78	2.88	7.68	0.60	0.05	trace	CO_2 none SO_3 none S 0.17 Cr_2O_3 trace BaO 0.05 Cu 0.10	100.15	
9 A2. II	54.30	13.63	1.89	2.22	2.13	7.36	0.16	4.41	2.19	4.09	0.61	0.20	0.71	CO_2 5.50 SO_3 none FeS_2 0.49 BaO trace ZnO 0.12	100.01	
10 A1. I	66.70	13.25	1.34	0.51	0.30	0.05	0.39	4.03	0.37	0.08	0.20	0.12	trace	CO_2 0.21 FeS_2 5.09 FeAsS 4.75 PbS 0.59 ZnS 1.86 BaO none	99.84	2.979
11 A1. I	66.02	14.14	1.53	0.37	0.67	0.26	0.39	4.63	0.48	0.10	0.56	0.17	trace	CO_2 0.25 F 0.02 FeS_2 6.73 FeAsS 0.72 PbS 2.02 ZnS 0.74 BaO 0.04	99.94	2.893
12 A1. I	71.93	12.21	0.64	2.99	0.58	2.59	0.23	3.29	0.37	2.06	0.40	0.10	0.18	CO_2 1.95 S 0.18 NiO none BaO trace SrO trace Fe 0.13 Zn 0.09 Pb trace	99.92	
13 A2. II	66.66	14.26	0.67	2.41	0.95	3.37	none	4.19	2.16	0.36	0.49	0.17	trace	CO_2 3.67 SO_3 none FeS_2 0.95 BaO none	100.31	2.774
14 A2. II	66.87	18.14	1.36	1.06	0.68	0.11	0.61	4.12	4.05	0.87	0.85	0.05	none	CO_2 none SO_3 0.05 S 0.23 Cu 0.70	99.75	2.27
15 A2. II	62.56	17.21	2.29	3.64	1.13	0.29	0.07	6.02	2.70	0.14	0.70	0.24	0.45	CO_2 1.93 SO_3 0.02 S 0.13 Cu 0.09	99.61	2.53

QUARTZ DIORITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Montrose Station, Lynnfield, Massachusetts.	M. F. Connor.	C. H. Clapp, pers. com.	Hybrid between granite and gabbro-diorite.	
2	Near Sweden, Gordon County, Georgia.	H. N. Stokes.	A. H. Brooks, U. S. G. S. B. 168, p. 55, 1900.	Meta-quartz diorite.	Not fresh. In W. T., p. 221.
3	Clancy, Montana.	J. G. Fairchild.	A. Knopf, U. S. G. S. rec. lab.	Quartz monzonite.	Altered, Cf. No. 8, II. 4. 2. 3.
4	Leonard Mine, Butte, Montana.	W. F. Hillebrand.	W. H. Weed, U. S. G. S. P. P. 74, p. 88, 1912.	Quartz monzonite.	Altered.
5	Butte, Montana.	H. N. Stokes.	W. H. Weed, J. G., VII, p. 749, 1899.	Granite (quartz monzonite).	Weathered. Also in U.S.G.S. P. P. 74, p. 86, 1912. In W. T., p. 375.
6	Atlantic Mine, Butte, Montana.	H. N. Stokes.	W. H. Weed, U. S. G. S. P. P. 74, p. 88, 1912.	Quartz monzonite.	Altered. Cf. No. 5, II. 4. 3. 3. In W. T., p. 375.
7	Parrott Mine, Butte, Montana.	E. T. Allen.	W. H. Weed, U. S. G. S. P. P. 74, p. 88, 1912.	Quartz monzonite.	Altered.
8	Colusa Mine, Butte, Montana.	E. T. Allen.	W. H. Weed, U. S. G. S. P. P. 74, p. 88, 1912.	Quartz monzonite.	Altered.
9	Original Mine, Butte, Montana.	E. T. Allen.	W. H. Weed, U. S. G. S. P. P. 74, p. 88, 1912.	Quartz monzonite.	Altered.
10	Rimini, Montana.	J. G. Fairchild.	A. Knopf, U. S. G. S. rec. lab.	Quartz monzonite.	Altered.
11	Rimini, Montana.	J. G. Fairchild.	A. Knopf, U. S. G. S. rec. lab.	Quartz monzonite.	Altered.
12	Hailey, Idaho.	W. F. Hillebrand.	W. Lindgren, U. S. G. S. A. R. 20, II, p. 219, 1900.	Quartz monzonite.	Altered. Cf. No. 90, I. 4. 2. 3. In W. T., p. 375.
13	Willow Creek District, Boise County, Idaho.	G. Steiger.	W. Lindgren, U. S. G. S. A. R. 18, III, p. 640, 1898.	Granodiorite.	Altered. In W. T., p. 375.
14	Frisco District, Utah.	R. C. Wells.	B. S. Butler, U. S. G. S. rec. lab.	Quartz monzonite.	Altered.
15	Frisco District, Utah.	R. C. Wells.	B. S. Butler, U. S. G. S. rec. lab.	Granodiorite.	Altered.

QUARTZ DIORITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
16 A1. I	61.64	14.66	1.95	1.68	2.55	4.65	2.71	3.07	2.56	1.04	0.48	0.24	0.06	CO_2 2.15 ZrO_2 0.01 SO_3 none Cl trace F trace FeS_2 0.32 Cr_2O_3 none BaO 0.18 SrO 0.06 Li_2O trace	100.01	
17 A1. I	59.68	15.61	2.49	2.38	2.52	4.63	3.96	2.96	2.00	0.51	0.62	0.29	0.08	CO_2 2.29 ZrO_2 0.01 SO_3 none Cl none FeS_2 0.02 Cr_2O_3 none BaO 0.15 SrO 0.07	100.27	
18 A1. I	61.99	15.81	3.28	2.69	2.24	4.62	2.73	2.51	1.99	0.91	0.94	0.11	trace	ZrO_2 0.03 S trace Cr_2O_3 trace BaO 0.06	99.91	
19 A1. I	60.26	15.73	1.25	2.68	1.82	5.44	1.92	3.71	2.54	0.33	0.42	0.12	0.04	CO_2 3.99 FeS_2 0.08 BaO 0.07 SrO trace Li_2O trace	100.40	
20 A1. I	59.76	14.45	1.04	3.52	2.26	6.09	1.12	3.73	2.58	0.26	0.46	0.16	0.09	CO_2 4.47 FeS_2 0.24 BaO 0.05 SrO trace Li_2O trace	100.28	
21 A1. I	58.43	17.40	0.77	2.19	1.50	5.25	1.76	4.03	2.61	0.30	none	0.13	none	CO_2 4.04 SO_3 none FeS_2 1.59 BaO none	100.00	
22 A1. I	56.25	17.65	0.76	2.64	1.69	4.46	0.30	6.01	2.36	0.30	0.25	0.21	none	CO_2 4.82 SO_3 none FeS_2 2.87 BaO 0.03	100.60	
23 A1. I	46.13	15.82	0.89	2.27	2.13	10.68	0.17	5.30	2.42	0.12	0.67	0.10	0.09	CO_2 11.24 SO_3 0.04 FeS_2 1.61 NiO trace ZnO trace BaO trace SrO trace	99.68	
24 A3. III	68.99	20.29	2.10	1.62	0.40	4.75	0.15	0.09	0.14		trace	trace	none	CO_2 1.10 S trace	99.63	
25 A2. II	57.96	17.43	0.45	1.82	2.34	5.07	5.17	0.45	1.04		1.21	0.02	none	CO_2 6.32 FeS_2 0.33	99.61	
26 A2. II	59.32	13.33	1.36	7.32	1.79	4.37	2.58	2.30	3.34		1.04	0.18		CO_2 2.91 SO_3 0.14 Org. 0.02	100.00	2.736
27 A2. II	55.54	15.64	1.19	7.13	4.84	5.67	3.17	2.28	2.93		1.24	0.45		CO_2 0.40 SO_3 0.33 Org. 0.06	100.87	2.798
28 A3. III	63.66	7.81	8.13	3.61	1.85	2.56	3.02	2.45	2.94			0.31	0.54	CO_2 3.04	99.92	
29 A3. III	66.05	15.86	2.52	0.91	0.51	4.35	4.30	3.05	1.48	0.79	trace		trace		99.82	
30 A3. III	60.14	14.62	6.10	4.67	0.24	6.25	3.34	3.26	1.54	0.37	0.33				100.86	
31 A2. II	58.77	18.04	2.19	4.98	2.64	6.05	1.26	2.42	3.89		0.05		trace		100.29	2.78
32 A2. II	68.26	14.44	2.07	2.62	0.75	2.71	3.62	3.49	1.16	0.10	0.71			CO_2 0.28	100.09	

QUARTZ DIORITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
16	Valeo Mine, Park City quadrangle, Utah.	W. F. Hillebrand.	J. M. Boutwell, U. S. G. S. P. P. 77, p. 84, 1912.	Quartz diorite porphyry.	
17	Daly West Mine, Park City quadrangle, Utah.	W. F. Hillebrand.	J. M. Boutwell, U. S. G. S. P. P. 77, p. 84, 1912.	Quartz diorite porphyry.	
18	Pinal Mountains, Globe District, Arizona.	W. F. Hillebrand.	F. L. Ransome, U. S. G. S. P. P. 12, p. 60, 1903.	Quartz-mica diorite.	
19	Providence Mine, Nevada County, California.	W. F. Hillebrand.	W. Lindgren, U. S. G. S. A. R. 17, II, p. 149, 1896.	Granodiorite.	Altered wall rock. Cf. No. 44, I.4.3.4. In W. T., p. 407.
20	Providence Mine, Nevada County, California.	W. F. Hillebrand.	W. Lindgren, U. S. G. S. A. R. 17, II, p. 149, 1896.	Granodiorite.	Altered wall rock. In W. T., p. 407.
21	Empire Mine, Nevada County, California.	G. Steiger.	W. Lindgren, U. S. G. S. A. R. 17, II, p. 149, 1896.	Granodiorite.	Altered wall rock. In W. T., p. 407.
22	Bellefountain Tunnel, Nevada County, California.	G. Steiger.	W. Lindgren, U. S. G. S. A. R. 17, II, p. 149, 1896.	Granodiorite.	Altered wall rock. In W. T., p. 407.
23	Ophir, Placer County, California.	W. F. Hillebrand.	W. Lindgren, U. S. G. S. A. R. 14, II, p. 275, 1894.	Granodiorite.	Altered wall rock. Cf. No. 88, II.4.3.4. In W. T., p. 407.
24	Smiths Post Island, Essequibo River, British Guiana.	J. B. Harrison.	J. B. Harrison, Rep. G. Ess. River, p. 45, 1900.	Quartz diorite.	In W. T., p. 407.
25	Omai, Essequibo River, British Guiana.	J. B. Harrison.	J. B. Harrison, Rep. G. Ess. River, p. 45, 1900.	Quartz diorite.	In W. T., p. 407.
26	Bielstein, near Rübeland, Harz Mountains.	Gremse.	K. A. Lossen, Jb. Pr. G. L.-A. (1889), p. 290, 1892.	Quartz diorite porphyry.	In W. T., p. 243.
27	Lampersdorf, Silesia.	W. Hampe.	E. Dathe, Jb. Pr. G. L.-A. (1886), p. 331, 1887.	Quartz diorite.	In W. T., p. 283.
28	Roztok, Moldauthal, Bohemia.	Strnad.	J. Kevana, Ref. N. J., 1898, I, p. 485.	Quartz diorite.	In W. T., p. 219.
29	Ochsensprung, near Maul, Tyrol.	G. Hradil.	G. Hradil, Sb. Ak. W. Wien, CXXI, p. 879, 1912.	Tonalite porphyry.	
30	Reinthal, near Maul, Tyr	G. Hradil.	G. Hradil, Sb. Ak. W. Wien, CXXI, p. 880, 1912.	Tonalite.	
31	Töll, near Meran, Tyrol.	E. Zdarek.	F. Becke, Ds. Ak. W. Wien, LXXV (1), p. 160, 1913.	Töllite (tonalite porphyry).	
32	Riasonov Trail, Jenissei District, Siberia.	G. Zhukovsky.	A. Meister, Reg. Aurif. Sib., IX, p. 239, 1910.	Chlorite adamellite.	

QUARTZ DIORITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
33 A3. III	63. 38	17. 36	1. 61	1. 98	1. 80	4. 18	4. 07	0. 31	0. 54					CO_2 1. 13 FeS_2 3. 38	99. 74	
34 A3. III	62. 43	17. 88	1. 78	3. 53	4. 50	3. 43	3. 10	2. 75	1. 37		trace	trace			100. 77	2. 74
35 A2. II	57. 69	15. 65	7. 42	2. 41	3. 10	6. 92	2. 33	2. 37	1. 59		0. 03	0. 22	trace		99. 73	2. 779

DACITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A2. II	67. 27	14. 84	1. 01	0. 85	1. 36	2. 30	2. 94	2. 87	4. 95	1. 55	0. 27	0. 06	trace	CO_2 none ZrO_2 none SO_3 none Cr_2O_3 trace BaO 0. 15 SrO none	100. 38	
2 A3. III	65. 78	14. 87	1. 27	1. 00	1. 89	2. 41	2. 58	2. 71	4. 32	2. 87		0. 08	trace		99. 78	
3 A2. II	63. 55	17. 10	3. 21	0. 92	0. 43	0. 82	2. 12	2. 30	5. 13	4. 20	0. 41	0. 10	0. 03	CO_2 none S trace	100. 32	
4 A1. I	60. 23	18. 64	3. 81	0. 88	1. 64	6. 04	3. 87	1. 46	1. 97	0. 95	0. 57	0. 20	trace	CO_2 none ZrO_2 0. 01 Cr_2O_3 trace BaO 0. 11 SrO 0. 05	100. 43	
5 A4. IV	68. 19	15. 13	1. 31	0. 42	0. 29	1. 19	3. 13	6. 56	n. d.		0. 32	0. 15			96. 69	
6 A1. I	60. 53	15. 32	0. 20	0. 14	0. 06	0. 41	0. 84	1. 06	6. 60	1. 33	0. 80	0. 27	trace	CO_2 none ZrO_2 0. 01 SO_3 5. 97 F trace FeS_2 7. 20 BaO 0. 06	100. 80	
7 A3. III	55. 34	16. 25	5. 59	2. 83	5. 51	3. 93	4. 81	1. 51	3. 06			0. 36		CO_2 1. 51	100. 70	2. 674
8 A3. III	70. 03	10. 65	1. 16	0. 72	0. 70	3. 55	1. 75	1. 62	5. 79	2. 48	0. 53	trace		CO_2 0. 94	99. 92	
9 A3. III	67. 27	16. 31	3. 13	1. 15	0. 84	3. 48	3. 61	2. 91	1. 16		0. 40	trace	trace		100. 26	
10 A3. III	68. 81	14. 61	1. 36	1. 26	0. 74	2. 21	3. 31	4. 61	2. 60	0. 32	0. 36	trace			100. 19	
11 A3. III	62. 23	16. 96	1. 27	2. 92	2. 02	6. 56	3. 07	1. 07	2. 47	0. 81	0. 63	trace		CO_2 0. 10	100. 11	
12 A3. III	67. 25	16. 38	4. 62	1. 30	1. 76	3. 05	2. 56	1. 36	0. 30				0. 33	CO_2 1. 56	100. 47	
13 A2. II	64. 48	15. 07	0. 60	5. 19	2. 17	3. 31	2. 55	3. 04	2. 01	0. 13	0. 90	0. 22	0. 11	CO_2 trace SO_3 none Cl trace NiO 0. 01	99. 79	2. 708
14 A2. II	76. 61	8. 31	1. 08	0. 59	0. 51	3. 61	0. 29	1. 98	1. 08	0. 43	0. 28	0. 11	0. 11	CO_2 1. 87 FeS_2 3. 59	100. 45	
15 A2. II	69. 35	11. 66	1. 53	1. 66	0. 46	2. 09	1. 06	3. 31	2. 12	1. 61	0. 43	0. 26	0. 11	CO_2 2. 24 FeS_2 1. 88	99. 77	

QUARTZ DIORITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
33	Dandenong, Victoria.	H. C. Jenkins.	J. W. Gregory, Pr. R. Soc. Vict., XIV, p. 201, 1902.	Granodiorite.	
34	Ensay, Omeo, Victoria.	A. W. Howitt.	A. W. Howitt, Tr. R. Soc. Vict., XXII, p. 99, 1886.	Quartz-mica diorite.	In W. T., p. 231.
35	Tambo River, Noyang, Victoria.	A. W. Howitt.	A. W. Howitt, Tr. R. Soc. Vict., XX, p. 31, 1884.	Quartz-mica diorite.	In W. T., p. 231.

DACITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Near Paskenta, Tehama County, California.	E. T. Allen.	J. S. Diller, A. J. S., XV, p. 360, 1903.	Dacite tuff.	
2	Near Paskenta, Tehama County, California.	G. Steiger.	J. S. Diller, A. J. S., XV, p. 360, 1903.	Dacite tuff.	In W. T., p. 417.
3	Hay Fork Valley, Trinity County, California.	R. C. Wells.	J. S. Diller, U. S. G. S. rec. lab.	Tuff (dacite?).	
4	Redding Creek, Trinity County, California.	E. T. Allen.	J. S. Diller, A. J. S., XV, p. 360, 1903.	Tuff.	
5	Tonopah, Nevada.	G. Steiger.	J. E. Spurr, U. S. G. S. P. P. 42, p. 148, 1905.	Rhyolite-dacite.	Altered. Low sum due to H_2O?
6	Combination Mine, Goldfield District, Nevada.	G. Steiger.	F. L. Ransome, Ec. G., II, p. 680, 1907.	Dacite.	Altered. Also in U. S. G. S. P. P. 66, p. 181, 1909.
7	Ruminhui Volcano, near Cotopaxi, Ecuador.	A. Young.	A. Young. Hochg. Ecuad., II (2), p. 228, 1902.	Dacite.	Altered.
8	Epidauros, Argolis, Greece.	M. Dittrich.	Milch and Renz, N. J. B. B., XXXI, p. 532, 1911.	Tuff (dacite?).	
9	Kalymnos Island, Aegean Sea.	F. Millosevitch.	F. Millosevitch, Rend. Ac. Linc., XXI (2), p. 309, 1912.	Dacite tuff.	
10	Lau Pangaion, Karoland, Sumatra.	M. Dittrich.	H. Stegmann, N. J. B. B., XXVII, p. 438, 1909.	Quartz trachyte-andesite tuff.	
11	Palpalang, Karoland, Sumatra.	M. Dittrich.	H. Stegmann, N. J. B. B., XXVII, p. 427, 1909.	Dacite.	Altered.
12	Dandenong, Victoria.	H. C. Jenkins.	J. W. Gregory, Pr. R. Soc. Vict., XIV, p. 201, 1902.	Dacite.	
13	Near Hesket, Macedon, Victoria.	A. G. Hall.	Skeats and Summers, G. S. Vict. B. 24, p. 40, 1912.	Dacite.	Propylitized.
14	Waihi Mine, Hauraki, New Zealand.	A. M. Finlayson.	Bell and Fraser, N. Z. G. S. B. 15, p. 55, 1912.	Dacite.	Altered.
15	Waihi Mine, Hauraki, New Zealand.	A. M. Finlayson.	Bell and Fraser, N. Z. G. S. B. 15, p. 55, 1912.	Dacite.	Altered.

DACITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
16 B2. III	63.45	15.26	2.28	3.01	1.29	3.14	2.21	1.78	2.90	1.10	0.75	0.29	0.36	CO_2 1.08	99.20	
17 A2. II	61.78	14.89	2.08	2.51	1.08	3.16	2.18	3.68	3.05	1.89	0.69	0.30	0.28	CO_2 2.01 FeS_2 0.65	100.23	
18 A2. II	59.95	17.34	0.79	4.35	2.65	4.05	2.21	2.63	2.88		0.79		0.47	CO_2 2.20	100.31	
19 A2. II	58.45	16.50	0.24	4.42	5.45	3.76	0.96	2.16	4.32		0.78			CO_2 2.83	100.30	
20 B2. III	58.39	16.51	2.46	2.98	1.66	4.08	2.08	2.89	2.87	2.41	0.68	0.31	0.32	CO_2 1.56	99.20	
21 A2. II	58.02	17.04	none	5.04	4.29	4.24	1.36	3.48	3.82		0.93		0.42	CO_2 1.14	99.78	
22 A2. II	57.20	16.39	3.01	3.13	3.31	4.44	1.58	3.60	3.16		0.60		0.22	CO_2 3.60	100.24	
23 A2. II	56.80	16.19	0.95	4.42	7.56	3.70	1.13	3.81	4.18		0.82		0.55	CO_2 0.05	100.16	
24 A2. II	66.31	16.22	1.14	2.34	0.85	3.84	3.95	2.27	2.32	0.14	0.54	0.21	0.05		100.18	
25 A2. II	62.85	15.17	4.78	1.59	1.83	5.35	2.56	2.42	2.32	0.30	0.55	0.32	0.07		100.11	

SYENITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 B2. III	57.75	17.50	2.92	2.94	1.70	3.86	5.08	3.51	0.37		1.53	1.05	0.19	CO_2 0.55 FeS_2 0.21 BaO 0.07	99.23	
2 A2. II	50.56	18.28	3.57	4.62	3.38	7.10	4.30	3.31	1.40		2.25		0.13	CO_2 0.76	99.66	
3 A1. I	40.72	2.78	6.58	4.24	26.25	8.66	0.42	0.27	5.51	0.26	0.07	0.28	0.14	CO_2 3.20 Cl 0.06 S 0.70 Cr_2O_3 0.28 SrO 0.03	100.45	
4 A3. III	58.25	18.22	1.07	5.96	trace	1.51	4.19	5.59	0.85		trace		0.10	CO_2 4.75	100.49	
5 A3. III	58.32	15.77	6.56	0.89	0.09	11.68	0.32	4.01	1.73			0.48	0.13	ZrO_2 trace	99.98	
6 A1. I	51.94	15.78	4.07	3.17	3.48	6.04	3.44	7.69	2.17		0.39	0.59	trace	SO_3 0.29 Cl 0.08 BaO 0.42 SrO 0.28	99.83	
7 A1. I	50.11	17.13	3.73	3.28	2.47	5.09	3.72	7.47	4.47		0.82	0.67	trace	SO_3 0.08 Cl 0.07 BaO 0.63 SrO 0.35	100.09	
8 A3. III	50.00	19.36	3.87	2.67	2.18	4.96	3.63	8.52	3.53	0.46					99.18	

DACITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
16	Waihi Mine, Hauraki, New Zealand.	A. M. Finlayson.	A. M. Finlayson, Ec. G., IV, p. 638, 1909.	Dacite.	"Fresh."
17	Waihi Mine, Hauraki, New Zealand.	A. M. Finlayson.	Bell and Fraser, N. Z. G. S. B. 15, p. 55, 1912.	Dacite.	Altered.
18	Waihi Mine, Hauraki, New Zealand.	Survey laboratory.	Bell and Fraser, N. Z. G. S. B. 15, p. 42, 1912.	Dacite.	Altered.
19	Waihi Mine, Hauraki, New Zealand.	Survey laboratory.	Bell and Fraser, N. Z. G. S. B. 15, p. 42, 1912.	Dacite.	Altered.
20	Waihi Mine, Hauraki, New Zealand.	A. M. Finlayson.	Bell and Fraser, N. Z. G. S. B. 15, p. 55, 1912.	Dacite.	Altered. Also in Ec. G., IV, p. 638, 1909.
21	Waihi Mine, Hauraki, New Zealand.	Survey laboratory.	Bell and Fraser, N. Z. G. S. B. 15, p. 42, 1912.	Dacite.	Altered.
22	Waihi Mine, Hauraki, New Zealand.	Survey laboratory.	Bell and Fraser, N. Z. G. S. B. 15, p. 42, 1912.	Dacite.	Altered.
23	Waihi Mine, Hauraki, New Zealand.	Survey laboratory.	Bell and Fraser, N. Z. G. S. B. 15, p. 42, 1912.	Dacite.	Altered.
24	Te Ariki Falls, Aroha, Hauraki, New Zealand.	Survey laboratory.	Henderson and Bartrum, N. Z. G. S. B. 16, p. 67, 1913.	Dacite tuff.	
25	Waita Wheta River, Aroha, Hauraki, New Zealand.	Survey laboratory.	Henderson and Bartrum, N. Z. G. S. B. 16, p. 67, 1913.	Dacite tuff.	

SYENITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Mount Yamaska, Quebec.	G. A. Young.	G. A. Young, Can. G. S. A. R. XVI, p. 21, H, 1906.	Akerite.	
2	St. Bruno Mountain, Quebec.	M. F. Connor.	J. A. Dresser, Can. G. S. Mem. 7, p. 18, 1910.	Umptekite.	
3	Rocky Islet Bay, Rainy Lake, Ontario.	M. F. Connor.	A. W. Lawson, Can. G. S. Mem. 40, p. 91, 1913.	Basic facies of syenite.	
4	Livermore Falls, Campton, New Hampshire.	G. W. Hawes.	G. W. Hawes, A. J. S., XVII, p. 150, 1879.	Syenite.	Not in W. T.
5	Milams Gap, Virginia.	W. C. Phalen.	W. C. Phalen, Smiths. Misc. Coll., XLV, p. 313, 1904.	Unakite.	Metamorphosed akerite.
6	Shonkin Creek, Highwood Mountains, Montana.	W. M. Bradley.	L. V. Pirsson, U. S. G. S. B. 237, p. 139, 1905.	Syenite porphyry.	In W. T., p. 295.
7	Palisade Butte, Highwood Mountains, Montana.	H. W. Foote.	L. V. Pirsson. U. S. G. S. B. 237, p. 92, 1905.	Syenite.	In W. T., p. 297.
8	Shonkin Sag, Highwood Mountains, Montana.	W. F. Hillebrand.	Weed and Pirsson, A. J. S., XII, p. 14, 1901.	Syenite.	Also in U. S. G. S. B. 237, p. 92, 1905.

SYENITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
9 A3. III	59.78	16.86	3.08	3.72	0.69	2.96	5.39	5.01	1.58				0.14	CO_2 0.75	99.96	
10 A1. I	63.01	18.48	0.06	0.32	0.06	2.66	10.01	0.39	0.27	0.05	0.13	0.06	0.06	CO_2 2.01 FeS_2 2.10 NiO none BaO 0.02 SrO trace	99.69	
11 A1. I	63.41	16.86	none	2.88	trace	1.47	7.38	3.09	0.42	0.29	0.26	0.12	0.28	CO_2 2.93 ZrO_2 0.04 SO_3 none Cl none S 0.05 BaO none	99.48	
12 A2. II	60.50	16.86	1.67	2.54	1.11	2.95	6.46	5.42	1.40		0.75	0.20	0.21	CO_2 0.70	100.77	
13 A4. IV	58.80	16.84	2.04		2.75	0.70	5.41	4.14	2.79					$CaCO_3$ 3.75 FeS_2 3.13	100.35	
14 A3. III	47.05	18.52	5.91	3.11	4.24	4.71	3.58	1.83	2.70					$CaCO_3$ 6.63 FeS_2 1.95	100.23	
15 A3. III	43.33	17.88	6.80	4.46	4.99	2.18	3.53	1.02	3.36					$CaCO_3$ 10.34 FeS_2 3.00	100.69	
16 A2. II	57.00	18.03	1.33	3.52	1.53	3.55	7.53	3.89	1.30		0.55	0.41	0.49	CO_2 1.05	100.18	
17 A2. II	48.46	16.81	1.46	9.14	4.44	6.14	6.31	2.33	0.59		3.05	0.67	trace	CO_2 1.28	100.68	
18 A2. II	69.00	14.54	0.86	0.49	0.40	2.12	4.42	5.83	0.50		0.47	0.01	0.03	CO_2 1.40 S trace	100.07	
19 A2. II	57.29	15.71	4.54	3.18	4.30	5.40	4.04	1.93	2.69		0.68		0.29		100.05	
20 A2. II	43.03	13.27	8.10	5.23	7.39	3.47	4.65	4.54	6.03		3.84	0.64	0.11	CO_2 trace SO_3 trace Cl trace	100.30	2.727
21 B2. III	40.19	16.03	6.77	4.11	4.27	5.77	6.12	4.01	5.26		3.21	2.32		SO_3 0.34 Cl trace BaO none SrO 0.21	99.24	2.745
22 A4. IV	57.63	16.47	5.37	n. d.	4.44	5.25	5.15	3.12	0.45					CO_2 2.14 S 0.95	100.97	
23 A2. II	46.96	15.97	1.92	7.35	8.97	2.72	1.65	5.55	5.58		1.35	0.26		CO_2 2.14	100.69	2.664
24 A3. III	58.46	14.38	3.75	6.67	1.59	5.24	1.33	3.40	2.03				0.36	CO_2 3.40	100.61 (100.45)	
25 A2. II	45.70	15.40	2.75	5.67	7.55	9.02	3.12	3.22	3.90		3.46	0.26	0.26		100.31 (100.05)	
26 A2. II	58.90	16.48	2.98	3.35	0.78	2.78	4.09	6.05	0.34	0.82	1.47	trace	0.08	CO_2 1.50 NiO 0.05 BaO none SrO none	99.67	

SYENITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
9	Silver Cliff, Colorado.	L. G. Eakins.	W. Cross, Pr. Colo. Sc. Soc., II, p. 240, 1887.	Syenite.	Also in U. S. G. S. A. R. 17 (II), p. 281, 1896. In W. T., p. 257.
10	Treadwell Mine, Douglas Island, Alaska.	W. F. Hillebrand.	G. F. Becker, U. S. G. S. A. R. 18, III, p. 39, 1888.	Soda syenite.	In W. T., p. 199.
11	Karta Bay, Kasaan Peninsula, Alaska.	R. C. Wells.	C. W. Wright, U. S. G. S. P. P. 87, p. 79, 1915.	Calcite syenite porphyry.	Calcite primary?
12	Ostö, Christiania Fjord, Norway.	V. Schmelck.	W. C. Brögger, Eg. Kg., III, p. 190, 1899.	Hedrumite.	In W. T., p. 253.
13	Vakkerö, Christiania Fjord, Norway.	G. Forsberg.	W. C. Brögger, Z. K., XVI, p. 64, 1890.	Mica syenite porphyry.	Center of dike. In W. T., p. 389.
14	Vakkerö, Christiania Fjord, Norway.	G. Forsberg.	W. C. Brögger, Z. K., XVI, p. 64, 1890.	Mica syenite porphyry.	1 foot from border of dike. In W. T., p. 389.
15	Vakkerö, Christiania Fjord, Norway.	G. Forsberg.	W. C. Brögger, Z. K., XVI, p. 64, 1890.	Mica syenite porphyry.	Border of dike. In W. T., p. 389.
16	Brathagen, Lougendal, Norway.	V. Schmelck.	W. C. Brögger, Eg. Kg., III, p. 116, 1899.	Heumite.	Border of dike. In W. T., p. 253.
17	Brathagen, Lougendal, Norway.	O. N. Heidenreich.	W. C. Brögger, Eg. Kg., III, p. 106, 1899.	Heumite.	Center of dike. In W. T., p. 299.
18	Kiirunavaara, Lapland, Sweden.	K. Schröder.	P. Geijer, G. Kir. Dist., p. 49, 1910.	Syenite porphyry.	
19	Svanken, near Rödö, Sweden.	H. Santesson.	P. J. Holmquist, Afh. Sv. G. Und., No. 181, p. 63, 1899.	Syenite porphyry.	In W. T., p. 241.
20	Michelsberg, Katzenbuckel, Odenwald.	W. Freudenberg.	W. Freudenberg, Mt. Bad. G. L.-A., V (1), p. 284, 1907.	Schliere in shonkinite.	
21	Michelsberg, Katzenbuckel, Odenwald.	W. Freudenberg.	W. Freudenberg, Mt. Bad. G. L.-A., V (1), p. 293, 1907.	Shonkinite porphyry.	
22	Triebischbach, Rothschönberg, Saxony.	Fritsch and Venator.	J. M. C. Henderson, Z. D. G. G., XLVII, p. 543, 1895.	Mica syenite.	In W. T., p. 391.
23	Pfeffelbach, St. Wendel, Harz Mountains.	Hesse.	K. A. Lossen, Jb. Pr. G. L.-A., X, p. 316, 1892.	Syenite porphyry.	In W. T., p. 393.
24	Dolanky, Moldauthal, Bohemia.	Plamina.	J. Klvana, Ref. N. J., I, p. 485, 1898.	Quartz syenite.	In W. T., p. 227.
25	Noil Nimassi, Timor Island.	Pisani.	H. A. Brouwer, N. J. Cb., p. 575, 1913.	Shonkinite.	
26	Oakey Creek, Nandewar Mountains, New South Wales.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXII, p. 903, 1908.	Pulaskite porphyry.	

SYENITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
27 A1. I	55. 86	15. 25	4. 92	6. 07	0. 20	2. 13	2. 34	9. 28	0. 50	0. 70	0. 65	0. 16	0. 42	CO_2 1. 80 SO_3 trace Cl trace F 0. 05 S 0. 09 Cr_2O_3 none V_2O_3 none BaO trace SrO none	100. 42	2. 706
28 A1. I	55. 16	16. 67	2. 36	7. 31	0. 56	2. 30	5. 65	6. 97	0. 88	0. 85	0. 60	0. 38	0. 47	CO_2 1. 50 SO_3 0. 25 Cl trace F 0. 15 S 0. 02 Cr_2O_3 none V_2O_3 none BaO trace SrO none	100. 08	2. 675

PORPHYRY.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A3. III	60. 71	14. 87	3. 26	3. 60	3. 52	3. 29	4. 40	2. 52	2. 35					CO_2 1. 68	100. 20	
2 A3. III	56. 25	18. 42	1. 56	2. 41	2. 38	6. 13	8. 10	0. 32	0. 22					CO_2 4. 58 S 0. 10	100. 47	
3 A3. III	59. 42	17. 86	3. 46	1. 59	1. 15	2. 61	9. 60	0. 60	0. 43					CO_2 2. 01 S 1. 66	100. 39	
4 A3. III	70. 74	14. 68	0. 69	0. 58	0. 28	4. 12	2. 29	2. 59	2. 09				0. 06	CO_2 2. 14 Cl trace BaO 0. 03 SrO trace	100. 29	2. 680
5 A2. II	68. 10	14. 97	2. 78	1. 10	1. 10	3. 04	3. 46	2. 93	1. 28		0. 07	0. 16	0. 09	CO_2 0. 92 Cl 0. 03 SrO 0. 08	100. 11	2. 736
6 A2. II	66. 45	15. 84	2. 59	1. 43	1. 21	2. 90	3. 92	2. 89	0. 84		0. 10	0. 36	0. 09	CO_2 1. 35 Cl 0. 05 SrO 0. 07	100. 09	2. 670
7 A1. I	66. 37	11. 15	none	0. 32	trace	0. 18	0. 56	9. 03	0. 44	0. 14	0. 23	none		CO_2 none ZrO_2 0. 02 SO_3 0. 35 FeS_2 10. 75 BaO 0. 10	99. 64	2. 652
8 A1. I	66. 27	15. 01	1. 84	0. 39	0. 71	0. 18	0. 72	9. 62	1. 50	0. 34	0. 47	0. 16	none	CO_2 none ZrO_2 none SO_3 none Cl none F 0. 15 S 1. 66 BaO 0. 17 SrO trace CuO 1. 62	100. 81	2. 43
9 A1. I	63. 09	16. 33	1. 37	3. 29	3. 53	0. 70	2. 79	3. 91	2. 35	0. 95	0. 43	0. 42	none	CO_2 none ZrO_2 none SO_3 none Cl none F 0. 08 S 0. 67 BaO 0. 09 SrO trace CuO 0. 55	100. 55	
10 A2. II	58. 64	15. 35	3. 25	2. 54	3. 84	5. 37	3. 60	4. 23	1. 50	0. 86	0. 83	0. 02	trace	CO_2 none S 0. 05 Cr_2O_3 trace BaO 0. 18	100. 26	
11 A2. II	56. 78	16. 90	6. 87	2. 34	0. 03	1. 18	0. 37	7. 02	2. 23	1. 32	0. 81	0. 04	trace	CO_2 0. 26 S 5. 93 Cr_2O_3 trace BaO 0. 14	102. 22 2. 22 100. 00	
12 A2. II	56. 17	15. 94	3. 43	1. 92	1. 60	5. 19	2. 48	4. 91	2. 95	1. 30	0. 90	0. 20	trace	CO_2 2. 01 S 1. 03 BaO 0. 18	100. 21	

SYENITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
27	Mittagong, New South Wales.	D. Mawson.	Taylor and Mawson, Pr. R. Soc. N. S. W., XXXVII, p. 341, 1903.	Syenite.	Melanocratic.
28	Mittagong, New South Wales.	D. Mawson.	Taylor and Mawson, Pr. R. Soc. N. S. W., XXXVII, p. 341, 1903.	Syenite.	Leucocratic.

PORPHYRY.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Swastika Area, Ontario.	E. L. Bruce.	E. L. Bruce, Rep. Bur. Min. Ont., XXI (1), p. 259, 1912.	Feldspar porphyry.	
2	Swastika Area, Ontario.	E. L. Bruce.	E. L. Bruce, Rep. Bur. Min. Ont., XXI (1), p. 262, 1912.	Porphyry.	
3	Nighthawk Lake, Porcupine Area, Ontario.	Not stated.	A. G. Burrows, Rep. Bur. Min. Ont., XXI (1), p. 218, 1912.	Felsite.	
4	Iron Hill, Alma District, Colorado.	W. F. Hillebrand.	H. B. Patton, Colo. G. S. B. 3, p. 81, 1912.	Porphyry.	
5	Johnson Gulch, Leadville, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. Mon. 12, p. 332, 1886.	Porphyry.	In W. T., p. 187.
6	Mount Lincoln, Leadville, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. Mon. 12, p. 332, 1886.	Porphyry.	In W. T., p. 175.
7	Leadville, Colorado.	R. C. Wells.	J. D. Irving, U. S. G. S. rec. lab.	Pyritic porphyry.	
8	Bingham District, Utah.	G. Steiger.	B. S. Butler, U. S. G. S. rec. lab.	Porphyry.	Altered.
9	Bingham District, Utah.	G. Steiger.	B. S. Butler, U. S. G. S. rec. lab.	Porphyry.	Altered.
10	Last Chance Mine, Bingham, Utah.	E. T. Allen.	J. M. Boutwell, U. S. G. S. P. P. 38, p. 178, 1905.	Porphyry.	Altered from No. 23, II.5.2.3.
11	Last Chance Mine, Bingham, Utah.	E. T. Allen.	J. M. Boutwell, U. S. G. S. P. P. 38, p. 178, 1905.	Porphyry.	Altered from No. 23, II.5.2.3.
12	Last Chance Mine, Bingham, Utah.	E. T. Allen.	J. M. Boutwell, U. S. G. S. P. P. 38, p. 178, 1905.	Porphyry.	Altered from No. 23, II.5.2.3.

PORPHYRY—Continued

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
13	63.85	17.51	1.94	0.55	—	5.67	0.25	4.77	1.02					CO_2 3.70 S 0.29 CuO 0.33	99.88	
A3. III																
14	82.10	11.30	0.79	n. d.	1.04	—	0.21	2.34	2.00						99.79	
A4. IV																
15	75.11	13.50	0.85	n. d.	1.02	0.64	0.38	5.75	2.37						99.62	
A4. IV															(99.61)	
16	70.50	17.85	1.22	n. d.	1.05	0.02	3.05	4.12	3.10						100.91	
A4. IV																
17	59.90	18.10	1.45	3.42	5.65	2.69	2.02	4.05	3.51						100.79	
A3. III																
18	70.68	11.45	1.31	0.72	2.28	0.65	4.85	0.23	1.41				0.05	CO_2 5.08 FeS_2 1.27	100.15	
A2. II																
19	56.44	16.17	7.72	3.00	2.02	10.13	1.17	1.18	2.37				0.30		100.50	
A3. III																
20	50.38	36.08	1.36	n. d.	0.66	0.15	1.32	5.17	4.40					S trace	99.52	2.718
A4. IV																
21	54.24	15.93	10.84	n. d.	2.94	3.39	3.91	3.93	4.62		1.06	trace	trace		100.86	2.695
A4. IV																
22	52.85	19.13	8.79	0.19	2.83	4.96	4.35	2.89	1.74		trace		trace	CO_2 2.13	99.86	2.66
A3. III																
23	52.18	19.13	7.42	0.21	1.41	5.66	3.79	4.13	3.58		trace		0.39	CO_2 2.11	100.01	2.67
A3. III																
24	50.78	18.70	7.28	1.23	5.33	1.57	1.83	7.36	4.20		1.32	0.22		CO_2 0.23	100.11	
A2. II																
25	49.68	19.11	8.45	0.50	3.73	0.33	0.79	8.45	7.30		1.42	0.21		CO_2 0.05 SO_3 0.17	100.19	
A2. II																
26	47.04	16.41	2.30	9.42	10.72	2.20	1.34	4.46	2.42		2.81	0.23	trace	SO_3 0.30	99.65	2.879
A2. II																
27	43.83	15.54	2.73	7.45	9.12	11.56	1.45	2.79	1.88		2.90	0.62		SO_3 0.19	100.06	2.996
A2. II																
28	43.51	21.57	1.88	3.04	2.83	13.68	trace	6.05	3.73		3.42	0.14		SO_3 0.24	100.09	2.875
A2. II																
29	41.98	15.11	3.29	9.77	6.88	8.04	1.16	4.65	4.22		2.28	0.49		CO_2 1.60 SO_3 0.34	99.81	2.850
A2. II																
30	40.60	17.95	7.09	8.16	7.12	6.00	1.94	4.85	2.43		3.02	0.14		CO_2 none SO_3 0.17	99.80	2.918
A2. II																
31	44.17	13.49	1.69	7.75	4.88	8.23	1.36	5.92	3.43		2.66	0.65		CO_2 6.03	100.69	2.743
A2. II																
32	61.22	15.40	6.06	0.63	1.96	0.62	3.54	6.48	3.02		0.60	0.41		SO_3 0.10	100.04	2.718
A2. II																

PORPHYRY—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
13	Tamaya, Chile.	C. Schwarz.	v. Groddeck, Z. D. G. G., XXXIX, p. 250, 1887.	Porphyry.	In W. T., p 391.
14	La Creuse, France.	Pisani.	L. de Launay, B. Sv. Ct. G. Fr., XI, No. 83, p. 76, 1902.	Porphyry tuff.	
15	Guéret, La Creuse, France.	Pisani.	L. de Launay, B. Sv. Ct. G. Fr., XI, No. 83, p. 76, 1902.	Porphyry.	
16	La Creuse, France.	Pisani.	L. de Launay, B. Sv. Ct. G. Fr., XI, No. 83, p. 77, 1902.	Orthophyre tuff.	
17	Samondeix, La Creuse, France.	Pisani.	L. de Launay, B. Sv. Ct. G. Fr., XI, No. 83, p. 77, 1902.	Andesitic orthophyre.	
18	San Dionisio, Huelva, Spain.	A. M. Finlayson.	A. M. Finlayson, Ec. G., V, p. 407, 1910.	Porphyry.	Altered from No. 27, I.3.2.3.
19	Koijärvi, Urjala, Finland.	A. W. Forsberg.	J. J. Sederholm, Fin. G. Und., Bl. 18, p. 49, 1890.	Uralite porphyry.	Also in T. M. P. M., XII, p. 120, 1891. In W. T., p. 247.
20	Oberhunden, Westphalia.	Bömer.	O. Mügge, N. J. B. B., VIII, p. 573, 1893.	Porphyry tuff.	Altered. In W. T., p. 393.
21	Reisigenstein, Thuringia.	A. Mühlenberg.	A. Mühlenberg, In. Diss. Halle, p. 51, 1908.	Orthophyre.	
22	Abtsberg, Friedrichsroda, Thuringia.	A. Mühlenberg.	A. Mühlenberg, In. Diss. Halle, p. 28, 1908.	Orthophyre.	Pebble in conglomerate.
23	Gottlob, Friederichsroda, Thuringia.	A. Mühlenberg.	A. Mühlenberg, In. Diss. Halle, p. 28, 1908.	Orthophyre.	Pebble in conglomerate.
24	Gerschberg, Prussia.	Boettcher.	H. Grebe, Erl. G. Kt. Pr., Bl. Wählen, p. 33, 1889.	Orthophyre.	In W. T., p. 393.
25	Audeborn, Prussia.	Boettcher.	H. Grebe, Erl. G. Kt. Pr., Bl. Wählen, p. 33, 1889.	Orthophyre.	In W. T., p. 393.
26	Schmalenberg, Harzburg. Harz.	Wölbling.	O. H. Erdmannsdoerfer, Jb. Pr. G. L.-A., XXV, p. 61, 1907.	Orthophyre tuff.	Rich in biotite.
27	Schmalenberg, Harzburg, Harz.	Wölbling.	O. H. Erdmannsdoerfer, Jb. Pr. G. L.-A., XXV, p. 61, 1907.	Orthophyre tuff.	Rich in augite.
28	Wilhelmsblick, Harzburg, Harz.	Eyme.	O. H. Erdmannsdoerfer, Jb. Pr. G. L.-A., XXV, p. 61, 1907.	Orthophyre tuff.	Rich in garnet.
29	Schmalenberg, Harzburg, Harz.	Eyme.	O. H. Erdmannsdoerfer, Jb. Pr. G. L.-A., XXV, p. 42, 1907.	Orthophyre.	Metamorphosed.
30	Schniggenloch, Harzburg, Harz.	Winter.	O. H. Erdmannsdoerfer, Jb. Pr. G. L.-A., XXV, p. 61, 1907.	Orthophyre tuff.	Rich in biotite.
31	Neuwerk, Harz.	Steffen.	K. A. Lossen, Jb. Pr. G. L.-A., VI, p. 213, 1886.	Orthophyre mandelstein.	In W. T., p. 393.
32	Berthelsdorf, Sudetische Mulde, Bohemia.	Eyme.	G. Berg, Jb. Pr. G. L.-A., XXVIII, p. 239, 1910.	Orthoclase porphyry.	

PORPHYRY—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
33 A2. II	67.36	14.14	3.61	0.48	0.74	3.10	3.79	3.56	0.98	1.06	0.66	0.61	0.19	CO_2 trace F 0.19	100.47	
34 A4. IV	59.82	17.89	4.43	n. d.	1.74	3.81	4.27	6.21	2.01				trace		100.18	
35 A2. II	56.22	13.15	3.49	0.69	1.52	7.93	0.45	8.45	1.42	1.19	0.47	0.39	trace	CO_2 4.30 F none	99.67	2.484
36 A3. III	60.75	18.45	1.75	3.42	1.66	6.95	3.13	1.65	1.82			0.17		CO_2 0.92	101.02	
37 A2. II	56.79	18.28	3.78	2.32	1.15	6.26	3.14	5.09	1.20		0.68	0.91	trace	CO_2 0.61	100.21	
38 A3. III	64.88	16.43	3.69	0.54	0.19	2.22	3.73	6.57	1.17					CO_2 0.49	99.91	
39 A3. III	61.52	19.96	1.78	3.16	2.72	3.36	2.28	3.24	1.86					CO_2 0.56	100.44	
40 A4. IV	59.52	13.02	11.08	n. d.	4.60	1.90	3.02	3.86	2.16					CO_2 1.16	100.32	
41 A2. II	69.99	14.92	1.09	1.44	0.45	0.57	4.05	4.83	1.02			0.07	0.10	$CaCO_3$ 1.41 $MgCO_3$ 0.23	100.17	
42 A1. I	62.85	13.58	1.95	5.45	1.92	4.10	3.32	0.88	2.50	0.20	0.90	0.18	0.14	CO_2 1.85 ZrO_2 none SO_3 trace Cl trace Cr_2O_3 none V_2O_3 trace NiO none BaO 0.10 SrO none Cu trace	99.82	2.753
43 A1. I	60.95	15.04	2.60	3.69	2.82	4.30	3.22	3.00	2.08	0.17	0.65	0.26	0.08	CO_2 0.80 ZrO_2 none SO_3 0.02 Cl trace V_2O_3 0.02 NiO trace BaO 0.13 SrO trace Cu trace	99.83	2.796
44 A3. III	76.25	15.12	1.86	trace	0.18	trace	1.37	3.10	1.61	0.10				S 0.92 Sb trace	100.51	2.72
45 A2. II	71.19	16.66	0.11	0.77	0.83	1.80	4.79	1.47	1.13	0.19	0.10	trace	none	CO_2 0.78 SO_3 none Cl trace	99.82	2.671
46 A2. II	76.80	13.91	none	1.00	0.77	0.24	1.16	3.04	1.88	0.07	0.14	0.33	0.26	CO_2 0.08 FeS_2 0.06	99.75	2.73
47 A2. II	73.13	12.21	1.17	1.68	0.65	2.81	3.52	1.98	0.28	0.21	0.85		0.67	CO_2 0.88 FeS_2 0.20	100.24	2.69
48 B2. III	68.60	10.18	1.34	3.65	4.46	1.59	0.79	2.76	2.38	0.24	1.56	0.15	0.13	CO_2 1.32 FeS_2 0.06	99.21	2.60
49 A3. III	68.46	12.25	2.27	3.20	2.08	2.63	4.01	2.05	0.83	0.05	0.61		trace	CO_2 2.00	100.59	

PORPHYRY—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
33	Zalas, near Cracow, Galicia.	Z. Rosen.	Z. Rosen, B. Ac. Sc. Crac., p. 816, 1909 (2).	Porphyry.	Weathered. Cf. No. 145, I.4.2.4.
34	Zalas, near Cracow, Galicia.	R. Zuber.	R. Zuber, Jb. G. R.-A. Wien, XXV, p. 745, 1885.	Porphyry.	In W. T., p. 393.
35	Filipowice, near Cracow, Galicia.	Z. Rosen.	Z. Rosen, B. Ac. Sc. Crac., p. 822, 1909 (2).	Porphyry tuff.	
36	Nordenberg, Ultenthal, Tyrol.	C. v. John.	W. Hammer, Jb. G. R.-A. Wien, LIII, p. 74, 1904.	Garnet porphyry.	
37	Monte Mulatto, Predazzo, Tyrol.	Dittrich and Pohl.	J. Romberg, Anh. Abh. Pr. Ak., p. 119, 1904.	Porphyry.	
38	Käserngrat, Windgälle Mountains, Switzerland.	C. Schmidt.	C. Schmidt, N. J. B. B., IV, p. 432, 1886.	Porphyry.	In W. T., p. 171.
39	Maroggia, Lake Lugano, Switzerland.	A. Schwager.	K. v. Gümbel, Geog. Jhft., VII, p. 70, 1894.	Porphyry.	Not in W. T.
40	Rovio, Lake Lugano, Switzerland.	A. Schwager.	K. v. Gümbel, Geog. Jh. ft., VII, p. 70, 1894.	Porphyry.	Not in W. T.
41	Konyam Bay, Siberia.	A. Lindström.	A. Lindström. Ref. N. J., 1885, I, p. 430.	Feldspar porphyry.	Not in W. T.
42	Jenolan Caves, New South Wales.	W. G. Stone.	G. W. Card, pers. com.	Porphyry.	
43	Jenolan Caves, New South Wales.	W. G. Stone.	G. W. Card, pers. com.	Porphyry.	
44	Diamond Creek, Nillumbik Parish, Victoria.	N. R. Junner.	N. R. Junner, Pr. R. Soc. Vict., XXV (2), p. 340, 1913.	Porphyry.	Altered.
45	Stawell, Victoria.	Not stated.	A. R. Secy Min. Vict. (1907), p. 63, 1908.	Feldspathic dike rock.	Not fresh.
46	Gorge Creek, Ashburton Goldfield, Western Australia.	Not stated.	J. A. Thompson, W. Aust. G. S. B. 33, p. 165, 1909.	Porphyry.	Altered.
47	Norseman, Western Australia.	E. S. Simpson.	W. D. Campbell, W. Aust. G. S. B. 21, p. 119, 1906.	Porphyry.	
48	Bangemall, Gascoyne Goldfield, Western Australia.	Not stated.	J. A. Thompson, W. Aust. G. S. B. 33, p. 161, 1909.	Porphyry.	Altered.
49	Cue, Western Australia.	C. C. Williams.	C. G. Gibson, W. Aust. G. S., B. 14, p. 15, 1904.	Feldspar porphyry.	

PORPHYRY—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
50 B3. IV	65. 51	18. 12	trace	2. 39	0. 38	2. 10	4. 27	3. 28	0. 46	0. 07	trace		0. 05	CO_2 2. 41 FeS_2 0. 06	99. 10	2. 72
51 A2. II	62. 16	14. 98	0. 39	3. 03	1. 32	4. 03	6. 18	1. 59	0. 25	0. 07	0. 16		0. 51	CO_2 5. 65 FeS_2 0. 60	100. 92	2. 72
52 A2. II	48. 62	22. 32	1. 08	3. 74	2. 69	2. 12	1. 82	5. 85	3. 61	1. 74	0. 81	0. 25	0. 15	CO_2 4. 63 SO_3 0. 22	99. 65	

KERATOPHYRE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A3. III	60. 13	20. 47	1. 04	0. 72	1. 15	2. 59	9. 60	1. 06	3. 44		trace		trace		100. 20	2. 63
2 A2. II	70. 57	15. 39	2. 77	1. 81	1. 52	1. 66	2. 61	2. 21	1. 12		0. 06	0. 34	0. 05	CO_2 0. 24 S 0. 09	100. 44	2. 668
3 A1. I	69. 48	11. 99	2. 54	2. 46	1. 16	1. 72	3. 33	4. 01	1. 56	0. 32	0. 14	0. 08	0. 20	CO_2 1. 34 FeS_2 0. 05 NiO 0. 03 BaO none SrO none	100. 41	
4 A2. II	66. 05	13. 29	3. 22	5. 07	1. 36	0. 50	6. 67	0. 87	1. 88	0. 96	0. 49	0. 09	trace		100. 45	
5 A3. III	63. 21	19. 92	1. 74	3. 29	1. 63	0. 78	5. 06	1. 42	2. 28		trace	trace		CO_2 0. 63	99. 96	
6 A3. III	82. 45	8. 36	2. 54	n. d.	0. 32	1. 73	2. 36	0. 78	0. 23			0. 15		CO_2 1. 04	99. 96	2. 648
7 A2. II	80. 42	9. 22	1. 22	0. 62	0. 34	0. 86	4. 50	0. 62	0. 66		0. 06	0. 06		CO_2 0. 98 SO_3 0. 04 Org. 0. 07	99. 67	2. 652
8 A2. II	73. 62	11. 87	0. 66	1. 21	0. 87	3. 11	0. 37	3. 25	2. 62		0. 06	0. 07		CO_2 2. 42 SO_3 0. 20	100. 33	2. 695
9 A2. II	54. 41	27. 04	1. 88	0. 11	0. 51	2. 00	1. 14	6. 71	3. 36		0. 54	0. 08		CO_2 1. 22 SO_3 0. 29 Org. 0. 10	99. 39	2. 754
10 A2. II	56. 23	17. 22	2. 81	1. 01	4. 85	1. 79	4. 33	4. 81	4. 87		1. 36	0. 21		CO_2 0. 55 SO_3 0. 15 Org. 0. 07	100. 26	2. 56
11 A2. II	68. 43	14. 23	1. 39	2. 04	1. 95	0. 28	6. 93	0. 99	0. 48	0. 16	0. 37	1. 04		CO_2 1. 49 SO_3 0. 12	99. 90	
12 A2. II	51. 61	15. 99	1. 74	9. 65	1. 69	3. 24	5. 44	4. 07	3. 15		1. 07	0. 52	trace	CO_2 2. 03 SO_3 0. 25	100. 45	
13 A2. II	49. 58	15. 24	2. 27	11. 01	2. 59	4. 25	4. 82	3. 58	3. 13		1. 63	1. 03	trace	CO_2 0. 96 SO_3 0. 23	100. 32	
14 A2. II	45. 28	16. 74	2. 64	10. 73	5. 47	3. 10	5. 32	0. 58	4. 79		2. 74	1. 65		CO_2 0. 55 S 0. 12 Org. 0. 14	99. 85	
15 A2. II	75. 47	11. 80	1. 54	0. 74	0. 40	0. 47	5. 56	1. 45	1. 97		0. 30	0. 12	0. 10	S 0. 02 Cr_2O_3 0. 21 BaO 0. 04	100. 19	2. 629

PORPHYRY—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
50	Boulder, Kalgoorlie, Western Australia.	C. G. Gibson.	E. S. Simpson, W. Aust. G. S. B. 6, p. 73, 1902.	Porphyry.	
51	Boulder, Kalgoorlie, Western Australia.	C. G. Gibson.	E. S. Simpson, W. Aust. G. S. B. 6, p. 73, 1902.	Porphyry.	
52	Waiwhero, Reefton District, New Zealand.	Henderson.	P. G. Morgan, pers. com.	Porphyry.	

KERATOPHYRE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Fair Haven, Connecticut.	H. S. Washington.	E. O. Hovey, A. J. S., II, p. 291, 1897.	Keratophyre.	CO_2 in H_2O. In W. T., p. 205.
2	Cerro de los Llanganates, Ecuador.	A. Lindner.	F. v. Wolff in W. Reiss, Ecuador, III, p. 259, 1904.	Keratophyre.	
3	Gairn an Lairs, near Lennoxtown, Glasgow, Scotland.	E. G. Radley.	G. S. G. B., Sum. Prog. (1907), p. 56, 1908.	Keratophyre.	
4	Trevennen, Mevagissey, Cornwall.	W. Pollard.	Reid and Teall, G. S. Eng. Mem. Sh. 353, p. 56, 1907.	Felsitic ash (keratophyre).	
5	Mehaigue, Belgium.	A. F. Renard.	C. Vallée Poussin, Ref. N. J., 1899, II, p. 65.	Keratophyre tuff.	In W. T., p. 393.
6	Oberhunden, Westphalia.	Bomer.	O. Mügge, N. J. B. B., VIII, p. 568, 1893.	Quartz keratophyre.	In W. T., p. 123.
7	Wibbeke, Westphalia.	Jacobs.	O. Mügge, N. J. B. B., VIII, p. 632, 1893.	Quartz keratophyre.	In W. T., p. 131.
8	Steimel, Eder District, Westphalia.	Gremse.	O. Mügge, N. J. B. B., VIII, p. 651, 1893.	Keratophyre tuff.	In W. T., p. 395.
9	Wibbecke, Westphalia.	Jacobs.	O. Mügge, N. J. B. B., VIII, p. 632, 1893.	Quartz keratophyre.	In W. T., p. 217.
10	Namborner Mühle, Saar-Nahe District, Rheinland.	Gremse.	K. A. Lossen, Jb. Pr. G. L.-A., X, p. 290, 1892.	Meso-keratophyre.	In W. T., p. 259.
11	Langenaubach, Hesse-Nassau.	F. Stadler.	R. Brauns, N. J. B. B., XXVII, p. 311, 1909.	Keratophyre.	
12	Wasserweg, Harz.	Not stated.	O. H. Erdmannsdörfer, N. J. Cb., 1909, p. 40.	Keratophyre.	
13	Wasserweg, Harz.	Not stated.	O. H. Erdmannsdörfer, N. J. Cb., 1909, p. 40.	Keratophyre.	
14	Krautberg, near Wienrod, Harz.	Not stated.	O. H. Erdmannsdoerfer, N. J. Cb., p. 40, 1909.	Keratophyre mandelstein.	
15	Hydra Island, Greece.	A. Lindner.	Milch and Renz, N. J. B. B., XXXI, p. 523, 1911.	Quartz keratophyre tuff.	

KERATOPHYRE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
16 A2. II	72.36	13.47	2.16	0.94	0.21	0.83	4.35	2.25	2.82		0.23	0.09	0.17		99.91	2.655
17 A2. II	69.35	15.61	0.07	1.29	0.99	3.88	4.51	0.40	1.61	0.24	0.75	trace		CO_2 1.52	100.22	
18 A3. III	79.18	10.20	0.90	2.26	0.91	0.31	2.30	1.53	1.96						99.56	
19 A3. III	70.77	15.80	0.86	2.74	0.52	0.25	5.03	2.70	1.00						99.66	
20 A1. I	69.41	15.87	0.24	1.58	1.14	1.75	3.42	2.44	0.75	0.16	0.20	0.55	0.16	CO_2 2.52 ZrO_2 trace FeS_2 0.07 Cr_2O_3 none V_2O_3 none BaO 0.08	100.34	2.72
21 A2. II	69.02	15.92	0.58	1.90	2.63	0.29	7.48	none	1.02	0.28	0.57	0.28	0.09	CO_2 0.14 FeS_2 0.11	100.31	

TRACHYTE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A1. I	72.77	12.15	0.44	3.06	0.22	0.07	3.38	4.67	0.55	0.17	0.20	trace	0.16	CO_2 2.06 ZrO_2 0.04 FeS_2 0.12 Cr_2O_3 none BaO 0.03 SrO none	100.09	
2 A2. II	61.15	15.70	4.31	1.12	3.04	2.84	1.54	2.22	7.05		0.69	0.75	trace	SO_3 0.18 Li_2O none	100.59	
3 A1. I	66.44	14.98	1.57	0.43	0.18	2.47	1.12	3.32	4.06	4.60	0.20	0.11	0.13	CO_2 0.67 ZrO_2 0.01 Cl trace S 0.02 BaO 0.11 SrO none	100.42	
4 A1. I	64.82	17.71	1.95	0.44	0.22	1.03	4.37	6.09	1.17		0.20	0.05	0.10	CO_2 1.32 ZrO_2 0.04 SO_3 none Cl 0.23 Cr_2O_3 none BaO 0.10 SrO trace Li_2O none	99.84	2.58
5 A1. I	58.74	15.09	4.66	0.84	2.75	2.68	0.25	8.05	3.09	2.08	0.98	0.40	0.09	CO_2 0.61 ZrO_2 0.02 S none BaO 0.07 SrO 0.04	100.44	
6 A3. III	56.68	16.62	6.28	n. d.	0.79	0.59	1.03	11.18	3.28		0.22	0.73	1.02	FeS_2 2.21 Cu trace	100.63	
7 B1. II	52.64	20.69	2.54	1.82	1.61	3.93	4.84	5.99	2.23	0.28	0.64	0.41	0.07	CO_2 0.75 BaO 0.60 SrO 0.21	99.25	
8 A2. II	52.00	18.06	2.18	5.14	2.84	4.59	3.78	4.68	1.84		0.98		0.25	CO_2 3.59	99.93	
9 A2. II	65.82	16.37	2.06	0.18	0.51	2.74	4.24	3.48	1.85	0.72	0.40	0.21	0.16	CO_2 1.84 BaO 0.03	100.61	
10 A2. II	63.02	15.50	4.81	0.13	0.62	2.67	4.46	3.96	1.49	1.00	0.43	0.16	0.10	CO_2 1.82 S 0.03 BaO none	100.20	
11 A1. I	63.12	15.44	1.73	3.53	0.62	1.31	5.81	5.36	0.44	0.14	0.51	0.25	0.27	CO_2 1.89 S none NiO none BaO none	100.42	

KERATOPHYRE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
16	Hydra Island, Greece.	A. Lindner.	Milch and Renz, N. J. B. B., XXXI, p. 528, 1911.	Keratophyre tuff.	
17	Epidauros, Argolis, Greece.	M. Dittrich.	Milch and Renz, N. J. B. B., XXXI, p. 516, 1911.	Quartz keratophyre.	
18	Rybnaja River, Jenissei District, Siberia.	Not stated.	A. Meister, Reg. Aurif. Sib., IX, p. 436, 1910.	Quartz keratophyre.	
19	Rybnaja River, Jenissei District, Siberia.	Not stated.	A. Meister, Reg. Aurif. Sib., IX, p. 436, 1910.	Quartz keratophyre.	
20	Boulder, Kalgoorlie, Western Australia.	H. Bowley.	E. S. Simpson, W. Aust. G. S. B. 42 (1), p. 61, 1912.	Keratophyre.	
21	Kalgoorlie, Western Australia.	Surv. lab.	R. A. Farquharson, W. Aust. G. S. B. 51, p. 61, 1913.	Quartz keratophyre.	

TRACHYTE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Quoggy Joe Mountain, Aroostook County, Maine.	W. F. Hillebrand.	H. E. Gregory, U. S. G. S. B. 165, p. 166, 1900.	Bostonite.	In W. T., p. 145.
2	Two Ocean Pass, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. B. 148, p. 132, 1897.	Trachyte tuff.	In W. T., p. 397.
3	Idaho Springs, Colorado.	W. T. Schaller.	S. H. Ball, U. S. G. S. P. P. 63, p. 134, 1908.	Biotite latite.	
4	Sunset, Boulder County, Colorado.	R. S. Breed.	R. S. Breed, Pr. Col. Sc. Soc., VI, p. 228, 1889.	Trachyte.	Not in W. T.
5	Goldroad Mine, Mohave County, Arizona.	G. Steiger.	F. C. Schrader, U. S. G. S. B. 397, p. 39, 1909.	Trachyte.	
6	Los Cerillos, New Mexico.	F. W. Clarke.	J. S. Diller, U. S. G. S. B. 42, p. 43, 1887.	Trachyte.	In W. T., p. 397.
7	Phoenix, British Columbia.	M. F. Connor.	O. E. Le Roy, Can. G. S. Mem. XXI, p. 46, 1912.	Augite trachyte.	
8	Onston Ness, Orkney Islands.	J. S. Flett.	J. S. Flett, Tr. R. Soc. Edin., XXXIX, p. 873, 1900.	Bostonite.	In W. T., p. 257.
9	Braid Hill, Pentland Hills, Scotland.	W. Pollard.	J. S. Flett, G. S. Scot. Mem. Sh. 32, p. 37, 1910.	Trachyte.	
10	Moreton Hall, Pentland Hills, Scotland.	W. Pollard.	J. S. Flett, G. S. Scot. Mem. Sh. 32, p. 37, 1910.	Trachyte.	
11	Salen, Mull, Scotland.	E. G. Radley.	G. S. G. B., Sum. Prog. (1912), p. 68, 1913.	Trachyte.	

TRACHYTE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
12 A2. II	55.38	18.34	1.13	5.86	3.47	3.25	7.12	0.22	2.39	0.48	0.90	trace		CO_2 2.00	100.54	
13 A2. II	54.20	21.00	2.60	4.32	2.02	3.80	6.58	0.42	1.23		2.60	0.04	trace	CO_2 1.57	100.38	2.68
14 A2. II	66.72	18.28	1.33	none	0.11	1.38	5.87	4.48	0.78		1.12	0.11	trace	SO_3 0.08 BaO 0.09	100.35	
15 A3. III	62.30	17.05	1.30	2.46	0.57	1.20	5.14	6.18	0.45		trace	trace		CO_2 2.65 FeS_2 0.43	99.73	
16 A3. III	60.11	19.01	4.63	0.37	0.23	0.66	6.5	5.36	1.37		0.96		trace	CO_2 0.84	100.07	
17 B3. IV	56.50	18.14	3.12	2.86	1.22	3.38	5.28	1.60	1.26		0.85			CO_2 5.11	99.32	
18 A2. II	63.01	14.69	5.15	0.98	1.07	4.24	3.86	1.06	1.55		3.33	0.56	0.23	CO_2 0.62 F 0.05	100.40	2.501
19 A2. II	61.17	20.74	2.62	0.01	0.45	2.00	5.40	4.57	0.76	0.80	0.66	0.35		CO_2 0.20 SO_3 0.14	99.87	
20 A3. III	62.54	17.42	3.52	1.52	2.26	3.81	3.29	3.57	2.68						100.61	
21 A3. III	54.15	18.25	3.62	2.09	2.56	4.89	4.43	6.56	3.69		trace	0.41			100.65	2.632
22 A2. II	53.23	16.11	2.77	3.99	2.12	5.34	6.35	3.80	2.32		2.10	0.76	0.37	CO_2 1.51 Cl trace	100.77	2.621
23 A2. II	49.53	19.20	1.76	4.90	2.32	6.23	7.77	3.10	3.00		1.45	0.41	0.28	CO_2 0.20 SO_3 none Cl none	100.15	2.580
24 A3. III	48.99	15.82	7.95	5.02	3.39	8.47	0.29	1.83	0.90		0.95			CO_2 6.02	99.64	
25 A4. IV	55.10	18.30	7.60	n. d.	0.40	6.55	2.95	2.80	6.30				trace	Cl trace	100.00	
26 A4. IV	54.16	17.36	3.55	n. d.	1.20	3.84	0.63	3.48	15.78					Cl 0.43	100.43	
27 A3. III	53.93	19.90	0.92	4.59	3.79	5.69	6.33	2.01	0.97					CO_2 2.42	100.55	
28 A2. II	51.38	15.91	3.17	4.03	2.14	3.60	6.07	3.33	2.42		1.45	0.42		CO_2 6.08 SO_3 0.28	100.38	
29 A3. III	55.10	18.56	6.80	0.03	0.62	0.70	3.17	4.00	8.30	3.17					100.45	
30 B3. IV	68.31	18.18	2.15	0.37	0.25	0.24	none	0.98	7.04	1.84					99.36	
31 A3. III	60.48	18.11	3.14	1.67	2.12	4.94	2.40	1.38	2.23	3.83					100.30	

TRACHYTE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
12	Abercastle, Pembrokeshire, Wales.	J. V. Elsden.	J. V. Elsden, Q. J. G. S., LXI, p. 295, 1905.	Lime bostonite.	
13	Killride, County Mayo, Ireland.	J. Weintraube.	Gardiner and Reynolds, Q. J. G. S., LXVIII, p. 93, 1912.	Lime bostonite.	
14	Puy de Dome, Auvergne.	P. Holland.	Dickson and Holland, Pr. Liv. G. Soc., VIII, p. 412, 1899.	Domite.	Decomposed. Not in W. T.
15	Gjefsen, Gran, Norway.	L. Schmelck.	W. C. Brögger, Eg. Kg., I, p. 131, 1894.	Lindöite (bostonite).	In W. T., p. 195.
16	Tutvet, Hedrum, Lougendal, Norway.	V. Schmelck.	W. C. Brögger, Eg. Kg., III, p. 203, 1899.	Bostonite.	In W. T., p. 197.
17	Lake Maena, Gran, Norway.	V. Schmelck.	W. C. Brögger, Q. J. G. S., L, p. 26, 1894.	Maenaite (bostonite).	Cf. Eg. Kg., III, p. 207, 1899. In W. T., p. 393.
18	Remscheid, Siebengebirge.	von Reis.	H. Laspeyres, D. Siebeng., p. 322, 1901.	Trachyte.	
19	Sporneiche, Odenwald.	W. Sonne.	G. Klemm, Nb. Ver. Erdk. (4), XXVI, p. 19, 1905.	Trachyte.	Altered. Cf. No. 40, I.5.2.4.
20	Hainsfahrt, near Nordlingen, Ries, Bavaria.	E. Schowalter.	E. Schowalter, In. Diss. Erl., p. 45, 1904.	Trachyte tuff.	
21	Mühlözen, near Gaute, Bohemia.	R. Pfohl.	J. E. Hibsch, T. M. P. M., XVII, p. 87, 1897.	Gauteite.	In W. T., p. 259.
22	Königsbachthal, near Nestersitz, Bohemia.	F. Hanusch.	J. E. Hibsch, T. M. P. M., XXIV, p. 303, 1905.	Bostonite.	
23	Grosszinken, Bohemia.	F. Hanusch.	J. E. Hibsch, T. M. P. M., XXIX, p. 421, 1910.	Sodalite gauteite.	No Cl?
24	Rezbanya, Hungary.	L. Tomasowsky.	A. Koch, F. K., XXXV, p. 270, 1905.	Quartz bostonite.	
25	Monte Nuovo, Phlegrean Fields, near Naples, Italy.	Favilli.	C. de Stefani, Pet. Mt. Ergh., No. 156, p. 162, 1907.	Trachyte tuff.	
26	Pianura, Phlegrean Fields, near Naples, Italy.	Manley.	C. de Stefani, Pet. Mt. Ergh., No. 156, p. 162, 1907.	Trachyte tuff.	
27	Dumala, Caucasus.	D. Beljankin.	Loewinson-Lessing, Vh. Rus. M. Ges., XLII, p. 274, 1905.	Dumalite (andesite-trachyte).	
28	Barranco del Almandero, Madeira.	Klüss.	C. Gagel, Z. D. G. G., LXIV, p. 415, 1912.	Maenaite.	
29	Riding School, Ascension Island.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (7), p. 651, 1912.	Trachyte tuff.	
30	Mancayan, Luzon, Philippine Islands.	L. S. Salinger.	A. J. Eveland, Min. Bu. Manila B. 4, p. 43, 1905.	Trachyte.	Altered.
31	Mancayan, Luzon, Philippine Islands.	L. S. Salinger.	A. J. Eveland, Min. Bu. Manila B. 4, p. 43, 1905.	Trachyte.	

TRACHYTE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
32 A3. III	54.80	19.29	1.83	2.54	3.11	8.21	1.55	2.50	4.82	1.58					100.23	
33 A2. II	63.22	13.57	1.50	2.07	1.80	4.56	0.90	3.82	2.10	0.26	0.50		0.09	CO_2 6.01	100.48	

MONZONITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A2. II	54.30	13.63	1.89	2.22	2.13	7.36	0.16	4.41	4.09	2.19	0.61	0.20	0.71	CO_2 5.50 SO_3 none FeS_2 0.49 BaO trace ZnO 0.12	100.01	
2 A2. II	73.61	13.97	none	none	none	0.31	0.04	0.06	4.18	0.58	0.60	0.33	trace	CO_2 none FeS_2 5.62 BaO 0.04 SrO trace	99.34	
3 A1. I	58.68	13.52	1.70	2.27	3.29	4.31	3.24	4.06	1.57	0.25	0.99	0.53	trace	CO_2 3.49 FeS_2 1.56 BaO 0.12 SrO 0.05 Li_2O trace	99.73	
4 A1. I	69.61	15.12		0.37	trace	0.05	0.42	4.54	2.01	0.27	0.36	0.04	0.14	CO_2 none ZrO_2 0.02 FeS_2 6.92 NiO trace BaO none SrO none ZnS 0.08 PbS 0.06 CuS 0.17	100.18	
5 A1. I	71.14	16.24	0.94	0.16	1.12	0.25	0.07	4.96	2.74	0.49	0.75	0.32	trace	CO_2 none SO_3 0.26 Cl trace V_2O_3 0.02 BaO 0.05 SrO trace	99.51	
6 A1. I	59.76	15.79	3.77	3.30	2.16	3.88	3.01	4.40	1.11	0.31	0.87	0.42	0.12	CO_2 0.78 Cl 0.04 V_2O_3 0.02 BaO 0.09 SrO trace MoO trace	99.83	
7 A1. I	72.78	15.35	0.55	0.10	0.89	0.14	0.36	5.00	3.22	1.21	0.45	0.05	none	ZrO_2 trace SO_3 0.08 FeS_2 0.06 BaO 0.02 SrO none Li_2O trace	100.26	
8 A1. I	69.55	16.43	0.46	0.11	0.62	0.15	0.17	5.05	2.69	1.00	0.41	0.05	none	ZrO_2 trace SO_3 0.10 FeS_2 3.09 Cu_2S 0.07 BaO 0.05 SrO none	100.00	
9 A1. I	46.67	20.92	0.37	0.36	0.85	0.15	0.16	4.33	5.01	0.94	0.43	0.15	none	ZrO_2 trace SO_3 0.18 FeS_2 19.18 Cu_2S 0.24 ZnS 0.32 MoS_2 0.20 BaO 0.04 SrO none	100.50	
10 A1. I	64.88	16.41	0.65		1.12	0.11	0.12	4.96	2.74	0.83	0.38	0.12	trace?	ZrO_2 trace SO_3 0.10 FeS_2 4.96 Cu_2S 2.42 MoS_2 none BaO 0.07 SrO none	99.87	
11 A2. II	60.39	13.94	4.07	2.91	2.39	5.17	2.68	1.88	2.76	1.11	0.41	0.07	0.08	CO_2 2.10	99.96	
12 A1. I	58.87	17.12	1.96	0.95	1.75	8.00	4.64	4.34	0.81	0.13	0.59	0.20	0.10	CO_2 0.84 S 0.09 BaO 0.06 SrO 0.02	100.47	
13 A3. III	62.77	15.04	4.60	1.92	2.30	6.76	2.60	0.08	3.01	0.95				CO^2 0.23	100.26	

TRACHYTE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
32	Mancayan, Luzon, Philippine Islands.	L. S. Salinger.	A. J. Eveland, Min. Bu. Manila B. 4, p. 43, 1905.	Trachyte.	
33	Hinchmors Creek, Jenolan Caves, New South Wales.	W. G. Stone.	G. W. Card, pers. com.	Felsite.	

MONZONITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Original Mine, Butte, Montana.	W. F. Hillebrand.	W. H. Weed, U. S. G. S. P. P. 74, p. 88, 1912.	Quartz monzonite.	Altered.
2	National Belle Mine, Silverton, Colorado.	H. N. Stokes.	F. L. Ransome, U. S. G. S. B. 182, p. 127, 1901.	Monzonite porphyry.	Altered.
3	Yankee Girl Mine, Silverton, Colorado.	H. N. Stokes.	F. L. Ransome, U. S. G. S. B. 182, p. 127, 1901.	Monzonite porphyry.	Altered.
4	Jessie Mine, Breckenridge District, Colorado.	R. C. Wells.	F. L. Ransome, U. S. G. S. P. P. 75, p. 101, 1911.	Quartz monzonite porphyry.	Altered.
5	Tintic Iron Mine, Tintic District, Utah.	H. N. Stokes.	Tower and Smith, U. S. G. S. A. R. 19, III, p. 661, 1899.	Monzonite.	Altered. Cf. No. 15, II.4.3.3. In W. T., p. 391.
6	Iron Duke Mine, Tintic District, Utah.	H. N. Stokes.	Tower and Smith, U. S. G. S. A. R. 19, III, p. 647, 1899.	Monzonite.	Altered. Cf. No. 15, II.4.3.3. In W. T., p. 229.
7	Copper Mountain, Morenci District, Arizona.	W. F. Hillebrand.	W. Lindgren, U. S. G. S. P. P. 43, p. 168, 1905.	Monzonite porphyry.	Altered.
8	Ryerson Mine, Morenci District, Arizona.	W. F. Hillebrand.	W. Lindgren, U. S. G. S. P. P. 43, p. 168, 1905.	Monzonite porphyry.	Silicified. Cf. No. 70, I.4.2.4.
9	Ryerson Mine, Morenci District, Arizona.	W. F. Hillebrand.	W. Lindgren, U. S. G. S. P. P. 43, p. 168, 1905.	Monzonite porphyry.	Altered. Cf. No. 70, I.4.2.4.
10	Humboldt Stopes, Morenci District, Arizona.	W. F. Hillebrand.	W. Lindgren, U. S. G. S. P. P. 43, p. 168, 1905.	Monzonite porphyry.	Altered.
11	Battle Flat, Bradshaw Mountains, Arizona.	G. Steiger.	Jaggar and Palache, U. S. G. S. Fol. 126, p. 5, 1905.	Quartz monzonite porphyry.	
12	Hadley, Kasaan Peninsula, Alaska.	G. Steiger.	C. W. Wright, U. S. G. S. P. P. 87, p. 83, 1915.	Monzonite.	
13	Spring Creek, Shasta County, California.	W. T. Schaller.	B. S. Butler, U. S. G. S. B. 419, p. 137, 1910.	Inclusion in monzonite.	Cf. No. 4, I.3.3.5.

MONZONITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
14 A1. I	60.37	15.96	0.51	1.80	1.63	4.12	3.13	5.07	1.34	0.92	0.71	0.47	0.05	CO_2 0.74 ZrO_2 0.04 SO_3 0.09 FeS_2 3.11 $CuFeS_2$ 0.20 BaO 0.11 SrO 0.09	100.46	
15 A2. II	53.75	17.48	4.56	3.71	3.20	5.82	3.15	3.71	2.14		0.99	0.24	0.17	CO_2 0.79	99.71	
16 A3. III	49.50	21.51	1.13	1.16	2.72	6.70	6.05	1.30	1.36			0.05		FeS 8.85	100.33	
17 A2. II	49.45	22.20	2.87	4.22	1.55	7.70	4.98	1.97	3.52		1.16	0.27			99.89	

DIORITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A3. III	48.98	17.76	2.14	6.52	20.09	8.36	6.77	2.08	4.50		0.56			CO_2 0.82	100.58	
2 A3. III	49.68	15.35	4.53	9.22	4.40	6.92	3.84	2.25	2.14	0.29				CO_2 0.64	100.64	
3 A1. I	47.18	16.90	5.21	7.22	3.71	9.69	2.76	0.68	1.66	0.92	2.94	0.38	0.14	CO_2 0.63 ZrO_2 trace Cl trace S 0.22 NiO trace BaO 0.01 SrO trace ZnO 0.03	100.28	
4 A3. III	47.96	16.85	4.33	4.17	9.15	13.25	1.25	0.30	2.89					CO_2 0.08	100.23	
5 A1. I	58.01	15.72	0.64	3.87	2.07	2.15	0.10	4.79	2.71	0.31	1.08	0.31	0.17	CO_2 2.86 S 1.25 NiO none BaO trace SrO none Fe 1.52 Ni 0.12 Pb 0.86 Cu 0.05 As 1.65	100.24	
6 A2. II	50.20	15.54	2.14	6.49	7.33	11.96	2.03	0.40	2.52	0.43	1.00	0.09	trace	CO_2 none S 0.03 Cr_2O_3 trace BaO none	100.16	
7 A2. II	50.03	10.89	2.32	7.99	11.84	9.73	1.66	0.57	2.61	0.46	1.23	0.02	trace	CO_2 0.78 S trace Cr_2O_3 trace BaO 0.04	100.17	
8 A1. I	46.39	16.17	2.65	9.30	8.58	8.90	2.25	0.73	2.59	0.47	1.59	0.06	trace	CO_2 none S 0.01 Cr_2O_3 trace NiO trace BaO 0.02 CuO 0.02		
9 A3. III	63.02	17.61	1.78	2.76	1.63	3.30	4.72	3.23	2.03			0.16	trace	BaO 0.08	100.32	2.689
10 A1. I	49.59	14.91	0.52	10.46	2.02	1.96	1.33	3.51	3.17	0.16	1.03	0.47	1.10	CO_2 9.40 ZrO_2 none FeS_2 0.36 NiO none BaO 0.07 SrO trace Li_2O none Zn, Pb trace	100.06	2.857

MONZONITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
14	Ely Central Mine, Ely, Nevada.	G. Steiger	A. C. Spencer, U. S. G. S. rec. lab.	Monzonite.	Mineralized.
15	Malga Gardone, Predazzo, Tyrol.	M. Dittrich.	J. Romberg, Anh. Abh. Pr. Ak. W., p. 52, 1904.	Syenitic monzonite.	
16	Topsail Point, Tamara Island, Los Islands, French Guinea.	Lassieur.	A. Lacroix, N. Arch. Mus., III, p. 78, 1911.	Micromonzonite.	Altered?
17	Maromandia, Ambavatovy, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., II, p. 230, 1903.	Micromonzonite.	

DIORITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Near St. John, New Brunswick.	W. D. Matthew.	W. D. Matthew, Tr. N. Y. Ac. Sci., XIV, p. 213, 1895.	Diorite porphyrite.	In W. T., p. 299.
2	Lake Dufresnoy, Kewagama Lake, Quebec.	S. J. Lloyd.	M. E. Wilson, Can. G. S. Mem. 39, p. 48, 1913.	Diorite.	
3	Near Ironstone, Massachusetts.	E. C. Sullivan.	B. K. Emerson, U. S. G. S. B. 419, p. 24, 1910.	Diorite.	
4	Quinnesec Falls, Menominee River, Wisconsin.	R. B. Riggs.	G. H. Williams, U. S. G. S. B. 62, p. 89, 1890.	Gabbrodiorite.	In W. T., p. 331.
5	Croesus Mine, Hailey, Idaho.	W. F. Hillebrand.	W. Lindgren, U. S. G. S. A. R. 20, III, p. 219, 1900.	Diorite.	Altered. Cf. No. 18, II.4.3.4. In W. T., p. 409.
6	Big Sandstone Creek, Encampment quadrangle, Wyoming.	E. T. Allen.	A. C. Spencer, U. S. G. S. P. P. 25, p. 32, 1904.	Diorite.	Derived from gabbro.
7	Cow Creek, Bridger Peak, Wyoming.	E. T. Allen.	A. C. Spencer, U. S. G. S. P. P. 25, p. 32, 1904.	Diorite.	Altered form of No. 46, III.5.4.4–5.
8	Verdi Mine, Encampment quadrangle, Wyoming.	E. T. Allen.	A. C. Spencer, U. S. G. S. P. P. 25, p. 32, 1904.	Diorite.	Altered norite.
9	McNulty Gulch, Leadville, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. B. 148, p. 176, 1897.	Diorite porphyry.	In W. T., p. 175.
10	Wellington Mine, Breckenridge District, Colorado.	W. T. Schaller.	F. L. Ransome, U. S. G. S. P. P. 75, p. 96, 1911.	Diorite porphyry.	Altered.

DIORITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
11 A1. I	46.62	12.66	trace	11.15	4.02	1.55	1.35	1.68	3.41	0.31	1.01	0.50	0.92	CO_2 11.48 ZrO_2 none FeS_2 1.99 Cr_2O_3 none NiO none BaO none SrO none ZnS 0.97 PbS 0.52	100.12	2.930
12 A2. II	45.73	19.45	5.28	3.18	6.24	13.86	0.64	0.32	3.56	1.57	0.23	trace	none	CO_2 0.28	100.34	
13 A1. I	58.53	17.74	1.58	1.46	1.71	5.08	5.69	3.90	1.18	0.18	0.81	0.27	0.11	CO_2 0.90 ZrO_2 0.06 SO_3 none FeS_2 0.96 BaO 0.07 SrO 0.05	100.28	
14 A1. I	64.36	18.18	0.64	0.43	0.28	2.56	8.96	0.89	0.55	0.18	0.17	0.06	0.11	CO_2 1.62 ZrO_2 0.03 SO_3 0.07 FeS_2 0.97 BaO 0.06 SrO 0.04	100.16	
15 A1. I	44.69	14.97	0.60	7.05	3.92	10.07	2.36	1.76	0.20	0.36	2.25	0.26	0.14	CO_2 8.47 ZrO_2 0.02 SO_3 none Fe_7S_8 2.25 FeS_2 0.27 BaO 0.14	99.78	
16 A1. I	54.20	15.86	3.32	4.14	3.51	5.32	3.28	3.30	2.40	0.55	1.35	0.68	0.19	CO_2 1.45 FeS_2 0.26 NiO 0.02 BaO 0.41 SrO 0.04	100.28	
17 A2. II	46.57	13.51	2.92	2.73	2.85	19.92	2.33	2.52	0.53	0.33	0.64	0.27	0.40	CO_2 3.40 MoS_2 0.78	99.70	
18 A2. II	47.60	16.50	0.76	4.11	4.24	6.44	1.90	3.74	3.82	0.18	0.50	0.04	0.04	CO_2 10.75 Cl trace S 0.17	100.79	
19 A2. II	44.34	17.97	1.54	7.31	5.24	6.80	1.10	3.65	5.07	0.28	0.44	0.08	0.05	CO_2 6.65 S 0.04	100.56	
20 A3. III	54.15	15.38	4.25	7.32	4.79	7.70	1.25	0.02	3.83	1.02				CO_2 0.38	100.09	
21 A3. III	52.13	18.65	4.88	4.42	3.29	10.52	1.55	0.15	3.28	0.65				CO_2 0.87	100.39	
22 A2. II	51.07	14.93	6.44	5.98	4.84	7.89	5.04	0.16	1.73	0.24	1.65	0.19	0.22	SO_3 trace Cl trace F trace	100.38	
23 A2. II	60.96	18.06	1.42	2.48	5.09	6.67	2.39	0.28	1.26		1.10	0.25	0.34	CO_2 0.04 S trace	100.34	2.856
24 A2. II	60.35	18.71	2.10	2.15	4.08	7.18	1.54	0.32	1.50		0.70	0.29	0.66	CO_2 0.08 S trace	99.67	2.801
25 A1. I	49.83	15.11	9.78	2.57	7.55	8.92	2.84	1.32	1.00		0.16	0.17	0.05	CO_2 0.09 ZrO_2 none Cl 0.02 S none CoO 0.64 BaO none Cu 0.05 Pb 0.01	100.11	
26 A3. III	49.46	16.77	1.98	6.57	9.33	11.17	1.55	0.04	2.02		0.79	trace	trace	CO_2 0.27 S trace	99.95	

DIORITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
11	Wellington Mine, Breckenridge District, Colorado.	W. T. Schaller.	F. L. Ransome, U. S. G. S. P. P. 75, p. 96, 1911.	Diorite porphyry.	Altered.
12	Yava Wash, Bradshaw Mountains, Arizona.	G. Steiger.	Jaggar and Palache, U. S. G. S. Fol. 126, p. 4, 1905.	Diorite.	Altered.
13	Treadwell Mine, Douglas Island, Alaska.	G. Steiger.	A. C. Spencer, U. S. G. S. B. 287, p. 101, 1906.	Albite diorite.	Altered.
14	Treadwell Mine, Douglas Island, Alaska.	G. Steiger.	A. C. Spencer, U. S. G. S. B. 287, p. 101, 1906.	Albite diorite.	Altered.
15	Treadwell Mine, Douglas Island, Alaska.	G. Steiger.	A. C. Spencer, U. S. G. S. B. 287, p. 63, 1906.	Diorite.	Altered.
16	Silver Bow Basin, Alaska.	W. F. Hillebrand.	G. F. Becker, U. S. G. S. B. 148, p. 233, 1897.	Diorite.	In W. T., p. 269.
17	Jumbo Mine, Copper Mountain, Alaska.	R. C. Wells.	C. W. Wright, U. S. G. S. P. P. 87, p. 106, 1915.	Diorite.	Altered.
18	Lillooet, British Columbia.	M. F. Connor.	A. M. Bateman, Can. G. S. rec. lab.	Diorite.	Altered. Cf. No. 78, II.5.3.4.
19	Lillooet, British Columbia.	M. F. Connor.	A. M. Bateman, Can. G. S. rec. lab.	Diorite.	Altered. Cf. No. 78, II.5.3.4.
20	Minnesota Mine, Shasta County, California.	W. T. Schaller.	B. S. Butler, U. S. G. S. B. 419, p. 138, 1910.	Diorite.	Altered.
21	Uncle Sam Mine, Shasta County, California.	W. T. Schaller.	B. S. Butler, U. S. G. S. B. 419, p. 138, 1910.	Diorite porphyry.	
22	Forbestown, Butte County, California.	H. N. Stokes.	H. W. Turner, U. S. G. S. A. R. 17, I, p. 731, 1896.	Uralite diorite.	In W. T., p. 327.
23	Smiths Post Island, Essequibo River, British Guiana.	J. B. Harrison.	J. B. Harrison, Rep. G. Ess. Riv., p. 43, 1900.	Diorite.	Altered. In W. T., p. 249.
24	Smiths Post Island, Essequibo River, British Guiana.	J. B. Harrison.	J. B. Harrison, Rep. G. Ess. Riv., p. 43, 1900.	Diorite.	In W. T., p. 249.
25	Mazaruni District, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Br. Gui., p. 48, 1908.	Epidiorite.	Altered gabbro. In W. T., p. 321.
26	Arakaka District, British Guiana.	J. B. Harrison.	J. B. Harrison, Goldf. Bri. Gui., p. 48, 1908.	Epidiorite.	

DIORITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
27 A3. III	52.47	12.15	3.47	5.23	9.94	9.71	2.81	2.26	1.62					CO_2 0.54	100.20	
28 A1. I	49.74	14.85	1.04	10.61	2.48	6.17	4.52	0.53	3.37	0.05	2.05	0.62	0.39	CO_2 3.18 Cl trace FeS_2 0.13 NiO none BaO none	99.73	
29 A1. I	42.36	14.09	2.17	10.48	5.70	10.05	3.26	0.80	2.92	0.12	4.95	1.02	0.28	CO_2 1.73 Cl trace NiO 0.09 BaO none	100.02	
30 A1. I	44.10	13.63	0.76	11.35	5.58	7.96	1.26	4.34	2.05	0.17	3.07	0.22	0.85	CO_2 5.18 FeS_2 0.09 NiO 0.04 BaO none	100.15	
31 A3. III	53.35	17.10	0.09	6.67	7.02	5.92	3.32	2.03	4.00		0.91			FeS_2 0.28	100.69	
32 A2. II	49.47	17.47	2.56	6.70	6.11	9.36	2.52	2.31	1.58		0.70	0.18	0.20	CO_2 0.75	100.01	
33 A2 II	43.22	18.95	10.73	1.72	2.08	18.40	0.41	2.09	1.04		0.50	0.12	0.70	S 0.27	100.23	
34 A2. II	57.35	14.61	2.18	3.99	3.96	3.51	2.93	1.92	4.08		0.81	0.25		CO_2 4.16 SO_3 0.20 Org. 0.02	99.97	2.666
35 A2. II	57.28	15.98	2.35	5.06	5.52	2.84	2.37	3.42	4.22		1.01	0.18		CO_2 0.41 SO_3 trace	100.64	2.653
36 A2. II	56.69	14.99	3.39	4.38	3.39	5.92	3.30	2.05	3.43		1.34	0.22		CO_2 1.00 SO_3 0.15	100.25	2.67
37 A2. II	54.55	15.44	3.48	0.80	4.41	7.85	2.45	4.09	3.75		0.96	0.45		CO_2 2.16 SO_3 0.10	100.49	2.67
38 B2. III	53.54	17.82	5.39	4.21	1.97	7.47	3.27	1.95	1.94		0.28	trace	0.52	CO_2 0.85 S 0.09 SrO trace	99.36	
39 A2. II	55.94	18.17	1.99	1.96	1.73	9.35	5.94	1.07	1.06		0.83	0.32	0.21	CO_2 1.45	100.02	
40 A3. III	52.23	16.57	7.01	1.42	3.93	5.97	2.85	3.05	3.84	0.57	2.68				100.10	2.88
41 A3. III	49.43	15.36	1.90	7.62	8.22	10.86	3.24	0.22	2.29		0.79				99.93	
42 A3. III	48.70	16.27	2.00	9.27	6.68	10.06	3.15	0.54	2.91		0.81				100.39	
43 A3. III	47.39	17.30	2.85	8.75	5.97	10.37	2.63	1.84	3.05		0.62				100.77	
44 A2. II	47.00	19.42	1.17	10.20	4.71	10.35	3.14	0.96	1.58		0.98		0.08		99.59	
45 A2. II	46.68	15.32	1.06	10.00	9.25	10.86	2.80	0.24	2.06		1.77		0.04		100.08	
46 A3. III	45.86	21.93	3.82	5.54	5.14	12.98	0.43	2.21	2.16						100.07	

DIORITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
27	Inchnadampf, Assynt, Scotland.	J. J. H. Teall.	J. J. H. Teall, G. Mag., XXIII, p. 350, 1886.	Diorite.	In W. T., p. 321.
28	Ardifuar, Crinan Loch, Argyll, Scotland.	E. G. Radley.	J. S. Flett, G. S. Scot. Mem. Sh. 36, p. 55, 1909.	Epidiorite.	
29	Ardifuar, Crinan Loch, Argyll, Scotland.	E. G. Radley.	J. S. Flett, G. S. Scot. Mem. Sh. 36, p. 55, 1909.	Epidiorite.	
30	Glencalvie Lodge, Rossshire, Scotland.	E. G. Radley.	G. S. G. B., Sum. Prog. (1911), p. 58, 1912.	Epidiorite.	
31	Saint-Pons, Esterel, France.	Pisani.	A. Michel-Levy, B. Sv. Ct. G. Fr., XXI, No. 130, p. 41, 1912.	Microdiorite.	
32	Langban, Wermland, Sweden.	G. Nyblom.	H. J. Sjogren, G. F. F., XXXII, p. 1307, 1910.	Diorite.	Not fresh.
33	Langban, Wermland, Sweden.	G. Nyblom.	H. J. Sjogren, G. F. F., XXXII, p. 1307, 1910.	Diorite.	Altered.
34	Litzel Kopf, near Buhlenberg, Birkenfeld, Harz.	Bärwald.	K. A. Lossen, Jb. Pr. G. L.-A., X, p. 266, 1892.	Diorite porphyrite.	In W. T., p. 409.
35	Steinhübel, near St. Wendel, Harz.	Hesse.	K. A. Lossen, Jb. Pr. G. L.-A., X (1889), p. 266, 1892.	Diorite porphyrite.	In W. T., p. 229.
36	Werschweiler, near St. Wendel, Harz.	Böttcher.	K. A. Lossen, Jb. Pr. G. L.-A., X (1889), p. 266, 1892.	Diorite porphyry.	In W. T., p. 243.
37	Gronig, near St. Wendel, Harz.	Hesse.	K. A. Lussen, Jb. Pr. G. L.-A., X (1889), p. 266, 1892.	Diorite porphyry.	In W. T., p. 271.
38	Kohldorf, Krasso-Szoreny, Hungary.	K. Emszt.	Rozlozsnit and Emszt, Mt. Ung. G. A., XVI, p. 192, 1908.	Diorite.	
39	Val Riccoletta, Monzoni, Tyrol.	Dittrich and Pohl.	J. Romberg, Anh. Abh. Pr. Ak. w., p. 89, 1904.	Diorite aplite.	
40	Spescha, Engadine, Switzerland.	L. Hezner.	u. Grubenmann, Btr. G. Kt. Schw., XXIII, p. 228, 1909.	Gabbro-diorite.	
41	Weressowsky Ouwae, Iss District, Ural Mountains.	Not stated.	Duparc and Pamfil, B. Soc. M. Fr., XXXIII, p. 360, 1910.	Gabbro-diorite.	
42	Borowskol, Tswettli-Bor, Iss District, Ural Mountains.	Not stated.	Duparc and Pamfil, B. Soc. M. Fr., XXXIII, p. 360, 1910.	Gabbro-diorite.	Altered.
43	Weressowsky Ouwae, Iss District, Ural Mountains.	Not stated.	Duparc and Pamfil, B. Soc. M. Fr., XXXIII, p. 360, 1910.	Gabbro-diorite.	
44	Mount Bielaia, Tagil District, Ural Mountains.	Not stated.	Duparc and Pamfil, B. Soc. M. Fr., XXXIII, p. 360, 1910.	Diorite.	Uralitized gabbro.
45	Mount Maminikha, Tagil District, Ural Mountains.	Not stated.	Duparc and Pamfil, B. Soc. M. Fr., XXXIII, p. 360, 1910.	Gabbro-diorite.	
46	Garevaia, Tilai Mountains, Ural Mountains.	Not stated.	Duparc and Pearce, Oural Nord, II, p. 500, 1905.	Diorite pegmatite.	

DIORITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
47 A3. III	40.30	17.63	6.35	10.28	8.23	13.85	2.48	0.26	0.92					Cr_2O_3 0.34	100.64	
48 A3. III	64.87	14.28	5.75	n. d.	2.01	5.47	3.51	0.87	1.70	0.24	0.42	0.20		CO_2 1.06	100.38	
49 B2. III	51.18	17.44	4.70	4.15	2.87	9.60	5.84	0.44	1.46		2.40	0.79	0.10		100.97	
50 A3. III	47.63	17.20	3.60	8.09	6.25	6.42	4.65	1.31	2.71	0.73	1.39	trace		CO_2 0.44 FeS_2 0.53	100.95	2.893

PORPHYRITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A1. I	54.69	16.53	4.54	2.83	2.99	5.34	5.19	3.93	1.05	0.32	0.91	0.73	0.07	CO_2 0.83 Cl trace BaO 0.37 SrO 0.06	100.38	
2 A2. II	52.33	15.09	4.31	4.03	6.73	7.06	3.14	3.76	2.68		0.14	1.02	0.09	BaO 0.07	100.45	2.785
3 A2. II	49.47	12.15	1.93	4.07	10.86	9.30	2.08	2.42	4.14		0.21	0.37	0.10	CO_2 3.31 Cr_2O_3 trace BaO 0.03	100.44	
4 A2. II	64.81	15.73	1.68	2.91	2.82	4.22	3.98	1.43	0.62		0.08	0.23	0.08	CO_2 1.08 Cl 0.04 FeS_2 0.90 SrO trace	100.61	2.740
5 A3. III	56.62	16.74	4.94	3.27	4.08	7.39	3.50	1.97	0.92			trace	0.15	CO_2 1.15 SrO trace	100.73	2.768
6 A2. II	71.19	13.81	1.45	1.68	0.74	2.87	4.24	1.82	0.92	0.15	0.35	0.08	0.07	CO_2 0.82 BaO 0.16 SrO trace	100.35	
7 A1. I	68.58	13.04	0.26	3.40	1.01	3.22	4.94	1.90	1.00	0.16	0.57	0.20	0.15	CO_2 1.31 FeS_2 0.15 BaO 0.10 SrO trace	99.99	
8 A3. III	63.82	16.53	1.28	2.93	1.99	5.57	4.12	0.77	1.82		trace		trace	CO_2 1.10	99.93	2.689
9 A3. III	55.77	15.88	2.55	9.20	10.09	3.11	2.30	0.23	1.00		0.09	trace	trace	CO_2 trace Cl trace	100.22	
10 A3. III	63.59	18.63	0.56	1.62	4.98	2.14	1.78	2.07	4.24	0.14	trace	none	trace	CO_2 0.65	100.40	
11 A3. III	65.16	15.56	2.11	3.39	2.40	6.70	2.54	1.47	1.11				0.36		100.80	
12 A3. III	48.64	11.68	10.57	6.31	6.78	10.88	2.90	1.01	1.02				0.39		100.18	
13 A2. II	58.21	15.54	6.52	1.78	2.60	4.40	2.96	2.58	0.56		2.09	0.32	0.26	CO_2 2.70	100.52	
14 A2. II	60.96	13.93	1.56	3.65	1.59	3.98	2.83	4.23	2.14		1.16	0.29		CO_2 3.27 SO_3 0.16	99.75	2.625

DIORITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
47	Koswinsky Kamen, Kitlin District, Ural Mountains.	L. Duparc.	Duparc and Pearce, Oural Nord, I, p. 171, 1902.	Issite (anorthite diorite).	
48	Kernize, Montenegro.	E. Manasse.	E. Manasse, Mem. d' Achl., p. 86, 1903.	Diorite porphyry.	
49	Porto Grande, Sao Vincente, Cape Verde Islands.	C. v. John.	C. v. John, Jb. G. R.-A. Wien, XLVI, p. 287, 1896.	Diorite.	In W. T., p. 285.
50	Navigation Creek, Noyang, Victoria.	A. W. Howitt.	A. W. Howitt, Tr. R. Soc. Vict., XX, p. 53, 1884.	Diorite.	In W. T., p. 283.

PORPHYRITE.

1	Northern part of Crazy Mountains, Montana.	W. F. Hillebrand.	J. E. Wolff, U. S. G. S. B. 148, p. 143, 1897.	Porphyrite.	In W. T., p. 261.
2	Cottonwood Creek, Montana.	L. G. Eakins.	G. P. Merrill, Pr. U. S. Nat. Mus., XVII, p. 648, 1895.	Augite porphyrite.	In W. T., p. 267.
3	East Gallatin River, Montana.	L. G. Eakins.	G. P. Merrill, Pr. U. S. Nat. Mus., XVII, p. 645, 1895.	Porphyrite (lamprophyre).	In W. T., p. 413.
4	Mosquito Amphitheater, Leadville, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. Mon. 12, p. 340, 1886.	Biotite porphyrite.	In W. T., p. 233.
5	Buckskin Gulch, Mosquito Range, Leadville, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. Mon. 12, p. 340, 1886.	Hornblende porphyrite.	In W. T., p. 277.
6	Milton, Calaveras County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 14, II, p. 484, 1894.	Quartz porphyrite.	In W. T., p. 179.
7	Latrobe, Eldorado County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 14, II, p. 473, 1894.	Porphyrite.	In W. T., p. 225.
8	Santa Catalina Island, California.	W. S. T. Smith.	W. S. T. Smith, Pr. Cal. Ac. Sci. (3), Geol. I, p. 25, 1897.	Porphyrite.	In W. T., p. 245.
9	Barama River, British Guiana.	J. B. Henderson.	J. B. Henderson, G. Goldf. Br. Gui., p. 61, 1908.	Porphyrite.	
10	Bahia Rodriguez, Skyring Water, Patagonia.	M. Dittrich.	P. Quensel, B. G. Inst. Un. Ups., XII, p. 31, 1913.	Porphyroid.	
11	Löytökorpi, Kankaanpää, Finland.	H. Berghell.	J. J. Sederholm, B. C. G. Fin., No. 6, p. 74, 1897.	Mica porphyrite.	Altered.
12	Pikonkörpi, Kalvola, Finland.	A. W. Forsberg.	J. J. Sederholm, Fin. G. Und., Bl. 18, p. 49, 1890.	Uralite porphyrite.	In W. T., p. 322.
13	Grafläsian, near Rödö, Sweden.	H. Santesson.	P. J. Holmquist, Afk. Sv. G. Und., No. 181, p. 73, 1899.	Porphyrite.	In W. T., p. 241.
14	Weiselberge, near Oberkirchen, Rheinland.	Böttcher.	K. A. Lossen, Z. D. G. G., XLIII, p. 537, 1891.	Porphyrite.	In W. T., p. 223.

PORPHYRITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
15 A2. II	50.81	15.90	3.60	3.72	7.18	3.67	3.32	0.81	6.80		1.06	0.27		CO_2 2.35 SO_3 0.21 Org. 0.05	99.75	2.643
16 A2. II	58.40	16.81	3.47	2.69	3.90	1.54	4.48	5.03	2.66		0.25	0.43		CO_2 0.48 SO_3 trace	100.14	2.642
17 A2. II	58.40	15.61	2.72	2.94	3.50	3.97	3.13	5.37	1.72		0.38	0.40		CO_2 2.56 SO_3 trace	100.70	2.674
18 A2. II	56.29	15.52	5.28	0.84	5.31	2.47	3.46	5.26	3.86		trace	0.37		CO_2 0.95 SO_3 0.16	99.77	2.660
19 A2. II	53.92	16.60	6.87	0.99	4.26	3.54	3.22	7.45	2.15		1.08	0.62		SO_3 0.13	100.83	2.709
20 A2. II	62.44	15.60	2.09	3.43	2.11	1.70	3.99	4.21	2.60		0.88	0.16		CO_2 0.62 SO_3 0.12	99.95	2.652
21 A2. II	61.83	14.80	1.83	5.31	2.69	0.73	3.57	4.54	2.49		1.17	0.23		CO_2 0.08 SO_3 0.18	99.55	2.656
22 A2. II	61.41	14.54	1.96	5.80	2.03	1.33	3.86	4.68	2.48		0.98	0.26		CO_2 0.88 SO_3 trace	100.21	2.663
23 A2. II	58.58	15.26	5.61	3.28	3.02	0.98	2.45	3.80	5.14		1.38	0.37		SO_3 0.07	99.94	2.674
24 A2. II	61.31	16.34	2.23	3.17	2.07	2.43	4.86	2.96	3.08		0.77	0.27		CO_2 1.08 SO_3 0.14 Org. 0.02	100.93	2.624
25 A2. II	57.85	17.20	5.04	1.53	2.81	6.69	3.21	2.26	2.00		0.83	0.15		CO_2 0.85 SO_3 0.14	100.56	2.676
26 A3. III	61.93	18.83	3.24	1.24	2.37	4.46	4.16	2.72	1.83						100.78	2.62
27 A2. II	59.60	14.30	1.49	6.43	1.49	4.54	2.90	1.84	4.63		1.12	0.24		CO_2 2.02 SO_3 0.19 Org. 0.02	100.81	2.646
28 A2. II	57.12	15.40	2.80	4.39	5.13	2.24	2.84	3.77	4.35		1.17	0.22		CO_2 0.75 SO_3 0.08	100.26	2.625
29 A2. II	55.47	13.86	5.98	2.64	3.65	2.75	3.63	4.35	2.94		1.19	0.22		CO_2 3.25 SO_3 0.14	100.07	2.683
30 A2. II	54.70	18.05	3.63	3.31	3.90	6.36	4.08	1.97	3.28		1.09	trace		SO_3 0.13	100.50	2.684
31 A2. II	54.32	17.36	2.32	6.14	3.04	3.11	3.83	3.27	4.52		1.18	trace		CO_2 1.51 SO_3 0.08	100.68	2.665
32 A3. III	59.07	20.06	2.05	5.17	0.45	3.35	8.29	0.21	0.47	0.63				CO_2 0.51	100.26	
33 A3. III	68.04	16.14	4.32	0.97	1.02	0.32	7.62	0.58	1.27						100.28	
34 A3. III	50.96	17.33	2.66	5.94	12.73	0.78	0.88	2.32	7.13				0.10		100.83	2.746

PORPHYRITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
15	Oberstein, Nahethal, Rheinland.	Bärwald.	K. A. Lossen, Jb. Pr. G. L.-A., X, p. 309, 1892.	Labradorite porphyrite.	In W. T., p. 413.
16	Kreiseberg, Thüringerwald, Thuringia.	G. F. Steffen.	H. Loretz, Jb. Pr. G. L.-A., IX, p. 300, 1889.	Biotite porphyrite.	In W. T., p. 259.
17	Unterneubrunn, Thüringerwald, Thuringia.	G. F. Steffen.	H. Loretz, Jb. Pr. G. L.-A., VIII, p. 108, 1888.	Mica porphyrite.	In W. T., p. 259.
18	Gotteskopf, near Ilmenau, Thuringia.	K. Klüss.	H. Loretz, Jb. Pr. G. L.-A., XIII, p. 135, 1893.	Porphyrite.	In W. T., p. 259.
19	Langewiesen, near Ilmenau, Thuringia.	Hesse.	H. Loretz, Jb. Pr. G. L.-A., XIII, p. 135, 1893.	Porphyrite.	In W. T., p. 259.
20	Bullerberg, near Magdeburg, Prussia.	Hesse,	F. Klockmann, Jb. Pr. G. L.-A., XI, p. 210, 1892.	Porphyrite.	In W. T., p. 223.
21	Supplingen, near Magdeburg, Prussia.	Hampe.	F. Klockmann, Jb. Pr. G. L.-A., XI, p. 159, 1892.	Porphyrite.	In W. T., p. 221.
22	Altenhausen, near Magdeburg, Prussia.	G. F. Steffen.	F. Klockmann, Jb. Pr. G. L.-A., XI, p. 159, 1892.	Porphyrite.	In W. T., p. 223.
23	Zissendorfer Berg, near Magdeburg, Prussia.	Fischer.	F. Klockmann, Jb. Pr. G. L.-A., XI, p. 210, 1892.	Porphyrite.	In W. T., p. 225.
24	Horst, Bl. Lebach, Prussia.	Gremse.	Weiss and Grebe, Erl. G. Kt. Pr., Bl. Lebach, p. 32, 1889.	Porphyrite.	In W. T., p. 227.
25	Himmelberg, Bl. Lebach, Prussia.	Hampe.	Weiss and Grebe, Erl. G. Kt. Pr., Bl. Lebach, p. 34, 1889.	Porphyrite.	In W. T., p. 243.
26	Kesselsdorf, Saxony.	W. Bruhns.	W. Bruhns, Z. D. G. G., XXXVIII, p. 750, 1886.	Porphyrite.	In W. T., p. 191.
27	Niederbrombach, Oberstein, Harz.	Böttcher.	K. A. Lossen, Jb. Pr. G. L.-A., X, p. 293, 1892.	Porphyrite.	Variolitic. In W. T., p. 245.
28	Bosenberg, near St. Wendel, Harz.	Jacobs.	K. A. Lossen, Jb. Pr. G. L.-A., X, p. 266, 1892.	Porphyrite.	In W. T., p. 225
29	Spiemont, Harz.	Böttcher.	K. A. Lossen, Jb. Pr. G. L.-A., X, p. 266, 1892.	Porphyrite.	In W. T., p. 225.
30	Herchweiler, n. St. Wendel, Harz.	Fischer.	K. A. Lossen, Jb. Pr. G. L.-A., X, p. 316, 1892.	Porphyrite.	In W. T., p. 281.
31	Pfeffelbach, n. St. Wendel, Harz.	Fischer.	K. A. Lossen, Jb. Pr. G. L.-A., X, p. 316, 1892.	Porphyrite.	In W. T., p. 265.
32	Hidas, Tur-Toroczko Range, Hungary.	S. Szentpetry.	S. Szentpetry, Muz. Fuz., I, p. 238, 1912.	Porphyrite tuff.	
33	Pozoritta, Bukowina.	C. v. John.	C. v. John, Jb. G. R.-A. Wien, XLIX, p. 561, 1899.	Albite porphyrite.	In W. T., p. 157.
34	Bruneck, Tyrol.	S. Hillebrand.	S. Hillebrand, T. M. P. M., XXV, p. 477, 1907.	Porphyrite.	Altered.

PORPHYRITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
35 A3. III	55.50	18.12	2.08	6.17	2.75	1.33	5.60	0.77	3.44	0.72	0.45		trace	$CaCO_3$ 2.68	99.61	
36 A2. II	54.84	18.15	2.06	4.29	6.12	3.90	0.80	0.89	4.22	0.60	2.00	$Ca_3P_2O_8$ 1.29	0.37	CO_2 trace FeS_2 0.11	99.94	2.75
37 A2. II	35.84	10.08	3.68	4.69	35.81	0.12	0.49	0.56	3.34	0.70	2.50	$Ca_3P_2O_8$ 1.40	0.48	FeS_2 0.07	99.76	2.75
38 A2. II	51.30	16.13	3.01	6.92	2.58	6.97	4.00	2.07	1.89	0.50	2.78		0.19	CO_2 1.64 NiO 0.05 BaO none SrO trace	100.03	
39 A?3. III	65.05	10.04	8.47	5.14	trace	4.80	3.39	0.56						CO_2 1.53	100.35	
40 A1. I	65.66	13.55	1.63	1.56	1.56	5.46	5.00	1.96	0.46	0.10	0.50	0.54	0.23	CO_2 1.58 ZrO_2 0.02 Cr^2O_3 0.01 V^2O_3 0.01 BaO 0.03	99.88	2.75
41 A3. III	63.05	14.04	n. d.	5.36	1.58	5.92	6.74	0.62	0.26	0.04	0.97		0.02	CO_2 1.47	100.07	2.75
42 A2. II	64.54	12.65	2.33	2.12	2.72	4.92	3.78	2.12	1.83	0.08	0.77		none	CO_2 none FeS_2 0.13	99.73	
43 A2. II	57.76	11.89	2.97	4.85	1.86	6.15	4.46	1.46	1.54	0.23	2.95	0.71	0.30	CO_2 2.80 FeS_2 0.06 C 0.30	100.09	
44 A2. II	56.96	15.19	1.13	4.17	3.75	5.40	3.79	0.65	4.71	0.07	0.74		0.68	CO_2 3.43 S trace	100.87	

ANDESITE.

1 A2. II	58.91	13.43	none	7.15	5.63	6.68	2.91	1.31	1.48		1.23	0.15		CO_2 1.35	100.23	
2 A3. III	63.25	14.89	6.54	none	0.82	0.59	4.47	4.78	3.20		trace	0.61		CO_2 0.78	99.93	
3 A2. II	45.30	16.07	8.26	2.17	5.58	5.63	2.44	4.06	2.93	0.30	1.70	0.43	0.20	CO_2 4.78	99.85	
4 A2. II	51.08	11.37	11.17	5.64	3.96	5.20	5.54	1.50	1.31	0.19	2.67	0.39	0.22		100.24	
5 A3. III	66.28	10.62	6.41	2.11	1.15	3.17	6.09	1.73	0.61					CO_2 1.47	99.64	
6 A3. III	64.12	16.32	6.72	1.38	0.33	3.49	6.22	0.53	0.34		trace		0.64	CO_2 none	100.09	
7 A2. II	63.69	18.60	0.94	0.09	0.18	0.24	0.32	12.81	1.14	0.51	0.32	0.10	0.34	CO_2 none SO_3 0.30 BaO 0.37	99.93	
8 A2. II	60.78	18.10	3.15	0.97	2.04	4.61	2.81	2.75	2.62	0.68	0.24	0.62	0.39	CO_2 none SO_3 0.16 BaO 0.18	100.10	
9 A2. II	57.35	16.33	1.47	2.58	4.31	6.12	0.70	3.82	3.05	0.62	0.65	0.16	0.30	CO_2 0.70 SO_3 2.43 BaO 0.05	100.64	

PORPHYRITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
35	Ananadura, near Kavkaz, Caucasus.	D. Beljankin.	D. Beljankin, Ann. Inst. Pet. Gr., XV, 1911.	Porphyrite.	
36	Zeia River, Amur District, Siberia.	P. Todakis.	E. Ahnert, Reg. Aurif. Sib., X, Tab. VII, 1910.	Porphyrite tuff.	
37	Zeia River, Amur District, Siberia.	P. Todakis.	E. Ahnert, Reg. Aurif. Sib., X, Tab. VII, 1910.	Augite porphyrite.	
38	Oakey Creek, near Mount Odin, Nandewar Mountains, New South Wales.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXII, p. 904, 1908.	Labradorite porphyry.	
39	Dandenong, Victoria.	H. C. Jenkins.	J. W. Gregory, Pr. R. Soc. Vict., XIV, p. 201, 1902.	Porphyrite.	MgO?
40	Kalgoorlie, Western Australia.	H. Bowley.	Simpson and Gibson, W. Aust. G. S. B. 42, p. 61, 1912.	Porphyrite.	
41	Kalgoorlie, Western Australia.	C. C. Williams.	E. S. Simpson, W. Aust. G. S. B. 6, p. 74, 1902.	Porphyrite.	
42	Mount Monger, Western Australia.	Survey laboratory.	R. A. Farquharson, W. Aust. G. S. B. 53, p. 59, 1913.	Porphyrite.	Altered.
43	Mount Monger, Western Australia.	Survey laboratory.	R. A. Farquharson, W. Aust. G. S. B. 53, p. 60, 1913.	Porphyrite.	
44	Mount Monger, Western Australia.	Survey laboratory.	R. A. Farquharson, W. Aust. G. S. B. 53, p. 61, 1913.	Porphyrite.	

ANDESITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Jernpynten, Disko Island, Greenland.	M. Dittrich.	T. Nicolau, Medd. Gron., XXIV, p. 243, 1900.	Andesite.	Iron bearing. Not in W. T.
2	North Haven, Fox Islands, Maine.	Magruder and Jones.	G. O. Smith, In. Diss. Johns Hop., p. 33, 1896.	Andesite.	In W. T., p. 419.
3	Neponset Valley, Massachusetts.	W. T. Hall.	F. Bascom, J. Ac. Sci. Phila. (2), XV, p. 155, 1912.	Andesite.	
4	Front Royal, Virginia.	G. Steiger.	A. Keith, U. S. G. S. A. R. 14, p. 305, 1894.	Andesite.	In W. T., p. 313.
5	Healing Springs, Davidson County, North Carolina.	J. E. Pogue.	J. E. Pogue, A. J. S., XXVIII, p. 228, 1909.	Andesite.	Also in N. C. G. S. B. 22, p. 67, 1910.
6	Virgilina, Granville County, North Carolina.	T. L. Watson.	T. L. Watson, B. G. S. A., XIII, p. 364, 1902.	Andesite.	Altered.
7	Keating Mine, Radersburg, Montana.	C. Palmer.	A. N. Winchell, U. S. G. S. rec. lab.	Andesite.	Much altered. Cf. No. 18, II.4.3.4.
8	Keating Mine, Radersburg, Montana.	C. Palmer.	A. N. Winchell, U. S. G. S. rec. lab.	Andesite.	Weathered. Cf. No. 18, II.4.3.4.
9	Keating Mine, Radersburg, Montana.	C. Palmer.	A. N. Winchell, U. S. G. S. rec. lab.	Andesite.	Altered. Cf. No. 18, II.4.3.4.

ANDESITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
10 A2. II	54. 97	18. 38	3. 06	4. 22	2. 38	5. 43	3. 45	3. 37	0. 82		0. 97	0. 42	trace	CO_2 2.92 SO_3 0.03 Cl trace Li_2O 0.03	100. 45	
11 A1. I	54. 61	15. 23	3. 51	4. 80	4. 69	7. 41	1. 46	2. 70	2. 47	0. 32	0. 86	0. 35	0. 09	CO_2 1.46 ZrO_2 none SO_3 none Cl none BaO 0.11 SrO 0.04	100. 11	
12 A1. I	52. 47	18. 23	3. 31	3. 85	2. 85	4. 56	4. 83	3. 81	2. 03	0. 68	0. 97	0. 64	0. 15	CO_2 1.01 ZrO_2 0.02 FeS_2 0.04 Cr_2O_3 trace V_2O_3 0.03 NiO trace BaO 0.23 SrO 0.11	99. 82	
13 A1. I	50. 72	16. 01	4. 35	4. 20	7. 06	9. 02	2. 92	1. 13	2. 14	0. 40	1. 08	0. 29	0. 07	CO_2 0.85 Cr_2O_3 none NiO none BaO 0.11 SrO 0.09	100. 44	
14 A2. II	50. 06	17. 00	2. 96	5. 42	3. 61	8. 14	3. 53	3. 40	4. 85		0. 51	0. 66	0. 14		100. 28	
15 A1. I	85. 49	5. 49	0. 23	0. 25	none	0. 27	none	none	3. 07	0. 46	0. 63	0. 07	none	CO_2 none SO_3 0.46 FeS_2 3.43 BaO 0.07	99. 92	
16 A1. I	64. 79	18. 93	none	none	none	0. 43	0. 15	0. 24	5. 39	0. 50	1. 21	0. 51	none	CO_2 none FeS_2 7.19 BaO 0.06 SrO trace	99. 40	
17 A1. I	55. 61	16. 40	5. 44	2. 37	3. 25	5. 85	2. 61	3. 77	1. 51	0. 46	1. 10	0. 45	0. 09	CO_2 1.33 S trace BaO 0.03 SrO 0.05	100. 32	
18 A2. II	58. 36	16. 13	3. 85	3. 25	2. 91	3. 57	4. 51	2. 41	1. 61		1. 49		0. 66	CO_2 1.54	100. 29	2. 655
19 A3. III	55. 77	16. 38	4. 27	4. 17	3. 10	6. 66	3. 65	2. 37	2. 36		0. 34			CO_2 1.58	100. 65	2. 745
20 A3. III	67. 13	18. 41	0. 45	0. 07	0. 44	0. 55	4. 17	5. 28	2. 98		0. 30	trace	trace		99. 78	
21 A3. III	63. 88	19. 96	2. 21	0. 57	0. 58	2. 03	4. 19	3. 88	2. 63				trace		99. 93	
22 A1. I	66. 44	14. 98	1. 57	0. 43	0. 18	2. 47	1. 12	3. 32	4. 06	4. 60	0. 20	0. 11	0. 13	CO_2 0.67 ZrO_2 0.01 Cl trace S 0.02 BaO 0.11 SrO none	100. 42	
23 A2. II	57. 55	15. 52	2. 68	2. 48	1. 37	5. 85	4. 90	2. 95	2. 15		0. 24	0. 83		CO_2 3.57 ZrO_2 trace Cl trace S trace V_2O_3 0.02	100. 21	
24 A2. II	57. 19	17. 12	0. 76	3. 15	1. 69	4. 32	0. 57	3. 22	4. 06	1. 57	0. 53	0. 13	0. 17	CO_2 4.94 S 0.28 BaO 0.27	99. 97	
25 A2. II	56. 36	11. 51	5. 82	1. 18	1. 42	0. 44	1. 30	0. 54	9. 80	8. 32	0. 87	0. 35	0. 08	ZrO_2 none SO_3 2.50 BaO 0.04	100. 53	
26 A3. III	65. 80	14. 48	3. 96	0. 70	2. 35	3. 19	3. 78	3. 32	2. 71	0. 12		0. 12		BaO 0.06	100. 59	

ANDESITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
10	Bald Mountain, Bear Gulch, Montana.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. B. 148, p. 129, 1897.	Shoshonite.	In W. T., p. 267.
11	Daylight, Zosel District, Montana.	H. N. Stokes.	W. H. Weed, U. S. G. S. B. 168, p. 119, 1900.	Andesite porphyry.	In W. T., p. 247.
12	Dike Mountain, Yellowstone National Park.	W. F. Hillebrand.	Hague and Jaggar, U. S. G. S. B. 168, p. 98, 1900.	Trachyte-andesite.	In W. T., p. 261.
13	Eagle Creek, Yellowstone National Park.	H. N. Stokes.	Hague and Jaggar, U. S. G. S. B. 168, p. 97, 1900.	Andesite.	In W. T., p. 321.
14	Lamar River, Yellowstone National Park.	L. G. Eakins.	J. P. Iddings, J. G., III, p. 944, 1895.	Shoshonite.	Also in U. S. G. S. Mon. 32, (II), p. 340, 1899. In W. T., p. 269.
15	White Cloud Mine, Silverton, Colorado.	G. Steiger.	F. L. Ransome, U. S. G. S. B. 182, p. 125, 1901.	Andesite breccia.	Altered.
16	White Cloud Mine, Silverton, Colorado.	H. N. Stokes.	F. L. Ransome, U. S. G. S. B. 182, p. 122, 1901.	Latite.	Altered.
17	Engineer Mountain, Silverton, Colorado.	H. N. Stokes.	F. L. Ransome, U. S. G. S. B. 182, p. 122, 1901.	Latite.	
18	King Solomon Mountain, Silverton, Colorado.	Gerhardt and Haldane.	F. R. van Horn, B. G. S. A., XII, p. 8, 1901.	Hornblende andesite.	
19	King Solomon Mountain, Silverton, Colorado.	E. B. Willard.	F. A. van Horn, B. G. S. A., XII, p. 8, 1900.	Hornblende andesite.	
20	Knickerbocker Hill, Silver Cliff, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. A. R. 17 (II), p. 321, 1896.	Andesite.	Much decomposed. In W. T., p. 149.
21	Robinson Plateau, Silver Cliff, Colorado.	L. G. Eakins.	W. Cross, U. S. G. S. A. R. 17 (II), p. 321, 1896.	Andesite.	In W. T., p. 163.
22	Idaho Springs, Colorado.	W. T. Schaller.	S. H. Ball, U. S. G. S. P. P. 63, p. 134, 1908.	Biotite latite.	
23	Sugarloaf Mountain, Boulder County, Colorado.	J. C. Blake.	J. C. Blake, Pr. Col. Sc. Soc., VII, p. 12, 1901.	Mica andesite.	
24	South Evans Gulch, Leadville, Colorado.	C. Palmer.	J. D. Irving, U. S. G. S. rec. lab.	Volcanic breccia.	
25	Slumgullion Flow, Lake City quadrangle, Colorado.	W. T. Schaller.	W. Cross, U. S. G. S. B. 419, p. 118, 1900.	Andesite.	
26	Iron Mountain, Iron Springs District, Utah.	R. D. Hall.	Leith and Harder, U. S. G. S. B. 338. p. 49, 1908.	Andesite.	Altered.

ANDESITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
27 A3. III	63. 63	15. 64	3. 59	0. 93	2. 32	4. 46	1. 70	5. 22	1. 70	0. 40		0. 15		BaO 0. 05	99. 79	
28 A3. III	63. 82	14. 28	2. 72	0. 81	5. 98	0. 70	3. 62	4. 24	1. 68	2. 30		0. 04		BaO 0. 04	100. 23	
29 A3. III	63. 76	16. 05	1. 91	0. 58	2. 46	4. 25	6. 26	2. 84	0. 93	1. 22		0. 28		BaO none	100. 54	
30 A1. I	54. 23	17. 37	4. 00	1. 95	3. 00	6. 67	2. 96	2. 80	3. 71	1. 60	0. 75	0. 34	0. 10	CO_2 0. 33 ZrO_2 0. 02 SO_3 none Cl trace FeS_2 0. 02 Cr_2O_3 none BaO 0. 15 SrO 0. 06	100. 06	
31 A1. I	54. 54	14. 66	4. 20	2. 74	3. 21	5. 64	3. 47	5. 28	1. 87	1. 10	0. 86	0. 49	0. 29	CO_2 2. 19 ZrO_2 none S 0. 01 BaO 0. 07 SrO 0. 05	100. 67	
32 B3. IV	49. 80	15. 33	n. d.	7. 44	6. 61	7. 19	2. 71	4. 36	1. 38		2. 67	0. 73	0. 30	CO_2 2. 56	101. 08	
33 A1. I	59. 76	17. 03	5. 99	0. 90	2. 11	4. 06	4. 50	2. 94	0. 43	0. 64	1. 07	0. 35	0. 10	CO_2 none SO_3 none Cl trace BaO 0. 14 SrO 0. 03	100. 05	
34 A2. II	66. 44	12. 77	1. 84	1. 35	1. 12	3. 50	3. 78	2. 54	2. 60	0. 20	0. 20	0. 12		CO_2 3. 11	99. 57	
35 B1. II	59. 06	16. 24	0. 43	4. 88	3. 51	5. 59	2. 84	3. 95	0. 19	0. 21	1. 08	0. 21	0. 20	CO_2 0. 70 BaO 0. 11 SrO 0. 12	99. 32	2. 796
36 A2. II	66. 64	13. 93	0. 95	1. 46	1. 14	2. 61	5. 66	2. 64	3. 81	1. 19	0. 18	0. 12			100. 33	
37 A3. III	69. 51	15. 61	0. 56	1. 27	0. 61	2. 80	3. 43	2. 81	3. 63		trace				100. 23	
38 A1. I	68. 75	16. 75	0. 48	1. 72	0. 83	0. 89	6. 95	0. 80	1. 52	0. 84	0. 27	0. 16	0. 04	CO_2 none BaO 0. 03 SrO 0. 03	100. 06	
39 A2. II	65. 40	15. 35	2. 10	1. 22	0. 60	1. 12	2. 07	3. 21	7. 00	1. 18	0. 55		0. 05	Cl 0. 01	100. 04	
40 A1. I	91. 40	4. 31	0. 77	0. 11	0. 18	none	0. 06	1. 68	0. 98	0. 46	0. 07	0. 04	0. 06	CO_2 none ZrO_2 0. 02 SO_3 none F trace S none BaO 0. 02	100. 16	
41 A2. II	76. 25	12. 84	0. 54	0. 33	0. 56	0. 16	0. 12	3. 20	3. 17	2. 14	0. 37	0. 12		CO_2 none	99. 80	
42 A1. I	73. 50	14. 13	1. 51	0. 26	0. 21	0. 12	0. 24	5. 11	2. 81	1. 07	0. 47	0. 09		CO_2 none SO_3 0. 17 S 0. 03 BaO 0. 19	99. 91	
43 A2. II	72. 98	14. 66	1. 01	0. 16	0. 33	0. 18	none	6. 93	2. 95	0. 97	0. 44	0. 16		CO_2 none	99. 87	
44 A1. I	71. 14	15. 24	1. 77	0. 26	0. 16	0. 09	0. 24	6. 31	2. 87	0. 85	0. 48	0. 05		CO_2 none SO_3 0. 05 S 0. 02 BaO 0. 17	99. 70	

ANDESITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
27	Desert Mound, Iron Springs District, Utah.	R. D. Hall.	Leith and Harder, U. S. G. S. B. 338, p. 49, 1908.	Andesite.	Weathered.
28	Iron Mountain, Iron Springs District, Utah.	R. D. Hall.	Leith and Harder, U. S. G. S. B. 338, p. 49, 1908.	Andesite.	Altered.
29	Iron Mountain, Iron Springs District, Utah.	R. D. Hall.	Leith and Harder, U. S. G. S. B. 338, p. 49, 1908.	Andesite.	Altered.
30	Ontario Tunnel, Park City quadrangle, Utah.	W. F. Hillebrand.	J. M. Boutwell, U. S. G. S. P. P. 77, p. 74. 1912.	Andesite.	
31	Bonanza Mine, Hillsboro, New Mexico.	G. Steiger.	Lindgren, Graton, and Gordon, U. S. G. S. P. P. 68, p. 43, 1910.	Andesite.	
32	Near Grant's, Mount Taylor region, New Mexico.	T. M. Chatard.	J. S. Diller, U. S. G. S. B. 148, p. 185, 1897.	Mica andesite.	In W. T., p. 419.
33	San Francisco Peak, San Francisco Mountains, Arizona.	H. H. Robinson.	H. H. Robinson, U. S. G. S. P. P. 76, p. 138, 1913.	Latite.	
34	Sloko Lake, Vancouver Island, British Columbia.	M. F. Connor.	D. P. Cairnes, Can. G. S. rec. lab.	Latite tuff.	
35	Record Mountain, Rossland Mountains, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38 (I), p. 327, 1912.	Latite.	
36	John Day Basin, Oregon.	F. C. Calkins.	F. C. Calkins, Un. Cal. Dep. G. B., III, p. 169, 1902.	Andesite ash.	
37	Stillwater Creek, Lassen Peak, California.	W. H. Melville.	J. S. Diller, U. S. G. S. B. 150, p. 212, 1898.	Andesite tuff.	In W. T., p. 419.
38	Spread Eagle Mine, Shasta County, California.	G. Steiger.	B. S. Butler, A. J. S., XXVIII, p. 29, 1909.	Feldspar-epidote rock.	Epidote primary?
39	Cordelia, n. San Francisco, California.	G. E. Colby.	A. C. Lawson, U. S. G. S. Fol. 193, p. 12, 1914.	Andesite tuff.	
40	Mizpah vein, Tonopah, Nevada.	G. Steiger.	J. E. Spurr, U. S. G. S. P. P. 42, p. 216, 1905.	Andesite.	Extreme stage of alteration.
41	Mizpah vein, Tonopah, Nevada.	G. Steiger.	J. E. Spurr, U. S. G. S. P. P. 42, p. 216, 1905.	Andesite.	Altered.
42	Mizpah Hill, Tonopah, Nevada.	G. Steiger.	J. E. Spurr, U. S. G. S. P. P. 42, p. 216, 1905.	Hornblende andesite.	Altered.
43	Mizpah vein, Tonopah, Nevada.	G. Steiger.	J. E. Spurr, U. S. G. S. P. P. 42, p. 216, 1905.	Andesite.	Altered to quartz and muscovite.
44	Tonopah, Nevada.	G. Steiger.	J. E. Spurr, U. S. G. S. P. P. 42, p. 216, 1905.	Hornblende andesite.	Kaolinitic alteration.

ANDESITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
45 A1. I	60.45	17.78	5.86	0.25	1.55	1.04	3.58	2.11	2.93	2.86	0.81	0.28		CO_2 none SO_3 none FeS_2 0.06 BaO 0.07	99.63	
46 A1. I	58.47	16.85	2.04	3.12	3.84	1.35	4.30	3.14	3.59	1.10	0.77	0.35	0.26	Cu_2 0.52 SO_3 none F 0.12 FeS_2 0.49 BaO 0.11	100.42	
47 A2. II	57.51	16.55	3.20	2.02	2.30	6.06	2.76	2.81	2.56	1.45	0.80	0.30	0.17	CO_2 1.91 SO_3 none S 0.02	100.42	
48 A1. I	56.26	16.18	5.56	1.17	2.78	5.07	3.25	3.43	2.61	2.07	0.73	0.32	0.21	CO_2 0.62 SO_3 none FeS_2 0.03 NiO trace BaO 0.12 SrO 0.06	100.47	
49 A1. I	55.60	16.70	2.23	3.51	2.60	4.27	4.08	3.17	3.06	0.88	0.72	0.28		CO_2 2.76 SO_3 none S none BaO 0.12	99.98	
50 A1. I	51.64	15.58	0.16	0.58	2.79	6.25	0.27	2.46	4.43	2.56	0.73	0.31	0.21	CO_2 4.24 ZrO_2 trace SO_3 0.03 FeS_2 7.89 NiO none SrO trace	100.13	
51 A1. I	43.00	16.49	2.86	6.31	6.19	5.69	0.12	0.84	7.93	3.00	0.89	0.36		CO_2 4.19 SO_3 0.08 FeS_2 2.55 BaO 0.07 SrO none	100.57	
52 A2. II	61.71	16.63	0.40	—	none	5.94	8.52	0.16	0.81	0.51	0.79	0.15		CO_2 4.05 ZrO_2 0.04	99.71	
53 A2. II	54.66	17.53	3.18	3.52	3.62	7.33	3.56	2.22	0.69	0.59	0.99	0.30	0.12	CO_2 1.35	99.66	
54 A2. II	53.37	16.57	3.84	2.45	5.79	6.30	3.40	2.55	2.33	0.39	0.86	0.29	0.08	CO_2 1.61 SrO trace	99.83	
55 A2. II	62.23	14.95	2.04	1.52	0.75	3.10	5.08	1.26	8.94		0.59	0.04		CO_2 trace C none	100.50	
56 A2. II	60.20	18.89	2.15	1.97	2.49	6.22	4.88	2.05	0.54	0.18	0.38	0.17	0.08		100.20	
57 A3. III	45.31	9.96	3.43	12.99	2.56	16.44	0.41	0.25	3.77					CO_2 5.39	100.51	
58 A1. I	61.03	20.93	7.73	1.42	0.16	0.35	2.58	1.76	2.89		0.67	0.08	0.06	CO_2 0.09 Cl 0.01 S trace NiO trace BaO 0.33 CuO 0.13	100.22	
59 A3. III	60.09	19.04	3.14	1.89	4.20	2.91	5.26	2.95	0.98						100.46	
60 A2. II	66.99	16.48	1.55	1.26	0.45	4.05	3.81	3.71	0.56			0.13	0.43	CO_2 0.29 S 0.08	99.79	2.585
61 A3. III	60.90	16.77	2.78	1.16	1.09	5.28	5.19	3.38	3.15		0.37		trace	X 0.29 S 0.57	100.93	2.680
62 A3. III	55.78	12.77	12.65	4.37	6.30	2.88	2.38	0.75	0.83		0.80		trace		99.51	

ANDESITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
45	Tonopah, Nevada.	G. Steiger.	J. E. Spurr, U. S. G. S. P. P. 42, p. 216, 1905.	Hornblende andesite.	"Relatively fresh."
46	Tonopah, Nevada.	G. Steiger.	J. E. Spurr, U. S. G. S. P. P. 42, p. 216, 1905.	Hornblende andesite.	"Freshest obtainable."
47	Tonopah, Nevada.	G. Steiger.	J. E. Spurr, U. S. G. S. P. P. 42, p. 57, 1905.	Pyroxene-biotite andesite.	"Completely decomposed."
48	Tonopah, Nevada.	W. F. Hillebrand.	J. E. Spurr, U. S. G. S. P. P. 42, p. 57, 1905.	Biotite andesite.	Altered.
49	Tonopah, Nevada.	G. Steiger.	J. E. Spurr, U. S. G. S. P. P. 42, p. 216, 1905.	Hornblende andesite.	Chloritic alteration.
50	Tonopah, Nevada.	W. F. Hillebrand.	J. E. Spurr, U. S. G. S. P. P. 42, p. 241, 1905.	Biotite-pyroxene andesite.	"Entirely altered."
51	Tonopah, Nevada.	G. Steiger.	J. E. Spurr, U. S. G. S. P. P. 42, p. 241, 1905.	Augite-biotite andesite.	Altered.
52	Cottonwood Canyon, Churchill County, Nevada.	G. Steiger.	F. L. Ransome, U. S. G. S. rec. lab.	Dike rock (andesite?).	
53	Columbia Mountain, Goldfield District, Nevada.	G. Steiger.	F. L. Ransome, U. S. G. S. P. P. 66, p. 50, 1909.	Andesite.	
54	Masons Butte, Wabuska, Nevada.	H. N. Stokes.	J. E. Spurr, J. G., IX, p. 593, 1901.	Quartz andesite.	
55	Canal Zone, Panama.	R. C. Wells.	D. F. McDonald, U. S. G. S. rec. lab.	Lava (andesite?)	
56	Chiriqui Mountains, Panama.	W. C. Wheeler.	D. F. McDonald, U. S. G. S. rec. lab.	Volcanic ash (andesite?).	"Recrystallized."
57	St. Thomas, West Indies.	J. Siemiradzki.	J. Siemiradzki, N. J., 1886, II, p. 178.	Anorthite andesite.	In W. T., p. 421.
58	Cuyuni River, British Guiana.	J. B. Harrison.	J. B. Harrison, G. Goldf. Br. Gui., p. 62, 1908.	Tuff (andesite?).	
59	Misti Volcano, near Arequipa, Peru.	F. H. Hatch.	F. H. Hatch, T. M. P. M., VII, p. 328, 1886.	Andesite.	"Silicified." In W. T., p. 263.
60	Cerro del Moro, San Luis, Argentina.	E. Kich.	F. Tannhäuser, N. J. B. B., XXII, p. 592, 1906.	Hornblende andesite.	Not fresh.
61	Cerro del Sololasta, San Luis, Argentina.	P. Jannasch.	F. Tannhäuser, N. J. B. B., XXII, p. 597, 1906.	Hornblende andesite.	
62	Burnt Hill, King Charles Land, Spitzbergen.	N. Sahlbom.	A. Hamberg, G. F. F., XXI, p. 523, 1899.	Hypersthene andesite scoria.	Not fresh. In W. T., p. 423.

ANDESITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
63 A3. III	58.07	17.62	4.97	3.09	1.46	5.23	3.31	2.15	4.15				trace		100.05	
64 A2. II	57.73	16.47	4.42	3.23	1.32	6.16	4.13	2.09	0.82	0.20	0.91	0.63	0.17	CO_2 2.47 Cl none S trace NiO trace	100.55	
65 A2. II	49.29	16.66	7.24	4.81	2.42	5.63	4.98	1.86	2.11	0.34	2.27	0.24	0.55	CO_2 2.32 Cl trace S none NiO 0.04 BaO trace	100.76	
66 A1. I	50.29	18.11	4.09	8.06	3.32	1.70	5.06	2.65	3.45	0.86	1.67	0.44	0.65	CO_2 none FeS_2 0.06 NiO none BaO none SrO none	100.41	
67 A1. I	50.06	15.72	3.94	7.63	3.82	5.90	4.55	2.16	1.36	0.67	2.46	0.64	0.30	CO_2 1.08 Cl 0.04 S none NiO 0.03 BaO 0.03 Li_2O none	100.39	
68 A4. IV	56.10	17.24	4.76	n. d.	2.29	11.20	2.04	1.38	1.55					CO_2 3.60	100.16	
69 A3. III	64.00	15.00	n. d.	3.24	2.17	4.17	5.10	1.49	0.60	0.64	0.06			CO_2 3.30	100.5	
70 A3. III	59.32	19.10	1.90	3.69	5.90	0.60	2.19	2.46	4.85						100.01	
71 A2. II	60.19	14.47	2.53	0.78	4.45	3.80	7.53	0.88	3.16	1.14	0.50	0.07	0.06	CO_2 0.38 S trace BaO trace	99.94	
72 B2. III	64.48	14.58	4.60	0.93	1.13	4.00	3.60	0.99	2.02		3.07	0.58	0.20	CO_2 0.94 F 0.05	101.17	2.593
73 A2. II	63.10	14.26	5.73	1.06	1.05	3.70	3.85	1.09	1.31		3.46	0.57	0.21	CO_2 0.46 F 0.05	99.90	2.446
74 A2. II	62.78	14.69	5.30	1.06	1.07	3.84	3.78	1.13	1.78		3.10	0.58	0.25	CO_2 0.54 F 0.05	99.95	2.445
75 A2. II	61.69	15.23	4.97	0.89	1.03	5.41	3.75	1.04	1.10		3.69	0.51	0.27	CO_2 0.52 F 0.05	100.05	2.522
76 A2. II	58.53	19.87	2.20	1.10	1.02	1.33	6.51	4.85	3.28	0.46	0.51	0.16		CO_2 0.13 SO_3 0.10	100.05	
77 A3. III	61.70	16.36	2.29	2.75	1.94	2.65	5.05	3.05	2.45				trace	CO_2 1.63	99.87	
78 A2. II	52.76	18.22	3.13	2.64	1.95	5.97	3.60	3.84	5.54		1.79	1.64			100.08	
79 A3. III	52.02	19.34	5.01	4.08	3.32	9.13	2.61	0.84	2.58	1.15					100.08	
80 B2. III	58.57	16.81	2.96	4.46	2.15	7.70	3.16	1.24	1.55	0.53	0.24	0.13	trace	CO_2 1.57	101.07	2.81
81 B3. IV	62.02	15.15	2.08	1.96	3.15	5.52	3.18	1.66	4.57						99.29	

ANDESITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
63	Beinn More, Mull, Scotland.	G. H. Perry.	J. W. Judd, Q. J. G. S., XLVI, p. 349, 1890.	Propylite.	Altered. In W. T., p. 241.
64	Blackford Hill, Pentland Hills, Scotland.	W. Pollard.	J. S. Flett, G. S. Scot. Mem. Sh. 32, p. 34, 1910.	Andesite.	
65	Corston Hill, Mid-Lothian, Scotland.	W. Pollard.	J. S. Flett, G. S. Scot. Mem. Sh. 32, p. 323, 1910.	Mugearite.	
66	Cairn on Lairs, Lennoxtown, n. Glasgow, Scotland.	E. G. Radley.	G. W. Tyrrell, G. S. Scot. Mem. Sh. 30, p. 142, 1911.	Mugearite.	
67	Balhennan, n. Stirling, Scotland.	E. G. Radley.	G. W. Tyrrell, G. S. Scot. Mem. Sh. 30, p. 142, 1911.	Mugearite.	Also in Q. J. G. S., LXVII, p. 202, 1911.
68	Cockfield-Armathwaite Dike, Preston, England.	J. E. Stead.	J. J. H. Teall, Q. J. G. S., XL, p. 224, 1884.	Andesite.	In W. T., p. 423.
69	Chateau de Panard, Brittany.	Pisani.	L. Vandernotte, Mass. Armor., p. 135, 1913.	Andesite.	
70	St. Hilaire, La Creuse, France.	Pisani.	L. de Launay, B. Sv. Ct. G. Fr., XI, No. 83, p. 77, 1902.	Andesite porphyry.	
71	Vattenviken, n. Ulfön, Nordingra, Sweden.	N. Sahlbom.	J. E. Sobral, G. Nord. Reg., p. 165, 1913.	Salic dike rock (andesite?).	
72	Froschberg, Siebengebirge, Rheinland.	Von Reiss.	W. Hocks, Jb. Pr. G. L.-A., XII, p. 16, 1893.	Andesite.	In W. T., p. 241.
73	Froschberg, Siebengebirge, Rheinland.	Von Reiss.	W. Hocks, Jb. Pr. G. L.-A., XII, p. 16, 1893.	Andesite.	In W. T., p. 241.
74	Froschberg, Siebengebirge, Rheinland.	Von Reiss.	W. Hocks, Jb. Pr. G. L.-A., XII, p. 16, 1893.	Andesite.	In W. T., p. 241.
75	Froschberg, Siebengebirge, Rheinland.	Von Reiss.	W. Hocks, Jb. Pr. G. L.-A., XII, p. 16, 1893.	Andesite.	In W. T., p. 241.
76	Annerod, Hesse.	Survey laboratory.	W. Schottler, Erl. G. Kt. Hes., Bl. Giessen, p. 100, 1913.	Pumice sand (andesite?).	
77	Schneidchen, Erdesbach, Pfalz, Bavaria.	A. Schwager.	Schuster and Schwager, Geog. Jhft., XXIII, p. 54, 1910.	Cuselite.	
78	Buchau, n. Karlsbad, Bohemia.	A. Krehan.	A. Krehan, Jb. G. R.-A. Wien., LXII, p. 36, 1912.	Trachyandesite.	
79	Balazsfalva, Siebenbürgen, Hungary.	S. Ferenczi.	J. v. Szadeczky, Muz. Füz., I, p. 181, 1912.	Andesite tuff.	
80	Bolijevici, Montenegro.	E. Manasse.	E. Manasse, Pr. Soc. Tosc., XIII, p. 171, 1903.	Hornblende andesite.	
81	Dubowka, Mariupol, Russia.	J. Morozewicz.	J. Morozewicz, Ref. N. J., 1900, I, p. 394.	Hornblende andesite.	

ANDESITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
82 A1. I	60.27	18.07	4.90	1.20	1.43	3.88	4.71	3.08	1.58		0.31	0.16	0.20	CO_2 0.79 Cl 0.02 S 0.02 BaO 0.03 SrO trace	100.65	2.704
83 A2. II	49.70	13.24	8.60	4.05	3.21	6.31	5.28	1.90	4.00		3.35	0.26			99.90	
84 A3. III	59.27	17.06	2.16	2.61	1.52	3.37	2.49	3.63	6.42	1.34	0.83		trace		100.70	
85 A3. III	57.26	16.95	7.55	n. d.	1.10	3.56	1.64	1.86	7.65	1.43	0.91		0.23		100.14	
86 A3. III	56.84	18.46	1.75	2.51	1.59	4.78	4.12	2.72	6.95	1.76			trace		100.48	
87 A4. IV	53.63	19.59	5.70	n. d.	3.35	3.53	3.64	1.62	7.91		0.96				99.93	
88 A2. II	59.47	16.97	2.80	3.69	2.82	5.83	2.40	2.36	2.27	0.65	0.77	trace			100.03	
89 A3. III	58.39	15.90	6.88	1.73	3.35	7.76	0.89	4.17	0.32				0.90		100.29	2.755
90 A2. II	54.33	16.96	3.86	3.72	3.11	5.81	2.05	1.67	4.27	0.87	0.72	0.23		CO_2 2.31 S 0.07	99.98	
91 A2. II	15.43	38.57	14.82	1.89	0.41	0.19	0.78	0.08	21.65	2.63	1.87	0.36	0.22	CO_2 0.52 SO_3 none Cl trace S none	99.36	
92 A2. II	16.82	34.75	19.17	n. d.	0.80	0.44	0.26	0.40	20.74	2.11	3.98	0.23	0.15		99.84	
93 A1. I	54.24	15.41	2.34	5.92	3.31	4.84	3.34	2.62	1.67	0.72	1.57	trace	trace	CO_2 4.44 ZrO_2 trace Cl 0.01 S 0.24 Cr_2O_3 none NiO 0.05 BaO none SrO none	100.67	2.625
94 A1. I	52.16	17.61	2.55	4.75	2.88	5.85	4.25	2.69	2.75	0.35	0.76	0.39	0.29	CO_2 2.89 ZrO_2 none SO_3 0.22 Cl 0.04 S 0.15 Cr_2O_3 none V_2O_3 trace NiO none BaO 0.08 SrO trace CuO none	100.66	2.667
95 A2. II	54.41	12.80	0.16	10.35	5.72	5.21	3.02	0.02	3.42	0.15	0.78		0.09	CO_2 3.58	99.71	
96 A1. I	45.52	10.87	0.84	7.92	11.72	6.80	2.24	0.04	3.32	0.06	0.43	0.45	0.32	CO_2 9.52 ZrO_2 0.01 FeS_2 0.17 Cr_2O_3 0.08 V_2O_3 0.30 BaO none	100.61	2.82
97 A1. I	43.13	12.16	1.54	10.64	4.79	8.71	1.70	0.48	2.59	0.12	1.22	0.88	0.60	CO_2 11.56 ZrO_2 none FeS_2 0.39 Cr_2O_3 none V_2O_3 0.04 BaO none	100.54	2.93
98 A3. III	66.20	20.51	0.84	1.12	0.72	0.95	0.90	3.10	5.50		0.21			CO_2 0.10	100.15	

ANDESITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
82	Jelowaya River, Jenissei District, Siberia.	E. Collett.	J. Rakovski, Tr. Mus. Pet. Gr., V., p. 227, 1911.	Trachyandesite.	Not fresh.
83	Wou-lou-si-chou, Yun-nan, China.	Pisani.	J. Deprat, Mem. Sv. Ct. Ind. Ch., I (1), p. 23, 1912.	Andesite.	
84	Guadalupe, near Manila, Luzon, Philippine Islands.	A. J. Cox.	A. J. Cox, Phil. J. Sci. (A), III, p. 404, 1908.	Tuff.	
85	Majayjay, near Manila, Luzon, Philippine Islands.	A. J. Cox.	A. J. Cox, Phil. J. Sci. (A), III, p. 404, 1908.	Tuff.	
86	Manila, Luzon, Philippine Islands.	A. J. Cox.	A. J. Cox, Phil. J. Sci. (A), III, p. 404, 1908.	Tuff.	
87	Saleijer Island, Celebes.	A. Wichmann.	A. Wichmann, Nk. Tds. Ned. Ind., LIV, p. 261, 1895.	Andesite tuff.	In W. T., p. 429.
88	Kuta-Baju Pass, Timorland, Sumatra.	M. Dittrich.	H. Stegman, N. J. B. B., XXVII, p. 432, 1909.	Hornblende andesite.	Altered.
89	Sago Volcano, Sumatra.	J. G. Kramers.	R. D. M. Verbeek, Sum. Westk., p. 518, 1883.	Augite andesite.	Not in W. T.
90	Parsambilan, Tobaland, Sumatra.	M. Dittrich.	H. Stegmann, N. J. B. B., XXVII, p. 424, 1909.	Andesite.	
91	Burangerang, Preanger Province, Java.	E. G. J. Mohr.	E. G. J. Mohr, B. Dep. Agric. Indes Neerl., XXVIII, p. 10, 1909.	Laterite.	From andesite.
92	Gapit River, Sumbawa Island.	A. Lindner.	G. Rack, N. J. B. B., XXXIV, p. 65, 1912.	Andesite laterite.	
93	Eumundi, Queensland.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXI, p. 169, 1906.	Andesite.	
94	Good Dog Mountain, Cambewarra Range, New South Wales.	H. P. White.	Card and Jaquet, Rec. G. S. N. S. W., VII, p. 132, 1902.	Andesite.	Average of 9 specimens.
95	North Pole, Pilbara, Western Australia.	C. C. Williams.	A. G. Maitland, G. S. W. Aust., B. 15, p. 12, 1904.	Andesite.	
96	Kalgoorlie, Western Australia.	H. Bowley.	Simpson and Gibson, W. Aust. G. S. B. 42, p. 61, 1912.	Propylite.	
97	Boulder, Kalgoorlie, Western Australia.	H. Bowley.	Simpson and Gibson, W. Aust. G. S. B. 42, p. 61, 1912.	Propylite.	
98	Tokotea Hill, Coromandel, Hauraki, New Zealand.	J. S. Maclaurin.	Fraser and Adams, G. S. N. Z. B. 4, p. 44, 1907.	Tuff.	

ANDESITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
99 A3. III	65.25	20.32	1.73	n. d.	1.20	none	1.06	3.90	3.78		0.50		0.05	FeS_2 2.21	100.00	
100 A2. II	58.40	19.11	5.76	1.22	2.84	2.95	2.80	2.59	1.76		0.72		0.29	CO_2 1.84	100.28	
101 A2. II	57.72	22.49	0.96	4.82	2.34	1.05	1.18	3.87	4.80		0.66		0.21	CO_2 0.05	100.25	
102 A2. II	60.75	18.34	0.40	5.76	2.03	2.60	1.69	2.92	3.30		0.51		0.42	CO_2 1.50	100.22	
103 A3. III	60.40	17.84	6.40	n. d.	0.13	4.30	2.46	1.15	7.00		0.41		0.05	CO_2 0.30	100.44	
104 A2. II	57.32	16.56	9.28	0.25	0.12	6.05	2.38	1.52	2.50		0.48		0.25	CO_2 3.20 SO_3 none	99.66	
105 A2. II	57.25	16.39	0.40	7.35	3.55	4.50	2.37	1.97	3.25		0.92		0.36	CO_2 1.38	99.69	
106 A2. II	55.58	17.27	1.12	7.41	4.85	7.30	1.50	0.46	2.05		0.67		0.40	CO_2 1.45	100.06	
107 A2. II	53.28	17.54	1.20	7.92	5.26	7.70	2.01	0.26	2.08		0.61		0.78	CO_2 1.24	99.88	
108 A2. II	48.90	17.67	1.20	7.06	3.91	11.00	1.89	0.34	2.28		0.98		0.19	CO_2 4.87	100.29	
109 A2. II	68.12	19.64	0.56	0.50	0.12	0.38	0.57	0.53	8.60		0.98		none		100.00	
110 A2. II	55.61	18.46	0.96	5.62	3.24	7.20	1.17	2.78	1.63		0.74		0.15	CO_2 2.18	99.74	
111 A2. II	57.42	17.61	2.34	3.77	2.19	5.69	3.22	1.94	2.62	0.85	0.68	0.31	0.43	CO_2 0.95	100.02	
112 A2. II	52.69	18.33	2.32	2.98	3.09	7.87	2.62	0.98	3.71	0.73	0.53	0.42	0.25	CO_2 3.59	100.11	
113 A2. II	61.83	16.68	1.52	1.44	2.40	5.05	3.12	1.78	2.43	2.77	0.56	0.16	0.04		99.78	
114 A2. II	61.20	17.61	4.35	1.33	1.21	4.48	3.21	1.74	2.69	1.38	0.85	0.10	0.05	CO_2 none	100.20	
115 A2. II	54.10	17.95	2.56	4.25	1.85	9.43	2.01	1.54	5.38		0.78		0.15		100.00	
116 A2. II	52.60	18.08	2.88	5.11	4.24	9.30	2.06	1.80	1.18		0.66		0.23	CO_2 2.25	100.39	

ANDESITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
99	Tokatea Hill, Coromandel, Hauraki, New Zealand.	J. S. Maclaurin.	C. Fraser, G. S. N. Z. B. 10, p. 21, 1910.	Felsite.	Altered.
100	Tokotea Saddle, Coromandel, Hauraki, New Zealand.	J. S. Maclaurin.	Fraser and Adams, G. S. N. Z. B. 4, p. 44, 1907.	Tuff.	
101	Tokotea Hill, Coromandel, Hauraki, New Zealand.	J. S. Maclaurin.	Fraser and Adams, G. S. N. Z. B. 4, p. 44, 1907.	Tuff.	
102	Tiki Creek, Coromandel, Hauraki, New Zealand.	J. S. Maclaurin.	Fraser and Adams, G. S. N. Z. B. 4, p. 44, 1907.	Tuff.	
103	Raffin Peninsula, Coromandel, Hauraki, New Zealand.	J. S. Maclaurin.	Fraser and Adams, G. S. N. Z. B. 4, p. 82, 1907.	Andesite.	
104	Coromandel, Hauraki, New Zealand.	J. S. Maclaurin.	Fraser and Adams, G. S. N. Z. B. 4, p. 93, 1907.	Andesite.	
105	Waikoromiko Creek, Coromandel, Hauraki, New Zealand.	J. S. Maclaurin.	Fraser and Adams, G. S. N. Z. B. 4, p. 73, 1907.	Andesite.	
106	Waikoromiki, Coromandel, Hauraki, New Zealand.	J. S. Maclaurin.	Fraser and Adams, G. S. N. Z. B. 4, p. 70, 1907.	Hypersthene andesite.	
107	Opitonui, Coromandel, Hauraki, New Zealand.	J. S. Maclaurin.	Fraser and Adams, G. S. N. Z. B. 4, p. 71, 1907.	Augite andesite.	
108	Whangarahi Creek, Coromandel, Hauraki, New Zealand.	J. S. Maclaurin.	Fraser and Adams, G. S. N. Z. B. 4, p. 74, 1907.	Andesite.	Altered.
109	Thames, Hauraki, New Zealand.	J. S. Maclaurin.	C. Fraser, G. S. N. Z. B. 10, p. 24, 1910.	Pyroxene andesite.	Altered and leached. Cf. No. 89, II.4.4.4–5.
110	Waihi, Hauraki, New Zealand.	Survey laboratory.	Bell and Fraser, G. S. N. Z. B. 15, p. 45, 1912.	Andesite.	
111	Thames, Hauraki, New Zealand.	(?)	Cited by A. M. Finlayson, Ec. G., IV, p. 637, 1909.	Hornblende andesite.	
112	Thames, Hauraki, New Zealand.	(?)	Cited by A. M. Finlayson, Ec. G., IV, p. 637, 1909.	Hornblende andesite.	Altered.
113	Aroha, Hauraki, New Zealand.	Survey laboratory.	Henderson and Bartrum, G. S. N. Z. B. 16, p. 62, 1913.	Andesite.	
114	Wairoa River, Aroha, Hauraki, New Zealand.	Survey laboratory.	Henderson and Bartrum, G. S. N. Z. B. 16, p. 62, 1913.	Andesite.	
115	Tararu Creek, Hauraki, New Zealand.	J. S. Maclaurin.	C. Fraser, G. S. N. Z. B. 10, p. 24, 1910.	Hornblende andesite.	Altered.
116	Karaka Mine, Hauraki, New Zealand.	J. S. Maclaurin.	C. Fraser, G. S. N. Z. B. 10, p. 24, 1910.	Pyroxene andesite.	

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ANDESITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
117 A2. II	54.90	18.23	0.74	3.70	4.20	3.42	2.92	2.19	3.44		0.57		0.18	CO_2 1.93 FeS_2 3.88	100.30	
118 A2. II	49.48	18.00	3.91	3.30	6.48	9.75	2.55	0.66	5.25		0.79	0.17			100.32	
119 A2. II	48.22	18.47	5.28	3.90	2.07	6.02	4.94	3.47	2.89	0.44	2.09	0.88	0.10	CO_2 1.23	100.00	

LAMPROPHYRES.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A2. II	50.03	14.08	2.92	6.11	10.73	7.46	1.46	2.64	3.70		0.61	0.42	0.08	Cr_2O_3 trace NiO trace BaO 0.04	100.28	
2 A1. I	50.76	12.20	1.19	6.65	11.75	6.26	2.16	4.79	0.66	0.22	0.76	0.28	0.30	CO_2 1.39 Cl none FeS_2 0.18 Cr_2O_3 0.10 V_2O_3 0.03 NiO 0.06 BaO 0.04	99.78	
3 A2. II	50.15	16.10	2.65	5.58	8.38	8.61	2.35	1.36	3.90		1.70	0.13			100.91 (100.78)	
4 A1. I	53.62	12.10	2.00	6.30	7.07	11.64	1.84	1.52	1.86	0.22	0.50	0.29	0.17	CO_2 1.12 SO_3 0.02 Cl trace V_2O_3 0.02 NiO trace BaO 0.04 SrO trace	100.33	2.892
5 A1. I	50.05	19.56	0.90	6.48	6.30	5.20	2.49	3.09	3.90	0.43	0.55	0.38	0.09	CO_2 0.32 ZrO_2 none SO_3 0.03 Cl trace Cr_2O_3 none V_2O_3 0.05 NiO trace BaO 0.15 SrO trace	99.97	2.775
6 A1. I	45.88	13.22	3.20	5.31	12.05	8.18	1.62	2.07	2.80	2.24	0.72	0.35	0.15	CO_2 1.36 ZrO_2 none SO_3 0.49 Cl none S none Cr_2O_3 0.04 V_2O_3 0.02 NiO 0.05 BaO 0.15 SrO trace Sb_2O_3 0.03	99.93	2.800
7 A3. III	55.39	11.90	0.90	4.71	3.67	7.63	1.99	4.30	6.08	0.26	1.26			CO_2 2.12	100.19	
8 A2. II	46.11	14.75	2.20	4.51	5.73	7.82	1.29	3.84	2.90		0.84		trace	CO_2 7.32 S 1.37 X 0.97	99.65	2.904
9 A3. III	40.71	19.46	7.46	6.83	6.21	11.83	1.80	3.26	1.53				0.18	CO_2 0.74	100.01	
10 A1. I	32.32	8.16	9.46	4.10	5.97	12.60	0.69	5.97	4.09	1.03	4.55	3.78	0.13	CO_2 6.30 S 0.26 BaO 0.36 SrO 0.24	100.01	
11 A1. I	49.59	15.30	5.01	4.19	4.50	5.51	2.24	3.80	3.59	2.98	1.50	0.94	0.11	CO_2 none ZrO_2 0.05 S 0.09 BaO 0.21 SrO 0.12	99.73	
12 A1. I	48.33	12.56	1.87	5.26	9.07	8.94	1.81	4.67	2.63	0.97	0.81	0.78	0.13	CO_2 2.64 BaO 0.24 SrO 0.05	100.76	2.771

ANDESITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
117	Talisman Mine, Aroha, Hauraki, New Zealand.	Survey laboratory.	Henderson and Bartrum, G. S. N. Z. B. 16, p. 62, 1913.	Andesite tuff.	
118	Jenny Island, Weddell quadrant, Antarctica.	Lassieur.	E. Gourdon, pers. com.	Andesite.	
119	Northern Foothills, S. Victoria Land, Antarctica.	G. T. Prior.	G. T. Prior, Nat. Ant. Exp., I, p. 132, 1907.	Banakite.	"CO_2 includes loss."

LAMPROPHYRES.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	South Boulder Creek, Montana.	L. G. Eakins.	G. P. Merrill, Pr. U. S. Nat. Mus., XVII, p. 670, 1895.	Lamprophyre.	In W. T., p. 329.
2	Garbh Alt, Glen Calvie, Scotland.	E. G. Radley.	J. S. Flett, G. S. Scot. Mem. Sh. 93, p. 125, 1912.	Lamprophyre schist.	
3	Courzieu, Lyonnais, France.	Pisani.	A. Michel-Levy, C. R., CLVI, p. 718, 1913.	Hornblende lamprophyre.	
4	Caves House, Jenolan, New South Wales.	W. G. Stone	G. W. Card, pers. com.	Lamprophyre.	
5	Caves House, Jenolan, New South Wales.	W. G. Stone.	G. W. Card, pers. com.	Lamprophyre.	
6	Hillgrove, New England, New South Wales.	J. C. H. Mingaye.	E. C. Andrews, Rec. G. S. N. S. W., VIII (3), p. 228, 1907.	Hornblende lamprophyre.	
7	Lake Dufresnoy, Kewagama Lake, Quebec.	S. J. Lloyd.	M. E. Wilson, Can. G. S. Mem. 39, p. 50, 1913.	Minette.	
8	Hulls cove, Conanicut Island, Rhode Island.	L. V. Pirsson.	L. V. Pirsson, A. J. S., XLVI, p. 375, 1893.	Minette.	In W. T., p. 397.
9	Franklin Furnace, Sussex County, New Jersey.	L. G. Eakins.	J. P. Iddings, U. S. G. S. B. 150, p. 238, 1898.	Minette.	In W. T., p. 397.
10	Apishapa Canyon, Colorado.	G. Steiger.	W. Cross, U. S. G. S. P. P. 90, p. 19, 1914.	Minette.	
11	Cerbat District, Mohave County, Arizona.	G. Steiger.	F. C. Schrader, U. S. G. S. B. 397, p. 33, 1909.	Minette.	
12	Dewdeny Trail, Nelson Range, British Columbia.	M. F. Connor.	R. A. Daly. Can. G. S. Mem. 38 (I), p. 311, 1912.	Olivine augite minette.	

LAMPROPHYRES—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
13 A1. I	41.57	9.75	4.06	4.47	8.65	11.10	1.57	6.10	2.30	1.54	2.36	4.05	0.25	CO_2 1.24 ZrO_2 0.02 Cl 0.04 F 0.23 FeS_2 0.06 Cr_2O_3 0.04 V_2O_3 0.04 NiO 0.02 BaO 0.44 SrO 0.11 Li_2O trace	100.01	
14 A1. I	49.14	14.89	1.08	3.88	7.07	5.13	2.74	5.82	1.16	0.15	1.81	1.49	0.14	CO_2 4.94 Cl 0.05 F 0.20 FeS_2 0.32 BaO 0.49 SrO none	100.50	
15 A2. II	52.18	12.85	0.77	4.95	7.64	4.71	1.93	5.29	1.73		1.85	0.03		CO_2 5.68	99.61	
16 A2. II	47.77	14.75	1.17	6.43	6.72	5.62	2.59	4.28	2.44		2.10	0.05		CO_2 5.54	99.46	
17 A2. II	51.22	17.56	3.51	4.34	3.22	4.52	5.72	4.37	1.93		1.70	1.08	0.20	CO_2 0.60	99.97	
18 A3. III	49.24	11.47	1.10	8.34	9.87	5.76	2.67	5.75	3.41		0.74			CO_2 1.56	99.91	
19 A2. II	50.81	15.13	2.40	3.52	10.64	4.96	1.01	7.01	3.07		1.71	0.62	trace	CO_2 trace Cl trace	100.88	
20 A2. II	51.12	7.25	7.79	2.06	10.61	7.25	2.48	3.62	3.00	3.14	1.52		0.21		100.05	
21 A1. I	52.06	13.36	1.26	5.24	6.75	6.73	1.38	6.03	0.98	0.14	2.08	0.91	0.11	CO_2 2.20 FeS_2 0.17 Cr_2O_3 trace BaO 0.12 SrO trace	99.52	
22 A2. II	45.15	15.39	2.76	5.64	6.38	8.83	2.67	2.77	2.85		2.80	0.56	0.14	CO_2 4.27	100.21	2.70
23 A1. I	47.31	16.21	5.11	2.90	3.08	7.11	3.92	3.73	2.17	0.87	1.64	0.90	trace	CO_2 4.98 ZrO_2 0.01 SO_3 0.05 Cl 0.05 S 0.06 BaO 0.17 SrO 0.02	100.29	
24 A1. I	44.31	14.10	4.75	6.02	7.80	9.66	3.74	2.83	3.29	0.88	2.10	0.53	0.18	CO_2 none S 0.10 BaO 0.10 SrO 0.10	100.49	
25 A2. II	53.12	14.94	5.06	3.18	4.79	7.07	3.73	2.00	3.18		0.85	0.47	trace	CO_2 1.67 S trace	100.06	2.85
26 A2. II	57.50	18.23	none	5.81	3.80	5.45	3.15	1.73	1.48	0.12	0.92	0.30	0.10	CO_2 0.50 FeS_2 1.12	100.21	
27 A2. II	48.73	11.92	4.79	4.56	5.93	9.24	2.62	2.47	1.52		1.34	0.32	0.36	CO_2 5.80 SO_3 0.34 Cl 0.11 BaO trace	100.05	
28 A2. II	47.42	15.65	2.66	4.05	4.90	8.56	2.60	4.10	2.60	0.30	0.70	0.54	0.10	CO_2 6.24 BaO 0.14 SrO 0.10	100.66	2.740
29 A3. III	58.20	19.20	1.10	3.52	2.01	3.67	3.60	4.55	1.40					CO_2 2.40	99.65	
30 A2. II	54.81	17.80	2.69	4.46	5.03	1.78	4.06	3.86	3.56		0.75	0.45		CO_2 0.44 SO_3 trace	99.69	2.712

LAMPROPHYRES—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
13	Northport, Columbia River, Washington.	W. F. Hillebrand.	F. L. Ransome, A. J. S., XXVI, p. 338, 1908.	Apatitic minette.	
14	St. Mabyn Church, Cornwall, England.	E. G. Radley.	C. Reid, G. S. Eng., sh. 335, p. 62, 1910.	Minette.	
15	Taillefer, near Pelvoux, France.	Lassieur.	P. Termier, B. Soc. M. Fr., XXXIV, p. 42, 1911.	Minette.	
16	Taillefer, near Pelvoux, France.	Lassieur.	P. Termier, B. Soc. M. Fr., XXXIV, p. 42, 1911.	Minette.	
17	Brathagen, Lougendal, Norway.	V. Schmelck.	W. C. Brögger, Eg. Kg., III, p. 130, 1899.	Soda minette.	In W. T., p. 263.
18	Weinheim, Baden?	Z. Weyberg.	Z. Weyberg, Ref. N. J., 1912, I, p. 398.	Minette.	
19	Plauensche Grund, Dresden, Saxony.	B. Doss.	B. Doss, T. M. P. M., XI, p. 27, 1890.	Augite minette.	In W. T., p. 265.
20	Zampachen, near Eule, Böhmische Mittelgebirge.	J. Friedrichsen.	V. Rosicky, Sb. Bohm. Ges. W., 1901, Art. XXX, p. 29.	Minette.	
21	Willow Tree Creek, Atunga, New South Wales.	W. N. Benson.	W. N. Benson, Pr. Linn. Soc. N. S. W., XXXVIII, p. 706, 1914.	Minette.	
22	Fourmile Creek, Castle Mountains, Montana.	L. V. Pirsson.	Weed and Pirsson, U. S. G. S. B. 139, p. 112, 1896.	Augite vogesite.	In W. T., p. 317.
23	Jennie Sample Mine, Cripple Creek, Colorado.	W. T. Schaller.	Lindgren and Ransome, U. S. G. S. P. P. 54, p. 95, 1906.	Vogesite.	
24	Dripping Stone, Apishapa quadrangle, Colorado.	G. Steiger.	W. Cross, U. S. G. S. P. P. 90, p. 19, 1914.	Augite vogesite.	
25	Sining Fu, W. Kansu, China.	C. Pfeil.	K. Futterer, Durch Asien, III (4), p. 23, 1911.	Vogesite.	
26	Waitahu, Reefton District, New Zealand.	Henderson.	P. G. Morgan, pers. com.	Mica vogesite.	
27	Bighorn Pass, Yellowstone National Park.	J. E. Whitfield.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 70, 1899.	Kersantite.	In W. T., p. 317.
28	Salmon River, Nelson Range, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38, (I), p. 313, 1912.	Kersantite.	
29	Hopital Camfront, Brittany, France.	Not stated.	C. Barrois, Cong. G. Int., VIII, Guide VII, p. 19, 1900.	Kersantite.	In W. T., p. 269.
30	Unterneubrunn, Thuringerwald, Thuringia.	W. Hampe.	H. Loretz, Jb. Pr. G. L.-A. (1887), p. 105, 1888.	Kersantite.	In W. T., p. 259.

LAMPROPHYRES—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
31 A2. II	52.25	14.93	3.50	3.70	5.84	6.33	2.86	3.76	2.68		0.62	0.62		CO_2 2.62 SO_3 0.21	99.92	2.725
32 A2. II	52.12	13.52	2.56	4.53	6.36	5.78	2.34	5.36	1.86		1.20	0.92		CO_2 3.59 SO_3 0.22	100.36	2.726
33 B3. IV	52.68	14.05	4.87	7.88	6.58	1.75	2.79	2.30	6.07		0.40	trace	trace	S trace	99.33	2.77
34 A3. III	49.16	14.17	4.62	6.60	7.01	6.45	4.61	2.23	4.22		0.42	trace	trace		99.49	2.72
35 A4. IV	49.82	14.50	8.06	n. d.	5.81	7.69	3.03	3.50	2.54			trace	trace	CO_2 4.42	99.57	
36 A4. IV	45.14	9.68	13.55	n. d.	10.78	8.65	2.02	3.27	4.24			trace	trace	CO_2 2.82 S trace	100.15	
37 A3. III	51.80	16.65	4.93	2.14	6.90	7.35	3.68	4.05	1.32				0.29	CO_2 0.50	99.61	
38 A2. II	54.36	14.71	1.89	6.11	7.92	2.42	1.18	4.62	4.05		0.96	0.52		CO_2 0.47 SO_3 0.38 C 0.05	99.64	2.755
39 A2. II	49.20	13.56	4.91	5.01	6.84	7.85	2.63	3.90	1.90		1.15	0.71	0.14	CO_2 1.50	100.62	
40 A2. II	45.48	11.89	1.78	6.29	13.27	9.42	2.14	2.84	2.72		0.52	0.79	0.08	CO_2 0.79	99.57	
41 A2. II	56.18	15.51	2.86	3.94	5.46	3.69	4.07	3.21	3.19		0.45	0.31		CO_2 0.95 SO_2 trace	99.82	2.708
42 A3. III	44.66	14.84	4.46	9.49	7.17	6.87	2.95	1.69	3.61		0.10		trace	CO_2 3.77	99.61	3.222
43 A2. II	52.83	12.40	3.17	4.02	6.42	5.64	2.22	6.18	4.18		0.69		0.05	CO_2 2.34	100.14	
44 A2. II	36.42	10.06	2.56	6.89	13.69	14.41	3.09	1.54	1.48	0.95	1.56	0.71		CO_2 4.08 FeS_2 3.32	100.76	
45 A3. III	53.28	16.03	1.93	5.88	8.66	2.84	4.73	1.92	4.92						100.19	2.70
46 A1. I	45.51	13.84	1.90	7.59	3.85	8.33	5.09	1.88	1.67	0.16	3.84	0.61	0.40	CO_2 2.23 SO_3 0.60 Cl 0.05 BaO 0.12	99.69	
47 A1. I	43.36	14.52	1.43	6.13	7.12	10.53	3.35	1.33	1.28	0.32	3.00	0.24	0.15	CO_2 0.64 SO_2 0.25 Cl 0.10 FeS_2 0.47 Fe_7S_8 5.60 BaO 0.01 SrO 0.01	99.84	
48 A3. III	40.95	16.45	13.47	n. d.	6.10	10.53	4.00	1.28	3.84		3.39	0.29	0.33		100.63	
49 A3. III	45.20	17.12	5.98	6.55	5.29	7.89	4.23	2.31	5.35		0.68				100.60	

LAMPROPHYRES—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
31	Querbachthal, Thuringerwald, Thuringia.	G. F. Steffen.	H. Loretz, Jb. Pr. G. L.-A. (1887), p. 112, 1888.	Kersantite.	In W. T., p. 271.
32	Unterneubrunn, Thuringerwald, Thuringia.	G. F. Steffen.	H. Loretz, Jb. Pr. G. L.-A. (1887), p. 105, 1888.	Kersantite.	In W. T., p. 259.
33	Bärenstein, Thuringia.	R. Pöhlmann.	R. Pöhlmann, N. J. B. B., III, p. 100, 1885.	Kersantite.	Border of dike. In W. T., p. 413.
34	Bärenstein, Thuringia.	R. Pöhlmann.	R. Pöhlmann, N. J. B. B. III, p. 97, 1885.	Kersantite.	In W. T., p. 315.
35	Falkenstein, Thuringia.	R. Pöhlmann.	R. Pöhlmann, N. J. B. B., III, p. 97, 1885.	Kersantite.	In W. T., p. 413.
36	Göhren, Thuringia.	R. Pöhlmann.	R. Pöhlmann, N. J. B. B., III, p. 97, 1885.	Kersantite.	In W. T., p. 413.
37	Stengerts, Shessart, Bavaria.	H. Stuber.	E. Goller, N. J. B. B., VI, p. 566, 1889.	Kersantite.	In W. T., p. 271.
38	Michaelstein, Harz.	F. Steffen.	M. Koch, Jb. Pr. G. L.-A. (1886), p. 68, 1887.	Kersantite.	In W. T., p. 227.
39	Oberlichtenau, Lausitz.	P. J. Beger.	P. J. Beger, Vh. Sachs. Ges. W., LXV, p. 376, 1913.	Kersantite.	
40	Oberlichtenau, Lausitz.	P. J. Beger.	P. J. Beger, Vh. Sachs. Ges. W., LXV, p. 376, 1913.	Kersantite.	
41	Wüstewaltersdorf, Silesia.	A. Steffen.	E. Dathe, Z. D. G. G., XXXVII, p. 1035, 1885.	Kersantite.	In W. T., p. 265.
42	Abendweide, Rieserferner, Tyrol.	F. Erben.	F. Becke, Ds. Ak. W. Wien, LXXV, p. 160, 1913.	Kersantite.	
43	Wielischthal, Tatra Mountains, Hungary.	Z. Weyberg.	Z. Weyberg, Ref. N. J., I, p. 398, 1912.	Kersantite.	
44	Val Flesch, n. Pizzo Formico, Lombardy.	E. Artini.	E. Artini, At. Soc. It. Mil., XLIII, p. 29, 1904.	Augite kersantite.	
45	Tschurnukan, Uda Bay, East Siberia.	Not stated.	K. E. Bogdanoritch Fund. Marek., p. 56.	Kersantite.	
46	Montreal, Quebec.	B. J. Harrington.	F. D. Adams, Cong. G. Int., XII, Guide III, p. 46, 1913.	Camptonite.	
47	Mount Royal, Montreal, Quebec.	M. F. Connor.	F. D. Adams, Cong. G. Int., XII, Guide III, p. 46, 1913.	Camptonite.	
48	Montreal, Quebec.	B. J. Harrington.	F. D. Adams, Cong. G. Int., XII, Guide III, p. 46, 1913.	Camptonite.	"H_2O mostly CO_2."
49	Portland Head Light, Portland, Maine.	E. C. E. Lord.	E. C. E. Lord, Am. G., XXII, p. 344, 1898.	Camptonite.	In W. T., p. 301.

LAMPROPHYRES—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
50 A2. II	42.73	14.50	4.03	7.28	5.46	8.46	3.11	2.28	3.08	0.36	4.30	0.93	0.19	CO_2 3.76 Cl trace S 0.18 NiO trace BaO trace Cu none	100.65	
51 A2. II	41.94	15.36	3.27	9.89	5.01	9.47	5.15	0.19	3.29		4.15		0.25	CO_2 2.47	100.44	
52 A3. III	38.45	19.68	4.01	11.15	6.65	9.37	2.77	1.72	1.49				trace	CO_2 4.82	100.11	
53 A1. I	48.22	14.27	2.46	9.00	6.24	8.45	2.90	1.93	1.66	0.28	2.79	0.61	0.20	CO_2 0.15 SO_3 none Cl 0.10 F 0.05 FeS_2 0.36 V_2O_3 0.03 NiO 0.03 BaO 0.04 SrO trace CuO trace	99.80	
54 A2. II	40.03	10.88	12.24	5.12	4.13	11.74	3.67	3.33	2.22		5.46	0.76	trace	CO_2 1.15	100.73	
55 A2. II	43.26	14.01	7.17	5.41	5.57	10.09	2.83	3.78	2.74	0.49	1.81	1.18	0.34	CO_2 1.57 S 0.21	100.46	
56 A2. II	50.99	15.62	8.47	1.43	5.23	6.53	3.39	3.05	2.48	1.39	0.67	0.53	trace	NiO 0.07	99.85	
57 A1. I	47.25	15.14	5.05	4.95	6.87	9.98	2.39	2.60	2.12	0.40	1.22	0.25	0.17	CO_2 1.87 S none V_2O_3 0.05 NiO 0.02 BaO 0.08 SrO 0.05	100.46	2.906
58 A1. I	43.98	13.30	3.67	6.92	7.03	10.66	2.15	1.64	1.52	0.42	1.18	0.32	0.22	CO_2 6.46 FeS_2 0.54 NiO 0.03 BaO 0.06 SrO 0.05	100.15	2.912
59 A2. II	43.68	16.91	5.06	4.01	4.76	80.7	2.37	4.44	3.39	1.95	1.24	0.72	0.07	CO_2 3.13	99.80	
60 A2. II	42.16	15.90	3.28	7.00	6.00	11.67	2.55	1.18	2.68		2.95	0.45	0.15	CO_2 4.54 S 0.20	100.71	
61 A3. III	45.96	12.68	7.63	7.94	8.25	8.36	1.88	0.98	4.10				0.61	CO_2 2.43	100.78	2.96
62 A3. III	42.13	16.31	6.43	7.95	7.37	9.62	2.27	2.48	3.16				0.50	CO_2 2.12	100.32	2.98
63 A3. III	41.99	17.58	6.67	8.33	80.3	8.53	2.12	2.81	2.99				0.29	CO_2 1.80	100.64	3.01
64 A2. II	39.13	11.38	7.33	8.13	8.64	11.77	2.47	1.93	2.87		4.02		0.42	CO_2 2.41	100.50	3.07
65 A1. I	42.22	10.62	4.74	6.18	8.68	14.80	2.46	1.41	1.16	0.50	2.49		0.05	CO_2 3.57 ZrO_2 0.73 S 0.12 Cr_2O_3 0.10 V_2O_3 0.05 BaO 0.04 SrO none	100.42	
66 A3. III	45.55	15.40	2.43	9.12	5.20	7.70	4.54	2.04	2.35		4.45			CO_2 2.15	100.93	

LAMPROPHYRES—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
50	Mount Gunstock, Belknap Mountains, New Hampshire.	H. S. Washington.	Pirsson and Washington, A. J. S., XXII, p. 500, 1906.	Camptonite.	In W. T., p. 319.
51	Livermore Falls, Campton, New Hampshire.	G. W. Hawes.	G. W. Hawes, A. J. S., XVII, p. 150, 1878.	"Diorite" (camptonite).	Not in W. T.
52	Campton Falls, Grafton County, New Hampshire.	L. G. Eakins.	J. P. Iddings, U. S. G. S. B. 150, p. 241, 1898.	Camptonite.	In W. T., p. 417.
53	Mount Ascutney, Vermont.	W. F. Hillebrand.	R. A. Daly, U. S. G. S. B. 209, p. 87, 1903.	Camptonite.	Altered. V_2O_3 subtracted from P_2O_5. In W. T., p. 319.
54	Oxford, New Jersey.	P. Jannasch.	H. Rosenbusch, Elem. Gest., p. 235, 1898.	Camptonite.	
55	Mossy Creek, Augusta County, Virginia.	J. M. Watson.	Watson and Cline, B. G. S. A., XXIV, p. 326, 1913.	Camptonite.	
56	Stinkingwater Canyon, Yellowstone National Park.	W. H. Melville.	J. P. Iddings, U. S. G. S. Mon. 32, (II), p. 340, 1899.	Camptonite.	In W. T., p. 275.
57	Snowstorm Peak, La Plata Mountains, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. Fol. 60, p. 7, 1899.	Camptonite.	In W. T., p. 317.
58	Indian Trail Ridge, La Plata Mountains, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. Fol. 60, p. 7, 1899.	Camptonite.	In W. T., p. 321.
59	Crazy Basin, Bradshaw Mountains, Arizona.	G. Steiger.	C. Palache, U. S. G. S. B. 228, p. 199, 1904.	Camptonite.	Not in U. S. G. S. Fol. 126, 1905.
60	Lago Sarmiento, Patagonia, Chile.	G. Nyblom.	P. D. Quensel, B. G. Inst. Ups., XI, p. 96, 1911.	Camptonite.	
61	Binniaro Firth, Orkney Islands.	J. S. Flett.	J. S. Flett, Tr. R. Soc. Edin., XXXIX, p. 887, 1900.	Camptonite.	In W. T., p. 335.
62	Wart of Skaill, Sandwick, Orkney Islands.	J. S. Flett.	J. S. Flett, Tr. R. Soc. Edin., XXXIX, p. 887, 1900.	Camptonite.	In W. T., p. 343.
63	Rennibuster, Orkney Islands.	J. S. Flett.	J. S. Flett, Tr. R. Soc. Edin., XXXIX, p. 887, 1900.	Camptonite.	In W. T., p. 345.
64	Hoxa, Orkney Islands.	J. S. Flett.	J. S. Flett, Tr. R. Soc. Edin., XXXIX, p. 887, 1900.	Camptonite.	In W. T., p. 343.
65	Sailean Sligenachs, Argyll, Scotland.	E. G. Radley.	J. J. H. Teall, G. S. Scot. Mem. Sh. 45, p. 126, 1908.	Camptonite.	
66	Hvinden, Gran, Norway.	L. Schmelck.	W. C. Brögger, Eg. Kg., III, p. 60, 1899.	Camptonite.	In W. T., p. 323.

LAMPROPHYRES—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
67 A2. II	44.22	12.73	5.68	5.18	6.98	11.57	2.12	1.71	2.74		2.50	1.05	0.45	CO_2 3.66	100.59	
68 A3. III	40.60	12.55	5.47	9.52	8.96	10.80	2.54	1.19	2.28		4.20			CO_2 2.68	100.79	
69 B2. III	43.85	15.25	7.63	4.57	4.47	8.54	4.22	4.04	1.80	0.63	3.25	0.79	0.33	CO_2 1.67	101.04	2.778
70 A3. III	38.46	17.75	5.09	12.66	7.50	7.86	4.56	1.73	2.97		1.12			CO_2 0.56	100.26	
71 A1. I	38.74	12.47	7.97	5.54	9.32	11.71	2.65	1.82	5.03		0.71	0.80	0.05	CO_2 2.33 Cl 0.02 F 0.68 S 0.36 BaO 0.05	100.22	2.910
72 A2. II	43.50	7.30	5.41	7.27	11.01	11.69	1.61	0.54	3.82	0.13	3.84	0.73	0.30	CO_2 2.93	100.08	3.008
73 A3. III	51.48	16.37	5.71	4.64	1.81	3.60	5.86	4.09	5.82			0.21			99.59	
74 A2. II	49.09	13.72	0.95	7.27	11.97	8.35	2.66	1.27	1.96		1.05		0.32	CO_2 0.95 SO_3 0.10 Cr_2O_3 0.09	99.75	
75 B2. III	41.80	19.00	5.04	8.07	2.31	9.80	1.79	1.33	3.97	2.50	3.30	0.70	0.17	CO_2 0.30	100.08	
76 B2. III	40.37	18.60	5.36	7.74	2.31	10.90	2.95	1.70	2.09		3.60	1.30	0.07	CO_2 3.10	100.09	
77 B2. III	34.50	19.50	3.60	9.07	2.46	8.90	1.59	1.61	4.22	1.62	3.10	0.76	0.14	CO_2 9.10	100.17	
78 A2. II	50.38	15.68	1.49	5.65	9.48	7.21	2.86	3.48	2.82		0.59	trace	0.11	CO_2 0.81	100.56	
79 A3. III	42.40	13.94	11.32	0.84	2.53	11.95	6.38	1.25	4.37						99.78	
80 A3. III	55.17	13.49	3.10	3.55	8.55	3.15	4.43	1.09	4.27				0.39	CO_2 3.27	100.46	
81 A2. II	54.51	10.70	2.43	2.99	10.46	2.92	2.94	3.56	4.96		1.21	0.48	trace	CO_2 2.74 BaO 0.11	100.01	

GABBRO.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A2. II	52.19	14.52	3.19	6.27	6.51	8.88	3.65	1.53	0.53		0.72	1.43	trace	CO_2 0.66	100.08	
2 A2. II	49.32	13.33	1.28	7.76	11.13	11.73	2.12	1.12	0.64		0.42	0.06		CO_2 0.89	99.80 (99.82)	
3 A2. II	57.62	16.44	2.34	4.89	2.53	6.40	2.91	1.52	1.15	0.20	0.64	0.29	0.27	CO_2 3.75	100.95	
4 A3. III	49.19	18.71	5.03	4.04	5.92	7.98	1.44	0.77	5.05					CO_2 1.82	99.95	

LAMPROPHYRES—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
67	Kjöse Aklungen, Norway.	L. Schmelck.	W. C. Brögger, Eg. Kg., III, p. 51, 1899.	Camptonite.	In W. T., p. 323.
68	Maena, Gran, Norway.	L. Schmelck.	W. C. Brögger, Q. J. G. S., L, p. 26, 1894.	Camptonite.	In W. T., p. 345.
69	Ziegenberg, near Nestersitz, Bohemia.	F. Hanusch.	J. E. Hibsch, T. M. P. M., XIV, p. 101, 1894.	Camptonite.	In W. T., p. 341.
70	Mulatto, Tyrol.	J. A. Ippen.	J. A. Ippen, Sb. Ak. W. Wien, CXI, p. 234, 1902.	Camptonite.	
71	Taganrog, Russia.	J. Morozewicz.	J. Morozewicz, Mem. C. G. Rus., No. 8, p. 42, 1903.	Camptonite.	
72	Buffelspruit, near Warmbaths, Transvaal.	M. Dittrich.	P. A. Wagner, Tr. G. Soc. S. Af., XV, p. 27, 1912.	Camptonite.	
73	Portobello Bay, Otago Harbor, Dunedin, New Zealand.	P. Marshall.	P. Marshall, Q. J. G. S., LXII, p. 398, 1906.	Camptonite.	
74	Galena Gulch, Mount Rangitoto, Mikonui, New Zealand.	J. S. Maclaurin.	P. G. Morgan, G. S. N. Z. B. 6, p. 141, 1908.	Camptonite.	
75	Blackwater River, Westport District, New Zealand.	Not stated.	P. G. Morgan, pers. com.	Camptonite.	
76	Haggard Creek, Westport District, New Zealand.	Not stated.	P. G. Morgan, pers. com.	Camptonite.	
77	Blackwater River, Westport District, New Zealand.	Not stated.	P. G. Morgan, pers. com.	Camptonite.	
78	Oberlichtenau, Lausitz.	P. J. Beger.	P. J. Beger, Vh. Sachs. Ges. W., LXV, p. 376, 1913.	Spessartite.	
79	Kostelic, Bohemia.	J. Friedrich.	K. Hinterlechner, Jb. G. R.-A. Wien, LII, p. 171, 1903.	Spessartite.	
80	Vera, Cabo de Gata, Spain.	A. Osann.	A. Osann, Z. D. G. G., XLI, p. 311, 1889.	Verite.	In W. T., p. 263.
81	Vera-Garrucha, Cabo de Gata, Spain.	M. Dittrich.	A. Osann, Rosenb. Fests., p. 277, 1906.	Verite.	

GABBRO.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Cote St. Pierre, near Ottawa, Quebec.	M. Dittrich.	A. Osann, Can. G. S. A. R., XII, p. 62, 1902.	Mica-hypersthene gabbro.	
2	Buckingham, Ottawa County, Quebec.	M. Dittrich.	A. Osann, Can. G. S. A. R., XII, p. 41, 1902.	Enstatite gabbro.	
3	Milnesville, Augusta County, Virginia.	J. G. Dinwiddie.	Watson and Cline, B. G. S. A., XXIV, p. 313, 1913.	Quartz gabbro.	
4	Lower Quinnesec Falls, Menominee River, Michigan.	R. B. Riggs.	G. H. Williams, U. S. G. S. B. 62, p. 89, 1890.	Gabbro-diorite.	Schistose. In W. T., p. 431.

GABBRO—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
5 A3. III	38.05	24.73	5.65	6.08	11.58	1.25	2.54	1.94	7.53					CO_2 0.93	100.28	
6 A2. II	48.23	18.26	1.26	6.10	10.84	9.39	1.34	0.73	2.00	0.26	1.00	0.07		CO_2 0.43	99.91	
7 A3. III	49.07	17.21	0.46	12.18	3.60	9.66	2.96	trace	1.55				trace	CO_2 2.70	99.89	
8 A3. III	35.81	14.32	7.38	15.25	10.49	7.23	2.06	0.37	5.25		2.30		0.18	BaO none SrO none	100.62	3.08
9 A2. II	49.42	13.58	3.98	3.59	5.06	18.15	2.22	1.42	0.50	0.28	0.71	1.38			100.29	
10 A2. II	48.58	20.23	1.26	3.02	7.59	14.01	2.25	0.19	2.68	0.28	0.09	trace	trace	S 0.10 NiO none BaO none SrO none	100.25	
11 A2. II	45.86	15.52	1.84	3.22	11.71	15.57	0.86	0.12	3.70	1.38	0.22	none	0.07	CO_2 none S 0.06 BaO none SrO none	99.93	
12 A1. I	44.19	20.66	0.52	3.26	11.90	10.76	1.35	1.03	5.19	0.74	0.12	trace	0.11	CO_2 0.06 ZrO_2 none S trace Cr_2O_3 0.15 NiO 0.03 BaO 0.04 SrO 0.05	100.16	
13 A3. III	47.49	15.81	1.07	4.50	10.39	15.53	1.16	trace	1.83	1.20		trace	0.41	NiO 0.06	99.45	
14 A3. III	45.69	13.30	1.85	4.72	13.06	13.50	1.36	trace	2.47	2.29		0.06	0.24	CO_2 1.89 SO_3 0.43	100.86	
15 A2. II	45.18	14.69	1.94	8.91	8.98	9.36	3.14	0.94	3.80		2.00	0.35	0.16	CO_2 0.32 S 0.20 BaO 0.05	100.02	
16 A1. I	48.00	24.74	0.18	11.03	9.94	0.99	0.84	1.47	0.97	0.06	0.99	0.06	0.24	FeS_2 0.59 Cr_2O_3 0.21 V_2O_3 trace NiO none BaO 0.05	100.36	
17 A3. III	71.63	12.21	1.71	1.48	1.01	11.00	0.54	trace	n. d.				trace		99.58	2.921
18 B3. IV	70.42	12.69	1.72	2.10	0.89	11.34	0.23	trace	n. d.				trace		99.39	2.945
19 A4. IV	69.54	12.38	2.58	1.68	0.97	10.46	trace	trace	2.07				trace		99.68	2.845
20 A3. III	69.53	12.98	1.27	1.99	1.02	8.87	0.94	1.85	1.29				trace		99.74	2.687
21 A4. IV	69.33	12.62	0.79	2.26	0.79	11.53	trace	trace	2.66				trace		99.98	2.798
22 A3. III	60.48	16.07	2.95	3.55	3.23	5.79	3.92	1.70	1.80				trace		99.49	2.766
23 A3. III	47.02	15.86	0.94	3.96	13.99	11.43	1.91	0.20	4.49	0.18					99.98	

GABBRO—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
5	Sturgeon Falls, Menominee River, Michigan.	R. B. Riggs.	G. H. Williams, U. S. G. S. B. 62, p. 76, 1890.	Gabbro.	Altered. In W. T., p. 431.
6	Crystal Falls, Michigan.	G. Steiger.	J. M. Clements, J. G., VI, p. 382, 1898.	Bronzite norite.	Also in U. S. G. S. Mon. 36, p. 245, 1899. In W. T., p. 331.
7	Bashitanaqueb Lake, Cook County, Minnesota.	A. D. Meeds.	N. H. Winchell, G. S. Minn. A. R. 21, p. 151, 1893.	Gabbro.	In W. T., p. 331.
8	Duluth, Minnesota.	A. N. Winchell.	A. N. Winchell, A. G., XXVI, p. 374, 1900.	Troctolite.	In W. T., p. 435.
9	Elkhorn District, Montana.	W. T. Schaller.	W. H. Weed, U. S. G. S. B. 419, p. 93, 1910.	Gabbro.	"Lime enriched."
10	Beverley Creek, Kittitas County, Washington.	H. N. Stokes.	G. O. Smith, U. S. G. S. Fol. 106, p. 6, 1904.	Gabbro.	In W. T., p. 289.
11	Riddles quadrangle, Oregon.	G. Steiger.	G. F. Kay, U. S. G. S. B. 419, p. 167, 1910.	Gabbroic greenstone.	
12	Panther Mountain, Port Orford quadrangle, Oregon.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. Fol. 89, p. 4, 1903.	Metagabbro.	
13	Bagley Canyon, Mount Diablo, California.	W. H. Melville.	W. H. Melville, B. G. S. A., II, p. 404, 1891.	Gabbro.	In W. T., p. 337.
14	Bagley Canyon, Mount Diablo, California.	W. H. Melville.	W. H. Melville, B. G. S. A., II, p. 404, 1891.	Gabbro.	In W. T., p. 431.
15	Rio Pinto, Patagonia, Chile.	R. Mauzelius.	P. D. Quensel, B. G. Inst. Ups., XI, p. 74, 1911.	Essexite-gabbro.	
16	Cufernach, near Huntley, Aberdeenshire, Scotland.	E. G. Radley.	J. J. H. Teall, pers. com.	Cordierite norite.	Contact of norite and phyllite.
17	Penmaenmawr, Wales.	L. Schaub.	L. Schaub, N. J., I, p. 117, 1905.	Quartz norite.	
18	Penmaenmawr, Wales.	L. Schaub.	L. Schaub, N. J., I, p. 118, 1905.	Quartz norite.	
19	Penmaenmawr, Wales.	L. Schaub.	L. Schaub, N. J., I, p. 120, 1905.	Quartz norite.	
20	Penmaenmawr, Wales.	L. Schaub.	L. Schaub, N. J., I, p. 113, 1905.	Quartz norite.	
21	Penmaenmawr, Wales.	L. Schaub.	L. Schaub, N. J., I, p. 119, 1905.	Quartz norite.	
22	Penmaenmawr, Wales.	L. Schaub.	L. Schaub, N. J., I, p. 105, 1905.	Quartz norite.	
23	High Boss, Holyhead Island, Anglesey, Wales.	J. O. Hughes.	A. Harker, Rep. B. A. A. S., p. 285, 1908.	Gabbro.	

GABBRO—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
24 A2. II	47.13	8.48	6.15	5.54	13.61	11.34	1.28	0.22	3.90		0.58	0.32	0.64	CO_2 0.47	99.66	
25 A2. II	48.41	16.15	1.39	8.61	7.12	11.83	2.34	0.60	0.95	0.27	1.19	0.22	0.18	CO_2 0.91 SO_3 trace S 0.12 BaO none	100.29	
26 A3. III	39.95	13.05	2.30	5.95	23.30	6.30	1.54	1.22	7.00		0.26				100.87	
27 A2. II	50.22	22.74	3.32	3.62	4.51	10.35	3.25	1.21	0.26		0.25	none		S 0.25	99.98	
28 A3. III	51.28	15.14	1.30	6.29	10.64	11.67	1.99	0.30	0.47		0.35	trace	trace		99.43	
29 A2. II	47.80	20.01	5.57	6.21	5.46	10.82	0.46	0.15	0.95	0.02	1.00	0.65		CO_2 0.03 SO_3 0.57	99.70	
30 A2. II	47.60	16.89	6.12	5.69	4.70	8.37	4.29	0.39	1.01	none	0.86	2.04		CO_2 none SO_3 1.83	99.79	
31 A2. II	47.40	16.29	1.57	5.55	8.13	17.57	0.71	0.51	0.87	0.05	0.50	0.58		CO_2 0.07 SO_3 0.49	100.34	
32 A2. II	36.58	3.69	11.16	4.10	30.68	2.58	0.25	8.45	0.64	0.26	0.77			CO_2 0.31 SO_3 0.23	99.90	
33 A2. II	45.76	16.39	5.57	4.92	8.74	14.63	1.42	0.42	0.57		0.84	0.04		CO_2 0.50 SO_3 0.37	100.17	
34 A2. II	50.16	14.62	3.07	9.54	5.78	9.36	3.43	0.49	1.85		1.42	0.36	0.14		100.22	
35 A3. III	46.67	15.59	3.15	10.19	7.76	12.45	1.19	1.35	0.72					CO_2 1.31	100.38	
36 A3. III	47.98	19.83	5.34	1.39	3.89	10.73	3.35	0.48	5.01	0.36		1.57			99.93	2.98
37 A3. III	46.81	19.95	6.06	3.00	4.22	3.91	3.98	4.19	4.21	0.32		3.22			99.87	2.84
38 A3. III	46.52	13.53	2.42	7.62	4.32	14.46	1.88	0.99	5.96	0.27		1.79			99.76	3.02
39 A3. III	45.64	15.64	7.30	4.97	6.02	3.82	3.05	3.74	4.40	0.50		5.09			100.17	2.86
40 A3. III	41.68	21.76	2.01	2.04	12.74	10.39	1.46	0.29	6.74	0.46	trace	trace		S 0.07	99.65	
41 A2. II	50.42	16.72	4.32	2.70	3.77	13.36	4.24	1.52	2.24		0.07		0.68		100.04	2.918
42 A3. III	47.22	20.09	5.51	2.02	4.39	6.93	2.56	1.52	8.88		trace		0.66		99.78	2.604

GABBRO—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
24	Rockmount, Isle of Man.	P. Holland.	Dickson and Holland, Pr. Liv. G. Soc., VI, p. 129, 1889.	Gabbro.	Not in W. T.
25	Porcupine Bank, Lat. 53° 27′ N., Long. 13° 37′ W., West of Ireland.	Not stated.	Cole and Crook, G. S. Irel. Mem., p. 8, 1910.	Olivine gabbro.	
26	La Rivandiere, Brittany, France.	Pisani.	L. Vandernotte, Mass. Armor., p. 115, 1913.	Troctolite.	
27	Skouge, Lindaes, n. Bergen, Norway.	Lillejord.	C. F. Kolderup, Berg. Mus. Harb., No. 12, p. 36 1903.	Saussuritized gabbro.	
28	Nuljuvaara, Rovaniemi, Finland.	N. Sahlbom.	V. Hackman, B. G. G. Fin., No. 15, p. 59, 1905.	Uralite gabbro.	
29	Braunberg, n. Seeheim, Odenwald.	G. Butzbach.	G. Klemm, Nb. Ver. Erdk. (4) XXVII, p. 12, 1906.	Gabbro.	
30	Waldsaum, Odenwald.	G. Butzbach.	G. Klemm, Nb. Ver. Erdk. (4) XXVII, p. 12, 1906.	Gabbro.	
31	Lohberg, Odenwald.	G. Butzbach.	G. Klemm, Nb. Ver. Erdk. (4) XXVII, p. 12, 1906.	Gabbro-diorite.	Not fresh.
32	Nieder Beerbach, Odenwald.	G. Butzbach.	G. Klemm, Nb. Ver. Erdk. (4) XXVII, p. 14, 1906.	Olivine gabbro.	
33	Ober Ramstadt, Hesse.	Stadler.	G. Klemm, Erl. G. Kt. Hes., Bl. Rossdorf, p. 29, 1912.	Gabbro.	
34	Bautzen, Lausitz.	M. Voigt.	M. Voigt, In. Diss. Leip., p. 18, 1906.	Norite.	
35	Der Gugl, Dobschau, Bohemia.	A. Silek.	J. Woldrich, B. Ac. Sc. Prag, XVII, p. 395, 1912.	Gabbro.	
36	Clemgia, Lower Engadine, Switzerland.	L. Hezner.	U. Grubenmann, Ecl. G. Helv., VIII, p. 205, 1903.	Saussurite gabbro.	
37	Clemgia, Lower Engadine, Switzerland.	L. Hezner.	U. Grubenmann, Ecl. G. Helv., VIII, p. 207, 1903.	Saussurite gabbro.	
38	Clemgia, Lower Engadine, Switzerland.	L. Hezner.	U. Grubenmann, Btr. G. Kt. Schw., XXIII, p. 215, 1909.	Hornblende gabbro.	
39	Clemgia, Lower Engadine, Switzerland.	L. Hezner.	U. Grubenmann, Ecl. G. Helv., VIII, p. 207, 1903.	Biotite gabbro.	
40	Gorgona Island, Tuscan Archipelago.	E. Manasse.	E. Manasse, Mem. A. d'Ach., p. 63, 1903.	Euphotide (saussurite gabbro).	Also in Mem. Soc. Tosc., XX, p. 47, 1904.
41	Dalnaja Gora, Ural Mountains.	J. Morozewicz.	J. Morozewicz, T. M. P. M., XXIII, p. 125, 1904.	Gabbro.	Weathered from No. 115, III.5.3.4.
42	Dalnaja Gora, Ural Mountains.	J. Morozewicz.	J. Morozewicz, T. M. P. M., XXIII, p. 125, 1904.	Gabbro.	Kaolin-like. Weathered from No. 115, III.5.3.4.

GABBRO—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
43 A2. II	47.77	21.34	2.13	6.75	3.58	12.30	1.89	0.53	2.80		0.60		0.02		99.71	
44 A3. III	47.64	16.76	2.49	7.96	6.41	12.72	2.76	0.43	2.63						99.80	
45 A3. III	44.39	10.60	3.89	11.03	10.54	17.51	1.18	0.53	0.93				trace	Cr_2O_3 trace	100.60	
46 A3. III	43.52	17.50	5.77	6.13	7.48	17.70	1.28	0.35	0.75						100.48	
47 A3. III	40.30	17.14	8.53	6.90	7.92	16.40	1.49	0.66	0.49				0.65		100.48	
48 A3. III	48.00	15.80	11.76	3.29	7.70	5.51	3.42	0.46	4.20			trace	trace	S trace	100.14	3.158
49 B3. IV	46.16	13.86	5.26	1.81	11.60	15.74	1.05	0.30	3.40				trace		99.18	3.00
50 A3. III	45.97	18.18	5.95	2.30	7.50	8.29	4.10	0.75	6.50				trace		99.54	2.870
51 A3. III	39.30	18.58	8.88	1.61	4.09	16.82	6.01	0.42	4.72			trace	trace	CO_2 0.13	100.56	3.122
52 A3. III	39.12	2.44	5.68	1.70	37.08	0.30	1.29	0.42	11.70						99.73	2.649
53 A2. II	44.09	19.13	3.12	6.17	8.46	8.78	2.78	1.88	4.14	0.72	0.82		0.24		100.33	
54 A2. II	46.99	16.18	1.00	3.80	10.30	13.90	2.13	0.32	4.80		0.47			Cr_2O_3 0.02	99.91	
55 A3. III	45.30	23.00	none	5.91	7.82	13.95	1.02	0.75	1.63		trace			CO_2 0.17	99.55	
56 A2. II	40.61	20.15	1.81	4.16	13.16	10.97	0.72	0.88	6.50	0.50	0.20	trace	0.07		99.73	2.71
57 A1. I	46.66	18.50	0.77	6.93	9.76	9.88	1.44	0.27	4.88	0.20	0.65	0.07	0.22	CO_2 0.09 ZrO_2 none SO_3 none Cl 0.03 FeS_2 0.03 Cr_2O_3 0.02 V_2O_3 0.01 NiO 0.03 BaO 0.02 SrO none Li_2O none	100.46	3.000
58 A2. II	47.32	20.10	0.48	3.55	7.14	13.80	2.84	0.68	3.80		0.22		0.25	CO_2 none Cr_2O_3 none	100.18	
59 A2. II	43.29	20.98	1.28	2.26	9.05	17.05	1.13	0.61	4.23		0.18		0.25	CO_2 none Cr_2O_3 0.09	100.40	
60 A2. II	33.95	19.91	1.28	6.98	5.23	26.95	0.15	—	4.85		0.42		0.28	CO_2 none Cr_2O_3 none	100.00	

GABBRO—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
43	Mount Popretschnaia, Tagil District, Ural Mountains.	Not stated.	Duparc and Pamfil, B. Soc. Min. Fr., XXXIII, p. 360, 1910.	Gabbro.	Altered.
44	Katechersky, Koswinsky, Ural Mountains.	L. Duparc.	Duparc and Pearce, Oural Nord, I, p. 214, 1902.	Gabbro.	
45	Pharkowsky-Ouwal, Ural Mountains.	L. Duparc.	Duparc and Pearce, Oural Nord, I, p. 145, 1902.	Gabbro.	
46	Loss Point, Tilai Mountains, Ural Mountains.	Not stated.	Duparc and Pearce, Oural Nord, II, p. 478, 1905.	Gabbro.	Uralitized.
47	Tilai Mountains, Iow District, Ural Mountains.	Not stated.	Duparc and Pamfil, B. Soc. M. Fr., XXXIII, p. 358, 1910.	Olivine gabbro.	
48	Kypriano, Laurium, Attica, Greece.	R. Lepsius.	R. Lepsius, Geol. Attika, p. 101, 1893.	Hornblende gabbro.	In W. T., p. 285.
49	Villia, Laurium, Attica, Greece.	R. Lepsius.	R. Lepsius, Geol. Attika, p. 98, 1893.	Gabbro.	In W. T., p. 335.
50	Laurium, Attica, Greece.	R. Lepsius.	R. Lepsius, Geol. Attika, p. 102, 1893.	Gabbro.	In W. T., p. 435.
51	Plaka, near Laurium, Attica, Greece.	R. Lepsius.	R. Lepsius, Geol. Attika, p. 97, 1893.	Gabbro.	In W. T., p. 435.
52	Kaisariani, Mount Hymettos, Attica, Greece.	R. Lepsius.	R. Lepsius, Geol. Attika, p. 99, 1893.	Olivine gabbro.	In W. T., p. 435.
53	Gochasa River, Karabagh, Armenia.	Not stated.	A. S. Ginsberg, Ann. Inst. Poly. Pet. Gr., XX, p. 66, 1913.	Olivbonb gae.r	
54	Kakoulima, French Guinea.	Pisani.	A. Lacroix, N. Arch. Mus., III, p. 114, 1911.	Gabbro.	
55	Riasanov Trail, Jenissei District, Siberia.	Not stated.	A. Meister, Reg. Aurif. Sib., IX, p. 418, 1910.	Gabbro.	Not fresh.
56	Kali Soeroean, Loh-oelo, Java.	N. Sahlbom.	G. Niethammer, T. M. P. M., XXVIII, p. 240, 1909.	Olivine norite.	
57	Boppy, Broken Hill, New South Wales.	J. C. H. Mingaye.	G. W. Card, pers. com.	Hornblende norite.	
58	Long Gulley, Dun Mountains, Nelson, New Zealand.	J. S. Maclaurin.	J. M. Bell, G. S. N. Z. B. 12, p. 35, 1911.	Prehnite rodingite.	
59	Serpentine Valley, Dun Mountains, Nelson, New Zealand.	J. S. Maclaurin.	J. M. Bell, G. S. N. Z. B. 12, p. 35, 1911.	Prehnite rodingite.	
60	Roding River, Dun Mountains, Nelson, New Zealand.	J. S. Maclaurin.	J. M. Bell, G. S. N. Z., B. 12, p. 33, 1911.	Rodingite.	

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DIABASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A3. III	42.96	17.45	2.29	11.04	9.77	6.80	1.93	1.51	4.75	0.47	0.66				99.63	
2 A3. III	48.41	19.29	1.33	8.27	4.70	4.93	5.92	0.41	3.99		0.88			CO_2 2.41	100.54	
3 A1. I	46.28	14.24	3.93	11.62	7.40	11.28	2.48	0.81	0.28	0.05	1.70	0.15	0.02	Cl 0.08 S 0.06 Cr_2O_3 0.01 BaO trace SrO trace	100.39	
4 A1. I	49.64	15.07	1.66	8.82	5.43	7.23	4.19	0.89	2.81	0.45	2.32	0.29	0.25	CO_2 0.32 ZrO_2 none FeS_2 0.79 Cr_2O_3 trace V_2O_3 0.04 NiO trace BaO 0.02 SrO 0.05	100.27	
5 A1. I	42.25	16.87	5.24	10.72	6.91	3.33	3.96	0.77	5.58	0.43	2.93	0.34	0.40	CO_2 none ZrO_2 none S trace Cr_2O_3 0.03 V_2O_3 0.07 NiO 0.01 BaO trace SrO none	99.84	
6 A2. II	41.15	13.51	2.32	8.63	10.09	8.75	3.21	1.22	3.05		1.60	0.61	1.28	CO_2 5.54	100.96	
7 A2. II	39.32	14.48	2.01	8.73	11.11	8.30	3.76	0.87	2.57		1.70	0.61	0.71	CO_2 5.25	99.42	
8 A1. I	49.63	14.40	2.85	8.06	7.25	9.28	2.47	0.70	1.47	0.27	1.68	0.25	0.17	CO_2 1.36 SO_3 none Cl 0.07 F trace FeS_2 0.22 NiO 0.04 BaO trace	100.17	
9 A2. II	45.56	16.57	0.36	9.40	10.34	8.01	2.55	1.20	3.93		1.20		0.20	CO_2 1.02	100.34	
10 B2. III	42.77	14.06	2.72	8.34	9.72	11.47	1.89	1.43	2.74		2.35		0.15	CO_2 1.62	99.26	
11 A2. II	41.63	13.26	3.19	9.92	7.31	8.86	2.49	3.32	1.35		3.95		0.27	CO_2 5.20	100.75	
12 A1. I	53.83	16.36	0.89	n. d.	0.13	9.81	7.89	1.58	0.36	0.15	0.86	0.11	trace	CO_2 7.47 ZrO_2 0.02 S 0.17 BaO none SrO none Cu 0.14	99.77	
13 A1. I	53.52	9.70	8.06	9.45	2.52	5.64	2.24	1.50	2.16	1.67	1.98	0.36	0.26	CO_2 1.02 ZrO_2 0.03 SO_3 none S 0.10 NiO none BaO none SrO none	100.21	
14 A2. II	51.56	14.82	4.30	7.21	7.36	7.09	4.21	0.17	1.47		1.97	0.09	trace	BaO trace	100.25	
15 A2. II	55.07	14.18	7.20	1.92	5.98	9.03	4.11	0.37	0.72		1.56		0.30		100.44	2.99
16 A3. III	49.28	15.92	1.91	10.20	5.99	7.44	3.40	0.72	3.90				0.37	CO_2 1.14	100.27	2.86
17 A2. II	46.86	13.96	5.23	4.67	7.69	9.42	1.85	2.02	3.43	1.29	1.13	0.15	trace	CO_2 2.19 F trace BaO 0.03 SrO trace	99.92	

DIABASE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Garthby, Quebec.	M. F. Connor.	J. A. Dresser, Can. G. S. Mem. 22, p. 33, 1913.	Diabase.	
2	Gowganda, Ontario.	N. L. Bowen.	N. L. Bowen, J. G., XVIII, p. 667, 1910.	Diabase.	
3	Rocky Islet Bay, Rainy Lake, Ontario.	M. F. Connor.	A. C. Lawson, Can. G. S. Mem. 40, p. 50, 1913.	Greenstone schist.	
4	Aroostook Falls, Aroostook County, Maine.	W. F. Hillebrand.	H. E. Gregory, U. S. G. S. B. 165, p. 176, 1900.	Diabase.	In W. T., p. 285.
5	Mars Hill, Aroostook County, Maine.	W. F. Hillebrand.	H. E. Gregory, U. S. G. S. B. 165, p. 179, 1900.	Diabase.	In W. T., p. 327.
6	Auburn, Maine.	Packard.	G. P. Merrill, A. G., X, p. 54, 1892.	Diabase.	In W. T., p. 437.
7	Lewiston, Maine.	Packard.	G. P. Merrill, A. G., X, p. 54, 1892.	Diabase.	In W. T., p. 437.
8	Mount Ascutney, Vermont.	W. F. Hillebrand.	R. A. Daly, U. S. G. S. B. 209, p. 88, 1902.	Diabase.	In W. T., p. 329.
9	Littleton, New Hampshire.	G. W. Hawes.	G. W. Hawes, A. J. S., XII, p. 133, 1876.	Metadiabase.	Not in W .T.
10	Livermore Falls, Campton, New Hampshire.	G. W. Hawes.	G. W. Hawes, A. J. S., XVII, p. 150, 1878.	Olivine diabase.	Not in W. T.
11	Livermore Falls, Campton, New Hampshire.	G. W. Hawes.	G. W. Hawes, A. J. S., XVII, p. 150, 1878.	Diabase.	Not in W. T.
12	Mount Tom, Massachusetts.	W. F. Hillebrand.	B. K. Emerson, J. G., X, p. 510, 1902.	Holyokeite (altered diabase).	
13	Holyoke, Massachusetts.	G. Steiger.	B. K. Emerson, B. G. S. A., XVI, p. 112, 1905.	Quartz diabase.	
14	Leverett, Massachusetts.	L. G. Eakins.	B. K. Emerson, U. S. G. S. Mon. 29, p. 345, 1898.	Diabase.	Altered. Not in W. T.
15	Maltby Park, New Haven, Connecticut.	G. W. Hawes.	G. W. Hawes, A. J. S., XI, p. 125, 1876.	Metamelaphyre.	Not in W. T.
16	Lake Saltonstall, n. New Haven, Connecticut.	G. W. Hawes.	G. W. Hawes, A. S. S., IX, p. 190, 1875.	Diabase.	Not in W. T.
17	Near Meriden, Connecticut.	H. N. Stokes.	B. K. Emerson, B. G. S. A., VIII, p. 77, 1897.	Diabase pitchstone.	Also in U. S. G. S. Mon. 29, p. 437, 1898. In W. T., p. 329.

DIABASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
18 A3. III	46.54	14.90	3.54	9.83	4.86	7.94	2.43	0.60	4.52				0.35	CO_2 4.35	99.85	2.83
19 A1. I	47.55	16.65	4.94	5.12	5.63	4.77	4.20	2.52	5.57	0.24	0.87	0.27	0.46	$CaCO_3$ 0.34 Cl 0.10 F 0.06 S 0.01 C 0.80	100.10	
20 A2. II	52.83	13.79	4.42	7.86	5.61	8.99	2.42	1.46	1.30	0.71	1.18	0.31		CO_2 trace S trace	100.88	
21 A2. II	52.34	12.46	3.37	10.08	3.97	7.88	2.26	1.66	1.46	0.14	2.96	1.19	0.11	CO_2 trace S 0.18	100.06	3.097
22 B2. III	49.65	13.93	4.11	9.78	4.89	9.05	2.86	1.71	1.49	0.09	3.03	0.32	0.14	CO_2 trace S 0.20	101.25	
23 A2. II	48.99	13.93	2.45	10.94	6.29	10.02	2.59	0.80	1.47	0.09	3.33	0.33	0.11	CO_2 trace S trace	100.34	
24 A2. II	48.10	15.25	2.57	8.28	9.33	11.11	1.48	0.35	1.22	0.53	0.69	0.11	0.15	CO_2 0.83 S 0.20	100.20	
25 A2. II	43.62	17.30	14.13	6.83	2.34	1.63	3.45	3.03	2.93	0.30	2.75	1.34	trace	Cr_2O_3 none NiO none BaO 0.09 SrO trace	99.74	
26 A2. II	48.85	15.83	2.50	10.79	5.82	6.20	2.79	1.31	3.77	0.27	1.28	0.22	0.11	CO_2 none SO_3 0.06 BaO none SrO 0.09	99.89	
27 A3. III	46.98	17.85	3.13	10.30	7.10	8.47	2.04	0.60	1.97	1.55		0.14	0.26	CO_2 0.20 Cl 0.07 S 0.10	100.76	2.83
28 A3. III	47.99	16.57	6.01	5.13	6.01	9.36	2.00	1.39	2.64		2.71		trace		99.81	
29 A3. III	46.99	18.47	4.44	7.24	6.03	9.53	3.37	0.33	3.90				trace		100.30	2.901
30 A3. III	46.13	19.79	7.24	3.79	7.27	11.43	2.55	0.52	1.83				trace	CO_2 0.29	100.84	2.877
31 A2. II	45.21	15.85	9.55	4.37	7.35	10.36	2.47	0.31	1.36	0.47	2.14	0.17	0.89	CO_2 0.48 Cl 0.04 S 0.07	100.99	
32 A2. II	46.85	22.62	5.12	1.58	2.01	1.25	0.80	2.66	8.25	3.12	1.12	0.16	2.54	CO_2 1.89 NiO 0.08 BaO 0.10	100.15	
33 A2. II	41.60	37.20	3.21	0.30	0.02	0.23	0.07	—	13.54	0.29	3.79	0.14	0.08	CO_2 0.38 BaO trace	100.85	
34 A1. I	46.47	16.28	3.15	8.96	6.56	7.90	3.64	0.21	3.89	0.28	1.28	0.13	0.09	CO_2 1.26 SO_3 none F trace Cr_2O_3 0.01 BaO none SrO none Cu trace	100.11	
35 A3. III	48.35	15.40	4.04	4.63	11.61	10.38	1.87	0.35	3.60					CO_2 0.08	100.31	
36 A1. I	48.07	19.02	7.65	4.83	3.30	9.84	2.84	0.63	1.69	0.43	1.72	none	0.21	CO_2 none S 0.11 Cr_2O_3 0.18 BaO 0.02 SrO 0.02	100.56	

DIABASE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
18	South Durham Mountain, Connecticut.	G. W. Hawes.	G. W. Hawes, A. J. S., IX, p. 191, 1875.	Diabase.	Not in W. T.
19	Stark's knob, Saratoga, New York.	E. W. Morley.	H. P. Cushing, N. Y. St. Mus. B. 169, p. 129, 1914.	Diabase.	
20	Rose's mill, Nelson County, Virginia.	W. M. Thornton.	Watson and Taber, Va. G. S. B. III A, p. 158, 1913.	Diabase.	Not fresh.
21	Tye River, Nelson County, Virginia.	W. M. Thornton.	Watson and Taber, Va. G. S. B. III A, p. 158, 1913.	Diabase.	
22	Roseland, Nelson County, Virginia.	W. M. Thornton.	Watson and Taber, Va. G. S. B. III A, p. 158, 1913.	Diabase.	
23	Piney River, Nelson County, Virginia.	W. M. Thornton.	Watson and Taber, Va. G. S. B. III A, p. 158, 1913.	Diabase.	
24	Cross Keys, Augusta County, Virginia.	J. W. Watson.	Watson and Cline, B. G. S. A., XXIV, p. 328, 1913.	Olivine diabase.	
25	Boone, Watauga County, North Carolina.	H. N. Stokes.	A. Keith, U. S. G. S. B. 168, p. 53, 1900.	Amygdaloid.	Metamorphosed. In W. T., p. 437.
26	Marquette District, Michigan.	G. Steiger.	C. R. Van Hise, U. S. G. S. B. 148, p. 98, 1897.	Altered greenstone.	In W. T., p. 319.
27	Lighthouse Point, Marquette, Michigan.	E. E. Ware.	A. C. Lane, J. G., XII, p. 89, 1904.	Diabase.	At contact.
28	Isle Royale, Michigan.	F. F. Sharpless.	A. C. Lane, G. S. Mich., VI (1), p. 250, 1898.	Diabase.	"Relatively fresh." Not in W. T.
29	Isle Royale, Michigan.	F. P. Burrall.	A. C. Lane, G. S. Mich., VI (1), p. 215, 1898.	Melaphyre.	Not in W. T.
30	Isle Royale, Michigan.	F. P. Burrall.	A. C. Lane, G. S. Mich., VI (1), p. 143, 1898.	Melaphyre.	Not in W. T.
31	St. Marys, Michigan.	F. K. Owitz.	A. C. Lane, Korngr. Auvergn., p. 8, 1906.	Diabase.	MnO high?
32	Penokee-Gogebic region, Michigan.	T. M. Chatard.	C. R. Van Hise, U. S. G. S. Mon. 19, p. 357, 1892.	Diabase.	Altered. Cf. No. 36, III.5.4.4–5. In W. T., p. 439.
33	Aurora Mine, Penokee-Gogebic region, Michigan.	T. M. Chatard.	C. R. Van Hise, U. S. G. S. Mon. 19, p. 357, 1892.	Diabase.	In W. T., p. 439.
34	Crystal Falls, Michigan.	H. N. Stokes.	J. M. Clements, U. S. G. S. Mon. 35, p. 103, 1899.	Metabasalt (diabase).	In W. T., p. 285.
35	Upper Quinnesec Falls, Menominee River, Wisconsin.	R. B. Riggs.	G. H. Williams, U. S. G. S. B. 62, p. 104, 1890.	Greenstone.	In W. T., p. 331.
36	Tamarack Creek, Minnesota.	A. W. Johnston.	F. F. Grout, J. G., XVIII, p. 644, 1910.	Diabase.	Weathered red.

DIABASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
37 A1. I	47.54	17.40	9.21	2.71	5.14	6.40	2.61	1.80	4.38	0.73	1.79	0.06	0.11	CO_2 0.15 S 0.04 Cr_2O_3 0.02 BaO 0.02	100.11	2.778
38 A1. I	47.22	17.17	10.21	2.47	5.00	6.58	2.70	2.15	3.73	0.54	1.96	0.15	0.12	CO_2 none S none Cr_2O_3 0.02 BaO 0.03	100.05	2.821
39 A1. I	46.99	21.15	7.14	3.94	2.73	2.17	0.80	6.12	6.32	1.30	0.92	0.56	0.12	CO_2 none S 0.14 Cr_2O_3 0.06 BaO none SrO 0.03	100.49	
40 A1. I	42.35	17.24	9.90	2.69	7.01	7.47	0.93	1.48	7.13	1.57	1.84	0.14	0.15	CO_2 0.10 S none Cr_2O_3 0.01 BaO 0.01	100.02	2.695
41 A2. II	46.88	17.27	2.47	8.84	6.73	8.65	2.51	1.25	3.30	0.28	1.64	0.35	0.15	S trace BaO trace	100.32	
42 A1. I	50.90	16.71	0.40	8.50	5.14	9.74	3.50	0.60	2.12	0.03	1.80	0.07	0.13	CO_2 0.51 ZrO_2 none S none BaO 0.02 SrO trace	100.17	
43 A2. II	52.06	14.34	2.11	7.74	9.26	8.05	1.74	0.73	2.90	0.59	0.47	0.13	trace		100.12	
44 A2. II	51.58	14.99	2.04	8.36	6.51	8.59	3.08	0.31	2.67	0.34	1.05	0.24	trace		99.76	
45 A2. II	51.28	15.05	2.42	8.01	6.07	7.08	4.43	0.12	2.96	0.39	1.33	0.13	0.25	NiO 0.10	99.62	
46 A2. II	49.08	14.68	1.95	9.63	6.69	10.09	4.60	0.20	1.18	0.28	1.72	0.23	0.15		100.48	
47 A2. II	54.66	15.85	1.82	5.12	5.64	8.75	3.46	0.47	2.48	0.25	0.67	0.15	0.18	FeS_2 0.09 NiO trace BaO 0.04 SrO trace	100.02	
48 A2. II	49.24	14.79	1.36	8.00	6.89	10.74	2.76	0.88	2.97	0.20	0.96	0.17	0.18	CO_2 0.90 BaO 0.04 SrO trace	100.08	
49 A2. II	48.26	14.83	3.27	5.97	8.77	11.38	1.57	1.13	3.37	0.10	0.51	0.25	0.15	CO_2 1.24 BaO 0.05 SrO trace	100.85	
50 A2. II	45.74	5.29	0.13	2.06	0.94	23.85	0.11	1.29	1.07	0.22	0.36	0.07	0.26	CO_2 18.91 FeS_2 0.49 BaO trace SrO none	100.79	
51 A2. II	46.98	14.94	5.01	4.88	6.86	5.40	3.52	1.10	4.48		0.42	0.49		CO_2 5.39	99.47	2.703
52 A2. II	57.56	13.83	2.46	3.63	4.67	7.27	3.96	0.48	2.66		0.17	trace	trace	CO_2 3.50 S none	100.19	
53 A2. II	49.80	13.93	2.24	8.07	8.85	7.96	2.02	0.19	2.20		0.08	trace	trace	CO_2 4.87	100.21	
54 A2. II	49.46	16.77	1.98	6.57	9.33	11.17	1.55	0.04	2.02		0.79	none	trace	CO_2 0.27 NiO trace S none	99.95	
55 B3. IV	49.07	10.60	12.03	6.57	4.68	8.58	2.56	1.76	1.70					CO_2 1.65	99.20	3.020

DIABASE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
37	Pine County, Minnesota.	F. F. Grout.	F. F. Grout, J. G., XVIII, p. 647, 1910.	Diabase.	Altered.
38	Pine County, Minnesota.	F. F. Grout.	F. F. Grout, J. G., XVIII, p. 647, 1910.	Diabase.	Altered.
39	Tamarack Creek, Minnesota.	A. W. Johnston.	F. F. Grout, J. G., XVIII, p. 644, 1910.	Diabase.	Weathered green.
40	Pine County, Minnesota.	F. F. Grout.	F. F. Grout, J. G., XVIII, p. 647, 1910.	Diabase.	Altered.
41	Mount Devon, Missouri.	W. F. Hillebrand.	A. Johannsen, U. S. G. S. B. 419, p. 40, 1910.	Devonite (diabase porphyrite).	Groundmass only (A. J.). Cf. p. 533.
42	Riddles quadrangle, Oregon.	G. Steiger.	G. F. Kay, U. S. G. S. B. 419, p. 167, 1910.	Diabase greenstone.	
43	Mitchell Canyon, Mount Diablo, California.	W. H. Melville.	W. H. Melville, B. G. S. A., II, p. 412, 1891.	Diabase.	In W. T., p. 333.
44	Mitchell Canyon, Mount Diablo, California.	W. H. Melville.	W. H. Melville, B. G. S. A., II, p. 412, 1891.	Diabase.	In W. T., p. 327.
45	Sulphur Bank, California.	W. H. Melville.	G. F. Becker, U. S. G. S. Mon. 13, p. 99, 1888.	Pseudodiabase.	In W. T., p. 327.
46	Mount St. Helena, California.	W. H. Melville.	G. F. Becker, U. S. G. S. Mon. 13, p. 98, 1888.	Pseudodiabase.	In W. T., p. 327.
47	Butte County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 14, II, p. 473, 1894.	Diabase tuff.	In W. T., p. 439.
48	Jackson, Amador County, California.	W. F. Hillebrand.	H. W. Turner, U. S. G. S. A. R. 14, II, p. 473, 1894.	Melaphyre tuff.	In W. T., p. 445.
49	Browns Valley, Yuba County, California.	W. F. Hillebrand.	W. Lindgren, U. S. G. S. B. 148, p. 228, 1897.	Diabase porphyrite.	In W. T., p. 333.
50	North Station Mine, Nevada County, California.	W. F. Hillebrand.	W. Lindgren, U. S. G. S. A. R. 17, II, p. 149, 1896.	Diabase.	Altered wall rock. In W. T., p. 439.
51	Miahuatlan, Oaxaca, Mexico.	A. Röhrig.	H. Lenk, Btr. G. Mex., II, p. 123, 1899.	Olivine diabase.	In W. T., p. 439.
52	Camans, Barama River, British Guiana.	J. B. Harrison.	J. B. Harrison, Rep. G. N. W. Dist., p. 12, 1898.	Diabase.	Altered. In W. T., p. 245.
53	Camans, Barama River, British Guiana.	J. B. Harrison.	J. B. Harrison, Rep. G. N. W. Dist., p. 12, 1898.	Diabase.	Altered. In W. T., p. 439.
54	Barama District, British Guiana.	J. B. Harrison.	J. B. Harrison, Rep. G. N. W. Dist., p. 6, 1898.	Diabase.	Altered. In W. T., p. 335.
55	Rio de Janeiro, Brazil.	F. Quincke.	E. O. Hovey, T. M. P. M., XIII, p. 216, 1892.	Diabase.	In W. T., p. 311.

DIABASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
56 A2. II	44.07	12.15	9.99	12.34	1.45	6.06	4.54	1.87	3.87	0.73	2.00	0.38	trace		99.45	
57 A2. II	48.63	12.49	11.72	9.08	2.37	8.75	2.46	0.64	0.80	0.79	2.20	0.77	trace		100.70	
58 A2. II	48.38	10.42	12.11	4.99	3.53	7.98	4.74	1.50	1.97	0.96	2.58	1.04	trace		100.20	
59 A3. III	51.80	16.43	1.20	10.64	5.76	4.13	3.81	0.85	3.89	1.47			0.39		100.37	
60 A2. II	48.02	13.03	2.11	9.99	4.21	9.77	2.17	0.49	4.27	1.05	3.36	0.40		SO_3 trace F 0.06 FeS_2 1.24	100.16	
61 A1. I	51.31	12.67	0.54	7.99	2.19	8.17	5.21	0.54	2.31	0.04	1.92	0.90	0.45	CO_2 6.15 FeS_2 0.30 Fe_7S_8 0.17 NiO trace BaO none SrO none	100.86	
62 A2. II	42.36	14.09	2.17	10.48	5.70	10.05	3.26	0.80	2.92	0.12	4.95	1.02	0.28	CO_2 1.73 Cl trace S none NiO 0.09 BaO none	100.02	
63 A3. III	49.80	17.77	2.29	8.75	5.67	8.85	1.48	0.48	2.62	1.04	1.56	trace	trace		100.31	2.932
64 A2. II	62.29	12.27	1.29	8.65	2.45	3.29	0.23	2.66	1.65		1.13	0.32	0.27	CO_2 4.34	100.84	2.648
65 A1. I	58.47	16.11	0.85	6.90	1.58	0.94	4.34	5.18	2.08	0.43	1.18		0.46	CO_2 1.34 Cl 0.07 FeS_2 0.03 NiO none BaO 0.08 Li_2O none	100.31	
66 A1. I	46.73	18.73	none	10.14	3.56	8.62	3.54	0.88	3.31	0.35	2.74	0.37	0.37	CO_2 0.58 FeS_2 0.05 NiO none BaO none	99.97	
67 A1. I	39.28	12.14	2.80	7.52	3.66	12.82	4.56	0.08	2.77	0.19	3.53	0.57	0.37	CO_2 10.06 Cl 0.01 NiO none BaO none Li_2O trace	100.36	
68 A2. II	50.75	12.15	9.26	0.15	6.22	6.31	0.55	7.03	1.78		1.46		0.43	CO_2 3.76	99.85	
69 A3. III	39.20	18.80	8.62	5.00	10.04	9.70	1.88	0.17	4.53	0.10					100.24	
70 A1. I	47.56	14.27	1.63	6.80	4.90	10.95	4.61	0.27	2.65	0.42	2.40	0.19	0.30	CO_2 2.95 FeS_2 0.05 Fe_7S_8 0.22 NiO 0.08 BaO none	100.25	
71 A1. I	47.19	13.96	3.39	9.01	7.10	8.08	4.50	0.70	2.56	0.12	2.09	0.56	0.47	CO_2 0.79 FeS_2 0.11 NiO 0.04 BaO 0.06 Li_2O trace	100.73	
72 A1. I	48.58	14.58	1.89	7.65	6.36	9.80	4.02	0.43	2.93	0.68	1.77	0.19	0.46	CO_2 1.00 FeS_2 0.26 NiO 0.03 BaO none Li_2O none	100.63	

DIABASE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
56	Tagaruassu, Serra des Parecis, Matto Grosso, Brazil.	M. Goldschlag.	M. Goldschlag, In. Diss. Jena, p. 27, 1913.	Proterobase.	
57	Cerro Domingo, Sierra Villa Rica, Paraguay.	M. Goldschlag.	M. Goldschlag, In. Diss. Jena, p. 31, 1913.	Olivine diabase.	Not fresh.
58	Esperanza, Rio Estrella, Paraguay.	M. Goldschlag.	M. Goldschlag, In Diss. Jena, p. 33, 1913.	Olivine diabase.	Not fresh.
59	Caribber Glen, Linlithgow, Scotland.	G. S. Blake.	J. D. Falconer, Tr. G. Soc. Edin., XLV, p. 147, 1908.	Diabase.	Margin of sill.
60	Kettlestoun, Linlithgow, Scotland.	G. S. Blake.	J. D. Falconer, Tr. R. Soc. Edin., XLV, p. 147, 1908.	Diabase.	
61	Tayvallich, Argyll, Scotland.	E. G. Radley.	J. S. Flett, G. S. Scot. Mem. Sh. 27–29, p. 87, 1911.	Diabase.	
62	Ardifuar, Crinanboch, Argyll, Scotland.	E. G. Radley.	J. S. Flett, G. S. Scot. Mem., Sh. 36, p. 55, 1909.	Diabase.	
63	Auchinstarry, Kilsyth, Dumbarton, Scotland.	D. P. Macdonald.	G. W. Tyrrell, G. Mag. (V), VI, p. 361, 1909.	Diabase.	
64	Whinsill, England.	A. M. Finlayson.	A. M. Finlayson, Q. J. G. S., LXVI, p. 304, 1910.	Diabase.	Altered. Cf. No. 55, III.5.3.4.
65	Trusham station, n. Newton Abbott, Devonshire, England.	E. G. Radley.	J. S. Flett, G. S. Eng. Mem., Sh. 339, p. 62, 1913.	Albite diabase.	
66	Teign, Devonshire, England.	E. G. Radley.	Dewey and Flett, G. Mag. (V), VIII, p. 208, 1911.	Albite diabase.	
67	Chipley Quarry, Bickington, Devonshire, England.	E. G. Radley.	J. S. Flett, G. S. Eng. Mem., Sh. 339, p. 56, 1913.	Spilite.	
68	Spencecombe, Exeter, England.	J. G. Wilson.	J. J. H. Teall, G. S. Eng. Mem., Sh. 325, p. 80, 1902.	Trap.	
69	Amlwch, Anglesey, Wales.	J. O. Hughes.	A. Harker, Rep. B. A. A. S., 1912, p. (4).	Diabase.	
70	Tregedden, Cornwall.	E. G. Radley.	Dewey and Flett, G. Mag. (V), VIII, p. 206, 1911.	Spilite.	
71	Cartuther, Cornwall.	W. Pollard.	J. S. Flett, G. S. Eng. Mem., Sh. 348, p. 100, 1907.	Proterobase.	Minverite (hornblende picrite), in H. Dewey, G. S. Eng. Sh. 337, p. 65, 1911.
72	Mullion Island, Cornwall.	W. Pollard.	Flett and Hill, G. S. Eng. Mem., Sh. 359, p. 185, 1912.	Spilite.	

DIABASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
73 A1. I	40.55	16.65	1.13	9.46	5.20	6.06	4.76	0.27	3.89	0.27	2.95	0.73	0.20	CO_2 7.85 Cl none S 0.10 NiO 0.07 BaO none SrO none	100.14	
74 A3. III	44.93	16.27	13.37	n. d.	6.40	1.84	2.03	0.84	12.55		1.34		0.28		99.85	2.592
75 A2. II	43.56	14.58	3.84	7.00	9.95	10.78	1.86	1.02	3.85		1.03		0.39	CO_2 1.93	99.79	2.923
76 B3. IV	48.50	17.20	0.40	9.23	8.22	3.19	4.08	0.49	6.20		3.46				100.97	
77 A3. III	45.80	15.10	9.44	2.34	3.92	7.70	4.33	1.38	5.00		3.12			CO_2 1.60	99.73	
78 A3. III	47.59	18.73	5.12	7.65	5.92	8.86	2.11	1.00	1.21		1.19		trace	CO_2 0.57	99.95	3.024
79 A2. II	56.33	16.25	1.22	3.46	4.89	6.92	6.26	0.39	0.80	0.15	1.76	0.96	0.13	S trace BaO none	99.52	
80 A2. II	50.29	16.00	2.14	8.36	5.92	10.22	3.24	0.62	1.52		1.35	0.18	0.27		100.11	
81 A2. II	49.68	16.40	3.46	7.50	6.20	10.14	3.00	1.12	1.52		0.70	0.09	0.32		100.13	
82 A2. II	47.18	15.76	6.11	5.38	7.88	9.18	3.09	0.44	3.89		0.59		0.56		99.96	
83 A2. II	46.19	15.29	1.27	10.90	6.76	8.53	2.45	0.38	3.70		1.51	0.13	0.19	CO_2 1.91 FeS_2 1.54	100.70	2.91
84 A2. II	45.27	14.69	2.31	11.02	8.18	9.47	2.19	0.76	3.18		1.47	0.13	0.19	CO_2 1.68 FeS_2 0.26	100.80	
85 B2. III	41.08	14.28	15.62	7.16	6.95	5.75	1.22	0.76	4.84		0.89	0.83			99.38	2.896
86 A2. II	55.04	13.83	2.19	7.39	4.78	7.08	5.90	0.36	0.77		1.15	0.08	0.20	CO_2 1.28 S 0.01	100.06	2.90
87 A2. II	51.05	12.68	10.23	3.89	8.30	6.83	2.96	1.06	0.33		1.22	0.13	0.35		100.03	
88 A3. III	49.70	19.31	none	8.93	8.13	12.27	1.17	0.14	0.95						100.60	
89 A2. II	49.03	16.20	5.28	4.69	16.90	4.35	1.19	0.62	0.61		0.80	none	0.15		99.82	
90 A3. III	46.52	16.11	11.76	6.31	5.45	9.79	2.20	1.83							100.38	
91 A2. II	54.23	14.37	2.26	4.76	7.71	7.00	2.56	3.30	1.79		0.89	0.48		CO_2 0.59 SO_3 0.15	100.09	2.779

DIABASE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
73	Devonport, England.	W. Pollard.	J. S. Flett, G. S. Eng. Mem., Sh. 348, p. 97, 1907.	Spilite.	
74	Fort Regent, St. Helier, Jersey, Channel Islands.	P. Holland.	Holland and Dickson, Pr. Liv. G. Soc., VII, p. 114, 1897.	Diabase.	Not in W. T.
75	Fort Regent, St. Helier, Jersey, Channel Islands.	P. Holland.	Holland and Dickson, Pr. Liv. G. Soc., VII, p. 114, 1897.	Diabase.	Not in W. T.
76	Poyet, Lyonnais, France.	Pisani.	A. Michel-Levy, C. R., CLVI, p. 718, 1913.	Ortho-albitophyre.	
77	Tranchée Prola, Esterel, France.	Pisani.	A. Michel-Levy, B. Sv. Ct. G. Fr., XXI, No. 130, p. 41, 1912.	Melaphyre.	
78	Mount Hellwald, Spitzbergen.	H. Backlund.	H. Backlund, Ref. N. J., II, p. 243, 1911.	Diabase.	
79	Västra Värnsingen, Nordingra, Sweden.	N. Sahlbom.	J. E. Sobral, G. Nord. Reg., p. 171, 1913.	Värnsingite (diabase pegmatite).	Not fresh.
80	Orrleksdammen, Grängesberg, Sweden.	A. Grabe.	H. Johansson, G. F. F., XXXII, p. 314, 1910.	Amphibolite (altered diabase).	
81	Ormbergstjärn, Grängesberg, Sweden.	A. Grabe.	H. Johansson, G. F. F., XXXII, p. 314, 1910.	Amphibolite (altered diabase).	
82	Stadsberg, Ragunda Massif, Jemtland, Sweden.	H. Santesson.	A. G. Högbom, Afh. Sv. G. Und., No. 182, p. 45, 1899.	Olivine melaphyre.	Not in W. T.
83	Rackelberget, Sala, Sweden.	G. Nyblom.	H. J. Sjögren, G. F. F., XXXII, p. 1373, 1910.	Diabase.	
84	Sala, Sweden.	G. Nyblom.	H. J. Sjögren, G. F. F., XXXII, p. 1373, 1910.	Diabase.	
85	Silfberg, Dalarue, Sweden.	O. Larsson.	M. Weibull, Lund. Un. Ar. Sk., XXXIII (2), No. 4, p. 12, 1897.	Melaphyre.	Not in W. T.
86	Kurravaara, Kiruna District, Lapland.	G. Nyblom.	A. Lundbolm, G. F. F., XXXII, p. 787, 1910.	Soda greenstone.	
87	Kemi, Finland.	N. Sahlbom.	V. Hackman, B. C. G. Fin., No. 15, p. 61, 1905.	Uralite diabase.	
88	Impilaks, Finland.	H. Berghell.	V. Hackman, B. C. G. Fin., No. 15, p. 65, 1905.	Diabase.	Altered to hornblende schist.
89	Herajärvi, Juuka, Finland.	N. Sahlbom.	V. Hackman, B. C. G. Fin., No. 15, p. 68, 1905.	Uralite diabase.	CaO and MgO interchanged?
90	Kantua, Eura, Finland.	Not stated.	H. Gylling, Fin. G. Und., Bl. 12, p. 55, 1888.	Diabase.	In W. T., p. 335.
91	Söterburg, Nahe District, Rheinland.	Böttcher.	K. A. Lossen, Jb. Pr. G. L.-A., X, p. 309, 1892.	Olivine weiselbergite.	In W. T., p. 269.

DIABASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
92 A2. II	52.49	15.91	8.01	0.55	5.01	5.69	3.09	2.66	4.46		0.99	0.37		CO_2 0.01 SO_3 0.08 Org. 0.98	100.30	2.622
93 A2. II	44.05	13.97	9.08	4.36	4.91	11.64	3.35	1.06	1.80	0.95	1.36	none		CO_2 3.85 SO_3 0.19	100.57	
94 A2. II	42.15	14.04	2.94	11.09	4.28	10.39	1.50	0.58	3.09	0.85	1.88	0.31		CO_2 5.89 SO_3 0.54	99.53	2.80
95 A2. II	41.79	16.29	9.92	3.25	6.55	7.97	1.06	1.63	5.07	4.08	1.80	0.74		CO_2 0.18 SO_3 0.22	100.55	2.77
96 A2. II	50.88	15.40	1.23	3.84	5.31	5.84	3.03	3.31	2.00	0.30	0.52	0.16		CO_2 8.46 SO_3 0.05	100.33	
97 A2. II	47.05	11.87	4.40	6.26	8.88	8.77	2.68	1.08	4.97	1.37	1.92	1.17			100.42	
98 A2. II	45.45	12.98	3.04	7.03	9.99	9.05	1.32	1.52	5.14	1.45	2.23	0.40		CO_2 0.24 SO_3 0.02	99.86	
99 A3. III	61.03	21.41	4.81	1.47	0.56	2.54	4.44	2.20	1.04		0.16				99.99	
100 A3. III	51.82	11.66	4.39	5.46	7.02	12.65	3.38	0.32	1.25		0.44			CO_2 1.01 S 0.32	100.72	3.008
101 A3. III	44.82	18.72	4.01	10.24	7.64	7.55	3.49	0.74	1.75		0.93			CO_2 0.63	100.43	
102 A2. II	58.69	16.55	2.69	3.59	3.65	7.72	2.85	0.11	0.46	0.42	1.62	0.69		CO_2 0.61 SO_3 0.26	99.91	2.83
103 A2. II	45.69	17.55	1.88	7.88	5.46	8.61	1.95	0.49	2.22	0.33	1.98	1.61		CO_2 3.66 SO_3 0.60	99.91	2.80
104 A2. II	43.98	15.25	2.52	9.63	8.39	9.16	1.84	0.42	3.55	0.28	1.81	2.25		CO_2 0.20 SO_3 0.63	99.91	2.96
105 A2. II	41.08	16.77	1.80	11.04	4.85	9.42	2.13	0.73	2.25	0.23	2.57	0.29		CO_2 6.57 SO_3 0.53	100.26	2.81
106 A2. II	47.33	14.76	0.91	10.06	8.71	9.11	2.43	0.58	3.20	1.92	1.26	0.04	0.05	CO_2 0.24 S trace	100.60	2.792
107 A2. II	47.27	14.12	4.68	7.94	7.44	5.68	3.82	1.21	3.86	0.95	1.81	0.16	0.60	CO_2 1.10	100.64	2.80
108 A2. II	42.48	16.52	3.94	8.19	5.61	11.46	2.43	1.19	2.80	1.07	1.74	0.21		CO_2 3.30	100.93	2.84
109 A2. II	50.21	16.72	4.19	5.01	6.69	7.73	2.50	2.53	3.16		0.64	0.37		CO_2 0.13 SO_3 trace	99.98	2.777
110 A2. II	46.02	18.03	7.17	2.78	4.83	8.68	3.31	1.33	3.22		0.95	0.35		CO_2 2.90 SO_3 trace	99.57	2.692
111 B2. III	45.83	15.43	3.04	7.96	6.19	5.92	2.32	2.19	3.67		1.61	0.29		CO_2 3.95	99.10	2.756

DIABASE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
92	Sötern, Nahethal, Rheinland.	Bärwald.	K. A. Lossen, Jb. Pr. G. L.-A., X, p. 309, 1892.	Olivine melaphyre.	In W. T., p. 445.
93	Niederscheld, Rheinland.	Not stated.	R. Brauns, N. J. B. B., XXI, p. 311, 1906.	Diabase.	
94	Trigensteiner Schulde, Rheinland.	Not stated.	R. Brauns, N. J. B. B., XXI, p. 312, 1906.	Diabase.	
95	Oberscheld, Rheinland.	Not stated.	R. Brauns, N. J. B. B., XXI, p. 311, 1906.	Variolite.	
96	Kreigsfeld, Hesse.	Not stated.	H. Schopp, Erl. G. Kt. Hes., Bl. Fursfeld, p. 41, 1913.	Melaphyre.	
97	Annerod, Giessen, Hesse.	K. Hoffmann.	W. Schottler, Abh. G. L.-A. Darm., IV (3), p. 466, 1908.	Trap.	Rich in chabazite.
98	Allertshausen, Giessen, Hesse.	K. M. Jene.	W. Schottler, Abh. G. L.-A. Darm., IV (3), p. 466, 1908.	Trap.	Rich in chabazite.
99	Ruppertshain, Taunus Mountains.	L. Milch.	L. Milch, Z. D. G. G., XLI, p. 432, 1889.	Diabase.	Much altered. In W. T., p. 443.
100	Rauenthal, Taunus Mountains.	L. Milch.	L. Milch. Z. D. G. G., XLI, p. 430, 1889.	Diabase.	
101	Rauenthal, Taunus Mountains.	L. Milch.	L. Milch, Z. D. G. G., XLI, p. 430, 1889.	Diabase.	Pressed zone.
102	Steinperf, Hesse-Nassau.	G. Butzbach.	R. Brauns, N. J. B. B., XXVIII, p. 401, 1909.	Diabase.	
103	Sechshelden, Hesse-Nassau.	G. Butzbach.	R. Brauns, N. J. B. B., XXVII, p. 290, 1909.	Diabase porphyrite.	
104	Manderbacher Löhren, Hesse-Nassau.	G. Butzbach.	R. Brauns, N. J. B. B., XXVII, p. 284, 1909.	Mica diabase.	
105	Haiger, Schleierberg, Hesse-Nassau.	G. Butzbach.	R. Brauns, N. J. B. B., XXVII, p. 291, 1909.	Diabase.	
106	Radersberg, n. Herborn, Hesse-Nassau.	E. Reuning.	E. Reuning, N. J. B. B., XXIV, p. 425, 1907.	Diabase.	
107	Hartenrod, n. Herborn, Hesse-Nassau.	F. Heineck.	F. Heineck, N. J. B. B., XVII, p. 110, 1903.	Diabase.	
108	Hartenrod, n. Herborn, Hesse-Nassau.	F. Heineck.	F. Heineck, N. J. B. B., XVII, p. 137, 1903.	Diabase.	
109	Querenberg, n. Giesshübl, Thuringerwald.	G. F. Steffen.	H. Loretz, Jb. Pr. G. L.-A., IX, p. 306, 1889.	Melaphyre.	In W. T., p. 271.
110	Sommerberg, Thuringerwald.	G. F. Steffen.	H. Loretz, Jb. Pr. G. L.-A., IX, p. 306, 1889.	Melaphyre.	In W. T., p. 447.
111	Thalexweiler, Prussia.	Not stated.	Weiss and Grebe, Erl. G. Kt. Pr., Bl. Lebach, p. 38, 1889.	Diabase.	In W. T., p. 443.

DIABASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
112 A2. II	45.81	14.92	1.99	6.52	7.62	9.32	4.54	0.31	4.11		0.70	0.11		CO_2 3.88	99.89	2.814
113 A2. II	56.03	19.74	2.40	4.07	1.49	8.17	3.16	2.09	0.90		1.51	0.22	0.17	CO_2 0.61 Li_2O trace	100.56	
114 A3. III	55.87	19.81	1.70	3.42	5.04	4.62	2.77	1.91	2.01		2.21			CO_2 1.11	100.47	
115 A2. II	52.45	17.57	1.17	4.82	4.84	11.76	2.29	1.40	1.23		0.72	0.15	0.10	CO_2 1.92	100.42	
116 A2. II	50.76	16.68	5.84	1.69	1.72	10.48	3.27	3.12	1.18		1.64	0.15	0.36	CO_2 4.02	100.91	2.73
117 A2. II	50.15	15.02	5.17	5.17	6.90	8.25	2.59	1.33	4.08		0.33	0.26		CO_2 0.32 SO_3 0.09	99.66	2.753
118 A2. II	50.08	18.30	0.91	6.66	3.71	3.77	1.14	5.63	6.17		1.07	0.10	0.16	CO_2 2.32	100.02	
119 A2. II	45.48	17.96	1.48	5.54	4.20	10.74	3.64	2.20	1.58		1.32	0.40	0.22	CO_2 6.02	100.78	
120 A3. III	47.32	16.42	7.76	5.95	5.83	9.52	3.31	1.23	2.10		trace	trace	0.28	S 0.11	99.83	2.916
121 A3. III	46.21	15.23	9.97	4.42	5.94	9.43	4.52	1.18	2.74		trace	trace	0.21	S trace BaO trace SrO 0.11	100.04	2.954
122 A3. III	45.29	13.67	12.91	8.12	5.66	5.41	5.18	1.57	2.39		trace		0.22	As_2O_3 0.07 SrO 0.31	100.80	2.939
123 A2. II	43.79	19.50	4.97	6.48	8.06	8.34	2.28	0.78	1.56		2.37	0.68		CO_2 1.19	100.00	
124 A2. II	52.23	17.40	1.90	5.40	6.50	2.86	4.30	1.85	5.58		1.19	0.31		CO_2 0.75 SO_3 0.10 C 0.09	100.46	2.637
125 A2. II	48.27	17.13	1.85	4.89	3.06	9.77	3.06	2.42	1.59		0.99	0.19		CO_2 6.90 SO_3 0.09	100.21	2.733
126 A2. II	49.03	12.63	3.68	10.94	1.64	7.76	2.33	2.40	3.42		2.06	0.54		CO_2 3.45	100.39	2.82
127 B2. III	48.50	14.39	2.13	10.91	6.54	8.71	3.18	0.58	3.95		1.74	0.22		CO_2 0.15	101.00	
128 A2. II	48.47	15.51	2.52	8.46	3.83	6.36	6.26	0.44	4.38		2.05	0.23		CO_2 1.29 SO_3 0.31	100.11	2.723
129 A2. II	48.28	15.53	2.50	9.01	3.80	6.07	6.10	0.82	4.51		1.88	0.32		CO_2 1.15 SO_3 0.31	100.27	2.725
130 A2. II	47.88	14.77	3.01	8.32	5.99	7.68	5.51	0.32	3.88		1.92	0.24		CO_2 0.62 SO_3 0.30	100.44	2.807
131 A2. II	44.69	16.27	2.16	7.16	5.00	8.98	4.65	1.30	3.86		1.91	0.18		CO_2 3.47 SO_3 0.38	100.01	2.774

DIABASE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
112	Blatt Allendorf, Prussia.	Not stated.	F. Beyschlag, Erl. G. Kt. Pr., Bl. Allendorf, p. 11, 1886.	Diabase.	In W. T., p. 443.
113	Albessen, Blatt Kusel, Bavaria.	A. Schwager.	M. Schuster, Erl. G. Kt. Bay., XX, p. 25, 1910.	Basaltic melaphyre.	
114	Kreimbach, Blatt Kusel, Bavaria.	A. Schwager.	M. Schuster, Erl. G. Kt. Bay., XX, p. 23, 1910.	Tholeyitic diabase.	
115	Relsberg, Blatt Kusel, Bavaria.	A. Schwager.	M. Schuster, Erl. G. Kt. Bay., XX, p. 23, 1910.	Tholeyitic diabase.	
116	Schallodenbach, Rheinpfalz, Bavaria.	A. Schwager.	M. Schuster, Geog. Jhft., XXVI, p. 256, 1914.	Melaphyre.	
117	Höringen, Pfalz.	K. Klüss.	A. Leppla, Jb. Pr. G. L.-A., XIV, p. 150, 1894.	Melaphyre.	In W. T., p. 323.
118	Albessen, Blatt Kusel, Bavaria.	A. Schwager.	M. Schuster, Erl. G. Kt. Bay., XX, p. 25, 1910.	Basaltic melaphyre.	
119	Pörrbach, Blatt Kusel, Bavaria.	A. Schwager.	M. Schuster, Erl. G. Kt. Bay., XX, p. 39, 1910.	Melaphyre.	
120	Neubau, Fichtelgebirge.	Deleré.	Deleré, In. Diss. Erl., 1895.	Proterobase.	Osann, II, p. 168.
121	Ochsenkopf, Fichtelgebirge.	Deleré.	Deleré, In. Diss. Erl., 1895.	Proterobase.	Epidotized. Osann, II, p. 168.
122	Hallerstein, Kirchenlaunitz, Fichtelgebirge.	Deleré.	Deleré, In. Diss. Erl., 1895.	Proterobase.	Osann, II, p. 168.
123	Wartleite, near Köditz, Fichtelgebirge.	E. Riman.	E. Riman, N. J. B. B., XXIII, p. 24, 1907.	Diabase.	
124	Pfeffelbach, near St. Wendel, Harz.	Hesse.	K. A. Lossen, Jb. Pr. G. L.-A., X, p. 316, 1892.	Diabase.	In W. T., p. 265.
125	Osterbrucken, near St. Wendel, Harz.	Fischer.	K. A. Lossen, Jb. Pr. G. L.-A., X, p. 280, 1892.	Melaphyre.	In W. T., p. 445.
126	Garkenholz, Rübeland, Harz.	K. Böttcher.	K. A. Lossen, Z. D. G. G., XL, p. 204, 1888.	Hysterobase.	In W. T., p. 443.
127	Hüttenrode, Harz.	Not stated.	O. H. Erdmannsdoerfer, N. J. Cb., p. 40, 1909.	Diabase.	
128	Rauhe Schacht, Bruchberg, Harz.	Haefke.	O. H. Erdmannsdoerfer, Z. D. G. G., LIX, p. 18, 1907.	Analcite diabase.	
129	Rauhe Schacht, Bruchberg, Harz.	Klüss.	O. H. Erdmannsdoerfer, Jb. Pr. G. L.-A., XXIX, p. 20, 1909.	Analcite diabase.	
130	Kleine Mollnthal, Bruchberg, Harz.	Haefke.	O. H. Erdmannsdoerfer, Jb. Pr. G. L.-A., XXIX, p. 20, 1909.	Analcite diabase.	
131	Kleine Mollnthal, Bruchberg, Harz.	Klüss.	O. H. Erdmannsdoerfer, Jb. Pr. G. L.-A., XXIX, p. 20, 1909.	Arfvedsonite diabase.	

DIABASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
132 A2. II	47.42	15.06	3.36	8.20	6.19	9.58	3.82	0.71	3.61		0.71	0.24	0.58	CO_2 0.57 SO_3 0.22	100.54	2.899
133 A2. II	46.13	18.13	1.97	8.39	7.01	5.87	3.28	1.73	4.91		2.10	0.25		CO_2 0.60 SO_3 0.13	100.50	
134 A2. II	46.16	17.96	1.84	9.08	6.75	4.21	2.85	1.82	5.65		2.07	0.35		CO_2 1.25 S 0.20	100.19	
135 A2. II	44.70	14.12	0.97	8.85	6.07	10.20	2.34	0.14	4.79		1.71	0.15		CO_2 5.50	99.86	2.84
136 A2. II	43.50	14.08	6.86	7.54	6.80	10.07	3.38	1.50	3.83		0.15	0.47		CO_2 1.88 SO_3 0.47	100.38	2.907
137 A2. II	42.78	14.13	3.31	10.97	6.85	3.63	2.37	3.46	5.75		3.21	1.44		CO_2 1.85 SO_3 0.44	100.19	
138 A4. IV	50.89	14.11	7.42	5.33	5.16	10.36	3.31	0.92	3.27						100.77	
139 A4. IV	44.41	12.43	8.76	5.81	12.19	7.43	2.83	1.16	5.37						100.36	
140 A3. III	46.10	17.77	3.97	9.84	7.32	6.35	4.00	0.61	2.42		1.01				99.39	
141 A3. III	45.02	18.42	4.86	8.35	7.19	8.24	4.67	0.38	2.61		0.94				100.68	
142 A2. II	43.92	12.53	2.50	9.60	13.26	8.50	2.33	1.49	2.27		1.45	0.33	0.20	CO_2 1.77	100.15	
143 A2. II	58.04	15.31	3.62	5.16	1.90	4.14	3.61	2.95	4.09		0.72	0.56		SO_3 0.22	100.32	2.683
144 B3. IV	54.47	17.22	7.61	0.14	1.63	4.46	4.25	4.17	2.10		trace	0.51		CO_2 2.30 SO_3 0.52	99.38	
145 A3. III	49.53	18.82	6.75	4.04	2.67	6.84	4.17	2.52	2.84		trace	0.86		CO_2 0.32 SO_3 0.44	99.80	
146 A3. III	48.39	13.43	9.19	4.65	4.26	12.83	3.23	0.99	2.98			0.35	trace	S trace	100.30	
147 A3. III	46.95	17.40	6.11	3.99	5.34	7.25	4.26	1.18	5.00		2.33				99.81	
148 A3. III	50.86	14.32	5.03	6.77	5.93	9.44	3.49	1.18	2.80		trace	0.62	0.14	S 0.05	100.69	
149 A3. III	45.44	12.79	8.82	5.24	3.24	7.05	3.46	7.79	4.08	0.95	0.65				99.51	
150 A2. II	57.86	13.08	6.76	0.93	3.41	1.24	2.63	8.93	2.22	1.09	1.58	0.38	0.41	F 0.05	100.37	
151 A2. II	52.00	14.08	8.40	1.09	3.91	9.61	3.83	2.58	0.42	0.91	2.01	0.49	0.72	CO_2 trace F 0.18	100.23	

DIABASE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
132	Haselthal, Bruchberg, Harz.	Eyme.	O. H. Erdmannsdoerfer, XXIX, p. 20, 1909.	Diabase.	
133	Braunesumpfthal, Harz.	Not stated.	O. H. Erdmannsdoerfer, N. J. Cb., 1909, p. 40.	Diabase porphyrite.	
134	Near Wendefurth, Harz.	Not stated.	O. H. Erdmannsdoerfer, N. J. Cb., 1909, p. 40.	Diabase porphyrite.	
135	Wendefurth, Harz.	K. Gremse.	K. A. Lossen, Jb. Pr. G. L.-A., X, p. 266, 1892.	Leucophyre.	In W. T., p. 443.
136	Osteröder Rindesthal, Bruchberg, Harz.	Eyme.	O. H. Erdmannsdoerfer, Jb. Pr. G. L.-A., XXIX, p. 20, 1909.	Olivine diabase.	
137	Schieferberg, near Neuwerk, Harz.	Not stated.	O. H. Erdmannsdoerfer, N. J. Cb., 1909, p. 40.	Diabase mandelstein.	
138	Pausa, Vogtlaud, Saxony.	A. Uhlemann.	A. Uhlemann, T. M. P. M., XXVIII, p. 426, 1909.	Diabase.	
139	Pausa, Vogtlaud, Saxony.	A. Uhlemann.	A. Uhlemann, T. M. P. M., XXVIII, p. 426, 1909.	Diabase.	
140	Kohlhau, Lausitz,	R. Reinisch.	R. Reinisch, Hab. Schr. Leip., p. 37, 1902.	Diabase.	Altered. Cf. No. 16, III.5.3.5.
141	Warmsdorf, Lausitz.	R. Reinisch.	R. Reinisch, Hab. Schr. Leip., p. 37, 1902.	Diabase.	Altered. Cf. No. 18, III.5.3.5.
142	Gräfenhain, Lausitz.	P. J. Beger.	P. J. Beger, Vh. Sachs. Ges. W., LXV, p. 376, 1913.	Theralite diabase.	
143	Heinzelberg, Sudeten, Bohemia.	Eyme.	G. Berg, Jb. Pr. G. L.-A., XXVIII, p. 239, 1910.	Melaphyre.	
144	Langwaltersdorf, Sudeten, Bohemia.	Böhm.	G. Berg, Jb. Pr. G. L.-A., XXVIII, p. 239, 1910.	Melaphyre.	
145	Alt Lässig, Sudeten, Bohemia.	Böhm.	G. Berg, Jb. Pr. G. L.-A., XXVIII, p. 239, 1910.	Melaphyre.	
146	Skolmeno, Bohemia.	J. Friedrich.	F. Slavik, Arch. Land. d. f. Bohm, XIV (2), p. 88, 1908.	Spilite.	
147	Radotin, Bohemia.	C. F. Eichleiter.	C. F. Eichleiter, Vh. G. R.-A. Wien, XXXIII, p. 350, 1899.	Diabase.	In W. T., p. 443.
148	Brünn, Moravia.	C. v. John.	v. John and Suess, Jb. G. R.-A. Wien, LVIII, p. 249, 1908.	Uralite diabase.	
149	Zacheugraben, near Breitenau, Styria.	L. Welisch.	L. Welisch, Mt. Nw. Ver. steierm., XLVII, p. 65, 1911.	Diabase.	
150	Poreba, near Cracow, Galicia.	Z. Rosen.	Z. Rosen, B. Ac. Sci. Crac., 1909 (2), p. 838.	Melaphyre.	
151	Regularise, near Cracow, Galicia.	Z. Rosen.	Z. Rosen, B. Ac. Sci. Crac., 1909, p. 801.	Melaphyre.	

DIABASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
152 A3. III	49.86	13.01	13.78	n. d.	3.50	7.26	4.00	1.66	2.08		0.69	0.38		CO_2 3.23	99.45	
153 A3. III	48.16	16.17	6.94	4.64	5.62	5.66	2.60	4.87	3.75					CO_2 1.26	99.67	
154 A3. III	47.59	16.84	6.33	6.62	5.48	5.99	2.23	4.43	3.30	2.10					100.91	
155 A2. II	47.20	16.60	7.80	6.40	5.69	7.20	4.74	0.55	1.29		1.80	0.18		S 0.09	99.54	
156 A3. III	49.64	17.02	5.51	3.69	6.96	3.52	4.93	0.97	1.12	0.24	2.02			CO_2 4.05	99.77	2.78
157 A3. III	48.54	15.85	5.84	4.63	9.16	2.19	5.10	0.64	4.15	0.14	2.08			CO_2 1.47	99.77	2.780
158 A3. III	45.22	14.38	6.75	5.00	6.58	11.13	4.43	0.63	1.92	0.25	1.96			CO_2 1.78	100.03	2.999
159 A3. III	45.97	14.49	9.12	3.54	6.86	7.46	4.72	0.50	4.13	0.43	2.82				100.04	2.92
160 A3. III	45.40	14.87	6.65	6.28	7.98	5.30	3.19	2.62	5.07	0.37	2.08				99.81	2.859
161 A3. III	52.14	17.36	3.20	6.12	6.81	3.42	4.41	1.07	4.98						99.51	2.8
162 A2. II	49.28	16.34	4.62	6.48	6.37	9.29	3.77	0.14	2.54	0.25	0.42	0.05	trace	S 0.06	99.61	
163 B2. III	43.44	16.49	4.54	9.02	4.02	10.50	3.68	3.56	3.06		0.87		0.16		99.34	
164 A3. III	53.17	13.62	5.42	5.96	3.84	8.67	2.95	2.40	3.56				trace		99.59	
165 A3. III	49.97	14.22	8.14	3.79	4.14	11.21	2.79	2.39	3.50				trace		100.15	2.976
166 B3. IV	49.95	14.77	7.41	3.53	4.28	10.26	2.87	2.63	3.40				trace		99.10	
167 A3. III	47.50	16.20	5.25	5.76	6.41	6.15	1.09	0.87	9.00		1.67				99.90	
168 A3. III	53.02	16.53	1.92	7.51	2.63	0.51	4.45	2.40	1.81			0.59	0.29		99.95	
169 A2. II	53.75	11.20	12.26	0.69	9.11	5.72	0.76	0.87	4.91		0.36		0.16		100.19	2.867
170 A2. II	51.72	12.10	7.35	6.67	6.53	8.78	1.94	0.82	1.18	0.19	2.16		0.40	CO_2 0.26	100.10	
171 A2. II	50.05	14.83	8.19	3.19	6.59	9.56	2.19	0.77	0.77		1.89		1.46		99.79	

DIABASE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
152	Near Ellman, Kitzbuchler Alps, Tyrol.	L. Obermaier.	A. Spitz, T. M. P. M., XXVIII, p. 501, 1909.	Monzonite-diabase.	
153	Cornon, Predazzo, Tyrol.	J. A. Ippen.	J. A. Ippen, N. J. Cb., 1903, p. 10.	Melaphyre.	
154	Cornon, Predazzo, Tyrol.	J. A. Ippen.	J. A. Ippen, N. J. Cb., 1903, p. 10.	Melaphyre.	
155	Auermadsattel, Salzkammergut, Tyrol.	C. v. John.	C. v. John, Jb. G. R.-A. Wien, XLIX, p. 256, 1899.	Diabase porphyrite.	In W. T., p. 285.
156	Tarasp, Lower Engadine, Switzerland.	L. Hezner.	U. Grubenmann, Btr. G. Kt. Schw., XXIII, p. 237, 1909.	Diabase.	
157	Champatsch Alp, Lower Engadine, Switzerland.	L. Hezner.	U. Grubenmann, Btr. G. Kt. Schw., XXIII, p. 238, 1909.	Diabase.	
158	Champatsch Alp, Lower Engadine, Switzerland.	L. Hezner.	U. Grubenmann, Btr. G. Kt. Schw., XXIII, p. 234, 1909.	Diabase.	
159	Pazza, near Remus, Lower Engadine, Switzerland.	L. Hezner.	U. Grubenmann, Btr. G. Kt. Schw., XXIII, p. 235, 1909.	Diabase.	
160	Ardez, Lower Engadine, Switzerland.	O. Züst.	O. Züst, In. Diss. Zür., p. 35, 1905.	Diabase.	
161	Monte Paularo, Carnic Alps, Veneto.	M. Gortani.	M. Gortani, Mem. Soc. Tosc., XXII, p. 181, 1906.	Diabase.	
162	Gorgona Island, Tuscan Archipelago.	E. Manasse.	E. Manasse, Mem. Soc. Tosc., XX, p. 52, 1904.	Diabase.	
163	Matotschin Scharr, Nova Zembla.	A. Wichmann.	A. Wichmann, Z. D. G. G., XXXVIII, p. 527, 1886.	Diabase.	In W. T., p. 445.
164	Jalguba, Olonez, Russia.	L. Lessing.	L. Lessing, T. M. P. M., VI, p. 294, 1885.	Variolite.	In W. T., p. 283.
165	Jalguba, Olonez, Russia.	L. Lessing.	L. Lessing, T. M. P. M., VI, p. 294, 1885.	Variolite aphanite.	In W. T., p. 325.
166	Jalguba, Olonez, Russia.	L. Lessing.	L. Lessing. T. M. P. M., VI, p. 294, 1885.	Variolite.	In W. T., p. 453.
167	French Guinea.	Not stated.	Lemoine and Chantard, B. Soc. G. Fr. (4), VIII, p. 35, 1908.	Diabase.	
168	Konyam Bay, Siberia.	Lindstrom.	Lindstrom, Ref. N. J., 1885, I, p. 430.	Diabase aphanite.	Not fresh. In W. T., p. 443.
169	Jenissei River, Siberia.	J. P. Tolmatschew.	J. P. Tolmatschew, Ref. N. J., 1900, I, p. 388.	Variolite.	In W. T., p. 455.
170	Avericha River, Jenissei District, Siberia.	Not stated.	A. Meister, Reg. Aurif. Sib., IX, p. 380, 1910.	Epidiabase.	Metamorphosed.
171	Angara River, Jenissei District, Siberia.	Not stated.	A. Meister, Reg. Aurif. Sib., IX, p. 352, 1910.	Mica diabase.	MnO high?

DIABASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
172	45.89	14.40	7.05	5.10	9.93	9.82	1.63	0.60	3.08		1.39		0.43	CO_2 1.19	100.51	
A2. II																
173	45.78	19.36	5.17	6.62	7.64	9.32	1.98	2.04	1.34					CO_2 0.48	99.73	
A3. III																
174	44.90	18.30	2.60	8.76	4.15	7.64	1.91	1.01	4.50		2.04		trace	CO_2 3.76	99.57	
A3. III																
175	50.37	13.01	3.24	14.66	1.78	5.70	1.42	1.74	2.76	0.70	1.60	0.69	0.69	CO_2 1.16 Cl 0.02 F 0.03 B_2O_3 0.83 NiO 0.05 BaO 0.11 SrO none	100.56	
A1. I																
176	48.21	16.01	1.12	6.94	8.29	7.68	4.23	0.51	5.86				0.90		99.75	2.74
A3. III																
177	48.62	15.96	1.92	6.63	7.50	9.12	2.70	0.93	3.76		1.32	0.18		CO_2 0.95	99.59	
A2. II																
178	47.15	14.36	4.52	4.87	8.52	7.89	3.53	1.38	4.75		1.09			CO_2 2.50	100.56	
A2. II															(100.66)	
179	59.01	12.93	2.77	6.36	4.78	6.32	0.92	2.50	4.48			trace			100.07	2.596
A3. III																
180	48.48	15.68	4.13	3.29	7.17	11.00	3.55	0.63	6.05						99.98	2.576
A3. III																
181	47.03	16.10	5.55	3.03	7.08	9.60	3.79	0.98	7.16						100.32	2.404
A3. III																
182	48.22	14.82	0.56	9.25	5.58	8.81	4.95	0.44	2.54	0.15	2.68	0.23		CO_2 1.40 FeS_2 0.37 Cr_2O_3 none NiO 0.03 BaO none SrO trace	100.26	
A1. I																
183	38.85	19.83	2.72	8.12	3.61	12.09	1.74	1.58	1.85	1.46	1.78	0.45	0.16	CO_2 6.17 SO_3 none Cl none S none NiO 0.05	100.46	2.967
A1. I																
184	53.09	16.03	4.36	1.73	3.36	5.16	8.09	0.03	0.98	0.05	0.98			CO_2 6.33 FeS_2 0.26	100.03	2.73
A3. III																
185	47.70	9.99	1.60	7.33	22.49	0.69	0.43	0.38	6.62	0.21	0.52		1.38	CO_2 1.35	100.69	2.08
A3. III																
186	42.17	9.29	n. d.	8.18	24.71	4.06	0.45	0.26	2.97	0.02	0.55		0.55	CO_2 6.70	100.19	2.85
A4. IV																
187	45.36	13.78	1.74	11.54	6.23	8.07	1.71	0.33	4.47	0.22	1.69	0.26	0.17	CO_2 4.49 FeS_2 0.17	100.23	2.85
A2. II																
188	41.00	12.61	0.63	8.08	15.25	11.12	1.85	1.46	4.19		1.12		0.41	CO_2 2.13 Cr_2O_3 0.10	99.95	
A2. II																
189	39.30	14.04	2.40	9.22	5.29	8.24	2.18	1.03	4.26	1.02	4.34	0.20	0.12	CO_2 8.54 SO_3 0.20	100.38	
A2. II																
190	49.16	15.27	8.64	7.22	8.34	5.26	2.72	0.61	0.98	0.44	0.48	trace	0.29	CO_2 0.71	100.12	2.70
A2. II																

DIABASE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
172	Angara River, Jenissei District, Siberia.	Not stated.	A. Meister, Reg. Aurif. Sib., IX, p. 345, 1910.	Olivine diabase.	
173	Angara River, Jenissei District, Siberia.	Not stated.	A. Meister, Reg. Aurif. Sib., IX, p. 357, 1910.	Mica diabase.	
174	Tatarka River, Jenissei District, Siberia.	Not stated.	A. Meister, Reg. Aurif. Sib., IX, p. 338, 1910.	Proterobase.	
175	Kusjkin Island, Siberia.	H. Backlund.	H. Backlund, Mem. Ac. Sci. St. P., XXI, No. 6, p. 29, 1910.	Diabase.	
176	Mount Dselola, Okhotsk, Siberia.	Not stated	K. E. Bogdanovitch, Fund. Marek., p. 56.	Diabase.	
177	Pe-Shan Massif, China.	M. Dittrich.	K. Futterer, Durch Asien, II (1), p. 332, 1905.	Diabase.	
178	Pe-Shan Massif, China.	C. Pfeil.	K. Futterer, Durch Asien, II (1), p. 339, 1905.	Diabase.	
179	Gunung Kerbau, Hiton, Ambon Island.	I. Balbareef.	R. D. M. Verbeek, Jb. Mijnw., XXXIV, p. 236, 1905.	Melaphyre.	French edition, p. 248.
180	Tandjoung Nousaniwi, Leitimor, Ambon Island.	J. S. Winarski.	R. D. M. Verbeek, Jb. Mijnw., XXXIV, p. 235, 1905.	Melaphyre.	French edition, p. 248.
181	Cape Nousaniwi, Leitimor, Ambon Island.	F. Jaronski.	R. D. M. Verbeek, Jb. Mijnw., XXXIV, p. 234, 1905.	Melaphyre.	French edition, p. 246.
182	Nundle, New South Wales.	W. N. Benson.	W. N. Benson, G. Mag. (V), X, p. 20, 1913.	Spilite.	
183	Bendigo, Victoria.	H. S. Whitelaw.	A. R. Secy. Min. Vict. (1911), p. 62, 1912.	Dike (diabase?).	
184	Leonora, Western Australia.	C. C. Williams.	C. F. V. Jackson, W. Aust. G. S. B. 13, p. 19, 1904.	"Greenstone" (diabase).	Altered.
185	Leonora, Western Australia.	C. C. Williams.	C. F. V. Jackson, W. Aust. G. S. B. 13, p. 19, 1904.	"Greenstone" (diabase).	Sp. gr. low?
186	Leonora, Western Australia.	C. C. Williams.	C. F. V. Jackson, W. Aust. G. S. B. 13, p. 19, 1904.	"Greenstone" (diabase).	
187	Bangemall, Gascoyne Goldfield, Western Australia.	Not stated.	J. A. Thompson, W. Aust. G. S. B. 33, p. 160, 1909.	Diabase.	
188	Waitaha River, Mikonui, New Zealand.	J. S. Maclaurin.	P. G. Morgan, G. S. N. Z. B. 6, p. 141, 1908.	Diabase.	
189	Moonlight Creek, Waiwhero, Reefton District, New Zealand.	Headerson.	P. G. Morgan, pers. com.	Diabase.	
190	Musgrave Peninsula, Carnley Island, Auckland Islands.	A. M. Wright.	Speight and Finlayson, Subant. Islds., II, p. 728, 1909.	Olivine diabase.	

DIABASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
191 A2. II	47.61	17.47	3.44	8.78	2.49	7.04	4.49	1.60	3.71	0.84	0.87	1.10	0.13	CO_2 0.28	99.85	2.68
192 B2. III	47.41	16.18	12.92	8.37	1.16	4.03	3.49	2.15	1.38	1.42	0.31	trace	0.27	CO_2 0.21	99.30	2.80

BASALT.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A1. I	31.42	11.57	2.37	7.48	5.32	16.71	2.26	0.74	4.17	0.76	2.30	0.46	0.38	CO_2 13.13 ZrO_2 none FeS_2 0.16 Cr_2O_3 trace V_2O_3 0.06 BaO 0.64 SrO none	99.93	
2 A2. II	47.52	13.91	7.06	3.76	6.84	5.71	3.06	0.77	4.55	1.75	1.19	0.15	0.18	CO_2 3.68 NiO trace BaO trace SrO trace	100.13	
3 A1. I	40.35	5.11	24.99	3.55	5.48	1.32	0.18	1.44	8.51	8.51	0.20		0.22	CO_2 none SO_3 none S none NiO none BaO none SrO none	99.86	
4 A2. II	47.20	15.36	3.06	8.87	4.20	5.05	4.72	1.40	3.04	0.16	3.30	0.36	0.20	CO_2 3.34 SO_3 trace F trace S trace BaO trace SrO trace	100.26	
5 A2. II	44.29	17.46	3.82	10.35	7.03	8.68	2.19	0.71	4.11	0.21	1.40	0.20	trace	BaO none	100.45	
6 A2. II	49.13	9.05	3.57	5.05	17.21	5.68	2.01	2.24	3.50	0.84	0.42	0.38	0.15	Cr_2O_3 0.39 NiO trace BaO 0.05	99.67	
7 A2. II	46.90	10.17	1.22	5.17	20.98	6.20	1.16	2.04	4.38	1.04	0.41	0.44	0.10	Cr_2O_3 0.33	100.54	2.86
8 A1. I	48.47	16.07	4.12	7.47	5.96	4.84	2.43	1.41	4.63	2.30	1.51	0.44	0.23	FeS_2 0.24 NiO trace BaO 0.03 SrO trace Cu trace	100.15	
9 A1. I	47.70	15.30	5.93	4.85	7.31	11.83	2.46	0.61	0.34	0.10	1.45	0.29	0.46	CO_2 1.87 SO_3 none Cl trace BaO 0.09 SrO 0.02	100.61	2.95
10 A2. II	46.74	16.86	6.44	4.13	6.18	11.90	3.13	0.50	0.89	1.24	1.04	0.56	0.23	CO_2 0.56	100.52	
11 A1. I	52.12	15.21	1.83	8.95	6.01	3.75	4.83	0.48	3.74	0.90	1.38	0.14	0.19	CO_2 0.09 ZrO_2 none S trace Cr_2O_3 none NiO 0.03 BaO trace SrO none	99.65	
12 A2. II	40.89	10.41	15.00	0.07	3.76	5.18	0.47	0.53	10.32	9.14	3.37	0.52	0.90	CO_2 none S 0.03 V_2O_3 0.01	100.60	
13 A2. II	49.85	17.00	4.02	5.51	7.65	1.18	4.78	none	6.65	2.16	0.97	0.10	none	S 0.07 BaO trace	99.94	
14 A2. II	48.76	16.60	5.60	5.01	6.93	8.79	2.47	0.66	2.19	1.49	1.26	0.19		CO_2 0.42 BaO 0.10	100.37	2.78

DIABASE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
191	Carnley Harbor, Auckland Islands.	A. M. Wright.	Speight and Finlayson, Subant, Islds., II, p. 736, 1909.	Porphyrite.	
192	Musgrave Peninsula, Carnley Island, Auckland Islands.	A. M. Wright.	Speight and Finlayson, Subant. Islds., II, p. 727, 1909.	Diabase.	

BASALT.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Castle Hill, Aroostook County, Maine.	W. F. Hillebrand.	H. E. Gregory, U. S. G. S. B. 165, p. 124, 1900.	"Volcanic tuff" (basalt?).	Not in W. T.
2	South Britain, Connecticut.	W. F. Hillebrand.	W. H. Hobbs, U. S. G. S. A. R. 21, III, p. 77, 1901.	Olivine basalt.	Weathered. In W. T., p. 447.
3	Holyoke, Massachusetts.	G. Steiger.	B. K. Emerson, B. G. S. A., XVI, p. 112, 1905.	Palagonite.	Blebs in No. 13, p. 866.
4	Crystal Falls, Michigan.	H. N. Stokes.	J. M. Clements, U. S. G. S. Mon. 36, p. 106, 1899.	Metabasalt.	In W. T., p. 447.
5	Mansfield, Crystal Falls, Michigan.	G. Steiger.	C. R. Van Hise, U. S. G. S. B. 168, p. 68, 1900.	Metadolerite.	In W. T., p. 331.
6	Bear Creek, Madison Valley, Montana.	T. M. Chatard.	G. P. Merrill, Pr. U. S. Nat. Mus., XVII, p. 641, 1895.	Basalt.	In W. T., p. 313.
7	Fort Ellis, near Bozeman, Montana.	T. M. Chatard.	G. P. Merrill, Pr. U. S. Nat. Mus., XVII, p. 640, 1895.	Basalt.	In W. T., p. 317.
8	Black Jack Mine, Silver City, Idaho.	W. F. Hillebrand.	W. Lindgren, U. S. G. S. A. R. 20, III, p. 176, 1900.	Basalt.	In W. T., p. 319.
9	Cedar Ranch Mesa, San Francisco Mountains, Arizona.	H. H. Robinson.	H. H. Robinson, U. S. G. S. P. P. 76, p. 150, 1913.	Basalt.	
10	Little Ash Creek, Bradshaw Mountains, Arizona.	G. Steiger.	Jaggar and Palache, U. S. G. S. Fol. 126, p. 7, 1905.	Basalt.	
11	Johnson Creek, Port Orford quadrangle, Oregon.	W. F. Hillebrand.	J. S. Diller, U. S. G. S. Fol. 89, p. 4, 1903.	Basalt.	
12	Near Portland, Oregon.	G. Steiger.	J. S. Diller, U. S. G. S. B. 260, p. 345, 1905.	Basalt glass.	
13	Bully Hill Mine, Shasta County, California.	E. T. Allen.	J. S. Diller, U. S. G. S. B. 213, p. 127, 1903.	Metabasalt.	Wall of ore body.
14	Dardanelles, Stanislaus County, California.	G. Steiger.	F. L. Ransome, U. S. G. S. B. 89, p. 58, 1898.	Olivine basalt.	In W. T., p. 289.

BASALT—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
15 A2. II	59.72	14.63	3.40	2.37	2.69	6.55	3.28	3.33	1.38	0.72	0.95	0.40	0.10	CO_2 1.12 BaO 0.04	100.68	
16 A2. II	48.59	17.80	8.70	0.93	4.85	10.49	3.06	1.70	0.67	0.76	1.54	0.43	0.14	CO_2 0.55	100.21	
17 A2. II	48.20	21.47	5.89	2.20	3.33	10.60	3.10	1.33	1.20	0.96	1.34	0.39	0.11	CO_2 0.38	100.50	
18 A2. II	64.16	14.42	2.72	2.65	1.35	3.24	4.42	2.42	1.49	0.47	0.94	0.23	0.11	CO_2 1.58	100.20	
19 A2. II	43.88	17.96	4.07	6.69	5.33	7.66	3.62	1.37	1.38	0.50	0.33		0.29	CO_2 6.34 F 0.04 S 0.12	99.58	
20 A1. I	51.37	13.27	5.12	7.59	2.83	6.83	3.58	1.85	2.28		3.09	0.43	trace	CO_2 1.80 Cl 0.03 S trace NiO 0.02 BaO 0.26 SrO 0.02	100.37	
21 A1. I	45.26	15.28	4.53	8.12	5.15	9.57	2.98	1.18	1.28		3.46	0.59	0.40	CO_2 2.90 SO_3 trace NiO trace BaO 0.06 SrO 0.02	100.78	
22 A1. I	47.36	12.47	2.64	10.03	6.97	9.70	2.50	1.08	1.59	0.10	2.02	0.30	0.14	CO_2 3.21 S none NiO 0.07 BaO none SrO none	100.18	
23 A2. II	45.24	15.63	5.56	7.19	7.88	9.38	2.01	0.72	2.21	1.12	2.26	0.20	0.23	CO_2 0.49 Cr_2O_3 trace NiO trace	100.61	2.85
24 A1. I	44.60	12.83	4.65	8.26	6.43	10.95	2.59	0.31	0.70	1.33	1.84	0.20	0.37	CO_2 5.39 S 0.24 Cr_2O_3 0.02 V_2O_3 0.04 NiO 0.04 BaO none	100.80	
25 A2. II	45.24	17.08	1.84	8.02	5.74	4.64	5.32	0.13	5.66		2.40	0.57	0.14	CO_2 2.98	99.76	2.62
26 A3. III	53.41	11.52	8.36	3.38	2.63	13.16	0.71	0.63	3.56	1.54			1.48		100.38	2.743
27 A3. III	51.31	14.55	n. d.	9.02	6.85	11.61	1.79	0.60	1.14		1.00		0.47	CO_2 1.47	99.81	2.880
28 A3. III	38.06	16.38	6.97	n. d.	0.87	20.42	1.95	0.56	2.31		0.96		0.84	CO_2 10.37 SO_3 0.13	99.82	
29 A3. III	51.10	16.75	n. d.	8.05	5.89	11.97	2.02	0.66	1.16		0.96		0.37	CO_2 1.20	100.11	2.859
30 A3. III	55.19	12.30	10.23	n. d.	4.12	7.53	2.13	1.30	1.55		1.03		0.63	CO_2 3.64	99.65	2.60
31 A1. I	49.80	16.24	3.85	5.31	4.52	4.01	4.88	2.51	2.43	1.08	1.73	0.18	0.27	CO_2 3.22 NiO 0.02 BaO 0.02 Li_2O trace	100.07	
32 A3. III	47.45	17.54	2.05	7.44	6.72	10.97	3.93	trace	2.67	0.24	trace		trace	CO_2 0.54	99.55	

BASALT—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
15	Black Peak, Bullfrog District, Nevada.	G. Steiger.	F. L. Ransome, U. S. G. S. B. 407, p. 56, 1910.	Quartz basalt.	
16	Near Black Butte, Goldfield District, Nevada.	G. Steiger.	F. L. Ransome, U. S. G. S. P. P. 66, p. 73, 1909.	Mica dolerite.	
17	Rabbit Spring, Goldfield District. Nevada.	G. Steiger.	F. L. Ransome, U. S. G. S. P. P. 66, p. 73, 1909.	Olivine dolerite.	
18	Bejuca, Panama.	W. C. Wheeler.	D. F. MacDonald, U. S. G. S. rec. lab.	Basaltic rock.	
19	Theotomio, Madeira River, Amazonas, Brazil.	G. S. Blake.	J. W. Evans, Q. J. G. S., LXII, p. 111, 1906.	Olivine basalt.	
20	Dalmahoy Hill, n. Edinburgh, Scotland.	Harrison and Reid.	J. B. Harrison, pers. com.	Dolerite.	
21	Salisbury Crags, n. Edinburgh, Scotland.	Harrison and Reid.	J. B. Harrison, pers. com.	Dolerite.	
22	Glen Dilbidale, Ross, Scotland.	E. G. Radley.	J. S. Flett, G. S. Scot. Mem., sh. 93, p. 102, 1912.	Amphibolite (metamorphosed dolerite).	
23	Ben Lee, Skye, Scotland.	W. Pollard.	A. Harker, Rocks of Skye, p. 248, 1904.	Olivine dolerite.	
24	Kildonan, Eigg, Scotland.	W. Pollard.	A. Harker, G. S. Scot. Mem., sh. 45, p. 166, 1908.	Dolerite.	
25	Victoria Park, Glasgow, Scotland.	P. Holland.	F. Rutley, Q. J. G. S., XLV, p. 631, 1889.	Tachylite.	In W. T., p. 449.
26	Pontesford Hill, Shropshire, England.	C. F. Baker.	W. S. Boulton, Q. J. G. S., LX, p. 469, 1904.	Palagonite tuff.	MnO high?
27	Crookdene Dike, Northumberland, England.	Heslop and Smythe.	Heslop and Smythe, Q. J. G. S., LXVI, p. 3, 1910.	Basalt.	
28	Crookdene, Northumberland, England.	Heslop and Smythe.	Heslop and Smythe, Q. J. G. S., LXVI, p. 6, 1910.	Basalt.	Weathered.
29	Collywell Dike, Northumberland, England.	Heslop and Smythe.	Heslop and Smythe, Q. J. G. S., LXVI, p. 3, 1910.	Basalt.	
30	Cleveland Dike, River Tees, England.	Not stated.	Heslop and Burton, G. Mag. (V), IX, p. 61, 1912.	Tachylite.	
31	Marloes, Pembrokeshire, Wales.	E. G. Radley.	H. H. Thomas, Q. J. G. S., LXVII, p. 200, 1911.	Marloesite.	
32	Bryn Llwyd, Anglesey, Wales.	J. O. Hughes.	A. Harker, Rep. B. A. A. S., p. 165, 1909.	Dolerite.	

BASALT—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
33 A3. III	49.80	17.94	2.37	6.74	4.02	9.00	4.03	0.20	3.54	0.10	1.70			CO_2 1.28	100.72	
34 A3. III	42.52	18.10	7.50	4.12	8.55	6.07	4.33	0.56	6.86		0.89			CO_2 trace	99.50	2.94
35 A3. III	37.97	19.45	7.85	2.95	4.58	18.25	2.90	trace	2.71		0.92			CO_2 2.58	100.16	3.01
36 A2. II	40.81	13.08	6.40	7.20	10.03	10.12	2.43	0.31	3.97	0.82	3.86	0.88	0.07		99.98	
37 A3. III	46.70	13.74	5.43	9.86	6.24	3.95	3.48	1.36	5.88		1.94		trace	CO_2 1.68	100.26	2.62
38 A1. I	44.31	14.87	8.43	2.85	6.06	10.96	3.46	0.71	3.82		3.74	0.79	0.14	SO_3 0.07 Cr_2O_3 0.04 V_2O_3 0.08 BaO 0.06	100.27	
39 A3. III	49.50	14.50	10.03	1.80	4.15	7.44	3.85	1.01	4.55		2.85				99.68	
40 B3. IV	46.25	17.70	0.48	8.50	6.29	7.53	3.82	2.80	3.65		2.62			CO_2 1.45	101.09	
41 A3. III	45.90	16.81	trace	10.40	7.23	8.91	3.07	0.39	3.65		2.46	0.07		CO_2 0.60	99.49	
42 B3. IV	46.82	14.31	11.11	1.92	7.50	9.03	4.43	2.22	0.16			1.85			99.35	
43 A3. III	46.46	18.70	6.72	3.35	5.85	9.72	2.55	1.36	4.13			0.65			99.49	
44 A2. II	52.16	15.86	4.90	5.86	4.57	8.16	3.67	0.88	2.28		0.32	0.24		CO_2 1.38 SO_3 0.21 org. 0.05	100.54	2.764
45 A2. II	50.74	15.89	7.88	1.75	4.59	8.97	3.27	1.30	3.25		1.37	0.44		CO_2 0.14 SO_3 0.13	99.72	2.742
46 A2. II	45.60	13.92	3.06	9.02	11.45	10.49	1.76	0.11	0.79	0.78	2.00	0.81		CO_2 0.77 SO_3 none	100.65	
47 A3. III	44.64	13.97	5.69	5.75	9.78	11.50	2.99	0.43	4.22		1.80				100.77	
48 A2. II	44.55	16.96	3.46	6.22	9.44	8.29	2.38	1.54	2.46	2.00	1.74	0.31		CO_2 0.57 SO_3 none	99.92	
49 A3. III	44.25	13.99	1.39	9.44	8.39	11.49	2.71	1.02	5.17	0.49	1.44				99.78	
50 A2. II	43.60	11.39	7.70	5.71	10.46	10.10	2.59	1.61	3.14	1.31	2.03	0.77		SO_3 0.31	100.72	
51 A2. II	43.30	12.67	1.69	8.86	14.16	10.34	2.69	1.43	0.97	0.28	2.31	0.68		CO_2 0.70 SO_3 0.01	100.09	

BASALT—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
33	Kilbride, County Mayo, Ireland.	J. Weintraube.	Gardiner and Reynolds, Q. J. G. S., LXVIII, p. 96, 1912.	Spilite.	
34	Roundwood, County Wicklow, Ireland.	Not stated.	W. J. Sollas, Pr. R. Dub. Soc., VIII, p. 106, 1893.	Variolite.	Not in W. T.
35	Roundwood, County Wicklow, Ireland.	Not stated.	W. J. Sollas, Pr. R. Dub. Soc., VIII, p. 106, 1893.	Variolite.	Not in W. T.
36	Rathjordan, County Limerick, Ireland.	G. T. Prior.	G. T. Prior, Min. Mag., XV, p. 317, 1910.	Analcite basalt.	
37	Scarlett Stack, Isle of Man.	P. Holland.	Dickson and Holland. Pr. Liv. G. Soc., VI, p. 128, 1889.	Basalt.	Not in W. T.
38	Gergovie, Auvergne.	P. Holland.	Dickson and Holland, Pr. Liv. G. Soc., VIII, p. 412, 1899.	Basalt.	Not in W. T.
39	Cogolin, Esterel, France.	Pisani.	A. Michel-Levy, B. Sv. Ct. G. Fr., XXI, No. 130, p. 41, 1912.	Basalt.	
40	Pic du Midi, Pyrenees.	Pisani.	A. de Romeu, B. Soc. M. Fr., XXX, p. 164, 1907.	Labradorite.	
41	Col d'Oncet, Pyrenees.	Pisani.	A. de Romeu, B. Soc. M. Fr., XXX, p. 164, 1907.	Labradorite.	
42	Puig Arigas Rojas, San Feliu de Pallares, Catalonia.	Fages.	L. Fernandez-Navarro, Mem. Soc. Esp. H. N., IV, No. 5, p. 410, 1907.	Basalt scoria.	
43	Mallorquinas, near Olot, Catalonia.	Fages.	L. Fernandez-Navarro, Mem. Soc. Esp. H. N., IV, No. 5, p. 410, 1907.	Basalt.	Altered.
44	Kyrburg, near Kirn, Nahethal, Rheinland.	Bärwald.	K. A. Lossen, Jb. Pr. G. L.-A., X, p. 309, 1892.	Basalt.	In W.T., p. 285.
45	Tiefert, near Kirn, Nahethal, Rheinland.	Bärwald.	K. A. Lossen, Jb. Pr. G. L.-A., X, p. 309, 1892.	Navite.	In W. T., p. 281.
46	Wartfeld, Giessen, Hesse.	F. Heiberger.	W. Schottler, Abh. G. L.-A. Hes., IV, p. 458, 1908.	Basalt.	
47	Albacher Hof, Giessen, Hesse.	A. Streng.	A. Streng, Ber. Oberhes. Ges., XXIX, p. 99, 1893.	Basalt.	In W. T., p. 327.
48	Dreihausen, Giessen, Hesse.	G. Butzbach.	W. Schottler, Abh. G. L.-A. Hes., IV, p. 460, 1908.	Basalt.	
49	Steinberg, Giessen, Hesse.	A. Streng.	W. Schottler, Abh. G. L.-A. Hes., IV, p. 458, 1908.	Basalt.	
50	Garbenteich, Giessen, Hesse.	W. Sonne.	W. Schottler, Abh. G. L.-A. Hes., IV, p. 462, 1908.	Basalt.	
51	Hohe Warte, Giessen, Hesse.	K. M. Jene.	W. Schottler, Abh. G. L.-A. Hes., IV, p. 458, 1908.	Basalt.	

BASALT—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
52 A2. II	42.78	13.90	6.34	5.26	8.90	10.91	3.09	0.51	2.74	1.60	2.98	0.78		CO_2 0.23 SO_3 0.09	100.11	
53 A2. II	42.53	11.64	4.18	7.84	13.70	9.72	1.87	1.63	1.38	1.05	2.57	0.85		CO_2 0.64 SO_3 0.24	99.84	
54 A2. II	42.25	13.57	5.11	5.86	10.05	12.46	3.00	0.65	1.38	1.42	1.55	0.88		CO_2 1.86 SO_3 0.13	100.17	
55 A2. II	41.73	13.15	8.68	3.44	8.80	12.05	3.19	1.02	5.18	0.60	1.89	0.53		SO_3 0.15	100.41	
56 A2. II	40.83	14.74	4.33	7.92	10.81	10.07	3.70	2.42	0.20	0.18	2.00	1.04		CO_2 1.31 SO_3 0.19	99.74	
57 A3. III	42.17	10.81	9.20	6.52	11.85	13.55	3.36	1.11	0.35		1.16				100.08	
58 A3. III	41.81	10.90	9.97	6.34	11.67	13.45	3.28	1.03	0.32		1.18				99.95	
59 A2. II	41.32	10.95	15.13	7.36	3.56	10.33	4.19	0.85	4.38		0.35	0.97		CO_2 0.20	99.59	
60 A2. II	53.60	14.43	1.62	8.70	0.41	8.00	5.61	2.03	2.02		1.98	0.16		CO_2 0.52 X 0.93 SO_3 0.15	100.16	
61 A3. III	44.22	19.54	2.27	4.33	6.96	9.02	2.46	3.84	5.60		trace	trace	0.12	SO_3 1.36	99.72	
62 A2. II	43.19	19.43	9.67	2.45	3.43	11.48	3.93	1.25	3.49	0.67	0.14	0.43		SO_3 trace Cl trace	99.56	2.858
63 A3. III	43.10	15.70	12.90	2.91	7.15	10.90	1.05	0.36	4.50		1.70	none			100.27	
64 A3. III	42.21	13.82	10.79	2.73	9.34	13.16	2.16	0.34	3.14		2.48				100.17	
65 A2. II	49.29	17.95	2.97	5.31	2.75	5.42	6.01	3.16	3.48	0.20	2.10	0.87		CO_2 0.16 SO_3 0.32	99.99	2.69
66 A2. II	47.67	14.83	5.01	6.34	5.50	9.31	3.49	1.57	1.91		2.56	0.20	0.08	CO_2 0.83 X 0.66 SO_3 0.05 Cl 0.15	100.16	2.994
67 A2. II	44.78	12.76	5.42	8.34	10.17	10.23	3.56	1.81	1.42		0.25	0.92		CO_2 0.93 SO_3 trace	100.89	2.952
68 A2. II	37.62	9.86	4.22	5.94	8.41	15.42	3.33	2.32	4.41		2.79	2.05		CO_2 3.55 SO_3 0.60 Cl 0.03 S 0.06	100.84	
69 A2. II	36.87	10.54	7.38	7.24	11.90	13.78	1.07	0.73	6.02		3.16	0.96		CO_2 0.44 SO_3 trace S 0.13	100.22	
70 A2. II	54.19	16.28	5.08	3.46	2.98	6.34	4.05	1.98	3.67		1.56	0.43		CO_2 0.07 SO_3 0.14	100.23	2.656
71 A2. II	44.69	16.18	4.88	6.93	6.52	10.41	3.58	2.66	2.41		1.00	0.56	0.22	CO_2 0.49 SO_3 0.33	100.86	

BASALT—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
52	Haardt, near Lich, Giessen, Hesse.	L. Walther.	W. Schottler, Abh. G. L.-A. Hes., IV, p. 454, 1908.	Basalt.	
53	Winnen, Giessen, Hesse.	G. Butzbach.	W. Schottler, Abh. G. L.-A. Hes., IV, p. 460, 1908.	Basalt.	
54	Altenbusick, Giessen, Hesse.	G. Butzbach.	W. Schottler, Abh. G. L.-A. Hes., IV, p. 454, 1908.	Basanitic basalt.	
55	Hundsköphel, Giessen, Hesse.	L. Walther.	W. Schottler, Abh. G. L.-A. Hes., IV, p. 454, 1908.	Basalt.	
56	Lollarer Kopf, Giessen, Hesse,	G. Butzbach.	W. Schottler, Abh. G. L.-A. Hes., IV, p. 454, 1908.	Basalt.	
57	Birstein, Vogel Gebirge. Hesse.	Hauser.	F. Tannhäuser, Bautech. Gest. Unt., I (1), p. 41, 1910.	Basalt.	Weathered.
58	Birstein, Vogel Gebirge, Hesse.	Hauser.	F. Tannhäuser, Bautech. Gest. Unt., I, (1), p. 41, 1910.	Basalt.	Weathered.
59	Gedern, Vogel Gebirge, Hesse.	J. M. Ledroit.	J. M. Ledroit, Ber. Oberh. Ges., XXIV, p. 152, 1886.	Basalt.	In W. T., p. 315.
60	Gottsbüren, Reinhardswald, Hesse.	P. Jannasch.	F. Rinne, Jb. Pr. G. L.-A., XIII, p. 78, 1893.	Basalt.	In W. T., p. 263.
61	Urberach, Häsengebirge, Hesse.	Kutscher and Rudolph.	C. Chelius, Nb. Ver. Erdk., IV, p. 12, 1891.	Basalt.	In W. T., p. 301.
62	Spreudlingen, near Frankfurt, Hesse.	Not stated.	C. Chelius, Nb. Ver. Erdk., XIV, p. 1, 1893.	Hornblende basalt.	In W. T., p. 301.
63	Seigertshausen, Knüll District, Hesse.	C. Trenzen.	C. Trenzen, N. J., 1902, II, p. 37.	Basalt.	
64	Predigtstuhl, Rhöngebirge.	Dürrfeld.	H. Bücking, Sb. Pr. Ak. W., 1910, p. 494.	Basalt.	
65	Oberberg, near Wissenbach, Hesse-Nassau.	F. Stadler.	R. Brauns, N. J. B. B., XXVII, p. 272, 1909.	Basalt.	
66	Hirzstein, Habichtswald, Hesse-Nassau.	O. Fromm.	O. Fromm, Z. D. G. G., XLIII, p. 70, 1891.	Basalt.	
67	Hünenburg, Prussia.	G. F. Steffen.	F. Beyschlag, Erl. G. Kt. Pr., Bl. Melsungen, p. 20, 1891.	Basalt.	In W. T., p. 345.
68	Petersberg, Fränkische Alp, Bavaria.	Not stated.	C. W. Gümbel, Geog. Beschr. Fränk. Alps, p. 569, 1891.	Basalt.	In W. T., p. 361.
69	Krummhübel, Riesengebirge.	Eyme.	Berg, Z. D. G. G., LXV, p. 205, 1913.	Glass basalt.	
70	Idarthal, St. Wendel, Harz.	Bärwald.	K. A. Lossen, Jb. Pr. G. L.-A., X, p. 316, 1892.	Basalt.	In W. T., p. 283.
71	Wesseln, Polzen District, Bohemia.	K. H. Scheumann.	K. H. Scheumann, Abh. Sachs. Ges. W., XXXII, p. 758, 1913.	Hauyne basalt.	

BASALT—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
72 A2. II	43.62	15.45	4.94	6.65	7.56	9.63	3.91	2.54	2.25		1.02	0.83	0.40	CO_2 0.75 SO_3 0.32 Cl trace	99.87	
73 A3. III	41.84	17.51	12.77	3.71	3.63	11.16	3.45	0.82	3.56			0.50		CO_2 0.88 SO_3 trace	99.83	
74 A2. II	48.67	14.15	9.07	0.83	6.36	6.16	1.61	0.96	9.39		1.99	0.36			99.55	
75 A2. II	48.38	12.76	8.91	4.83	6.23	7.65	1.13	1.67	6.00		2.07	0.64			100.27	
76 B2. III	49.06	16.61	4.94	5.97	4.80	8.31	3.53	0.60	1.01		2.24	0.66	0.59	CO_2 0.94	99.26	
77 A3. III	50.53	9.49	9.03	2.12	12.13	4.68	4.91	0.62	5.22		0.32	trace	trace	CO_2 1.05	100.10	2.717
78 A2. II	47.05	14.68	9.36	2.43	6.52	9.22	7.31	1.43	0.79		1.10	0.02	0.12	CO_2 trace	100.03	2.739
79 A3. III	47.43	17.20	4.20	5.27	4.85	7.56	3.53	1.51	2.42	3.12	3.00			CO_2 none	100.09	
80 A3. III	39.00	15.58	6.13	3.11	6.55	6.82	3.22	0.59	6.03	8.18	2.59			CO_2 1.83	99.63	
81 A3. III	35.48	8.30	12.30	14.60	7.10	1.04	3.92	trace	16.80		none				99.54	
82 A2. II	52.37	17.42	5.58	3.22	3.84	6.66	5.51	0.67	1.85	1.74	1.05	0.34	0.14	CO_2 0.28	100.67	
83 A2. II	56.58	14.88	2.31	3.04	3.76	8.69	3.36	2.18	1.43	0.69	0.77	0.15	0.16	CO_2 2.32 BaO 0.07	100.39	
84 A2. II	48.12	16.21	2.94	7.56	7.24	8.71	2.91	1.44	1.72		1.58	0.60	trace	CO_2 0.84	99.87	
85 A2. II	44.08	13.12	3.50	6.68	8.90	14.05	1.57	1.56	1.86	0.52	2.12	0.36		CO_2 1.87	100.19	
86 B2. III	34.39	13.05	5.20	0.98	8.62	18.52	2.56	0.24	3.72	2.22	0.63		trace	CO_2 10.89 S none CuO 0.07	101.09	
87 A3. III	50.40	19.84	5.97	3.16	3.82	8.56	3.15	1.08	3.52				trace		99.50	2.72
88 A3. III	48.48	19.19	4.29	3.62	7.39	8.94	3.06	0.89	4.19				trace		100.90	
89 A3. III	48.82	14.10	2.75	8.73	4.25	5.50	4.00	1.76	4.50		5.12				99.53	
90 A2. II	44.85	11.76	5.20	8.10	4.07	9.03	2.92	1.70	7.40		4.37	0.39			99.79	
91 A3. III	23.20	4.92	0.55	4.03	3.53	0.88	0.48	0.30	4.80					$CaCO_3$ 55.85	99.46	

BASALT—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
72	Wesseln, Polzen District, Bohemia.	K. H. Scheumann.	K. H. Scheumann, Abh. Sachs. Ges. W., XXXII, p. 758, 1913.	Hauyne basalt.	
73	Chlumek, near Pschan Mittelgebirge, Bohemia.	J. Hanaman.	J. Hanaman, Arch. Landdf. Böhm., VII (3), p. 66, 1890.	Basalt.	3 places. Not in W. T.
74	Szentgyorgyhegy, Zala, Hungary.	K. Emszt.	K. Emszt, Jb. Ung. G. A. (1904), p. 339, 1906.	Basalt tuff.	3 places.
75	Szentgyorgyhegy, Zala, Hungary.	K. Emszt.	K. Emszt, Jb. Ung. G. A. (1904), p. 339, 1906.	Basalt tuff.	3 places.
76	Monte Venda, Euganeau Hills, Italy.	M. Stark.	M. Stark. T. M. P. M., XXV, p. 329, 1906.	Basalt.	
77	Palagonia, Val di Noto, Sicily.	G. Ponte.	G. Ponte, Att. Ac. Gioen.(5), III, No. X, p. 7, 1910.	Basalt glass.	From palagonite. Cf. No. 2, III. 6.2.5.
78	Monte Lauro, Val di Noto, Sicily.	S. Mariscalco.	S. Mariscalco, Att. Ac. Gioen. (5), VII, No. IX, p. 6, 1913.	Basalt.	
79	Monte Levante, Linosa Island.	H. S. Washington.	H. S. Washington, J. G., XVI, p. 29, 1908.	Basalt tuff.	
80	Monte Pozzolana, Linosa Island.	H. S. Washington.	H. S. Washington, J. G., XVI, p. 29, 1908.	Basalt tuff.	
81	Franz Joseph Land.	J. J. H. Teall.	J. J. H. Teall, G. Mag., XXXIV, p. 554, 1897.	Palagonite.	In W. T., p. 453.
82	Balaklava, Crimea.	I. A. Bagasheff.	W. W. Arschinow, Geol. Crim., p. 11, 1910.	Basalt tuff.	
83	Mytilene, Mytilene Island, Aegean Sea.	T. M. Chatard.	J. S. Diller, U. S. G. S. B. 79, p. 29, 1891.	Quartz basalt.	In W. T., p. 245.
84	Mao Manduku, Adamawa, Kamerun.	M. Dittrich.	W. Edlinger, In. Diss. Erl., p. 82, 1908.	Dolerite.	
85	Aukarana, Madagascar.	Boiteau.	A. Lacroix, pers. com.	Basalt.	
86	Copper Island, Commander Islands, Bering Sea.	W. Staronka.	J. Morozewicz, Com. C. Russ., Mem. 72, p. 73, 1913.	Basalt tuff.	
87	Cape Okssyn, Kamchatka.	Not stated.	K. Bogdanovitsch, Pet. Mt., L, p. 196, 1904.	Basalt.	
88	Mount Krasnaja, Tigil River, Kamchatka.	Not stated.	K. Bogdanovitch, Pet. Mt., L, p. 124, 1904.	Basalt.	
89	Tou-mou-nyi, Yunnan, China.	Pisani.	J. Deprat, Mem. Sv. G. Indo-Ch., I (1), p. 234, 1912.	Andesitic basalt.	
90	Tsouen-tien-po, Yunnan, China.	Pisani.	J. Deprat, Mem. Sv. G. Indo-Ch., I (1), p. 232, 1912.	Basalt.	
91	Wou-long, Yunnan, China.	Pisani.	J. Deprat, Mem. Sv. G. Indo-Ch., I (1), p. 235, 1912.	Basalt tuff.	

BASALT—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
92 A3. III	58.35	16.70	4.08	3.28	3.29	7.71	2.62	2.87	1.08	0.08					100.06	
93 A2. II	43.70	14.98	5.38	5.44	7.45	9.64	3.02	2.38	5.27		2.15	0.66	0.06	CO_2 trace SO_3 0.11 Cu trace	100.24	2.98
94 A1. I	54.88	12.62	3.02	7.11	3.73	4.16	6.01	1.10	1.76	0.23	3.63		0.25	CO_2 trace ZrO_2 0.44 FeS_2 0.71 Cr_2O_3 none NiO 0.05 BaO none	99.70	
95 A1. I	53.17	9.36	1.29	9.62	9.00	7.46	4.26	0.48	1.80	0.07	1.85	0.12	0.19	CO_2 1.17 FeS_2 0.30 Cr_2O_3 none NiO 0.04 BaO none	100.18	
96 A1. I	52.48	17.03	2.10	6.48	2.21	5.22	4.31	3.10	1.92	0.88	1.12	0.61	0.02	CO_2 2.21 ZrO_2 trace SO_3 0.13 Cl none S none Cr_2O_3 none V_2O_3 0.01 NiO none BaO 0.07 SrO trace	99.90	2.715
97 A1. I	51.38	15.18	7.30	3.06	4.03	7.07	3.10	3.53	2.56	0.87	0.90	0.61	0.09	CO_2 0.46 ZrO_2 none SO_3 0.03 Cl 0.05 S none Cr_2O_3 none V_2O_3 0.01 NiO none BaO 0.07 SrO trace Li_2O none	100.30	2.77
98 A3. III	51.16	17.98	2.85	4.09	4.10	7.30	3.92	1.61	2.32	2.51	1.27	none		CO_2 1.03	100.14	
99 A1. I	50.54	12.77	2.50	8.01	5.89	9.24	3.33	0.57	1.96	1.24	1.80	0.23	0.11	CO_2 2.07 ZrO_2 none SO_3 none Cl none S none Cr_2O_3 0.01 V_2O_3 0.04 NiO none BaO none SrO trace Li_2O none	100.31	2.808
100 A1. I	44.70	17.28	2.10	9.63	8.24	9.24	2.28	1.31	2.83	1.21	0.56	0.45	0.10	CO_2 0.14 ZrO_2 0.08 SO_3 none Cl trace S none Cr_2O_3 0.02 V_2O_3 0.01 NiO 0.02 BaO 0.02 SrO trace Li_2O none	100.22	2.876
101 A1. I	50.43	14.72	2.90	4.59	6.67	7.13	2.47	1.23	3.49	3.82	0.82	0.22	0.03	CO_2 1.67 ZrO_2 trace SO_3 0.01 Cl trace F none S none Cr_2O_3 0.02 V_2O_3 0.03 NiO none BaO none SrO trace Li_2O none	100.25	2.587
102 A1. I	49.10	16.11	0.60	10.62	7.43	11.76	1.04	1.06	0.50	0.20	1.20	0.09	0.21	CO_2 0.16 ZrO_2 none SO_3 none Cl 0.21 S none Cr_2O_3 0.01 V_2O_3 0.03 NiO 0.02 BaO none SrO trace Cu trace ZnS 0.03	100.39	3.124

BASALT—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
92	Antamok River, Benguet, Luzon, Philippine Islands.	P. J. Fox.	A. J. Eveland, Phil. J. Sci. (A), II, p. 226, 1907.	Basalt.	Altered. Cf. Ref., p. 251.
93	Mas River, Timor Island.	O. Pufahl.	A. Wichman, Gest. Timor, p. 128, 1887.	Basalt.	In W. T., p. 325.
94	Hanging Rock, Nunale, New South Wales.	W. N. Benson.	W. N. Benson, Pr. Linn. Soc. N. S. W., XXXVIII, p. 704, 1914.	Albitized dolerite.	Anal corr. by W. N. B., pers. com.
95	Bingara, New South Wales.	W. N. Benson.	W. N. Benson, G. Mag. (V), X, p. 20, 1913.	Albite dolerite.	Anal. corr. by. W. N. B., pers. com.
96	Dubbo, New South Wales.	J. C. H. Mingaye.	Dep. Min., N. S. W. A. R. (1905), p. 165, 1906.	Dolerite.	
97	Durras, New South Wales.	W. E. Stone.	Dep. Min. N. S. W. A. R. (1912), p. 198, 1913.	Basalt.	
98	Staggy Creek, New South Wales.	L. A. Cotton.	W. N. Benson, pers. com.	Quartz dolerite.	
99	Rob Roy Gully, Inverell, New South Wales.	Not stated.	Dep. Min. N. S. W. A. R. (1908), p. 184, 1909.	Olivine basalt.	
100	Byron, Inverell, New South Wales.	Not stated.	Dep. Min. N. S. W. A. R. (1908), p. 184, 1909.	Olivine basalt.	Cf. No. 51, III.6.3.4.
101	Oakey Creek, Copetown, New South Wales.	J. C. H. Mingaye.	G. W. Card, Rec. G. S. N. S. W. VIII, p. 264, 1907.	Dolerite.	Altered. Diamond bearing.
102	Broken Hill, New South Wales.	J. C. H. Mingaye.	D. Mawson, Mem. R. Soc. S. Aust., II (4), p. 269, 1912.	Uralite dolerite.	

BASALT—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
103 A2. II	48. 30	17. 94	3. 23	5. 82	2. 78	8. 09	3. 85	2. 30	2. 36	1. 76	2. 64	0. 56	0. 20	CO_2 0. 71 NiO 0. 03 SrO trace	100. 60	
104 A1. I	45. 88	17. 16	3. 03	7. 57	6. 26	7. 20	4. 08	1. 78	3. 17	0. 88	2. 24	0. 19	0. 24	CO_2 0. 60 SO_3 0. 09 Cl 0. 02 Cr_2O_3 0. 01 V_2O_3 0. 03 NiO 0. 05 BaO 0. 13 SrO trace	100. 61	2. 898
105 A1. I	43. 06	16. 31	5. 40	7. 61	5. 49	9. 37	3. 12	1. 07	2. 93	1. 16	2. 46	0. 32	0. 23	CO_2 1. 36 Cl 0. 02 FeS_2 0. 26 V_2O_3 0. 05 NiO 0. 06 BaO 0. 02 SrO trace	100. 30	2. 814
106 A1. I	42. 48	14. 70	3. 96	9. 24	9. 15	9. 98	3. 13	1. 99	1. 34	0. 14	2. 38	none	0. 11	CO_2 0. 94 ZrO_2 none SO_3 0. 10 Cl 0. 02 Cr_2O_3 0. 01 V_2O_3 0. 02 NiO 0. 06 CoO trace BaO 0. 12 SrO trace CuO 0. 01	100. 27	3. 027
107 A1. I	41. 62	15. 49	3. 41	9. 38	10. 47	9. 74	2. 68	1. 86	2. 16	0. 34	1. 88	0. 23	0. 08	CO_2 0. 56 ZrO_2 none SO_3 0. 09 Cl 0. 02 Cr_2O_3 trace V_2O_3 0. 02 NiO 0. 03 BaO 0. 22 SrO trace Li_2O none	100. 28	
108 A1. I	38. 12	14. 11	3. 58	7. 43	6. 91	11. 40	2. 23	1. 16	2. 71	0. 58	1. 12	0. 40	0. 18	CO_2 9. 60 SO_3 0. 24 Cl trace Cr_2O_3 0. 01 V_2O_3 0. 02 NiO none CoO none BaO 0. 07 SrO trace Li_2O none	99. 87	2. 903
109 A1. I	47. 32	16. 99	4. 30	5. 76	5. 73	7. 98	3. 07	1. 22	2. 71	1. 49	1. 70	0. 42	0. 29	CO_2 1. 21 ZrO_2 none SO_3 none Cl 0. 06 S none Cr_2O_3 trace V_2O_3 0. 02 NiO 0. 02 BaO 0. 06 SrO trace Cu none	100. 35	2. 765
110 A1. I	45. 60	11. 62	2. 80	9. 18	10. 41	8. 46	2. 58	1. 88	3. 32	0. 76	1. 85	0. 41	0. 14	CO_2 1. 01 ZrO_2 none SO_3 none Cr_2O_3 none V_2O_3 0. 02 NiO none BaO none SrO none Li_2O none	100. 04	2. 933
111 A1. I	46. 88	18. 32	2. 50	7. 91	5. 36	8. 46	2. 96	1. 47	1. 96	0. 78	2. 30	0. 64	0. 01	CO_2 0. 62 ZrO_2 none SO_3 0. 02 Cl trace S none Cr_2O_3 none V_2O_3 0. 03 NiO 0. 02 BaO none SrO trace Cu trace	100. 24	2. 911
112 A1. I	45. 14	17. 41	0. 20	9. 27	5. 75	9. 06	2. 75	1. 81	2. 53	0. 41	2. 10	0. 46	0. 07	CO_2 3. 20 ZrO_2 none SO_3 none Cl none FeS_2 0. 09 Cr_2O_3 0. 01 V_2O_3 0. 07 NiO none BaO none SrO trace Li_2O none	100. 33	2. 941

BASALT—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
103	Dundas, near Sydney, New South Wales.	W. N. Benson.	W. N. Benson, Pr. R. Soc. N. S. W., XLV, p. 186, 1911.	Hornblende basalt.	Incorrect in op. cit., XLIV, p. 544, 1910.
104	Dundas, Pennant Hills, New South Wales.	H. P. White.	Mingaye and White, Rec. G. S. N. S. W., VII, p. 230, 1903.	Olivine basalt.	
105	Prospect Quarry, near Sydney, New South Wales.	J. C. H. Mingaye.	Mingaye and White, Rec. G. S. N. S. W., VII. p. 230, 1903	Dolerite.	
106	Hurstville, near Sydney, New South Wales.	J. C. H. Mingaye.	Mingaye and White, Rec. G. S. N. S. W., VII, p. 230, 1903.	Olivine basalt.	
107	Seal Bay, near Sydney, New South Wales.	H. P. White.	Mingaye and White, Rec. G. S. N. S. W., VII, p. 230, 1903.	Olivine basalt.	
108	Guildford, near Sydney, New South Wales.	H. P. White.	Mingaye and White, Rec. G. S. N. S. W., VII, p. 230, 1903.	Dolerite.	Altered.
109	Bong Bong Mountain, Kiama, New South Wales.	H. P. White.	Jaquet, Card, and Harper, Rec. G. S. N. S. W., VIII, p. 58, 1905.	Dolerite.	
110	Minamurra River, Kiama, New South Wales.	Survey laboratory.	Dep. Min. N. S. W. A. R. (1913), p. 191, 1914.	Dolerite.	
111	Near Wollongong, New South Wales.	W. A. Greig.	Dep. Min. N. S. W. A. R. (1912), p. 198, 1913.	Olivine basalt.	
112	Near Wollongong, New South Wales.	J. C. H. Mingaye.	Dep. Min. N. S. W. A. R. (1912), p. 198, 1913.	Analcite basalt.	

BASALT—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
113 A1. I	46.12	12.39	2.70	9.53	10.26	10.00	2.72	1.56	1.80	0.26	1.28	0.46	0.19	CO_2 0.77 ZrO_2 none SO_3 0.15 Cl 0.08 S none Cr_2O_3 0.02 V_2O_3 0.06 NiO none BaO 0.01 SrO trace Li_2O none Cu trace	100.36	3.013
114 A1. I	44.52	15.36	2.40	7.83	9.49	7.14	3.98	1.71	4.83	0.75	1.25	0.56	0.11	CO_2 0.43 ZrO_2 none SO_3 none Cl trace S none Cr_2O_3 none V_2O_3 trace NiO 0.02 BaO 0.02 SrO none Li_2O none	100.40	2.755
115 A1. I	42.54	12.57	7.20	7.64	6.41	8.90	3.24	2.29	2.72	1.70	2.12	1.18	0.18	CO_2 1.06 ZrO_2 none SO_3 0.08 S none Cr_2O_3 trace V_2O_3 0.02 NiO none BaO 0.06 SrO trace	99.91	2.845
116 A1. I	43.38	19.24	none	7.64	8.88	9.16	3.72	1.32	3.78	0.42	1.28	0.86	0.06	CO_2 0.48 ZrO_2 none SO_3 none Cl 0.03 S none Cr_2O_3 0.02 V_2O_3 0.03 NiO none BaO 0.01 SrO none Li_2O none Cu trace	100.31	2.872
117 A1. I	42.50	9.28	2.60	6.66	18.84	9.60	1.95	0.92	4.40	0.48	0.70	0.49	0.12	CO_2 1.49 ZrO_2 none SO_3 none Cl trace S none Cr_2O_3 none V_2O_3 0.02 NiO 0.04 BaO 0.02 SrO none Cu none	100.11	2.938
118 A1. I	41.40	15.39	4.00	6.84	3.41	12.02	2.81	2.13	4.26	0.52	0.95	0.32	0.16	CO_2 5.98 ZrO_2 none SO_3 none Cl trace S none Cr_2O_3 none NiO none BaO 0.06 SrO trace Li_2O none	100.25	2.792
119 A1. I	41.22	15.60	1.99	8.95	6.26	9.96	2.21	2.02	1.87	0.68	1.44	0.37	0.06	CO_2 7.12 SO_3 0.50 Cl 0.03 Cr_2O_3 0.01 V_2O_3 trace NiO trace BaO 0.19 SrO trace Li_2O trace	100.48	2.919
120 A2. II	50.50	16.01	1.40	8.98	6.13	8.05	3.08	2.02	0.29	0.48	2.04	0.39	trace	CO_2 0.68	99.97	2.86
121 A2. II	45.86	13.19	2.82	8.61	10.58	9.09	2.44	1.00	1.33	1.66	2.20	none	0.24	CO_2 0.60 SO_3 trace NiO 0.03	100.16	2.922
122 A1. I	44.91	13.77	5.28	5.81	12.19	8.56	1.73	0.94	3.40	1.34	1.73	0.32	0.33	CO_2 trace Cl none Cr_2O_3 0.05 NiO 0.03	100.39	2.874
123 A3. III	43.88	16.58	5.53	9.11	5.77	9.60	2.02	1.06	2.22	0.64	3.52	trace			99.93	

BASALT—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
113	Kangaroo Mountain, New South Wales.	W. A. Greig.	G. W. Card, pers. com.	Olivine basalt.	
114	Kembla, New South Wales.	H. P. White.	Dep. Min. N. S. W. A. R. (1912), p. 198, 1913.	Olivine dolerite.	
115	Byarong Creek, Kembla, New South Wales.	W. A. Greig.	Dep. Min. N. S. W. A. R. (1912), p. 198, 1913.	Analcite basalt.	
116	South Bulli, New South Wales.	W. A. Greig.	Dep. Min. N. S. W. A. R. (1912), p. 198, 1913.	Olivine basalt.	
117	South Bulli, New South Wales.	H. P. White.	G. W. Card, pers. com.	Basalt.	
118	Murramarrang, New South Wales.	H. P. White.	Dep. Min. N. S. W. A. R. (1912), p. 198, 1913.	Dolerite.	
119	Long Reef, Narrabeen. New South Wales.	H. P. White.	Mingaye and White, Rec. G. S. N. S. W., VII, p. 230, 1903.	Dolerite.	
120	Will Will Rock, Bourke County, Victoria.	F. L. Stillwell.	F. L. Stillwell, Pr. R. Soc. Vict., XXIV, p. 177, 1911.	Basalt.	
121	Colungulac, Camperdown District, Victoria.	A. G. Hall.	H. J. Grayson, Mem. G. S. Vict., No. 9, p. 22, 1910.	Basalt.	
122	Berrys Creek, Victoria.	D. J. Mahony.	A. R. Sec. Min. Vict. (1911), p. 62, 1912.	Basalt.	
123	Moroka Valley, near Mount Wellington, Gippsland, Victoria.	Ampt.	E. O. Thiele, Pr. R. Soc. Vict., XXI, p. 267, 1908.	Basalt.	Altered.

BASALT—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
124 A2. II	53.85	14.00	0.36	8.12	4.51	6.43	3.14	0.60	2.94	0.06	0.55		0.87	CO_2 4.37 S none	99.80	
125 A2. II	52.10	16.35	1.18	7.91	3.71	7.35	3.30	0.68	2.36	0.12	2.08	0.45	0.35	CO_2 2.49 FeS_2 0.17	100.60	
126 A2. II	48.05	13.82	0.73	15.43	3.91	5.78	1.14	0.30	4.24	0.08	1.14	0.27	0.97	CO_2 4.42 FeS_2 0.32	100.60	
127 A4. IV	43.56	18.88	8.24	n. d.	2.22	12.47	2.64	3.52	2.28		0.45			CO_2 5.74	100.00	
128 A2. II	42.05	14.35	3.64	8.96	13.98	7.45	3.16	1.31	0.99	0.32	1.92	0.83	0.30	CO_2 0.76 SO_3 0.10	100.12	
129 A2. II	32.36	26.15	5.04	10.30	3.76	10.74	1.23	1.68	5.66		1.55		0.25	CO_2 1.12 Cr_2O_3 0.05	99.89	
130 A3. III	36.85	11.97	13.90	6.54	10.73	9.00	4.13	0.79	(4.74)	(5.48)	4.05	1.25	1.13	SO_3 trace S 0.14 CoO 0.04 CuO 0.10	100.62	
131 A3. III	35.86	12.10	7.82	8.09	9.72	12.08	6.23	1.93	n. d.		2.90	1.08	0.39	SO_3 0.27 FeS_2 1.40 CuO 0.25	100.12	
132 A3. III	47.33	17.96	12.64	0.51	3.97	6.29	3.67	1.10	(3.08)	(2.38)	4.84	1.05	0.64	SO_3 0.07 S 0.07 CuO 0.15	100.29	
133 A3. III	45.79	15.09	5.34	5.58	5.92	10.21	3.67	0.90	n. d.		3.25	0.29	0.49	SO_3 2.54 CuO 0.18	99.25	
134 A3. III	51.65	19.12	6.60	n. d.	0.76	5.50	7.47	1.92	2.30		3.50	0.98	0.76		100.56	
135 A3. III	42.98	20.31	16.63	0.24	5.57	7.22	2.40	0.21	4.26						99.82	
136 A3. III	41.82	17.63	15.02	0.90	4.48	5.43	3.06	0.25	11.14						99.73	
137 A3. III	38.40	19.02	17.31	0.41	4.87	6.89	2.72	0.30	10.22						100.14	
138 A3. III	40.50	14.85	14.30	n. d.	4.32	6.10	4.13	0.96	10.10		4.20	0.82	0.28		100.56	

NEPHELITE SYENITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A2. II	50.72	15.45	11.82	0.80	0.13	0.14	10.83	2.94	4.66		2.84	none	0.31		100.64	2.70
2 A1. I	55.90	19.75	1.00	2.05	0.59	3.10	7.25	5.61	2.00		0.70	0.10	0.10	CO_2 1.85 SO_3 0.04 Cl trace BaO 0.09 SrO trace	100.77	
3 A1. I	49.96	16.53	3.18	4.35	3.95	8.24	4.81	2.95	0.70	0.07	2.73	0.32	0.10	CO_2 0.80 Cl 0.22 FeS_2 1.37 BaO 0.05 SrO 0.02	100.35	

BASALT—Continued.

No	Locality.	Analyst.	Reference.	Rock name.	Remarks.
124	Bamboo Creek, Pilbara, Western Australia.	C. C. Williams.	A. G. Maitland, W. Aust. G. S. B. 15, p. 12, 1904.	Greenstone (dolerite).	
125	Sherlock River, Pilbara, Western Australia.	Not stated.	L. Glanert, W. Aust. G. S. B. 41, p. 32, 1911.	Dolerite.	
126	Pecawah Hill, Pilbara, Western Australia.	Not stated.	L. Glanert, W. Aust. G. S. B. 41, p. 28, 1911.	Dolerite.	
127	Stephenson Island, Whangaroa, New Zealand.	J. S. Maclaurin.	Bell and Clarke, G. S. N. Z. B. 8, p. 65, 1909.	Basalt.	
128	Punakaiki River, Waiwhero, Reefton District, New Zealand.	Henderson.	P. G. Morgan, pers. com.		
129	Humbug Creek, Mikonui, New Zealand.	J. S. Maclaurin.	P. G. Morgan, G. S. N. Z. B. 6, p. 141, 1908.	Basalt.	Altered.
130	Panahou, Oahu, Hawaiian Islands.	A. B. Lyons.	A. B. Lyons, A. J. S., II, p. 424, 1896.	Basalt.	Ignited before analysis. In W. T., p. 455.
131	Panahou, Oahu, Hawaiian Islands.	A. B. Lyons.	A. B. Lyons, A. J. S., II, p. 424, 1896.	Basalt.	Ignited before analysis. In W. T., p. 455.
132	Mount Kobala, Waimea, Hawaii, Hawaiian Islands.	A. B. Lyons.	A. B. Lyons, A. J. S., II, p. 424, 1896.	Basalt.	Ignited before analysis. In W. T., p. 453.
133	Kilauea, Hawaii, Hawaiian Islands.	A. B. Lyons.	A. B. Lyons, A. J. S., II, p. 424, 1896.	Basalt.	Pelé's hair. Decomposed by SO_2. Ignited before analysis. In W. T., p. 325.
134	Perseverance Harbor, Campbell Island.	B. C. Aston.	B. C. Aston, Subant. Islds., II, p. 767, 1909.	Basalt.	Weathered.
135	Gazelle Harbor, Kerguelen Island	R. Reinisch.	R. Reinisch, D. Tiefs. Exp., X (3), p. 64, 1908.	Basalt tuff.	
136	Kerguelen Island.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (2), p. 219, 1908.	Basalt tuff.	
137	Green Lake, Kerguelen Island.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (2), p. 219, 1908.	Basalt tuff.	
138	Antipodes Island.	B. C. Aston.	B. C. Aston, Subant. Islds., II, p. 763, 1909.	"Black scoria" (basalt).	

NEPHELITE SYENITE.

1	S. Siorarsuit, Ilimausak region, Greenland.	C. Detlefsen.	N. V. Ussing, G. Julhb., p. 168, 1911.	Aegirite lujavrite.	
2	Mount Royal, Montreal, Quebec.	M. F. Connor.	F. D. Adams, Cong. G. Int., XII, Guide 3, p. 41, 1913.	Nephelite syenite.	
3	Mount Royal, Montreal, Quebec.	M. F. Connor.	F. D. Adams, Cong. G. Int., XII, Guide, 3, p. 46, 1913.	Nephelite syenite.	

NEPHELITE SYENITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
4 A1. I	45.68	18.26	2.87	3.98	2.63	8.06	6.41	3.81	0.75	0.07	2.58	0.22	0.14	CO_2 2.90 Cl 0.10 FeS_2 0.38 Fe_7S_8 0.80 BaO 0.01 SrO 0.02	99.67	
5 A2. II	43.67	20.91	3.54	8.01	1.46	7.37	6.73	2.25	2.52		0.78	0.11	0.05	CO_2 2.37	99.77	
6 A3. III	53.38	20.22	1.56	1.99	0.29	3.29	7.89	6.21	3.43				trace	FeS_2 1.77	100.03	
7 A2. II	56.44	15.54	3.27	3.67	1.73	4.16	5.81	4.27	2.06	0.44	1.16	0.83		CO_2 0.97	100.35	
8 A2. II	58.43	19.82	2.74	1.16	0.02	1.08	9.70	4.09	2.34		trace	0.02	0.08	CO_2 trace Cl 0.44	99.92	
9 A2. II	56.67	19.64	3.45	0.86	0.02	1.25	10.08	4.07	3.66		trace	0.03	0.06	CO_2 trace Cl trace	99.79	
10 B2. III	53.58	25.26	0.64	1.20	0.08	1.20	10.49	5.28	0.04		0.27	trace		CO_2 0.79 Cl 0.50	99.33	
11 A2. II	52.35	14.11	7.98	2.17	0.66	4.65	9.30	2.78	3.20		0.59		0.62	CO_2 1.50 ZrO_2 0.39	100.30	
12 A2. II	56.26	23.59	0.85	2.61	0.27	0.54	7.77	5.72	0.37		0.47		0.09	CO_2 1.37	99.91	
13 A2. II	44.63	13.77	7.30	5.60	4.47	7.96	4.20	2.65	4.04		4.25	0.09	0.08	CO_2 1.34 CuO 0.05	100.43	
14 A1. I	51.48	17.07	1.90	4.95	1.10	3.04	5.65	5.22	3.25	0.67	1.16	0.41	0.26	CO_2 4.07 ZrO_2 none SO_3 none Cl 0.11 S none Cr_2O_3 none V_2O_3 none NiO none BaO 0.06 Cu none	100.40	2.569

PHONOLITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A2. II	54.95	18.64	4.75	1.55	0.60	2.27	4.91	7.65	3.35	0.90	0.42	0.18	0.34		100.51	
2 A3. III	52.73	20.05	3.43	0.99	0.17	3.35	7.94	4.77	4.85	0.69		trace		CO_2 0.93 BaO 0.11	100.01	2.466
3 A2. II	48.07	18.36	3.95	3.39	0.32	3.76	8.72	4.71	4.65	0.45		0.14	0.55	CO_2 2.65	99.72	2.60
4 A2. II	60.05	19.97	4.32	1.04	0.23	0.91	7.69	3.24	1.26	0.15	0.11		0.79	Cl 0.28	100.04	2.708
5 A2. II	56.74	20.30	1.06	n. d.	0.23	0.57	0.62	13.36	1.15	0.33	0.58	0.25	none	ZrO_2 0.07 FeS_2 4.65 BaO 0.19 SrO trace	100.10	
6 A2. II	52.20	20.67	3.26	1.38	0.48	4.43	6.61	4.90	3.56	0.36	0.14	0.12	0.09	CO_2 1.54 SO_3 0.04 BaO 0.09	99.87	2.463

NEPHELITE SYENITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
4	Westmont, Mount Royal, Montreal, Quebec.	M. F. Connor.	F. D. Adams, Cong. G. Int., XII, Guide 3, p. 46, 1913.	Nephelite syenite.	Groundmass of breccia.
5	Monmouth Township, Ontario.	N. N. Evans.	Adams and Barlow, Tr. R. Soc. Can., II (4), p. 37, 1909.	Nephelite syenite.	Also in Can. G. S. Mem. 6, p. 270, 1910.
6	Diamond Jo quarry, Magnet Cove, Arkansas.	Brackett and Smith.	J. F. Williams, Ig. R. Ark., p. 238, 1891.	Foyaite.	In W. T., p. 295.
7	Mauchline, Ayrshire, Scotland.	M. Dittrich.	G. W. Tyrrell, G. Mag. (V), IX, p. 72, 1912.	Analcite syenite.	
8	Nagy Kövez, Mecsek Mountains, Hungary.	B. Mauritz.	B. Mauritz, T. M. P. M., XXXI, p. 475, 1912.	Foyaite.	Much zeolitized.
9	Somlo, Mecsek Mountains, Hungary.	B. Mauritz.	B. Mauritz, T. M. P. M., XXXI, p. 472, 1912.	Foyaite.	Much zeolitized.
10	Ditro, Siebenbürgen, Hungary.	J. v. Szadeczky.	J. v. Szadeczky, Ref. N. J., 1901, I, p. 402.	Nephelite syenite.	In W. T., p. 213.
11	Wijdhoek, Pilandsberg, Transvaal.	F. Pisani.	H. A. Brouwer, C. R., CXLIX, p. 1008, 1909.	Lujavrite.	Also in Transv. Nephsy., p. 132, 1910.
12	Mount Sobatchia, Ural Mountains.	Bourdakow.	A. Karpinsky, Cong. G. Int., VII, Guide V, p. 22, 1897.	Miascite.	In W. T., p. 211.
13	Banatette River, Kupang Bay, Timor Island.	O. Pufahl.	A. Wichmann, Samml. G. R. Mus. Loiden, II, p. 87, 1887.	Foyaite.	In W. T., p. 343.
14	Minumurra River, Kiama, New South Wales.	H. P. White.	Jaquet, Card, and Harper, Rec. G. S. N. S. W., VIII, p. 36, 1905.	Nephelite syenite.	

PHONOLITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Blairmore, Alberta, Canada.	C. W. Dickson.	C. W. Knight, Can. Rec. Sci., IX, p. 276, 1905.	Blairmorite, (analcite trachyte tuff).	
2	Heron Bay, Lake Superior, Ontario.	H. W. Charlton.	A. P. Coleman, J. G., VII, p. 435, 1899.	Heronite.	In W. T., p. 207.
3	Heron Bay, Lake Superior, Ontario.	A. H. A. Robinson.	A. P. Coleman, Rep. Bur. Min. Ont., IX, p. 189, 1900.	Heronite.	Cf. No. 13, II.6.1.4.
4	Gales Point, Essex County, Massachusetts.	A. S. Eakle.	A. S. Eakle, A. J. S., VI, p. 491, 1898.	Biotite tinguaite.	In W. T., p. 197.
5	Victor, Cripple Creek, Colorado.	W. F. Hillebrand.	Lindgren and Ransome, U. S. G. S. P. P. 54, p. 189, 1906.	Phonolite.	Altered. In W. T., p. 403.
6	Sabucan, Ibitimi, Paraguay.	L. Lindner.	L. Milch, T. M. P. M., XXIV, p. 217, 1905.	Phonolite.	

PHONOLITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
7 A3. III	48.55	11.97	5.73	4.41	4.77	10.06	4.86	4.30	2.62		3.04	trace			100.31	
8 A2. II	50.26	20.15	3.67	2.62	1.43	3.28	8.09	4.67	3.85		0.24	0.05	trace	CO_2 0.96 X 0.75 SO_3 0.16	100.18	
9 A2. II	45.48	18.75	3.99	1.57	1.50	7.22	10.69	3.80	2.10		1.18	0.46	0.15	CO_2 2.77 BaO 0.13	99.79	
10 A2. II	55.91	19.73	2.73	1.36	0.75	2.39	7.24	2.13	4.33		trace	0.18	0.46	CO_2 1.89 SO_3 0.21 Cl 0.10 F trace	99.41	2.471
11 A1. I	51.02	18.63	3.14	0.84	1.02	7.89	4.13	6.08	1.10		trace	0.16	0.59	CO_2 4.53 SO_3 0.29 Cl 0.09 F trace Ce_2O_3 trace Cu 0.15	99.66	2.480
12 A2. II	54.98	13.28	10.60	0.39	1.80	1.55	5.46	6.32	1.78		2.82	0.65	0.37	Cl 0.06	100.06	2.75
13 A3. III	54.71	11.39	13.67	0.48	1.70	1.82	6.54	5.42	0.90	0.73	2.78		trace	Cl trace	100.14	2.70
14 A2. II	53.40	18.21	2.19	2.68	0.96	3.66	8.45	3.87	3.37		1.25	0.06	0.70	CO_2 1.06 SO_3 0.15 Cl 0.02	100.03	2.490
15 A3. III	53.00	16.47	5.29	3.10	0.63	4.15	7.21	5.09	1.68	trace	0.72	trace	0.37	CO_2 3.20 SO_3 none Cl none	100.91	2.527
16 A2. II	56.49	18.77	3.00	1.46	0.63	3.29	7.10	5.18	1.83	0.62	0.74	0.27	0.32	CO_2 1.00	100.70	2.517
17 A3. III	47.00	17.86	4.85	4.02	1.10	5.30	6.84	4.55	1.53	1.10	trace	0.32	1.25	CO_2 4.80	100.52	2.492
18 A2. II	58.33	19.31	3.77	0.69	0.27	1.15	8.93	5.08	2.39		0.13	0.02		CO_2 0.04 SO_3 0.12	100.23	2.580
19 A3. III	52.40	19.93	3.83	1.51	0.32	1.34	11.71	4.10	3.54	0.23		trace	0.45	CO_2 0.21 SO_3 none Cl 0.05	99.62	2.499
20 A3. III	51.98	20.61	4.08	1.32	0.38	1.12	11.69	4.42	3.29	0.32		trace	0.40	CO_2 0.44 SO_3 none Cl 0.09	100.14	2.492
21 A3. III	50.15	18.45	4.71	1.24	0.37	1.39	12.02	4.65	5.25	0.78		trace	0.26	CO_2 0.52 SO_3 none Cl trace	99.79	2.434
22 A2. III	51.98	22.46	2.48	1.87	0.83	4.63	3.66	3.93	2.06	1.08	4.71		0.08	CO_2 0.04 NiO 0.04 BaO none SrO none	99.85	

ESSEXITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A2. II	44.62	7.90	4.22	5.67	14.00	19.44	1.20	0.31	0.75	0.07	1.87		0.10	CO_2 0.60	100.75	
2 A2. II	44.39	8.36	2.18	8.25	16.70	12.90	1.28	1.28	2.08	0.02	1.98		0.15		99.57	

PHONOLITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
7	Centurion, Paraguay.	M. Goldschlag.	M. Goldschlag, In. Diss. Jena, p. 24, 1913.	Phonolite.	
8	Alnö, Sweden.	P. Jannasch.	H. Rosenbasch, Elem. Gest., p. 215, 1898.	Tinguaite.	In W. T., p. 297.
9	Pyhäkuru, Kuolajärvi, Finland.	I. G. Sundell.	I. G. Sundell, B. C. G. Fin., No. 16, p. 14, 1905.	Nephelite porphyry.	
10	Schwintel, Hegau, Baden.	G. F. Föhr.	G. F. Föhr, In. Diss. Wurzb., p. 30, 1883.	Phonolite.	In W. T., p. 203.
11	Gennersbohl, Hegau, Baden.	G. F. Föhr.	G. F. Föhr, In. Diss. Wurzb., p. 24, 1883.	Phonolite.	In W. T., p. 297.
12	Michelsberg, Katzenbuckel, Odenwald.	O. N. Heidenreich.	W. Freudenberg, Mt. Bad. G. L.-A., V, (1), p. 315, 1907.	Tinguaite.	
13	Michelsberg, Katzenbuckel, Odenwald.	W. Sonne.	W. Freudenberg, Mt. Bad. G. L.-A. V (1), p. 315, 1907.	Tinguaite.	
14	Pömmerle, Bohemia.	F. Hanusch.	J. E. Hibsch, T. M. P. M., XXI, p. 576, 1902.	Nephelite porphyry (phonolite).	
15	Near Topkowitz, Bohemia.	F. Hanusch.	J. E. Hibsch, T. M. P. M., XIX, p. 33, 1900.	Tinguaite porphyry.	In W. T., p. 297.
16	Ziegenberg, near Nestersitz, Bohemia.	F. Hanusch.	J. E. Hibsch, T. M. P. M., XIV, p. 97, 1894.	Phonolite.	In W. T., p. 213.
17	Königsbachthal, Bohemia.	F. Hanusch.	J. E. Hibsch, T. M. P. M., XIX, p. 76, 1900.	Sodalite porphyry.	MnO high? In W. T., p. 465.
18	Nagy Köves, near Fünfkirchen, Mecsek Mountains, Hungary.	K. Gremse.	K. A. Lossen, Z. D. G. G., XXXIX, p. 507, 1887.	Phonolite.	Zeolitized. In W. T., p. 213.
19	Kosciusko, New South Wales.	F. B. Guthrie.	David, Guthrie, and Woolnough, Pr. R. Soc. N. S. W., XXXV, p. 366, 1901.	Muniongite (tinguaite).	North border of dike.
20	Kosciusko, New South Wales.	F. B. Guthrie.	David, Guthrie, and Woolnough, Pr. R. Soc. N. S. W., XXXV, p. 366, 1901.	Muniongite (tinguaite).	South border of dike.
21	Kosciusko, New South Wales.	F. B. Guthrie.	David, Guthrie, and Woolnough, Pr. R. Soc. N. S. W., XXXV, p. 366, 1901.	Muniongite (tinguaite)	Center of dike.
22	Mount Ningadhurn, Nandewar Mountains New South Wales.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W. XXXII, p. 903, 1908.	Phonolite-trachyte.	Altered.

ESSEXITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Rougemont Mountain, Rouville County, Quebec.	M. F. Connor.	J. J. O'Neill, Can. G. S. Mem. 43, p. 71, 1914.	Essexite.	
2	Rougemont Mountain, Rouville County. Quebec.	M. F. Connor.	J. J. O'Neill, Can. G. S. Mem. 43, p. 81, 1914.	Essexite porphyry.	

ESSEXITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
3 A1. I	43.10	13.94	4.92	6.93	8.86	14.65	2.50	0.89	0.55	0.15	2.80	0.27	0.14	CO_2 0.64 SO_3 none Cl trace S 0.22 BaO 0.03 SrO 0.03	100.62	
4 A1. I	46.77	14.91	7.80	4.90	2.94	6.30	4.97	2.37	4.28	0.92	2.31	0.98	0.29	CO_2 trace ZrO_2 none FeS_2 0.07 Cr_2O_3 none V_2O_3 0.02 BaO 0.04 SrO 0.03 Li_2O trace	99.90	
5 A2. II	40.40	13.49	5.87	4.88	8.01	10.02	3.45	2.94	3.06	0.61	2.21	1.09	0.63	CO_2 3.72 S 0.19	100.57	
6 A3. III	51.03	8.48	11.95	3.21	6.34	6.96	5.42	4.83	1.68					SO_3 0.67 Cl 0.37	100.94	2.86
7 A1. I	48.90	14.70	4.14	3.68	3.95	8.26	5.22	0.56	2.44	0.52	0.95	0.79	0.03	CO_2 5.42 SO_3 0.04 BaO 0.31 SrO 0.13 Li_2O trace	100.04	
8 A2. II	46.95	17.05	3.61	9.53	7.11	7.04	3.42	0.82	2.05		1.58	0.63	0.03	CO_2 0.80	100.62	
9 A1. I	48.63	15.03	0.51	9.55	6.34	5.95	5.32	0.56	3.16	0.93	2.04	0.34	0.20	CO_2 1.12 FeS_2 0.44 NiO none BaO 0.04 Li_2O trace	100.16	
10 A1. I	46.06	15.94	2.94	7.44	4.14	7.04	4.95	2.76	4.22	0.55	2.56	0.84	0.31	CO_2 0.11 Cl trace FeS_2 0.36 NiO none BaO 0.10 SrO none	100.32	
11 A1. I	45.71	15.23	2.84	6.93	8.11	7.34	3.96	1.31	4.70	1.54	1.64	0.47	0.54	S 0.08 Cr_2O_3 0.02 V_2O_3 0.03 NiO 0.02 BaO 0.04 Li_2O trace	100.51	
12 A1. I	43.55	14.84	3.09	7.44	7.41	7.66	3.82	1.90	5.08	1.79	2.48	0.63	0.23	CO_2 0.53 Cl trace FeS_2 0.13 NiO none BaO 0.07 SrO none	100.65	
13 A2. II	44.50	15.28	2.81	6.88	4.91	12.08	3.94	2.41	3.09	0.72	2.43	0.24	0.26	CO_2 1.16	100.71	
14 A1. I	40.87	16.23	1.31	7.37	9.83	11.13	2.78	0.53	4.28	1.35	2.85	0.52	0.64	CO_2 0.38 FeS_2 0.21 NiO 0.06 BaO none	100.34	
15 A2. II	41.80	14.56	6.09	6.41	4.66	14.87	4.25	1.94	1.18		4.14	0.52		CO_2 0.40	100.82	
16 A2. II	48.79	17.23	1.99	6.78	2.92	5.58	5.48	3.77	3.93	0.28	1.44	1.11		CO_2 0.16 SO_3 0.29	99.75	2.66
17 A3. III	46.45	15.49	4.86	6.83	3.47	9.38	3.23	0.57	3.80			0.85		CO_2 4.90	99.83	
18 A3. III	43.40	13.60	6.66	6.83	8.15	9.05	1.66	0.64	3.20			0.26		CO_2 7.10	100.55	
19 A6. III	42.15	18.75	4.94	7.30	3.74	9.75	3.34	2.07	4.35			0.58		CO_2 3.10	100.07	

ESSEXITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
3	Mount Royal, Montreal, Canada.	M. F. Connor.	F. D. Adams, Cong. G. Int., XII, Guide 3, p. 39, 1913.	Essexite.	
4	Mapleton Township, Aroostook County, Maine.	W. F. Hillebrand.	H. E. Gregory, U. S. G. S. B. 165, p. 183, 1900.	Teschenite.	In W. T., p. 261.
5	Mount Solon, Augusta County, Virginia.	J. W. Watson.	Watson and Cline, B. G. S. A., XXIV, p. 320, 1913.	Teschenite.	
6	Three Peaks, Crazy Mountains, Montana.	A. M. Comey.	J. E. Wolff, North Transcont. Surv., p. (11), 1885.	Nephelite rock (theralite).	In W. T., p. 299.
7	Shields River, Crazy Mountains, Montana.	H. N. Stokes.	W. H. Weed, U. S. G. S. B. 148, p. 146, 1897.	Theralite.	Altered. In W. T., p. 457.
8	Cerro Donoso, Patagonia.	N. Sahlbom.	P. D. Quensel, B. G. Inst. Ups., XI, p. 93, 1911.	Essexite porphyry.	
9	Lochend, near Edinburgh, Scotland.	E. G. Radley.	J. S. Flett, G. S. Scot. Mem., Sh. 32, p. 293, 1910.	Essexite.	
10	Mons Hill, Dalmeny, Mid-Lothian, Scotland.	E. G. Radley.	J. S. Flett, G. S. Scot. Mem., Sh. 32, p. 293, 1910.	Teschenite.	
11	Blackburn, Linlithgowshire, Scotland.	W. Pollard.	J. S. Flett, G. S. Scot. Mem., Sh. 32, p. 299, 1910.	Teschenite.	
12	Mochrie's crag, Linlithgowshire, Scotland.	E. G. Radley.	J. S. Flett, G. S. Scot Mem., Sh. 32, p. 299, 1910	Teschenite.	
13	Lugar, Ayrshire, Scotland.	A. Scott.	G. W. Tyrrell, pers. com.	Teschenite-basalt.	
14	Barshaw House, near Paisley, Glasgow, Scotland.	E. G. Radley.	G. S. G. B., Sum. Prog., (1907), p. 55, 1908.	Theralite.	
15	Monchique, Serra de Monchique, Portugal.	Singhof.	Kraatz-Koschlau and Hackman, T. M. P. M., XVI, p. 237, 1896.	Segregation in nephelite syenite (teschenite).	In W. T., p. 349.
16	Oberberg, near Wissenbach, Hesse-Nassau.	F. Stadler.	R. Brauns, N. J. B. B., XXVII, p. 274, 1909.	Essexite.	
17	Hotzendorf, Moravia.	C. F. Eichleiter.	C. F. Eichleiter, Vh. G. R.-A. Wien, XXX, p. 72, 1896.	Teschenite.	In W. T., p. 457.
18	Lohtka, Frankstadt, Moravia.	C. F. Eichleiter.	C. F. Eichleiter, Vh. G. R.-A. Wien, XXX, p. 73, 1896.	Teschenite.	In W. T., p. 457.
19	Bluendorf, Neutitschein, Moravia.	C. F. Eichleiter.	C. F. Eichleiter, Vh. G. R.-A. Wien, XXX, p. 71, 1896.	Teschenite.	In W. T., p. 487.

ESSEXITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
20 A3. III	38.85	15.65	10.43	8.88	1.49	11.35	1.96	0.62	4.50			0.62		CO_2 6.25	100.60	
21 A3. III	39.20	15.52	8.80	5.08	6.49	14.45	2.04	1.11	3.70			1.18		CO_2 2.80	100.37	
22 A2. II	46.47	18.77	3.55	4.83	3.90	7.28	3.73	4.65	4.93		1.21	0.14		CO_2 0.34	99.80	
23 A2. II	42.91	16.68	2.00	6.56	6.25	10.31	3.39	2.09	3.17		1.70	0.21	0.11	CO_2 4.52 Cl trace	99.90	
24 A2. II	49.73	17.68	3.09	5.59	2.33	5.70	6.01	2.75	4.55	1.09	0.86	0.40	0.21		99.99	
25 A2. II	49.87	14.98	6.17	4.40	1.77	6.34	5.08	2.04	1.66	2.60	0.74			CO_2 3.22 SO_3 0.25 Cl trace S 0.76	99.88	2.722
26 A2. II	46.20	16.01	5.08	7.01	5.07	7.09	6.50	2.04	4.31		0.76	0.51	0.16	CO_2 0.21	100.95	
27 A1. I	48.25	17.38	4.54	5.31	2.13	6.03	5.81	3.00	3.85		2.73	0.65	0.30	CO_2 0.51 Cl 0.09 F none S 0.04 BaO 0.03 SrO trace	100.65	2.751
28 A2. II	58.82	16.91	2.40	4.59	0.88	2.42	6.74	2.96	0.56	1.98	1.14	0.34	0.13	CO_2 0.54 Cl 0.01	100.42	2.665
29 A1. I	43.06	16.31	5.40	7.61	5.49	9.37	3.12	1.07	2.93	1.16	2.46	0.32	0.23	CO_2 1.36 Cl 0.02 S 0.26 V_2O_3 0.05 NiO 0.06 BaO 0.02 SrO trace	100.30	2.814
30 A1. I	41.05	12.27	6.39	11.07	6.38	10.96	2.43	0.53	3.58	0.44	4.39	0.19	0.17	CO_2 0.03 ZrO_2 none Cl trace S 0.35 Cr_2O_3 trace V_2O_3 0.06 NiO 0.02 BaO none SrO trace Cu trace	100.31	3.058
31 A1. I	46.22	9.33	5.85	7.39	3.08	10.80	3.21	1.80	1.78	0.94	3.70	0.80	0.32	CO_2 4.46 SO_3 0.32 Cl 0.03 S 0.10 Cr_2O_3 0.02 V_2O_3 0.02 BaO 0.24 SrO none Li_2O trace	100.41	2.801

TRACHYDOLERITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A2. II	45.27	15.03	4.04	9.10	6.59	6.64	5.07	1.08	1.85	0.14	4.41	0.16	trace	CO_2 0.38 SO_3 none Cl trace	99.76	2.988
2 A1. I	46.71	15.59	8.27	1.40	4.90	6.41	4.97	2.85	3.16	1.08	2.40	0.76	0.18	CO_2 1.06 NiO trace BaO 0.08 SrO 0.06	99.88	
3 A2. II	44.49	13.03	2.78	8.24	11.23	8.58	3.16	2.25	0.76	0.55	2.60	0.92	0.17	CO_2 0.86 Cr_2O_3 0.02 NiO 0.07	99.71	
4 A2. II	55.39	16.81	9.87	2.60	3.22	6.03	0.83	0.62	1.07		2.19	0.69		CO_2 0.93	100.25	2.78

ESSEXITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
20	Neutitschein, Moravia.	C. F. Eichleiter.	C. F. Eichleiter, Vh. G. R.-A. Wien, XXX, p. 72, 1896.	Teschenite.	In W. T., p. 457.
21	Jasenitz, Moravia.	C. F. Eichleiter.	C. F. Eichleiter, Vh. G. R.-A. Wien, XXX, p. 74, 1896.	Teschenite.	In W. T., p. 457.
22	Val dei Coccoletti, Monte Mulatto, Predazzo, Tyrol.	M. Dittrich.	J. Romberg, Sb. Pr. Ak. W., I, p. 743, 1902.	Theralite.	
23	Val Deserta, Monte Mulatto, Predazzo, Tyrol.	M. Dittrich.	J. Romberg, Sb. Pr. Ak. W., p. 104, 1904.	Essexite.	
24	Kursebi, Caucasus.	D. Beljankin.	D. Beljankin, Ann. Inst. Poly. Pet. Grt., XVII, p. 10, 1912.	Teschenite.	
25	Ribeira das Voltas, Madeira.	Klüss.	C. Gagel, Z. D. G. G., LXIV, p. 399, 1912.	Essexite.	
26	Hamasat, Massaua, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 87, 1909.	Teschenite.	
27	Minussinsk, Jenessei, Siberia.	E. Collett.	J. Rakovsky, B. Ac. Imp. St. P., p. 251, 1911.	Teschenite.	
28	Prospect, near Sydney, New South Wales.	H. P. White.	Jensen and Jevons, Pr. R. Soc. N. S. W., XLV., p. 539, 1912.	Essexite aplite.	
29	Prospect, near Sydney, New South Wales.	J. C. H. Mingaye.	Jensen and Jevons, Pr. R. Soc. N. S. W., XLV, p. 504, 1912.	Essexite.	
30	Prospect, near Sydney, New South Wales.	J. C. H. Mingaye.	Jensen and Jevons, Pr. R. Soc. N. S. W., XLV, p. 504, 1912.	Pallio-essexite.	
31	Jellore Creek, Mittagong, New South Wales.	D. Mawson.	Taylor and Mawson, Pr. R. Soc. N. S. W., XXXVII, p. 341, 1903.	Essexite.	H_2O corrected by authors, pers. com.

TRACHYDOLERITE.

1	Nunasarnausak, Ilimausak Region, Greenland.	C. Winther.	N. V. Ussing, G. Julhb., p. 212, 1911.	Trachydolerite.	
2	Blaikie Heugh, near Traprain Law, East Lothian, Scotland.	W. Pollard.	E. B. Bailey, G. S. Scot. Mem., Sh. 33, p. 126, 1910.	Kulaite.	
3	Halvdans Fjeld, Wood Bay, Spitzbergen.	M. Dittrich.	V. Goldschmidt, Skr. Vid. Krist., 1911, No. 9, p. 16.	Trachydolerite.	
4	Frauenberg, near Breitfirst, Rhöngebirge.	R. Wedel.	R. Wedel, Jb. Pr. G. L.-A., XI, p. 23, 1892.	Trachydolerite.	In W. T., p. 221.

TRACHYDOLERITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
5 A2. II	50.61	19.36	5.28	3.07	2.29	6.39	5.36	2.91	2.45		0.19	1.06	0.61	CO_2 0.78 SO_3 trace Cl 0.08	100.44	
6 A2. II	48.11	16.41	8.96	2.60	3.03	7.96	3.76	2.55	3.10		2.50	0.64		ZrO_2 0.27 SO_3 0.27	100.18	2.789
7 A3. III	36.59	33.51	15.54	1.78	0.86	0.32	1.10	0.91	9.51						100.12	
8 A3. III	36.58	28.45	12.95	4.54	0.54	0.81	0.94	1.12	13.70						99.63	
9 A3. III	34.33	35.19	9.01	6.90	0.47	0.28	0.61	0.82	13.75						99.36	
10 A3. III	30.82	20.35	16.75	8.08	4.24	5.52	2.01	1.21	11.76						100.74	

MONCHIQUITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A1. I	37.34	11.85	5.37	6.40	9.66	11.92	2.91	2.05	2.56	0.24	3.93	0.04	0.18	CO_2 5.08 Cl 0.04 FeS_2 0.47 BaO 0.04 SrO 0.02	100.09	
2 A2. II	36.69	11.96	5.45	8.90	7.85	10.28	3.88	2.07	0.25	1.70	5.44	0.62	0.38	CO_2 3.78 SO_3 0.92 Cl 0.04 BaO trace	100.21	
3 A2. II	36.29	10.91	7.55	5.52	9.29	13.48	3.42	1.40	3.65		4.60		0.23	CO_2 3.85	100.19	
4 B2. III	42.03	13.60	7.55	6.65	6.41	14.15	1.83	0.97	1.08		3.70	0.57		SO_3 0.08 NaCl 0.05 FeS_2 0.56	99.23	
5 A2. II	36.40	12.94	8.27	4.59	11.44	14.46	0.97	3.01	2.36		0.42	1.04		CO_2 3.94	99.84	
6 A2. II	44.66	12.12	5.81	3.20	8.77	8.14	4.47	2.75	4.33		1.02	2.02	0.21	CO_2 2.19	99.69	
7 A2. II	42.46	12.04	3.19	5.34	12.40	12.14	1.21	2.68	4.03		2.47	0.84	0.16	CO_2 0.55	99.51	
8 A1. I	44.08	12.80	4.58	3.84	7.22	11.21	2.97	3.31	2.35	0.77	1.43	0.70	0.14	CO_2 4.14 ZrO_2 none SO_3 0.01 Cl 0.04 S 0.14 Cr_2O_3 0.05 BaO 0.13 SrO 0.06 Li_2O trace	99.97	
9 A1. I	31.55	9.85	5.27	5.90	7.45	15.22	3.69	3.90	1.82	0.92	4.86	2.34	0.11	CO_2 5.27 ZrO_2 none SO_3 1.52 S 0.27 BaO 0.07 SrO 0.09	100.04	
10 A2. II	43.74	14.82	2.40	7.52	6.98	10.81	3.08	2.90	2.94		2.80	0.64		CO_2 1.50 Cl trace S 0.10	100.23	2.914
11 A3. III	42.51	12.85	2.67	7.52	12.00	11.83	2.75	2.15	2.96				0.83	CO_2 3.46	100.53	2.905

TRACHYDOLERITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
5	Pihlberg, Polzen District, Bohemia.	K. H. Scheumann.	K. H. Scheumann, Abh. Sachs. Ges. W., XXXII, p. 757, 1913.	Sodalite trachydolerite.	
6	Mawensi, Kilimanjaro, German East Africa.	C. Klüss.	L. Finckh, Z. D. G. G., LXV, p. 501, 1913.	Basaltoid trachydolerite.	ZrO_2 by color with H_2O_2.
7	Napoleon's tomb, St. Helena.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (7), p. 645, 1912.	Trachydolerite.	Altered.
8	James Valley, St. Helena.	R. Reinisch,	R. Reinisch, D. Sudp. Exp., II (7), p. 645, 1912.	Trachydolerite.	Altered.
9	Nap Seal, St. Helena	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (7), p. 645, 1912.	Trachydolerite.	Altered.
10	Westpoint Crater, St. Helena.	R. Reinisch.	R. Reinisch, D. Sudp. Exp., II (7), p. 645, 1912.	Trachydolerite.	Altered.

MONCHIQUITE.

1	Mile End quarry, Montreal, Quebec.	M. F. Connor.	F. D. Adams, Cong. G. Int., XII, Guide 3, p. 46, 1913.	Monchiquite.	
2	Reservoir, Montreal, Quebec.	B. J. Harrington.	F. D. Adams, Cong. G. Int., XII, Guide 3, p. 46, 1913.	Monchiquite.	
3	Hurry Inlet, Liverpool Land, East Greenland.	N. Sahlbom.	O. Nordensjöld, Medd. Grönl., XXVIII, p. 212, 1908.	Ouachitite.	
4	Fourche Mountain, Little Rock, Arkansas.	Noyes and Brackett.	J. F. Williams, Ig. R. Ark., p. 108, 1891.	Fourchite.	In W. T., p. 333.
5	Near Hot Springs, Arkansas.	L. G. Eakins.	J. F. Kemp in J. F. Williams, Ig. R. Ark., p. 399, 1891.	Ouachitite.	In W. T., p. 349.
6	Musselshell River, Crazy Mountains, Montana.	L. G. Eakins.	W. H. Weed, U. S. G. S. B. 148, p. 144, 1897.	Monchiquite?	In W. T., p. 341.
7	Willow Creek, Castle Mountains, Montana.	L. V. Pirsson.	Weed and Pirsson, U. S. G. S. B. 139, p. 115, 1896.	Monchiquite.	Fe_2O_3 corrected by L. V. P. In W. T., p. 343.
8	Cripple Creek, Colorado.	W. T. Schaller.	Lindgren and Ransome, U. S. G. S. P. P. 54, p. 96, 1906.	Monchiquite.	
9	Near Beaver Creek, Uncompahgre quadrangle, Colorado.	G. Steiger.	E. S. Larsen, U. S. G. S. rec. lab.	Analcite rock.	
10	Rio do Ouro, Serra de Tingua, Brazil.	P. Jannasch.	Hunter and Rosenbusch, T. M. P. M., XI, p. 464, 1890.	Monchiquite.	In W. T., p. 343.
11	Grainbank, Kirkwall, Orkney Islands.	J. S. Flett.	J. S. Flett, Tr. R. Soc. Edin., XXXIX (IV), p. 891, 1900.	Monchiquite.	In W. T., p. 351.

MONCHIQUITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
12 A1. I	43.55	14.60	5.34	7.46	4.77	7.94	5.01	1.40	4.58	0.63	2.52	0.88	0.55	CO_2 0.56 FeS_2 0.31 NiO 0.05 BaO 0.27 SrO none	100.42	
13 A1. I	39.54	13.74	4.05	7.85	8.66	9.64	2.24	3.70	2.77	0.61	2.72	1.01	0.40	CO_2 2.48 FeS_2 0.27 Cr_2O_3 0.10 V_2O_3 0.05 NiO 0.05 BaO 0.19 SrO 0.14 Li_2O trace	100.06	
14 A2. II	40.26	10.22	2.86	7.14	8.75	13.43	1.51	1.32	3.53	1.24	2.26	0.65	0.20	CO_2 5.80 SO_3 0.62 Cl trace Cr_2O_3 trace	99.79	
15 A2. II	42.57	15.90	2.10	6.85	3.18	10.55	4.71	3.88	2.00		2.50	trace	0.79	CO_2 4.87	99.90	
16 A2. II	43.31	14.13	4.64	6.05	8.43	11.92	2.53	1.74	1.28		2.46	0.53		CO_2 3.32 FeS_2 0.32	100.66	
17 A2. II	46.69	17.57	2.01	8.57	3.00	8.04	5.25	3.76	1.27		1.45	0.58		CO_2 0.88 SO_3 none Cl 0.04	99.43	2.751
18 A1. I	40.30	12.42	7.64	5.04	12.34	12.10	3.31	1.22	3.32		0.50	0.99	0.02	CO_2 0.60 Cl 0.05 F 0.85 S 0.32 BaO 0.20 SrO trace	101.12	2.892
19 A1. I	39.62	12.98	7.58	5.47	9.93	10.55	4.30	1.27	4.33		0.53	1.02	0.15	CO_2 0.70 Cl 0.07 F 1.23 S 0.35 BaO 0.26 SrO trace	100.34	2.970
20 A1. I	39.28	13.04	7.83	5.72	9.88	10.88	3.72	1.39	4.25		0.62	1.16	0.05	CO_2 0.71 Cl 0.03 S 0.57 BaO 0.68 SrO trace F 0.73	100.54	2.896
21 A1. I	42.52	16.82	2.90	7.56	6.43	9.78	4.02	1.31	5.51	0.47	1.30	1.46	0.15	CO_2 0.07 ZrO_2 none Cl trace S none Cr_2O_3 none V_2O_3 0.03 NiO none BaO 0.04 SrO trace Li_2O none	100.37	2.812
22 A1. I	41.72	16.87	5.90	3.87	4.23	10.32	4.99	2.73	3.67	0.45	1.70	0.85	0.15	CO_2 2.54 ZrO_2 none SO_3 none Cl 0.03 S none V_2O_3 0.02 NiO 0.04 BaO 0.13 SrO 0.03	100.24	2.732
23 A1. I	40.62	13.63	7.05	6.07	5.71	10.05	2.23	2.48	4.58	1.30	2.30	1.16	0.08	CO_2 0.71 ZrO_2 none SO_3 0.38 S 0.11 Cr_2O_3 none V_2O_3 0.06 NiO none BaO 1.46 SrO trace Cu trace	99.98	2.844
24 A1. I	40.25	10.83	5.30	8.00	12.53	9.64	3.76	1.48	2.58	0.78	2.74	0.73	0.30	CO_2 1.14 ZrO_2 none SO_3 none Cl 0.03 S none Cr_2O_3 0.01 V_2O_3 0.04 NiO 0.06 BaO 0.18 SrO trace Li_2O none Cu none	100.38	3.024

MONCHIQUITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
12	Camasan Fhais, Argyll, Scotland.	E. G. Radley.	J. J. H. Teall, G. S. Scot. Mem., Sh. 45, p. 128, 1908.	Monchiquite.	
13	Kilchattan, Colonsay Island, Scotland.	E. G. Radley.	J. S. Flett, G. S. Scot. Mem., Sh. 35, p. 46, 1911.	Nephelite ouachitite.	
14	Golden Hill, Monmouthshire, England.	S. J. Johnstone.	W. S. Boulton, Q. J. G. S., LXVII, p. 470, 1911.	Monchiquite.	
15	S. Berge, Alnö, Sweden.	N. Sahlbom.	N. Sahlbom, N. J., II, p. 98, 1897.	Monchiquite.	In W. T., p. 459.
16	Bornwald, Spreudlingen, Odenwald.	L. Walter.	G. Klemm, Nb. Ver. Erdk. (4), XXVIII, p. 34, 1907.	Monchiquite.	
17	Rosenkamm, near Zinkenstein, Bohemia.	F. Hanusch.	J. E. Hibsch, T. M. P. M., XXIX, p. 419, 1910.	Monchiquite.	
18	Taganrog District, Russia.	J. Morozewicz.	J. Morozewicz, Mem. C. G. Rus., No. 8, p. 41, 1903.	Monchiquite.	
19	Taganrog District, Russia.	J. Morozewicz.	J. Morozewicz, Mem. C. G. Rus., No. 8, No. 41, 1903.	Monchiquite.	
20	Taganrog District, Russia.	J. Morozewicz.	J. Morozewicz, Mem. C. G. Rus., No. 8, p. 41, 1903.	Monchiquite.	
21	South Bulli, New South Wales.	H. P. White.	Dep. Min. N. S. W. A. R. (1912), p. 198, 1913.	Monchiquite.	
22	Mount Nabo, Wollongong, New South Wales.	J. C. H. Mingaye.	Dep. Min. N. S. W. A. R. (1912), p. 198, 1913.	Monchiquite.	
23	Kembla, Wollongong, New South Wales.	W. G. Stone.	Dep. Min. N. S. W. A. R. (1912), p. 198, 1913.	Fourchite.	
24	Murrumburrah, New South Wales.	H. P. White.	Mingaye and White, Rec. G. S. N. S. W., VII, p. 302, 1904.	Leucite monchiquite.	

MONCHIQUITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
25 A1. I	39.35	11.60	3.32	7.38	9.82	12.66	2.00	1.77	3.82	1.28	1.98	0.64	0.21	CO_2 4.04 ZrO_2 none SO_3 none Cl 0.05 S 0.46 Cr_2O_3 trace V_2O_3 0.03 NiO 0.01 BaO 0.08 SrO trace Cu none	100.50	2.915
26 A1. I	36.88	4.53	2.03	9.67	25.40	7.61	1.17	0.43	0.82	0.58	2.10	none	0.04	CO_2 8.10 ZrO_2 0.06 S 0.17 NiO 0.07 BaO none SrO none	99.66	
27 A2. II	40.92	11.34	0.54	12.96	7.78	9.28	3.27	1.94	1.77	0.64	6.57	0.51	0.13	CO_2 2.82	100.47	2.95

NEPHELITE BASALT, ETC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A1. I	48.61	20.74	4.29	0.22	2.11	0.25	0.16	0.77	7.07	12.10	3.57	0.29	none	F 0.63 Cr_2O_3 trace BaO none SrO none	100.81	
2 A1. I	35.03	9.80	5.55	4.98	9.78	15.09	2.04	2.16	2.05	0.41	2.20	1.99	0.06	CO_2 7.83 ZrO_2 none SO_3 none Cl trace FeS_2 0.38 BaO 0.14 SrO 0.17	99.66	2.99
3 A2. II	49.07	19.46	2.30	3.50	0.60	3.82	9.25	4.39	5.99		0.64	trace	0.38	CO_2 trace	99.40	
4 A3. III	41.76	12.61	8.39	7.38	5.23	13.62	2.58	1.19	3.66					CO_2 4.49	100.31	
5 A2. II	39.04	12.47	7.89	3.93	8.93	13.84	3.29	1.21	1.75	1.17	1.61	3.98		CO_2 0.53 SO_3 0.15	99.79	
6 A2. II	45.19	10.49	8.60	5.04	5.97	12.94	2.04	4.09	3.31		1.01		0.50	CO_2 0.77 MoS_2 0.20	100.15	
7 A3. III.	40.39	15.12	10.83	n. d.	8.76	13.84	2.62	1.84	1.46		1.12	1.23	0.20	CO_2 1.66 SO_3 0.60 Cr_2O_3 trace	99.67	
8 A2. II	39.31	12.39	1.32	11.22	9.43	14.10	2.95	1.89	2.42		0.50	2.30	1.30	CO_2 1.23	100.36	3.124
9 A2. II	39.16	10.06	6.54	7.71	13.74	15.30	2.38	1.46	1.55		1.52	0.75	0.11	CO_2 0.58 Cr_2O_3 trace	100.86	
10 B2. III	41.80	12.43	6.29	4.84	13.62	10.88	3.40	1.71	2.17		2.15	trace		CO_2 0.65 X 0.94 SO_3 0.13 Cl trace	101.01	3.011
11 A2. II	39.16	10.06	6.54	7.71	13.74	15.30	2.38	1.46	1.55		1.52	0.75	0.11	CO_2 0.58 Cr_2O_3 trace	100.86	3.023
12 A3. III	55.02	18.14	6.03	1.32	2.12	6.67	4.55	4.03	2.08		trace	0.63		SO_3 none Cl trace	100.59	2.698
13 A2. II	46.88	15.95	3.36	6.37	4.04	9.72	5.04	2.79	3.16		2.31	0.78	0.48	SO_3 none Cl none	100.88	2.69
14 A2. II	40.20	12.11	7.04	6.61	6.58	13.25	3.58	1.61	2.06		4.73	1.09	0.28	CO_2 1.24 SO_3 0.34 Cl none	100.72	2.920

MONCHIQUITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
25	Kiama, New South Wales.	H. P. White.	Jaquet, Card, and Harper, Rec. G. S. N. S. W., VIII, p. 50, 1905.	Leucite monchiquite.	
26	Dingo Creek, Nandewar Mountains, New South Wales.	H.I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXII, p. 904, 1908.	Monchiquite.	
27	Sheepshead Line, Bendigo, Victoria.	F. Stillwell.	F. Stillwell, Pr. R. Soc. Vict., XXV, p. 4, 1912.	Monchiquite.	

NEPHELITE BASALT, ETC.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Anna Lee Mine, Cripple Creek, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. B. 148, p. 162, 1897.	Nephelite basalt.	Altered. In W. T., p. 457.
2	Appie Ellen Shaft, Cripple Creek, Colorado.	W. F. Hillebrand.	W. Cross, U. S. G. S. A. R. 16, II, p. 50, 1896.	Nephelite basalt.	Altered. In W. T., p. 457.
3	Sud Berge, Alnö, Sweden.	N. Sahlbom.	N. Sahlbom, N. J., II, p. 97, 1897.	Nephelinite.	In W. T., p. 303.
4	Hamberg, Neckarelz, Baden.	E. E. Dana.	F. Schalch, G. Sp. Kt. Bad. Bl. Mosbach, p. 32, 1894.	Nephelite basalt.	In W. T., p. 459.
5	Hitzberg, Odenwald.	G. Butzbach.	G. Klemm, Nb. Ver. Erdk. (4), XXVIII, p. 40, 1907.	Nephelite basalt.	
6	Rosengärtchen, Heubach, Hesse.	K. Tichauer.	R. Wedel, Jb. Pr. G. L.-A., XI, p. 33, 1892.	Nephelite basalt.	In W. T., p. 341.
7	Russberg, near Darmstadt, Hesse.	E. Becker.	E. Becker, Ref. N. J., I, p. 370, 1906.	Nephelite basalt.	
8	Rossberg, near Darmstadt, Hesse.	E. Becker.	E. Becker, Ref. N. J., I, p. 370, 1906.	Hauyne-nephelite basalt.	
9	Oberleinleiter, Hesse Cassel.	A. Schwager.	Leppla and Schwager, Geog. Jhft., I, p. 69, 1888.	Nephelite basalt.	In W. T., p. 363.
10	Pietzelstein, Rhöngebirge.	E. Möller.	E. Möller, N. J., p. 116, 1888.	Nephelite basalt.	In W. T., p. 345.
11	Oberleinleitner, Fichtelgebirge.	A. Schwager.	Leppla and Schwager, Geog. Jhft., I, p. 69, 1888.	Nephelite basalt.	In W. T., p. 363.
12	Kolmer Scheibe, Bohemia.	R. Pfohl.	J. E. Hibsch, T. M. P. M., XV, p. 258, 1896.	Hauyne tephrite.	In W. T., p. 265.
13	Fuchsberg, near Stankowicz, Bohemia.	F. Hanusch.	Hibsch and Seeman, T. M. P. M., XXXII, p. 87, 1913.	Tephrite.	Zeolitized.
14	Grosspriesen, Bohemia.	F. Hanusch.	J. E. Hibsch, T. M. P. M., XXI, p. 528, 1902.	Hauynophyre.	

NEPHELITE BASALT, ETC.—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
15 A2. II	39.94	15.87	1.15	9.77	11.36	12.69	3.03	0.87	1.41		2.00	0.82	0.46	CO_2 0.54	99.91	2.976
16 A3. III	40.99	16.50	10.62	n. d.	3.29	12.63	5.95	2.36	2.63		2.41	0.89	0.35	SO_3 0.64 Cl 0.36	99.62	2.91
17 B2. III	37.17	10.74	5.69	5.94	9.84	14.73	4.22	1.09	2.64	1.63	0.94	1.47	trace	CO_2 4.62 Cl 0.04 S 0.21	100.97	
18 A2. II	31.39	12.15	5.89	6.41	9.82	16.61	3.48	1.21	3.17	1.66	1.23	1.40	0.41	CO_2 5.31	100.14	
19 A2. II	39.37	16.50	2.28	7.97	4.48	10.22	4.73	3.38	4.77		3.31	0.13	0.06	CO_2 0.64 SO_3 2.14 Cl 0.09	100.07	2.82
20 A3. III	45.30	17.81	1.70	8.20	6.02	8.51	4.95	2.56	2.75		1.93	trace			99.73	
21 B2. III	43.47	12.60	9.85	3.53	4.11	11.96	3.25	1.74	4.14		2.52	1.04	1.74		99.92	
22 A2. II	37.53	8.35	13.81	5.01	5.94	10.96	3.31	1.99	9.33		1.96		1.02	CO_2 1.00	100.21	
23 A1. I	41.40	17.01	2.50	7.74	5.56	7.64	3.93	2.13	2.54	1.72	2.30	0.94	0.10	CO_2 4.34 ZrO_2 none SO_3 0.06 Cl trace S trace Cr_2O_3 trace V_2O_3 none NiO none BaO 0.21 SrO trace Cu none	100.12	2.783
24 A2. II	39.92	11.26	4.24	11.01	8.01	8.91	3.18	2.70	2.15	0.40	1.02	0.41	0.11	CO_2 6.82 SO_3 0.30 V_2O_3 trace	100.44	3.01

IJOLITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A2. II	38.93	15.41	5.10	4.24	5.57	16.49	5.27	1.78	5.20		1.62	0.35	trace	Cl 0.02 FeS_2 0.89 SrO trace Li_2O trace	100.57	
2 A2. II	38.11	20.84	5.67	1.46	3.80	14.44	6.65	2.12	4.51	0.57	0.48	0.84	0.14	CO_2 0.65 ZrO_2 0.18 SO_3 none S 0.14	100.60	2.769
3 B2. III	36.51	8.22	8.29	3.31	8.19	18.85	2.10	1.08	1.40		3.11		trace	X 2.10 Cl 0.03 FeS_2 6.03 SrO trace	99.22	
4 A2. II	46.29	17.47	2.24	7.07	2.10	5.82	8.69	1.47	5.12	0.69	2.37	0.70	0.28	CO_2 none F trace BaO 0.09	100.40	
5 A2. II	46.58	15.25	7.58	4.70	2.30	4.68	8.93	1.70	4.53	1.91	0.53	1.04	0.10	CO_2 none	99.83	

LIMBURGITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A2. II	36.80	4.16	n. d.	8.33	25.98	8.63	0.17	2.48	6.93	0.51	1.26	0.47	0.13	CO_2 2.95 SO_3 0.06 S 0.95 NiO 0.09 BaO 0.12 SrO trace	100.22	

NEPHELITE BASALT, ETC.—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
15	Saubernitz, Bohemia.	F. Hanusch.	J. E. Hibsch, T. M. P. M., XXIX, p. 412, 1910.	Nephelite basalt.	
16	Teufelsmühle, Hochstraden, Styria.	A. Jäger.	A. Sigmund, T. M. P. M., XVI, p. 347, 1897.	Nephelinite.	In W. T., p. 459.
17	Recoaro, Vicentino, Italy.	E. Artini.	E. Artini, R. Inst. Lomb. (2), XL, p. 503, 1907.	Nosean-nephelite basalt.	
18	Poleo-Folgare, Vicentino, Italy.	L. Maddalena.	L. Maddalena, Rend. Ac. Linc., XVII (1), p, 807, 1908.	Nosean-nephelite basalt.	
19	Etinde Volcano, Kamerun.	M. Dittrich.	E. Esch, Sb. Pr. Ak. W., p. 299, 1901.	Hauynophyre.	In W. T., p. 351.
20	Bekinkina, Ambavatovy, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., II, p. 229, 1903.	Hornblende nephelinite.	Bekinkinite of Rosenbusch.
21	Fort Ternan, Uganda Railway, British East Africa.	M. Goldschlag.	M. Goldschlag, N. J. Cb., p. 596, 1912.	Nephelite basalt.	
22	Karungu, Victoria Nyanza, British East Africa.	M. Goldschlag.	M. Goldschlag, N. J. Cb., p. 595, 1912.	Nephelinite.	
23	Bulli, New South Wales.	W. G. Stone.	G. W. Card, pers. com.	Analcite basalt.	
24	Sapling Flat, Caperteo Valley, New South Wales.	J. C. H. Mingaye.	G. W. Card, Rec. G. S. N. S. W., VII, p. 42, 1902.	Nephelite basalt.	

IJOLITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Magnet Cove, Arkansas.	J. F. Williams.	J. F. Williams, Ig. R. Ark., p. 226, 1891.	Nephelite biotite syenite (ijolite).	In W. T., p. 353.
2	Magnet Cove, Arkansas.	H. S. Washington.	H. S. Washington, J. G., IX, p. 619, 1901.	Biotite ijolite.	In W. T., p. 307.
3	Magnet Cove, Arkansas.	J. F. Williams.	J. F. Williams, Ig. R. Ark., p. 227, 1891.	Dark nephelite syenite (jacupirangite).	In W. T., p. 361.
4	Glenmuir Water, Lugar, Ayrshire, Scotland.	A. Scott.	G. W. Tyrrell, pers. com.	Lugarite.	
5	Barshaw, near Paisley, Renfrewshire, Scotland.	A. Scott.	G. W. Tyrrell, pers. com.	Lugarite.	

LIMBURGITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Syracuse, New York.	H. N. Stokes.	Darton and Kemp, A. J. S., XLIX, p. 461, 1895.	Limburgite.	In W. T., p. 469.

LIMBURGITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
2 B2. III	38.34	9.67	4.28	6.37	17.41	10.27	2.87	2.13	3.61		1.64	0.24	0.14	CO_2 1.58 SO_3 0.54 Cr_2O_3 0.13	99.22	2.989
3 A2. II	42.16	19.55	3.19	7.86	6.28	10.09	2.19	1.77	3.48	0.61	1.99	0.70		CO_2 0.14 SO_3 0.07	100.08	
4 A2. II	41.45	11.93	2.79	7.54	15.16	10.14	2.82	0.43	3.50	1.03	2.43	0.54		CO_2 0.26 SO_3 none	100.02	
5 A2. II	41.17	15.60	3.19	7.49	11.84	11.52	2.75	0.46	1.92	0.67	2.47	0.76		CO_2 0.63 SO_3 none	100.47	
6 A2. II	40.66	17.21	4.14	8.21	11.69	9.03	3.34	1.60	0.38	0.14	1.77	0.82		CO_2 1.10 SO_3 0.16	100.25	
7 A3. III	41.90	13.83	6.27	4.59	13.17	11.40	2.21	0.34	3.87		2.28				99.86	
8 A3. III	41.14	14.28	5.14	6.23	11.05	12.28	2.87	0.80	4.71		2.07				100.57	
9 A3. III	41.32	17.52	6.70	6.23	5.94	12.80	1.69	1.14	5.96			0.61			99.91	
10 B2. II	40.48	16.10	11.20	1.18	9.04	13.21	1.26	2.74	3.26		0.50		0.28		99.25	
11 A3. III	46.76	17.93	5.33	5.62	7.31	8.24	3.53	2.20	1.83		trace			CO_2 1.33	100.08	

LEUCITE BASALT, ETC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A1. I	47.98	13.34	4.09	4.24	7.01	9.32	3.51	5.00	2.10		0.58	1.03	trace	CO_2 1.24 SO_3 trace Cl 0.21 BaO 0.50 SrO 0.14	100.29	
2 A1. I	43.62	12.73	4.89	4.10	9.37	11.62	2.96	1.30	3.94	1.91	1.46	0.82	0.12	CO_2 0.63 ZrO_2 0.02 BaO 0.16 SrO 0.14	99.79	
3 A2. II	51.53	18.28	4.89	2.11	1.69	5.10	3.01	4.74	6.90		1.33	0.46	0.18	S 0.07	100.29	2.554
4 A2. II	50.08	18.87	3.48	3.49	2.14	6.70	4.10	4.58	4.17		1.39	0.39	0.29	CO_2 0.26 S 0.04	100.16	2.651
5 A2. II	43.33	13.59	9.09	2.75	6.60	9.00	3.86	0.96	3.30	3.29	3.16	1.18		CO_2 0.13 S none	100.24	
6 A2. II	44.16	12.96	8.07	3.10	10.83	12.26	1.92	0.72	2.41	0.46	2.06	1.03			99.98	2.965
7 A2. II	47.61	15.71	8.69	1.35	5.72	10.70	2.56	6.34	0.28		1.14	0.19		Cl 0.20	100.49	
8 A2. II	47.60	16.34	7.15	2.45	5.65	10.25	2.31	5.77	0.31		1.41	0.77		Cl 0.12	100.13	
9 A2. II	47.31	15.10	0.42	3.67	8.55	13.10	3.04	5.92	0.66		0.78	0.06		SO_3 0.48 Cl 0.50	99.65	

LIMBURGITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock Name.	Remarks.
2	Kilometer 37, Santa Cruz R. R., Rio Janeiro, Brazil.	F. E. Wright.	F. E. Wright, T. M. P. M., XX, p. 304, 1901.	Limburgite.	
3	Obersteinberg, near Giessen, Hesse.	G. Butzbach.	W. Schottler, Abh. G. L.-A. Darm., IV, p. 452, 1908.	Limburgite.	
4	Dachsberg, near Giessen, Hesse.	K. M. Jene.	W. Schottler, Abh. G. L.-A. Darm., IV, p. 452, 1908.	Limburgite.	
5	Trieb, near Giessen, Hesse.	K. M. Jene.	W. Schottler, Abh. G. L.-A. Darm., IV, p. 452, 1908.	Limburgite.	
6	Staufenberg, near Giessen, Hesse.	G. Butzbach.	W. Schottler, Abh. G. L.-A. Darm., IV, p. 452, 1908.	Limburgite.	
7	Hundskopf, Rhöngebirge.	Dürrfeld.	H. Bücking, Sb. Pr. Ak. W., 1910, p. 510.	Limburgite.	
8	Dornberg, Rhöngebirge.	Dürrfeld.	H. Bücking, Sb. Pr. Ak. W., 1910, p. 510.	Limburgite.	
9	Wellemin, Mittelgebirge, Bohemia.	C. F. Eichleifer.	G. Irgang, T. M. P. M., XXVIII, p. 60, 1909.	Limburgite.	
10	Kostelce, near Melnik, Mittelgebirge, Bohemia.	J. Hanusch.	B. Zahalka, Sb. Böhm. Ges. W., 1905, Art. III, p. 57.	Limburgite.	
11	Dorfestein, near Fürstenfeld, Styria.	R. v. Zeynck.	A. Sigmund, T. M. P. M., XVII, p. 534, 1898.	Magmabasalt.	In W. T., p. 283.

LEUCITE BASALT, ETC.

No.	Locality.	Analyst.	Reference.	Rock Name.	Remarks.
1	Near Highwood Peak, Highwood Mountains, Montana.	H. W. Foote.	L. V. Pirsson, U. S. G. S. B. 237, p. 168, 1905.	Leucite basalt.	In W. T., p. 341.
2	Near Rhyolite, Bullfrog District, Nevada.	G. Steiger.	F. L. Ransome, U. S. G. S. B. 407, p. 60, 1910.	Leucite basanite.	
3	Mondhalde, Kaiserstuhl, Baden.	F. Graeff.	F. Graeff, Ref. N. J., 1890, II, p. 65.	Tephrite (mondhaldeite).	Center of dike. In W. T., p. 271.
4	Mondhalde, Kaiserstuhl, Baden.	F. Graeff.	F. Graeff, Ref. N. J., 1890, II, p. 65.	Tephrite (mondhaldeite).	Border of dike. In W. T., p. 271.
5	Obersteinberg, near Giessen, Hesse.	K. M. Jene.	W. Schottler, Abh. G. L.-A. Darm., IV, p. 456, 1908.	Leucite basanite.	
6	Dobernberg, near Tetschen, Bohemia.	P. Pfohl.	J. E. Hibsch, T. M. P. M., XIV, p. 111, 1894.	Leucite basanite.	In W. T., p. 461.
7	Eruption of 1906, Mount Vesuvius, Italy.	Pisani.	A. Lacroix, N. Arch. Mus. (4), IX, p. 104, 1907.	Leucite tephrite.	Metamorphosed.
8	Eruption of 1906, Mount Vesuvius, Italy.	Pisani.	A. Lacroix, N. Arch. Mus. (4), IX, p. 104, 1907.	Leucite tephrite.	Metamorphosed.
9	Monte Somma, Italy.	Pisani.	A. Lacroix, N. Arch. Mus. (4), IX, p. 135, 1907.	Leucite tephrite.	Enriched with limestone. Metamorphosed.

MELILITE ROCKS.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A3. III	37.91	11.51	2.35	5.38	17.54	13.57	1.75	2.87	9.40		0.23			CO_2 in H_2O	100.51	
2 A1. I	29.24	11.40	5.84	4.74	10.38	18.35	1.44	2.42	5.05	1.04	2.40	2.10	0.15	CO_2 5.02 SO_3 0.33 Cl trace S 0.17 BaO 0.24 SrO 0.15	100.45	
3 B3. IV	35.25	6.10	8.53	5.60	20.40	7.40	0.70	2.88	10.15		2.25			CO_2 in H_2O	99.26	
4 B3. IV	33.10	7.88	16.71	1.48	13.42	5.25	0.23	0.29	17.85		2.90			CO_2 in H_2O	99.11	
5 A3. III	38.79	14.55	5.67	6.68	7.78	14.65	2.78	2.54	1.99	0.67	0.80			CO_2 3.56	100.46	
6 A1. I	40.01	5.41	7.12	1.08	8.89	30.99	0.60	none	2.00	0.52	1.00	0.88	0.11	CO_2 1.51 ZrO_2 none S 0.06 Cr_2O_3 none V_2O_3 none NiO none BaO none SrO 0.21	100.39	3.165
7 A1. I	38.57	5.79	5.41	3.33	8.44	30.72	2.34	0.42	0.62	0.34	1.71	0.83	0.16	CO_2 1.28 ZrO_2 0.02 Cl none S 0.03 BaO 0.28 SrO 0.35	100.64	
8 A2. II	35.54	11.72	5.86	5.99	13.56	15.83	1.91	2.24	1.67		2.03	0.32		CO_2 4.30	100.97	3.052
9 A2. II	33.87	15.25	2.37	5.15	12.52	14.43	1.41	1.02	2.47		2.12	0.99	0.32	CO_2 8.64	100.36	3.033
10 A2. II	30.69	10.48	5.76	7.47	11.10	13.25	1.41	1.82	2.88		5.52	0.64	0.55	CO_2 8.21	99.78	
11 A2. II	29.25	8.80	3.92	5.42	17.66	17.86	0.77	2.45	2.61		2.54	2.86	trace	CO_2 6.00 (F 0.25)	100.29	
12 A2. II	24.19	12.00	6.45	9.32	14.07	17.37	1.99	3.06	5.16		trace	3.96	trace	CO_2 2.77 Cl 0.53 S 0.29 Cr_2O_3 trace	101.16	3.15
13 A2. II	32.07	6.40	9.62	0.83	11.50	21.07	1.77	0.58	10.33		2.30	0.83		CO_2 2.33	99.63	
14 A2. II	37.14	12.20	4.73	7.74	15.88	12.78	3.50	1.59	1.26		1.64	0.47	0.22	CO_2 1.08 SO_3 0.23	100.46	
15 A2. II	30.05	9.64	2.12	9.10	16.15	17.65	2.91	1.94	3.72		1.62	0.91	0.99	CO_2 3.58 SO_3 0.56 Cl trace	100.94	
16 A3. III	27.52	9.48	13.37	n. d.	16.64	16.75	2.38	—	3.37		2.67	1.19		CO_2 6.36 S 0.10	100.00	

PYROXENITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A3. III	53.22	3.14	n. d.	7.95	20.09	14.44	trace	trace	0.98		none		0.11	SO_3 trace Cl 0.26 Cr_2O_3 0.23	100.42	
2 A2. II	51.94	2.53	2.88	9.38	25.97	3.60	none	none	2.82		none	none	trace	SO_3 0.19 Cl 0.16 Cr_2O_3 0.60	100.07	

MELILITE ROCKS.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	St. Anne de Bellevue, near Montreal, Quebec.	P. H. le Rossignol.	F. D. Adams, A. J. S., XLIII, p. 271, 1892.	Alnöite.	In W. T., p. 467.
2	Charles, near Montreal, Canada.	M. F. Connor.	F. D. Adams, Cong. G. Int., XII, Guide 3, p. 46, 1913.	Alnöite.	
3	Manheim, Herkimer County, New York.	C. H. Smyth.	C. H. Smyth, B. G. S. A., IX, p. 262, 1898.	Alnöite.	In W. T., p. 467.
4	Manheim, Herkimer County, New York.	C. H. Smyth.	C. H. Smyth, B. G. S. A., IX, p. 262, 1898.	Alnöite.	In W. T., p. 467.
5	Boring, 1,110 to 1,140 feet deep, Bermuda.	R. C. Wells.	L. V. Pirsson, A. J. S., XXXVIII, p. 341, 1914.	Melilite basalt.	"Mixed with monchiquite."
6	Iron Hill Area, Uncompahgre quadrangle, Colorado.	G. Steiger.	E. S. Larsen, U. S. G. S. rec. lab.	Melilite rock.	Altered. Cf. No. 1, IV.2.3.3.2.
7	Beaver Creek, Uncompahgre quadrangle, Colorado.	G. Steiger.	E. S. Larsen, U. S. G. S. rec. lab.	Melilite rock.	
8	Naversdale, Orkney Islands.	J. S. Flett.	J. S. Flett, Tr. R. Soc. Edin., XXXIX, p. 897, 1900.	Alnöite.	In W. T., p. 467.
9	Long Geo, Holm, Orkney Islands.	J. S. Flett.	J. S. Flett, Tr. R. Soc. Edin., XXXIX, p. 898, 1900.	Melilite monchiquite.	In W. T., p. 467.
10	Storkalfven, Rödö, Sweden.	H. Santesson.	P. J. Holmquist, Abh. Sv. G. Und., No. 181, p. 86, 1899.	Alnöite.	In W. T., p. 467.
11	Norrwik, Alnö, Sweden.	N. Sahlbom.	N. Sahlbom, N. J., II, p. 100,1897.	Alnöite.	F calculated. In W. T., p. 467.
12	Stornaset, Alnö, Sweden.	F. Berwerth.	Raimau and Berwerth, Ann. K. K. Nh. Mus., X, p. 76, 1895.	Alnöite.	In W. T., p. 467.
13	Jusiberg, Schwäbische Alb, Bavaria.	E. Gaiser.	E. Gaiser, In. Diss. Bres., p. 36, 1904.	Melilite basalt tuff.	
14	Modlibov, Polzen District, Bohemia.	K. H. Scheumann.	K. H. Scheumann, Abh. Sachs. Ges. W., XXXII, p. 759, 1913.	Polzenite.	
15	Kleinhaida-Schwojka, Polzen District, Bohemia.	K. H. Scheumann.	K. H. Scheumann, Abh. Sachs. Ges. W., XXXII, p. 759, 1913.	Polzenite.	
16	Devin, Polzen District, Bohemia.	K. H. Scheumann.	K. H. Scheumann, Abh. Sachs. Ges. W., XXXII, p. 760, 1913.	Polzenite.	

PYROXENITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Dogwood road, Baltimore County, Maryland.	J. E. Whitfield.	G. H. Williams, U. S. G. S. B. 148, p. 83, 1897.	Pyroxenite.	Altered. In W. T., p. 367.
2	Johnny Cake road, Baltimore County, Maryland.	J. E. Whitfield.	G. H. Williams, U. S. G. S. B. 148, p. 83, 1897.	Pyroxenite.	Altered. In W. T., p. 367.

PYROXENITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
3 A2. II	50.10	2.00	2.38	8.68	26.85	5.06	none	none	4.16		none	none	0.29	SO_3 trace Cl 0.26 Cr_2O_3 0.36	100.14	
4 A2. II	39.74	12.33	4.38	5.17	7.71	17.02	2.05	1.53	3.80		2.34	0.85		CO_2 2.79	99.71	2.96
5 A4. IV	37.58	0.57	9.49	n. d.	32.34	0.48	0.32	0.20	6.70	12.64	trace	none	0.28		100.60	
6 A1. I	50.36	2.46	4.26	4.41	20.76	6.15	0.51	0.09	4.07	2.21	trace	trace	0.29	CO_2 4.44 ZrO_2 none SO_3 none Cl none S none Cr_2O_3 0.04 V_2O_3 trace NiO 0.31 BaO 0.02 SrO trace	100.38	2.802

PERIDOTITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A3.	38.24	0.70	3.50	4.25	41.92	0.68	0.20		9.76	0.60					99.85	
2 A3. III	38.16	0.63	3.32	4.76	41.84	0.68	0.20		9.63	0.47					99.69	
3 A3. III	35.05	0.73	9.05	5.08	33.09	0.54	—	—	8.47					CO_2 1.54 Cr_2O_3 6.74	100.27	
4 A2. II	37.41	2.18	3.64	3.46	41.08	none	0.54	0.41	8.84	0.09	0.12	0.08		CO_2 2.03 Cr_2O_3 0.16	100.04	
5 A1. I	28.04	3.51	n. d.	14.95	21.97	1.78	0.28	0.08	2.54	1.48	0.20	0.04	0.24	CO_2 1.01 Fe_7S_8 21.53 $CuFeS_2$ 1.03 NiS 0.94 CoS 0.03 SrO trace	99.65	
6 A3. III	20.89	6.93	17.81	26.04	15.65	0.96	trace	none	0.42		10.00				99.26	
7 A4. IV	19.98	6.75	19.25	21.42	16.83	lost	trace	trace	4.77		9.76				99.32	
8 B2. III	28.83	2.94	3.60	5.13	24.31	11.24	0.75	1.31	3.96	0.83	5.67	0.77		CO_2 11.64	100.98	
9 A2. II	43.87	1.64	8.94	2.60	27.32	6.29	0.50		7.64	1.08	0.12	trace	0.19	Cr_2O_3 0.44 NiO trace	100.63	3.022
10 A2. II	39.20	4.60	3.45	6.15	31.65	3.23	0.42	0.14	9.38	0.50	0.52	trace	0.20	Cr_2O_3 0.41 NiO 0.30 Li_2O trace	100.15	
11 A3. III	34.50	14.37	2.85	4.46	21.81	11.43	0.51	7.50	7.14			0.77		CO_2 0.21 SO_3 0.60	100.15	
12 A1. I	33.84	5.88	7.04	5.16	22.96	9.46	0.33	2.04	1.50	0.68	3.78	0.89	0.16	CO_2 0.43 Cl 0.05 Cr_2O_3 0.18 NiO 0.10 CoO trace BaO 0.06	100.54	

PYROXENITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
3	Johnny Cake road, Baltimore County, Maryland.	J. E. Whitfield.	G. H. Williams, U. S. G. S. B. 148, p. 83, 1897.	Pyroxenite.	Altered. In W. T., p. 367.
4	Tan K'ar-thing, Shalakuto River, Nan Shan, China.	C. Pfeil.	K. Futterer, Durch Asien, III (4), p. 23, 1911.	Augitite.	
5	Ilocos Norte, Lazon, Philippine Islands.	L. A. Salinger.	W. D. Smith, Phil. J. Sci. (A), II, p. 151, 1907.	Pyroxenite.	
6	Newtons Basin, Nepean River, New South Wales.	J. C. H. Mingaye.	Dep. Min. N. S. W. A. R. (1908), p. 184, 1909.	Diallage rock.	Inclusion in basalt.

PERIDOTITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Ireland, Megantic County, Quebec.	M. F. Connor.	J. A. Dresser, Can. G. S. rec. lab.	Dunite.	
2	Blacklake station, Megantic County, Quebec.	M. F. Connor.	J. A. Dresser, Can. G. S. rec. lab.	Dunite.	
3	Northeast Bay, Lake Abitibi, Ontario.	A. T. White.	M. B. Baker, Rep. Bur. Min. Ont., XVIII (I), p. 274, 1909.	Peridotite.	
4	Bayville, Boothbay quadrangle, Maine.	M. W. Adams.	I. H. Ogilvie, An. N. Y. Ac. Sci., XVII p. 547, 1907.	Dunite.	
5	Union, Knox County, Maine.	W. F. Hillebrand.	E. S. Bastin, J. G., XVI, p. 134, 1908.	Pyrrhotite peridotite.	
6	Iron Mine Hill, Cumberland, Rhode Island.	C. H. Warren.	Johnson and Warren, A. J. S., XXV, p. 33, 1908.	Cumberlandite.	"Chloritic alteration." Cf. No. 1, V.3.5.1.3.
7	Iron Mine Hill, Cumberland, Rhode Island.	C. H. Warren.	Johnson and Warren, A. J. S., XXV, p. 33, 1908.	Cumberlandite.	"CaO very small." Serpentine alteration. Cf. No. 1, V.3.5.1.3.
8	Gates, near Masontown, Fayette County, Pennsylvania.	M. W. Adams.	Kemp and Ross, An. N. Y. Ac. Sci., XVII, p. 517, 1907.	Peridotite.	
9	Johnny Cake road, Baltimore County, Maryland.	T. M. Chatard.	G. H. Williams, Am. G., VI, p. 39, 1890.	Lherzolite.	In W. T., p. 367.
10	Ilchester, Howard County, Maryland.	W. F. Hillebrand.	G. H. Williams, U. S. G. S. A. R. 15, p. 674, 1895.	Cortlandtite.	In W. T., p. 357.
11	Marion, Crittenden County, Kentucky.	L. G. Eakins.	J. S. Diller, U. S. G. S. B. 148, p. 94, 1897.	Mica peridotite.	In W. T., p. 469.
12	Flanary dike, Crittenden County, Kentucky.	W. F. Hillebrand.	J. S. Diller, A. J. S., XLIV, p. 288, 1892.	Mica peridotite.	In W. T., p. 363.

PERIDOTITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
13 A1. I	29.81	2.01	5.16	4.35	32.41	7.69	0.11	0.20	8.92		2.20	0.35	0.23	CO_2 6.66 SO_3 0.28 Cr_2O_3 0.43 NiO 0.05	100.86	2.781
14 A3. III	29.43	2.36	n. d.	9.46	31.66	6.94	0.78	0.65	10.90		1.48	trace		CO_2 5.65 SO_3 0.30 Cr_2O_3 0.14	100.15	2.697
15 A2. II	39.37	4.47	4.96	9.13	26.53	3.70	0.50	0.26	7.08	0.87	0.66	0.17	0.12	CO_2 1.23 Cr_2O_3 0.68 BaO trace SrO trace	99.94	
16 A2. II	37.36	4.76	6.61	6.12	31.11	1.19	trace	trace	10.37	0.65	0.79	0.06	trace	CO_2 none Cr_2O_3 0.62 NiO 0.04	99.68	
17 A3. III	47.92	5.69	5.99	0.84	21.82	3.16	0.29	1.43	9.49		2.71			CO_2 0.49	99.83	
18 A3. III	38.78	6.85	8.83	1.99	26.34	3.88	0.78	2.56	7.85	1.95	0.89			CO_2 0.14	100.84	2.317
19 A2. II	41.36	1.21	9.18	n. d.	42.90	1.34	0.04	0.04	1.94	0.16	none	0.04	0.10	CO_2 1.40 S 0.50 Cr_2O_3 0.15 NiO 0.15 BaO none SrO none	100.51	3.160
20 A2. II	40.25	1.10	4.61	3.04	37.91	1.16	0.48	0.16	9.08	0.32	trace		0.11	CO_2 1.95 Cr_2O_3 0.15	100.32	2.868
21 A1. I	38.40	0.29	3.42	6.69	45.23	0.35	0.08		4.11	0.24	none	trace	0.24	CO_2 1.10 ZrO_2 none S 0.06 Cr_2O_3 0.07 NiO 0.10 BaO none SrO none	100.38	
22 A3. III	33.48	1.50	7.27	1.36	42.02	0.02	0.29		13.26	0.60			0.06		99.86	
23 A1. I	44.81	1.88	1.98	4.52	30.91	6.58	0.15		6.88	0.15	none	0.02	0.13	CO_2 1.79 Cr_2O_3 0.29 NiO 0.09 BaO none SrO none	100.18	
24 A2. II	43.17	11.42	4.97	6.36	16.97	11.62	1.11	0.10	2.51	0.22	1.23	0.04	0.14	CO_2 0.71 S 0.06	100.63	
25 A1. I	44.73	11.89	4.85	6.61	10.77	7.69	2.77	0.89	4.15	3.49	1.53	0.46	0.41	Cl none S 0.05 Cr_2O_3 0.05 V_2O_3 0.03 NiO 0.03 BaO 0.03	100.43	
26 A1. I	41.01	5.00	5.52	8.66	26.92	4.43	0.98	0.25	4.95	0.43	0.66	0.10	0.47	CO_2 0.76 S none Cr_2O_3 0.14 V_2O_3 0.03 NiO 0.17 CoO 0.05 CuO trace	100.53	
27 A3. III	42.87	10.93	3.44	10.14	16.27	9.11	0.92	0.13	2.87	0.57	trace	trace	trace	CO_2 2.72	99.95	2.88
28 A1. I	36.41	6.53	3.02	8.18	26.88	4.47	0.02	none	3.57	0.63	0.88	0.19	0.47	CO_2 8.26 FeS_2 none Cr_2O_3 0.35 V_2O_3 0.07 NiO 0.10 BaO none CuO trace	100.03	
29 A3. III	46.16	5.83	10.96	2.27	21.10	6.73	0.84	0.68	4.79			trace	0.16	CO_2 0.38	99.90	

PERIDOTITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
13	Willard, Elliott County, Kentucky.	T. M. Chatard.	J. S. Diller, A. J. S., XXXII, p. 125, 1886.	Peridotite.	Also in U. S. G. S. B. 38, p. 24, 1887. In W. T., p. 471.
14	Willard, Elliott County, Kentucky.	Peter and Kastle.	J. S. Diller, U. S. G. S. B. 38, p. 24, 1887.	Peridotite.	In W. T., p. 471.
15	Opin Lake, Marquette region, Michigan.	W. F. Hillebrand.	Van Hise and Bayley, U. S. G. S. A. R. 15, p. 511, 1895.	Peridotite.	In W. T., p. 361.
16	Crystal Falls, Michigan.	H. N. Stokes.	J. M. Clements, U. S. G. S. Mon. 36, p. 219, 1899.	Picrite porphyry.	In W. T., p. 471.
17	Murfreesboro, Pike County, Arkansas.	H. S. Washington.	Unpublished.	Peridotite (kimberlite).	"Green ground." Altered. Diamond-bearing.
18	Murfreesboro, Pike County, Arkansas.	R. N. Brackett.	J. F. Williams, Ig. R. Ark., p. 383, 1891.	Peridotite (kimberlite).	Diamond-bearing. In W. T., p. 363.
19	MacRae Creek, Rossland Mountains, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38 (1), p. 335, 1912.	Dunite.	
20	Rock Creek, Midway Mountains, British Columbia.	M. Dittrich.	R. A. Daly, Can. G. S. Mem. 38 (1), p. 394, 1912.	Dunite.	
21	Eagle Creek and Tulameen River, British Columbia.	W. F. Hillebrand.	J. F. Kemp, U. S. G. S. B. 193, p. 44, 1903.	Dunite.	In W. T., p. 369.
22	Olivine Mountain, Tulameen District, British Columbia.	M. F. Connor.	C. Camsell, Can. G. S. Mem. 26, p. 53, 1913.	Peridotite.	
23	Strawberry Valley, Butte County, California.	W. F. Hillebrand.	H. W. Turner, J. G., III, p. 403, 1895.	Peridotite.	Also in U. S. G. S. A. R. 17, 1, p. 735, 1896. In W. T., p. 471.
24	Sequoia Post Office, Yosemite National Park, California.	G. Steiger.	H. W. Turner, U. S. G. S. B. 228, p. 242, 1904.	Amphibole picrite.	
25	Blackburn, Linlithgowshire, Scotland.	W. Pollard.	J. S. Flett, G. S. Scot. Mem., Sh. 32, p. 300, 1910.	Picrite.	
26	Dunan Liath, Rossshire, Scotland.	W. Pollard.	J. S. Flett, G. S. Scot. Mem., Sh. 93, p. 127, 1912.	Peridotite.	
27	Ty Croes, Anglesey, Wales.	J. A. Phillips.	T. G. Bonney, Q. J. G. S., XXXIX, p. 254, 1883.	Hornblende picrite.	In W. T., p. 355.
28	Polyphant, Lewannick, Cornwall.	E. G. Radley.	H. Dewey, G. S. Eng. Mem., Sh. 337, p. 65, 1911.	Hornblende picrite.	
29	Schriesheim, Baden.	M. Dittrich.	M. Dittrich, Mt. Bad. G. L.-A., V, p. 6, 1907.	Schriesheimite (amphibole picrite).	Weathered. Cf. No. 2, IV.1.3.2.1.

PERIDOTITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
30 A2. II	36.58	3.69	11.16	4.10	30.68	2.58	0.25	0.20	8.45	0.64	0.26	0.77		CO_2 0.31 SO_3 0.23	99.90	
31 A1. I	39.07	9.95	5.15	10.37	19.19	6.29	0.97	0.19	7.65		0.68	0.13	0.17	CO_2 0.09 S 0.15 Cr_2O_3 0.05 NiO 0.02 CuO 0.16	100.28	
32 A2. II	34.66	11.63	5.40	5.75	21.36	4.59	0.30	0.12	8.08	4.07	2.99	0.80		CO_2 0.20 SO_3 0.19	100.14	2.53
33 B2. III	42.57	4.58	7.71	7.31	22.16	5.24	0.45		7.64		1.50	0.16	trace		99.32	
34 B2. III	40.81	4.35	9.10	6.54	24.56	4.67	0.63		7.26		1.08	0.06	0.29		99.35	
35 A2. II	38.35	7.03	6.82	8.68	25.69	0.12	0.40	0.45	10.89		0.90	0.12		SO_3 0.22	99.67	2.73
36 A2. II	40.80	3.21	2.84	13.45	27.83	3.04	0.13	0.12	5.67		0.34	0.11		CO_2 2.04 Fe_7S_8 0.45	100.03	
37 A3. III	39.42	1.62	4.70	4.73	34.19	1.56	n. d.	n. d.	12.29				0.89	CO_2 0.37 Spinel 0.47	100.23	2.86
38 A3. III	38.82	0.39	3.32	4.08	43.45	trace	0.08	0.09	8.47	1.13	0.15			SO_3 trace Cr_2O_3 3.32 Org. 0.11	103.41 (100.04)	2.819
39 A3. III	41.35	13.90	8.24	7.13	8.79	11.65	0.15	0.16	5.35		0.22			CO_2 2.70	99.64	
40 A3. III	40.65	12.85	4.88	8.30	18.05	8.05	1.38	0.91	2.70			0.64		CO_2 2.30	100.71	
41 A3. III	39.75	14.40	7.58	8.57	6.17	12.65	0.81	0.28	2.15			0.71		CO_2 6.50	99.57	
42 A3. III	39.05	13.95	8.16	6.25	8.89	14.02	0.55	0.89	2.95			0.55		CO_2 5.10	100.36	
43 A3. III	42.54	7.96	4.78	8.64	19.79	6.04	2.57	0.99	5.88		trace	0.09		CO_2 0.56	99.84	
44 A3. III	43.47	2.97	4.42	4.48	39.44	3.30	n. d.	n. d.	1.87		0.15		trace	Cr_2O_3 0.43	100.53	
45 A2. II	39.88	3.83	3.16	5.02	30.99	2.41	1.10	0.68	8.20	2.28	0.03	trace		CO_2 2.04 S 0.10 Cr_2O_3 0.20 NiO 0.20	100.12	
46 A2. II	39.95	2.41	5.95	2.80	36.10	1.03	0.38	trace	10.13	0.57	trace	trace	0.13	CO_2 trace S 0.12 Cr_2O_3 0.05 NiO 0.16	99.78	
47 A4. IV	42.66	6.26	6.89	2.78	24.64	8.02	2.88	n. d.	6.34						100.47	
48 A4. IV	38.06	0.31	6.72	5.29	39.91	0.52	n. d.	n. d.	8.35					Cr_2O_3 1.39	100.55	

PERIDOTITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
30	Nieder Beerbach, Rossdorf, Hesse.	Stadler.	G. Klemm, Erl. G. Kt. Hes., Bl. Rossdorf, p. 29, 1912.	Peridotite.	
31	Sechsheldon, Dillenburg, Hesse Nassau.	L. Doermer.	L. Doermer, N. J. B. B., XV, p. 609, 1902.	Amphibole picrite.	
32	Steinperf, Hesse Nassau.	G. Butzbach.	R. Brauns, N. J. B. B., XXVIII, p. 407, 1909.	Picrite porphyrite.	
33	Lauterbach, Vogtland, Saxony.	A. Uhlemann.	A. Uhlemann, T. M. P. M., XXVIII, p. 430, 1909.	Picrite.	
34	Pausa, Vogtland, Saxony.	A. Uhlemann.	A. Uhlemann, T. M. P. M., XXVIII, p. 426, 1909.	Picrite.	Contact with diabase.
35	Stoppenberg, Harz.	K. Hampe.	E. Dathe, Jb. Pr. G. L.-A., IX, p. 327, 1889.	Paleopicrite.	In W. T., p. 471.
36	Leuthen, Laudeck, Silesia.	A. Lindner.	E. Dathe, Jb. Pr. G. L.-A., XIX, p. 127, 1899.	Actinolite-olivine rock.	
37	Kottschenberg, Silesia.	H. Traube.	H. Traube, Ref. N. J., I, p. 241, 1885.	Olivine diallage rock (wehrlite).	In W. T., p. 471.
38	Habendorf, Silesia.	K. Hampe.	E. Dathe, Jb. Pr. G. L.-A., IX, p. 327, 1889.	Peridotite.	In W. T., p. 471.
39	Stranik, Hotzendorf, Moravia.	C. F. Eichleiter.	C. F. Eichleiter, Vh. G. R.-A. Wien, XXX, p. 76, 1896.	Picrite.	In W. T., p. 471.
40	Sohle, Moravia.	C. F. Eichleiter.	C. F. Eichleiter, Vh. G. R.-A. Wien, XXX, p. 76, 1896.	Picrite porphyry.	In W. T., p. 471.
41	Mtschenowitz, Moravia.	C. F. Eichleiter.	C. F. Eichleiter, Vh. G. R.-A. Wien, XXX, p. 75, 1896.	Picrite.	In W. T., p. 471.
42	Zamrsk, near Keltsch, Moravia.	C. F. Eichleiter.	C. F. Eichleiter, Vh. G. R.-A. Wien, XXX, p. 74, 1896.	Picrite.	In W. T., p. 471.
43	Tomasesd, Hunyad, Hungary.	K. Emszt.	P. Rozlozsnik, F. K., XXXV, p. 519, 1905.	Feldspar picrite.	
44	Gorduno Valley, near Bellinzona Piedmont.	L. Hezner.	U. Grubenmann, Vrt. Jhft. Ges. Zür., LIII, p. 10, 1908.	Olivine-garnet rock.	Metamorphosed. Cf. No. 44, V.1.4.1.1.
45	Grotta d'Oggi, San Piero in Campo Elba.	G. d'Achiardi.	G. d'Achiardi, Mem. A. d'Ach., p. 125, 1903.	Anthophyllite peridotite.	
46	Naravet-Keu, Samoyed Urals.	M. Dittrich.	H. Backlund, Mem. Imp. Ac. Sci. St. P., XXVIII, No. 3, p. 41, 1912.	Harzburgite.	
47	Suprega, Ural Mountains.	Kultacheff and Loewinson-Lessing.	Loewinson-Lessing, Jushno-Saosk., p. 166, 1900.	Picrite.	In W. T., p. 361
48	Koswinsky Kamen, Ural Mountains.	L. Duparc.	Duparc and Pearce, Oural Nord., I, p. 163, 1902.	Dunite.	

PERIDOTITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
49 A3. III	35.70	0.75	4.29	5.38	43.34	—	—	—	9.35		0.21		0.26	Cr_2O_3 —	99.86	
50 A2. II	40.07	8.95	4.82	7.81	13.86	13.83	1.34	0.56	2.45		2.35	0.35		CO_2 3.78 S 0.04	100.21	3.096
51 A2. II	35.12	0.56	8.49	3.78	39.72	0.87	0.16	0.08	10.86		0.09	0.08			99.81	
52 A2. II	46.83	3.71	3.24	4.35	21.33	3.83	0.63	0.70	5.22	7.95	1.34	0.74			99.87	2.62
53 A2. II	38.29	2.66	5.77	2.93	29.46	2.42	0.30	1.03	10.19	3.13	2.00	1.44		CO_2 0.20	99.82	2.68
54 A2. II	38.15	1.19	6.55	3.24	27.33	4.13	0.25	0.56	9.69	3.52	1.72	2.15		CO_2 1.41	99.89	2.64
55 A2. II	38.02	3.03	8.13	2.21	27.78	4.80	0.84		10.11	2.60	2.30	0.41		CO_2 0.28	100.51	2.695
56 A3. III	33.84	6.16	27.40	0.19	21.62	n. d.	0.20		9.33	1.23	0.43			Cr_2O_3 0.04	100.44	2.757
57 A2. II	32.03	2.90	6.12	3.40	33.49	7.60	0.35	1.34	6.31	0.51	1.73	1.45		CO_2 2.50 BaO 0.06	99.73	
58 B2. III	30.95	4.02	6.16	2.66	32.30	8.92	0.35	1.61	6.81	0.55	2.34	0.15	trace	CO_2 2.54 NiO trace	99.36	2.835
59 A2. II	30.32	2.74	4.50	4.09	29.64	10.40	0.45	0.75	6.56	1.19	1.78	1.34		CO_2 6.21 BaO 0.04	99.97	
60 A2. II	29.56	2.47	4.18	4.84	37.47	7.19	0.22	0.33	4.82	0.43	1.18	0.43	trace	CO_2 6.71 NiO 0.30	100.18	2.85
61 B2. III	38.08	2.46	24.48	2.59	12.88	4.14	1.12	0.84	10.14	0.25	none	0.67	trace	CO_2 1.67 S trace Cr_2O_3 trace	99.32	
62 A2. II	36.57	5.09	13.75	4.68	11.85	8.49	2.55	0.64	6.31	5.47	none	0.58	none	CO_2 4.61 S trace Cr_2O_3 trace	100.59	
63 B2. III	33.42	0.94	23.84	3.52	10.80	9.84	0.97	0.86	7.83	0.43	none	0.89	none	CO_2 5.88 S trace Cr_2O_3 trace	99.22	
64 A2. II	36.00	0.69	4.44	2.90	39.70	3.58	0.11	0.26	8.02	0.63	0.58	0.64		CO_2 2.74	100.29	2.98
65 A2. II	35.49	3.42	6.37	3.02	30.98	5.12	0.20	2.61	6.69	0.47	1.65	0.63	trace	CO_2 3.03 S trace NiO trace	99.68	2.923
66 A2. II	31.80	3.41	5.19	3.48	24.69	10.04	0.29	4.32	5.59	0.63	1.40	1.49		CO_2 7.65	99.98	
67 A2. II	46.30	6.41	9.13	2.24	17.82	13.02	0.98	0.37	1.78	0.21	0.58		0.21	CO_2 0.93	99.98	

PERIDOTITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
49	Krebet-Salatim, Ural Mountains.	Not stated.	Duparc and Wunder, C. R., CLII, p. 884, 1911.	Dunite.	
50	Ribeira de Massapez, Madeira.	Klüss.	C. Gagel, Z. D. G. G., LXIV, p. 399, 1912.	Madeirite (essexitic peridotite).	
51	Riviere du Mat, Reunion.	Boiteau.	A. Lacroix, C. R., CLV, p. 539, 1912.	Dunite.	
52	Premier Pipe, Elandsfontein, Pretoria, Transvaal.	M. Dittrich.	P. A. Wagner, Tr. G. Soc. S. Afr., XIV, p. 53, 1911.	Kimberlite.	"Blue ground."
53	Premier Pipe, Elandsfontein, Pretoria, Transvaal.	M. Dittrich.	P. A. Wagner, Tr. G. Soc. S. Afr., XIV, p. 53, 1911.	Kimberlite.	
54	Premier Pipe, Elandsfontein, Pretoria, Transvaal.	M. Dittrich.	P. A. Wagner, Tr. G. Soc. S. Afr., XIV, p. 53, 1911.	Kimberlite tuff.	
55	Premier Pipe, Elandsfontein, Pretoria, Transvaal.	P. A. Wagner.	P. A. Wagner, Diam. Gest. S. Afr., p. 76, 1909.	Kimberlite.	"Blue ground."
56	Schuller mine, Pretoria, Transvaal.	C. Gardthausen.	Kymaston and Hall, Rep. S. Afr. A. A. S., p. 194, 1904.	Kimberlite.	"Blue ground."
57	De Beer's mine, Kimberley, Griqualand.	M. Dittrich.	P. A. Wagner, Tr. G. Soc. S. Afr., XIV, p. 53, 1911.	Kimberlite.	
58	De Beer's mine, Kimberley, Griqualand.	P. A. Wagner.	P. A. Wagner, Diam. Gest. S. Afr., p. 63, 1909.	Kimberlite.	"P_2O_5 low." Cf. Wagner, Diam. Flds., S. Afr., p. 84, 1914.
59	De Beer's mine, Kimberley, Griqualand.	M. Dittrich.	P. A. Wagner, Tr. G. Soc. S. Afr., XIV, p. 53, 1911.	Kimberlite.	
60	St. Augustine's mine, Kimberley, Griqualand.	M. Dittrich.	P. A. Wagner, Diam. Flds. S. Afr., p. 84, 1914.	Kimberlite.	
61	Vogelfontein mine, Transvaal.	Not stated.	H. S. Harger, Tr. G. Soc. S. Afr., VIII, p. 120, 1905.	Kimberlite.	"Hardibank."
62	Vogelfontein mine, Transvaal.	Not stated.	H. S. Harger, Tr. G. Soc. S. Afr., VIII, p. 120, 1905.	Kimberlite.	"Blue ground."
63	Vogelfontein mine, Transvaal.	Not stated.	H. S. Harger, Tr. G. Soc. S. Afr., VIII, p. 120, 1905.	Kimberlite.	"Hardibank."
64	Klipfontein, Orange River Colony.	M. Dittrich.	P. A. Wagner, Tr. G. Soc. S. Afr., XIV, p. 53, 1911.	Kimberlite.	
65	Lion Hill mine, Smaldeel, Orange River Colony.	P. A. Wagner.	P. A. Wagner, Diam. Gest. S. Afr., p. 85, 1909.	Kimberlite.	
66	Lion Hill dike, Smaldeel, Orange River Colony.	M. Dittrich.	P. A. Wagner, Diam. Flds. S. Afr., p. 110, 1914.	Kimberlite.	
67	Rybnaja River, Jenissei District, Siberia.	Not stated.	A. Meister, Reg. Aurif. Sib., IX, p. 429, 1910.	Picrite.	

PERIDOTITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
68 A2. II	41.50	10.88	12.14	1.28	17.82	7.71	0.61	0.56	5.81	0.31	0.62		0.12	CO_2 0.23	99.59	
69 A2. II	38.04	7.01	6.59	6.48	20.17	4.40	0.17	0.12	7.70		0.40			CO_2 0.93 Cr_2O_3 7.42	99.43	
70 A3. III	39.16	3.76	4.32	3.55	38.15	2.08	0.70	—	8.27	0.73					100.72	2.88
71 A1. I	39.91	13.67	6.55	8.98	11.96	6.18	1.28	0.66	3.74	3.66	1.75	0.61	0.18	CO_2 0.40 SO_3 trace Cl 0.02 S 0.20 Cr_2O_3 0.21 V_2O_3 trace NiO trace BaO none SrO none Li_2O none	99.96	2.891
72 A2. II	39.13	3.48	1.83	7.58	42.15	0.07	—	—	0.80	2.80	0.16		0.21	CO_2 3.05 Cr_2O_3 0.20 NiO 0.04	100.75	
73 A1. I	41.43	5.92	4.03	7.46	27.49	4.31	0.35	0.64	6.47	0.32	0.60	0.24	0.42	CO_2 0.38 SO_3 none Cl trace Cr_2O_3 0.31 NiO 0.03	100.50	2.931
74 A2. II	31.07	5.49	1.49	7.64	17.49	5.46	3.82	0.11	0.05	0.07	0.26		0.18	CO_2 27.24	100.43	2.89
75 A2. II	38.37	1.51	2.08	4.82	41.41	none	$\underbrace{0.10}_{Na_2O+K_2O}$		11.11		0.05		0.35	Cr_2O_3 0.20	100.00	

ORES, ETC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 A2. II	33.89	0.94	6.85	22.73	6.85	9.68	0.37	0.34	1.66	0.32	12.97	3.29	0.31	CO_2 trace Cl 0.01 F 0.02	100.23	

PERIDOTITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
68	Rybnaja River, Jenissei District, Siberia.	Not stated.	A. Meister, Reg. Aurif. Sib., IX, p. 429, 1910.	Picrite.	
69	Riasanov trail, Jenissei District, Siberia.	Not stated.	A. Meister, Reg. Aurif. Sib., IX, p. 424, 1910.	Wehrlite.	
70	Batan Island, Philippine Islands.	Survey laboratory.	W. D. Smith, Min. Bur. Manila B. 5, p. 20, 1905.	Peridotite.	
71	Jellore Creek, Mittagong, New South Wales.	D. Mawson.	Taylor and Mawson, Pr. R. Soc. N. S. W., XXXVII, p. 341, 1903.	Picrite.	
72	Dundas, near Sydney, New South Wales.	W. N. Benson.	W. N. Benson, Pr. R. Soc. N. S. W., XLIV, p. 532, 1910.	Dunite.	
73	Frenchmans Gulley, Walhalla, Victoria.	Not stated.	Secy. Min. Vict. A. R. (1907), p. 63, 1908.	Peridotite.	
74	Hannans Lake, Kalgoorlie, Western Australia.	C. G. Gibson.	E. S. Simpson, W. Aust. G. S. B. 6, p. 75, 1902.	Peridotite.	
75	Lee River, Dun Mountains, Nelson, New Zealand.	Not stated.	J. M. Bell, G. S. N. Z. B. 12, p. 37, 1911.	Harzburgite.	

ORES, ETC.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Lovingston, Nelson County, Virginia.	W. M. Thornton.	Watson and Taber, Va. G. S. B. III A, p. 135, 1913.	Hornblende nelsonite.	

Part IV.—INFERIOR ANALYSES.

GRANITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 B4. V	69.39	17.46	n. d.	1.38	0.52	2.14	5.18	2.77	0.47	0.06					99.37	
2 B4. V	67.50	18.23	n. d.	2.39	1.56	1.85	3.79	4.25	0.90	0.08					100.55	
3 B4. V	76.20	14.41	n. d.	1.49	0.65	2.19	3.32	2.44	n. d.						100.70	2.65
4 C3. V	69.80	14.53	5.35	n. d.	1.72	3.17	2.87	4.37	n. d.		0.05	0.06	0.06		101.98	
5 D3. V	64.85	11.44	2.94	6.02	1.60	3.49	3.92	3.02	0.78			0.24	trace		98.30	2.788
6 C4. V	74.64	14.90	1.56	n. d.	trace	0.39	0.41	6.88	0.27						99.05	
7 C4. V	73.02	16.22	n. d.	2.59	trace	0.94	3.60	3.42	(0.21)				trace	S none	100.00	
8 C3. V	73.48	15.26	n. d.	1.42	0.09	0.88	3.12	5.66	n. d.				0.10	CO_2 none S trace	100.01	
9 C4. V	72.97	14.63	n. d.	1.73	0.27	1.48	3.28	5.18	(0.33)				0.10	S 0.03	(100.00)	
10 D2. V	71.54	14.24	0.74	1.18	0.34	0.98	3.39	4.73	0.61		0.84			CO_2 trace S trace	98.59	
11 C4. V	70.94	15.68	n. d.	2.29	0.19	1.23	3.58	5.54	(0.37)				0.13	CO_2 none S 0.05	(100.00)	
12 C2. IV	67.59	17.41	0.15	2.98	1.40	3.05	4.89	2.59	0.18	0.04	0.83	0.19		CO_2 none	101.30	
13 C3. V	72.47	16.17	n. d.	0.41	0.14	1.65	3.43	4.83	(0.49)			0.39		S 0.02	100.00	
14 D3. V	71.44	14.72	2.39	0.46	0.96	trace	7.66	0.89	0.61		0.78	trace	trace	S trace	99.91	2.635
15 D3. V	70.42	14.64	1.54	2.34	1.20	trace	7.80	0.71	0.61		0.48	trace	trace	S trace	99.74	2.634
16 B4. V	76.07	12.67	2.00	n. d.	0.10	0.85	3.37	4.71	n. d.				0.03		99.80	
17 D4. V	75.14	15.57	n. d.	2.49	n. d.	1.85	4.41	0.54	n. d.						100.00	
18 C3. V	72.02	14.43	1.25	0.89	trace	1.18	5.85	5.41	0.35				0.33		101.71	
19 D4. V	73.05	14.53	2.96	n. d.	trace	2.06	(1.72)	5.39	0.29				trace		100.00	
20 D4. V	71.64	15.66	2.34	n. d.	trace	2.70	(1.58)	5.60	0.48				trace		100.00	2.654
21 D4. V	72.73		16.95		trace	1.05	0.90	8.15	0.22						100.00	

GRANITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	McLaren Bay, Lake Keepawa, Quebec.	F. G. Wait.	G. C. Hoffmann, Can. G. S. A. R. IX, p. 19 R, 1898.	Granitite gneiss.	In W. T., p 373.
2	Lake Wicksteed, Quebec.	F. G. Wait.	G. C. Hoffmann, Can. G. S. A. R. IX, p. 19 R, 1898.	Granite gneiss.	In W. T., p. 159.
3	Bad Vermilion Lake, Rainy River District, Ontario.	W. Lawson.	A. P. Coleman, J. G., IV, p. 909, 1896.	Granite.	In W. T., p. 137.
4	Sultana Island, Ontario.	R. M. Rosebrugh.	A. P. Coleman, Rep. Bur. Min. Ont., VI, p. 122, 1897.	Granite.	Not in W. T.
5	Sudbury, Ontario.	T. L. Walker.	T. L. Walker, Q. J. G. S., L III, p. 56, 1897.	Granite.	In W. T., p. 375.
6	Blue Hill, Hancock County, Maine.	H. J. Williams	W. C. Day, U. S. G. S. A. R. 19, VI, p. 215, 1898.	Granite.	In W. T., p. 373.
7	Blue Hill, Hancock County, Maine.	Ricketts and Banks.	W. C. Day, U. S. G. S. A. R. 18, V, p. 962, 1897.	Granite.	In W. T., p. 373.
8	Waldoboro, Lincoln County, Maine.	Ricketts and Banks.	W. C. Day, U. S. G. S. A. R. 20, VI, p. 391, 1899.	Granite.	In W. T., p. 373.
9	Jonesboro quarry, Washington County, Maine.	Ricketts and Banks.	T. N. Dale, U. S. G. S. B. 313, p. 170, 1907.	Granite.	
10	North Jay, Maine.	E. T. Rodgers.	W. C. Dale, U. S. G. S. A. R. 19, VI, p. 219, 1898.	Granite.	In W. T., p. 373.
11	Hurricane Island, Knox County, Maine.	Ricketts and Banks.	T. N. Day, U. S. G. S. B. 313, p. 137, 1907.	Granite.	
12	Damaris Cove Island, Boothbay, Maine.	M. W. Adams.	I. H. Ogilvie, Ann. N. Y. Ac. Sci., XVII, p. 531, 1907.	Granite.	
13	Mason, Hillsboro County, New Hampshire.	Ricketts and Banks.	W. C. Day, U. S. G. S. A. R. 20, VI, p. 418, 1899.	Granite.	In W. T., p. 373.
14	Redstone, Carroll County, New Hampshire.	F. C. Robinson.	W. C. Day, U. S. G. S. A. R. 20, VI, p. 417, 1899.	Granite.	In W. T., p. 373.
15	Redstone, Carroll County, New Hampshire.	F. C. Robinson.	W. C. Day, U. S. G. S. A. R. 20, VI, p. 417, 1899.	Granite.	In W. T., p. 373.
16	Milford, Massachusetts.	C. F. Chandler.	W. C. Day, U. S. G. S. A. R. 19, VI, p. 221, 1898.	Granite.	In W. T., p. 373.
17	Quincy, Massachusetts.	E. A. Angell.	W. C. Day, U. S. G. S. A. R. 19, VI, p. 229, 1898.	Granite.	Cf. Nos. 25, 26, 27, I.4.1.3. In W. T., p. 373.
18	Milford, Massachusetts.	R. H. Richards.	T. N. Dale, U. S. G. S. B. 354, p. 81, 1908.	Granite.	
19	Westerly, Rhode Island.	F. W. Love.	J. F. Kemp, B. G. S. A., X, p. 375, 1899.	Granite.	Na_2O by difference. In W. T., p. 373.
20	Westerly, Rhode Island.	F. W. Love.	J. F. Kemp, B. G. S. A., X, p. 375, 1899.	Granite.	Na_2O by difference. In W. T., p. 373.
21	Stony Creek, Connecticut.	L. P. Kinnicut.	J. F. Kemp, B. G. S. A., X, p. 375, 1899.	Granite.	In W. T., p. 373.

GRANITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
22 B4. V	68.11	14.28	n. d.	2.63	0.68	1.86	6.57	5.46	n. d.					S 0.34	99.93	
23 B3. IV	75.61	12.53	2.22	0.86	0.20	1.35	5.21	3.18	0.09						101.25	
24 B3. IV	73.54	15.20	0.50	0.81	0.03	1.69	4.99	2.31	0.06	—	0.08				99.21	
25 B3. IV	63.19	10.50	10.97	1.51	1.44	6.12	1.92	4.02	0.19						99.86	
26 B4. V	67.98	16.14	n. d.	4.39	0.53	5.89	4.32	0.45	0.30						100.00	
27 C4. V	64.12	20.91	2.96	n. d.	0.66	1.98	4.57	4.82							100.02	
28 C4. V	77.25	8.18	8.17	n. d.	0.39	0.70	1.22	0.01					1.82		99.79	
29 B4. V	75.14	8.61	7.49	n. d.	0.04	0.93	5.82	2.57	none				trace		100.60	
30 B4. V	70.70	16.50	2.34	n. d.	0.29	2.96	4.56	2.45	none					FeS_2 0.09	99.89	
31 B4. V	66.01	17.44	5.62	n. d.	1.11	1.44	5.06	3.16	none					MnO 0.23	100.07	
32 C4. V	73.66	15.39	1.24	n. d.	0.38	1.36	0.55	6.89	n. d.						99.07	2.62
33 C4. V	72.22	14.51	n. d.	n. d.	0.58	1.32	3.21	4.30	0.52		0.24	trace	trace		99.70	2.63
34 D4. V	71.20	17.04	3.48	n. d.	0.11	n. d.	2.32	4.70	0.63						99.48	
35 C4. V	69.74	13.72	3.64	n. d.	0.22	1.54	3.59	4.98							99.23	2.64
36 D4. V	74.64	14.00	1.05	n. d.	0.37	1.76	7.77		0.41						100.00	
37 B4. V	69.45	15.93	1.31	n. d.	0.55	1.91	4.33	5.16	0.50						99.14	
38 B4. V	69.25	16.04	1.72	n. d.	0.31	1.89	4.52	4.94	0.43						99.10	2.670
39 D4. V	68.89	16.47	2.34	n. d.	0.40	1.63	4.38	4.15	0.32						98.58	
40 B4. V	68.81	17.67	1.13	n. d.	0.50	2.17	4.97	3.90	0.30						99.45	
41 B4. V	68.76	16.80	0.99	n. d.	1.00	2.72	3.70	4.82	0.29						99.08	

GRANITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
22	Waterford, Connecticut.	Ricketts and Banks.	W. C. Day, U. S. G. S. A. R. 19, VI, p. 214, 1898.	Granite.	In W. T., p. 373.
23	New York City, New York.	V. Ziegler.	V. Ziegler, Ann. N. Y. Ac. Sci., XXI, p. 5, 1911.	Granite.	
24	Cornell Dam, near Peekskill, New York.	E. Walker.	G. S. Rogers, Ann. N. Y. Ac. Sci., XXXI, p. 61, 1911.	Granite.	
25	Stony Point, Rockland County, New York.	J. F. Geiste.	W. C. Day, U. S. G. S. A. R. 20, VI, p. 421, 1899.	"Granite" (diorite).	In W. T., p. 373.
26	Wilmington, Delaware.	Booth, Garrett, and Blair.	W. C. Day, U. S. G. S. A. R. 19, VI, p. 214, 1898.	"Granite" (quartz diorite).	In W. T., p. 373.
27	Petersburg, Virginia.	Hunt and Clapp.	W. C. Day, U. S. G. S. A. R. 19, VI, p. 227, 1898.	Granite	In W.T., p. 375.
28	Bellemont, Gaston County, North Carolina.	Not stated.	J. A. Holmes, N. C. G. S. Rep., I, p. 84, 1893.	Granite.	Not in W. T.
29	Dunns Mountain, Rowan County, North Carolina.	Not stated.	J. A. Holmes, N. C. G. S. Rep., I, p. 89, 1893.	Granite.	Not in W. T.
30	Mount Airy, Surry County, North Carolina.	Not stated.	J. A. Holmes, N. C. G. S. Rep., I, p. 94, 1893.	Granite.	Not in W. T.
31	Morrisville, Iredell County, North Carolina.	Not stated.	J. A. Holmes, N. C. G. S. Rep., I, p. 87, 1893.	Granite.	Not in W. T.
32	Rion quarry, Fairfield County, South Carolina.	Not stated.	E. Sloan, S. C. G. S. (IV), B. 2, p. 214, 1908.	Granite.	
33	Heath Springs, Kershaw County, South Carolina.	Hardin and Robertson.	E. Sloan, S. C. G. S. (IV), B. 2, p. 219, 1908.	Granite.	
34	Pacolet River, Spartanburg County, South Carolina.	Pittsburgh Testing Laboratory.	E. Sloan, S. C. G. S. (IV), B. 2, p. 198, 1908.	Granite.	
35	Anderson quarry, Fairfield County, South Carolina.	Garrett, Booth, and Blair.	E. Sloan, S. C. G. S. (IV), B. 2, p. 210, 1908.	Granite.	
36	Washington, Wilkes County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9 A, p. 225, 1902.	Granite.	Alkalies by difference.
37	Elberton, Elbert County, Georgia.	T. L. Watson.	T. L. Watson, Am. G., XXVII, p. 204, 1901.	Granite.	
38	Elberton, Elbert County, Georgia.	T. L. Watson.	T. L. Watson, Am. G., XXVII, p. 204, 1901.	Granite.	
39	Loganville, Walton County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9 A, p. 150, 1902.	Granite gneiss.	
40	Near Lexington, Coweta County, Georgia.	T. L. Watson.	T. L. Watson, A. G., XXVII, p. 204, 1901.	Granite.	Also in Ga. G. S. B. 9 A, p. 88, 1902.
41	Camak, Warren County, Georgia.	T. L. Watson.	T. L. Watson, Am. G., XXVII, p. 214, 1901.	Granite.	

GRANITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
42 B4. V	63.27	19.93	2.82	n. d.	0.49	2.89	4.14	4.85	0.86						99.25	2.739
43 D4. V	61.18	22.80	1.74	n. d.	0.34	3.06	(7.94)		2.94						100.00	
44 D4. V	53.58	26.27	3.07	n. d.	1.44	0.17	1.88	3.85	9.02						99.28	
45 D4. V	48.35	28.03	4.75	n. d.	3.45	3.97	(5.35)		6.10						100.00	
46 C4. V	76.62	13.02	1.01	n. d.	0.05	0.51	2.24	6.38	—						99.83	
47 B4. V	73.78	17.18	n. d.	1.64	n. d.	0.85	2.82	4.48	0.12						100.87	
48 B4. V	67.99	15.85	5.36	n. d.	0.41	1.78	3.21	4.81	0.30						99.71	
49 B3. IV	66.10	20.82	1.52	2.17	0.95	1.57	2.94	3.48	0.54						100.09	
50 B4. V	77.05	11.77	2.33	n. d.	n. d.	2.21	2.90	3.98	0.52			0.02			100.68	
51 C2. 4	71.43	16.80	1.22	0.16	1.42	0.99	3.42	3.48	0.85			0.35	0.22		99.34	
52 D4. V	71.98	15.07	2.69	n. d.	0.58	2.46	(6.92)		0.20						100.00	
53 D4. V	71.74	14.54	1.46	1.80	0.39	3.13	(6.06)		0.92						100.00	
54 D4. V	67.45	13.04	8.34	n. d.	2.65	4.68	(3.57)		0.27						100.00	
55 D4. V	68.24	16.30	3.50	n. d.	1.88	3.20	(6.40)		0.48						100.00	
55 C4. V	75.35	13.69	3.94	n. d.	0.06	2.97	1.14	2.85	n. d.						100.00	
56 B3. IV	71.63	13.86	0.46	2.76	trace	3.26	3.40	2.65	0.89		trace	0.20			99.11	2.68
57 C4. V	71.60	13.63	3.03	n. d.	0.94	3.37	4.54	1.31	0.63						99.04	
58 C4. V	69.33	12.77	2.19	n. d.	1.03	7.23	4.75	0.42	1.47						99.19	
59 C3. V	64.91	21.49	1.09	4.62	1.13	0.71	2.72	3.55	n. d.						100.22	

GRANITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
42	Greenville, Meriwether County, Georgia.	T. L. Watson.	T. L. Watson, Am. G., XXVII, p. 216, 1901.	Granite.	
43	Newnan, Coweta County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9 A, p. 87, 1902.	Granite.	Weathered. Alkalies by difference.
44	Coweta station, Coweta County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9 A, p. 93, 1902.	Granite.	Weathered. Cf. No. 4, I.5.2.3.
45	Greenville, Meriwether County, Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9 A, p. 75, 1902.	Granite.	Alkalies by difference. Weathered surface. Cf. No. 42, above.
46	Waushara County, Wisconsin.	Not stated.	W. C. Day, U. S. G. S. A. R. 18 (V), p. 975, 1897.	Granite.	In W. T., p. 375.
47	Montello, Fox River valley, Wisconsin.	W. W. Daniells.	Hobbs and Leith, B. Un. Wisc. 158, p. 262, 1907.	Granite.	
48	Wausau, Wisconsin.	W. W. Daniells.	S. Weidman, J. G., XII, p. 552, 1904.	Granite.	
49	Athelstane, Wisconsin.	W. W. Daniells.	E. R. Buckley, Wisc. G. S. B. IV, p. 148, 1898.	Granite.	In W. T., p. 161
50	Graniteville, Missouri.	W. H. Melville.	C. R. Keyes, Mo. G. S. Rep., sh. 4, p. 25, 1895.	Granite.	In W. T., p. 375.
51	Sugarloaf Mountain, Boulder County, Colorado.	C. D. Henry.	C. D. Henry, Pr. Col. Sc. Soc., VII, p. 116, 1903.	Granite.	3 places.
52	Little Spokane River, Washington.	R. W. Thatcher.	S. Shedd, Wash. G. S. A. R. II, p. 43, 1902.	Granite.	Alkalies by difference.
53	Wawawai Canyon, Snake River, Washington.	R. W. Thatcher.	S. Shedd, Wash. G. S. A. R. II, p. 37, 1902.	Granite.	Alkalies by difference.
54	Index, Washington.	R. W. Thatcher.	S. Shedd, Wash. G. S. A. R. II, p. 39, 1902.	Granite.	Alkalies by difference.
55	Medical Lake, Washington.	R. W. Thatcher.	S. Shedd, Wash. G. S. A. R. II, p. 46, 1902.	Granite.	Alkalies by difference.
55	Exeter, Tulare County, California.	Watertown Arsenal.	W. C. Day, U. S. G. S. A. R. 20, VI, p. 358, 1899.	Granite.	In W. T., p. 375.
56	Carmelo Bay, California.	J. Posada.	A. C. Lawson, B. Dep. G. Un. Cal., I, p. 16, 1893.	Granite.	In W. T., p. 189.
57	George's Dog, Virgin Gorda, West Indies.	P. T. Cleve.	P. T. Cleve, Sv. Vet. Ak. Hndl., IX, No. 12, p. 33, 1871.	Granite.	Not in W. T.
58	Sound, Virgin Gorda, West Indies.	T. Nordström.	P. T. Cleve, Sv. Vet. Ak. Hndl., IX, No. 12, p. 34, 1871.	Granite.	Not in W. T.
59	Janucillo, Monte Cumbre, Argentina.	J. C. Jenkins.	A. Stelzner, Btr. G. Arg., I, p. 211, 1885.	Anden granite.	Al_2O_3 high. In W. T., p. 375.

GRANITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
60 C3. V	75.8	13.7	0.5	0.3	trace	0.5	1.9	6.5	0.3						99.5	2.59
61 C3. V	66.6	17.4	1.1	2.1	1.2	2.2	3.1	4.6	0.9						99.2	2.62
62 C3. V	62.3	18.6	1.5	3.0	2.5	4.3	1.9	4.8	0.6						99.5	2.67
63 B3. IV	67.12	20.12	3.71	0.28	0.82	1.79	1.53	3.38	1.01					CO_2 0.03 SO_3 0.05	99.84	2.701
64 B3. IV	66.02	21.43	4.62	0.63	1.77	1.81	0.15	3.17	0.16					CO_2 0.08 SO_3 0.04	99.88	2.731
65 C2. IV	59.34	18.91	6.22	0.95	2.55	3.97	2.61	2.91	1.43		0.72	0.26		Cl 0.03	99.90	
66 B4. V	68.55	16.21	2.26	n. d.	1.04	2.40	4.08	4.14	n. d.				0.45		99.13	
67 C4. V	70.6	13.3	3.1	n. d.	0.4	2.2	0.8	9.2	0.3						99.9	
68 B4. V	74.69	16.21	trace	1.16	0.48	0.28	1.18	3.64	1.23				0.58	Li_2O 0.10	99.55	2.64
69 D4. V	72.43	18.08	2.20	n. d.	trace	trace	$\underbrace{\qquad\qquad}_{4.12}$		3.69	0.29			trace		100.81	2.45
70 B4. V	75.00	13.24	2.52	n. d.	n. d.	0.69	3.07	4.33	0.80						99.65	
71 D4. V	71.78	15.86	4.19	n. d.	0.50	3.16	4.10	1.13	1.17						101.89	
72 B4. V	70.69	15.20	3.76	n. d.	0.45	3.31	4.69	2.31	0.56						101.07	
73 B3. IV	72.5	16.3	2.5	n. d.	0.5	1.1	3.2	3.2	0.54	-	0.2	trace		Cl trace	100.04	
74 A4. IV	75.12	13.21	2.66	n. d.	trace	0.33	4.46	3.55	0.47						99.80	
75 C4. V	71.80	16.00	1.76	n. d.	1.83	1.74	3.47	4.20	0.62						101.42	
76 C4. V	70.10	16.56	n. d.	1.66	0.61	1.85	5.58	3.69	0.97				trace		101.58	
77 D4. V	69.8	15.6	3.0	n. d.	1.2	1.5	4.0	4.7							99.8	
78 D4. V	77.4	13.8	1.4	n. d.	0.5	0.3	6.5	0.5	0.7						101.1	

GRANITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
60	Ben Dambain, Loch Garabal, Scotland.	J. H. Player.	Dakyns and Teall, Q. J. G. S., XLVIII, p. 115, 1892.	Eurite.	In W. T., p. 375.
61	Alt-na-Lairige, Loch Garabal, Scotland.	J. H. Player.	Dakyns and Teall, Q. J. G. S., XLVIII, p. 115, 1892.	Granitite.	In W. T., p. 375.
62	Alt-na-Lairige, Loch Garabal, Scotland.	J. H. Player.	Dakyns and Teall, Q. J. G. S., XLVIII, p. 115, 1892.	Granitite.	In W. T., p. 375.
63	Staindrop Rig, Cheviot Hills, Scotland.	I. Macadam.	H. Kynaston, Tr. G. Soc. Edin., VII, p. 394, 1899.	Granite.	Al_2O_3 high. Alkalies low. In W. T., p. 135.
64	Black Lynn, Linhope, Cheviot Hills, Scotland.	I. Macadam.	H. Kynaston, Tr. G. Soc. Edin., VII, p. 394, 1899.	Granite.	Al_2O_3 high. Alkalies low. In W. T., p. 215.
65	Stratherrie, Glen Liath, Scotland.	W. Mackie.	W. Mackie, Tr. G. Soc. Edin., VIII (1), p. 54, 1901.	Granite.	
66	Shap Fell, Westmoreland, England.	J. B. Cohen.	Harker and Marr, Q. J. G. S., XLVII, p. 276, 1891.	Granite.	In W. T., p. 375.
67	Y Drosge, Caernarvonshire, Wales.	E. H. Acton.	A. Harker, Bala. Volc. Ser., p. 46, 1889.	Granophyre.	Alkalies? In W. T., p. 375.
68	Carn Brea Hill, Redruth, Cornwall.	Phillips.	J. J. H. Teall, Brit. Petrog., p. 314, 1888.	Granite.	Al_2O_3 high. Alkalies low. MnO high. In W. T., p. 125.
69	Trelavour Downs, Bodmin, Cornwall.	Collins.	W. A. E. Usscher, G. S. Eng. Mem. Sh. 347, p. 73, 1909.	Elvan.	
70	Mourne Mountains, Ireland.	S. Houghton.	W. J. Sollas, Tr. R. Ir. Ac., XXX, (XI), p. 491, 1894.	Granite.	In W. T., p. 375.
71	Aughrim, Leinster, Ireland.	Not stated.	W. J. Sollas, Tr. R. Ir. Soc., XXIX (XIV), p. 477, 1891.	Microgranite.	In W. T., p. 375.
72	Aughrim, Leinster, Ireland.	Not stated.	W. J. Sollas, Tr. R. Ir. Soc., XXIX (XIV), p. 471, 1891.	Soda granite.	In W. T., p. 375.
73	Foxdale, Isle of Man.	W. C. Simmons.	W. C. Simmons, G. Mag. (V), VIII, p. 351, 1911.	Granite.	
74	Guisanne River, Pelvoux, Dauphiny, France.	Rüst.	P. Termier, B. Soc. G. Fr., XXVII, p. 404, 1899.	Granite.	Not in W. T.
75	Le Huelgoat, Brittany, France.	Not stated.	C. Barrois, Cong. G. Int., VIII, Guide 7, p. 21, 1900.	Granite.	In W. T., p. 375.
76	Cevius, Isere Valley, France.	E. Ritter.	E. Ritter, B. Sv. Ct. G. Fr., IX, No. 60, p. 30, 1897.	Protogine.	Not in W. T.
77	Actot, Flamanville, La Marche, France.	Not stated.	A. Leclere, B. Sv. Ct. G. Fr., XVII, No. 113, p. 7, 1906.	Granite.	Other analyses in paper.
78	Dames de Meuse, Ardennes, France.	J. de Lapparent.	J. de Lapparent, B. Soc. M. Fr., XXXII, p. 257, 1909.	Microgranite.	Alkalies?

GRANITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
79 D4. V	74.7	13.3	2.9	n. d.	2.3	0.4	4.6	2.1	1.0						101.3	
80 D4. V	70.8	15.0	4.1	n. d.	1.0	2.2	5.1	2.3	0.8						101.3	
81 B4. V	76.62	11.76	n. d.	3.51	0.22	1.80	3.02	2.85	0.70						100.48	
82 B4. V	76.20	12.89	n. d.	1.72	0.80	0.50	3.19	3.93	1.16						100.39	
83 B4. V	75.96	13.38	n. d.	1.66	0.34	0.88	3.32	4.58	0.46						100.58	
84 C4. V	74.66	13.84	n. d.	2.01	0.41	1.05	3.33	5.34	0.64						101.28	
85 B4. V	74.14	13.30	n. d.	1.61	0.20	0.69	3.63	6.08	0.60						100.25	
86 B4. V	72.42	14.83	n. d.	1.79	0.28	1.15	3.42	5.49	0.53						99.91	
87 C4. V	72.15	16.12	n. d.	2.01	0.32	1.20	3.43	5.71	0.74						101.68	
88 B4. V	72.08	13.54	n. d.	2.75	0.40	1.15	4.33	4.76	0.51						99.52	
89 B4. V	71.84	14.07	n. d.	2.01	0.40	1.08	4.11	5.25	0.86						99.62	
90 B4. IV	70.62	15.50	n. d.	2.84	0.32	2.05	3.05	4.76	1.01						100.15	
91 B4. IV	69.95	14.35	n. d.	3.47	1.20	1.27	3.32	4.92	1.29						99.77	
92 B4. IV	69.85	16.10	n. d.	1.89	0.71	0.72	3.21	6.13	0.90						99.51	
93 B4. IV	69.54	15.20	n. d.	2.76	0.34	2.16	4.19	5.37	0.97						100.53	
94 D4. V	68.55	15.95	n. d.	1.85	0.46	1.86	3.70	5.57	0.91						98.85	
95 B4. V	68.91	15.89	n. d.	3.46	0.60	2.35	4.10	4.01	0.53						99.85	
96 B5. V	68.53		20.37		0.45	2.47	3.17	5.25	0.39						100.63	
97 D4. V	66.35	17.47	n. d.	3.18	0.46	2.31	5.64	5.43	0.73						101.57	
98 B4. V	62.10	18.02	n. d.	3.57	0.75	2.59	6.51	4.07	1.99					GlO 1.02	100.62	

GRANITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
79	Dames de Meuse, Ardennes, France.	J. de Lapparent.	J. de Lapparent, B. Soc. M. Fr., XXXII, p. 257, 1909.	Microgranite.	
80	Mairus, Ardennes, France.	J. de Lapparent.	J. de Lapparent, B. Soc. M. Fr., XXXII, p. 257, 1909.	Microgranite.	
81	Aiguille du Grand Charmoz, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 48, 1898.	Protogine.	Whole series unreliable. In W. T., p. 377.
82	Near Orny, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 48.	Protogine.	In W. T., p. 377.
83	Arete du Chatelet, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 47.	Protogine.	In W. T., p. 377.
84	Treutz Bouc, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 48.	Protogine.	In W. T., p. 379.
85	Arete de la Breya, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 47.	Protogine.	In W. T., p. 379.
86	Col du Geant, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 48.	Protogine.	In W. T., p. 379.
87	Pas d'Arpette, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 48.	Protogine.	In W. T., p. 379.
88	Le Pissoir, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 48.	Protogine.	In W. T., p. 379.
89	Clocher de Planereuse, Mont Blanc.	L. Duparc.	Duparc and Mracec, Mass. Mt. Blanc, p. 47.	Protogine.	In W. T., p. 379.
90	Aiguille du Dru, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 48.	Protogine.	In W. T., p. 379.
91	Col du Chardonnet, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 48.	Protogine.	In W. T., p. 379.
92	Glacier d'Orny, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 48.	Protogine.	In W. T., p. 379.
93	Glacier d'Orny, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 48.	Protogine.	In W. T., p. 379.
94	Glacier d'Orny, Mont Blanc.	L. Duparc.	Duparc and Mrezec, Mass. Mt. Blanc, p. 48.	Protogine.	In W. T., p. 379.
95	Glacier de Brensa, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 48.	Protogine.	In W. T., p. 379.
96	Le Portalet, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 47.	Protogine.	In W. T., p. 379.
97	Rocher de la Tourette, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 48.	Protogine.	In W. T., p. 379.
98	Aiguille de Charmoz, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 48.	Protogine with beryl.	In W. T., p. 203.

GRANITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
99 D3. III	61.27	16.35	3.02	6.00	1.69	4.57	1.94	7.26	0.45				0.48		102.03	
100 C4. V	76.5	13.9	0.5	0.7	0.1	0.5	3.7	4.5	0.8						101.2	
101 B4. V	61.90	19.45	5.25	n. d.	1.80	3.85	4.30	1.60	1.40						99.55	
102 C4. V	59.60	22.25	3.95	n. d.	2.05	0.60	7.40	1.15	3.50						99.50	
103 D4. V	79.40	9.28	1.00	n. d.	1.76	0.28	3.83	1.44	1.10						98.09	
104 B3. IV	76.22	12.45	0.88	0.10	0.54	2.57	3.40	2.86	0.10						99.12	
105 C3. V	76.19	12.30	0.83	0.20	0.53	0.36	5.60	2.14	0.60						98.75	
106 B3. IV	75.64	10.43	2.45	0.08	1.50	0.39	2.67	4.70	1.20						99.06	
107 B4. V	74.74	11.97	1.88	0.64	n. d.	n. d.	4.25	5.61							99.09	
108 B3. IV	73.79	12.36	0.63	0.52	0.19	trace	5.45	5.71	0.51						99.16	2.573
109 B4. V	71.79	14.26	1.61	0.72	n. d.	n. d.	6.61	4.10							99.09	
110 B4. V	70.56	11.88	6.52	trace	trace	trace	7.04	3.70							99.70	
111 D3. V	67.63	16.90	2.37	0.32	1.61	1.95	5.31	3.34	2.10			0.30			101.83	
112 C4. V	66.62	17.35	3.91	0.19	trace	trace	4.52	4.93	1.85			0.99			100.36	
113 C3. V	73.01	13.80	2.75	n. d.	1.04	2.03	3.37	4.97	0.38		0.29				101.64	
114 C2. IV	68.69	17.12	0.88	0.41	0.39	1.91	7.03	3.82	0.56		0.31			F trace BaO 0.40	101.52	
115 B4. V	73.82	14.44				0.35	2.45	8.90	n. d.						99.96	
116 B4. V	73.70	14.11	n. d.	n. d.	n. d.	0.39	3.04	8.72	n. d.						99.96	
117 B4. V	74.04	14.44	n. d.	n. d.	n. d.	0.33	2.01	9.36	n. d.						100.18	
118 D4. V	76.8	14.9	n. d.	n. d.	n. d.	1.7	6.1	1.5	n. d.						101.0	

GRANITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
99	Mont Blanc.	E. Ritter.	E. Ritter, B. Sv. Ct. G. Fr., IX, No. 60, p. 32, 1897.	Inclusion in protogine.	Not in W. T.
100	Pic du Midi d'Ossan, Pyrenees.	Not stated.	J. de Lapparent, B. Soc. M. Fr., XXXIV, p. 297, 1911.	Microgranite.	
101	Trois Seigneurs, Pyrenees.	M. Longchambon.	M. Longchambon, B. Sv. Ct. G. Fr., XXI, No. 131, p. 41, 1912.	Granite.	Al_2O_3 high.
102	Freychinede, Pyrenees.	M. Longchambon.	M. Longchambon, B. Sv. Ct. G. Fr., XXI, No. 131, p. 41, 1912.	Granite gneiss.	Al_2O_3 high. Alkalies?
103	Giravalle, Corsica.	J. Deprat.	J. Deprat, B. Sv. Ct. G. Fr., XVII, No. 117, p. 61, 1907.	Micropegmatite.	
104	Calanques de Piana, Corsica.	J. Deprat.	J. Deprat, B. Sv. Ct. G. Fr., XVII, No. 114, p. 35, 1906.	Granite.	
105	Locality not stated. Northwest Corsica.	J. Deprat.	J. Deprat, B. Sv. Ct. G. Fr., XVII, No. 117, p. 60, 1907.	Microgranite.	
106	Canava landre Vico, Corsica.	J. Deprat.	J. Deprat, B. Sv. Ct. G. Fr., XVII, No. 117, p. 58, 1907.	Elvan granite.	
107	Salto, Corsica.	J. Deprat.	J. Deprat, B. Sv. Ct. G. Fr., XVII, No. 114, p. 37, 1906.	Granite.	
108	Ahietto, Corsica.	G. Rupprecht.	G. Rupprecht, In. Diss. Erl., p. 14, 1889.	Granite.	In W. T., p. 377.
109	Capoalla Cuculla, Corsica.	J. Deprat.	J. Deprat, B. Sv. Ct. G. Fr., XVII, No. 114, p. 39, 1906.	Micropegmatite.	
110	Capreja, Taïta Valley, Corsica.	J. Deprat.	J. Deprat, B. Sv. Ct. G. Fr., XVII, No. 117, p. 53, 1907.	Microgranite.	
111	Locality not stated. Northwest Corsica.	J. Deprat.	J. Deprat, B. Sv. Ct. G. Fr., XVII, No. 117, p. 56, 1907.	Microgranite.	
112	Ajaccio, Corsica.	G. Rupprecht.	G. Rupprecht, In. Diss. Erl., p. 6, 1889.	Biotite granite.	In W. T., p. 377.
113	Articuza, La Haya, Guipuzcoa, Spain.	Pisani.	P. Termier, B. Soc. G. Fr. (4), VI, p. 13, 1907.	Granite.	
114	Prestern Saeter, near Brudvik, Bergen, Norway.	P. Schei.	C. F. Kolderup, Berg. Mus. Aarb., 1903, No. 12, p. 118.	Granite.	
115	Hi Herö, Norway.	Students.	J. H. L. Vogt, Sil. Schm. Lös., II, p. 120, 1904.	Graphic granite.	
116	Arendal, Norway.	E. A. Dalset.	J. H. L. Vogt, Sil. Schm. Lös., II, p. 120, 1904.	Graphic granite.	
117	Voie, Arendal, Norway.	A. Gröningsaefer.	J. H. L. Vogt, Sil. Schm. Lös., II, p. 120, 1904.	Graphic granite.	
118	Evje, Sätersdohn, Norway.	Student.	J. H. L. Vogt, Sil. Schm. Lös., II, p. 120, 1904.	Graphic granite.	Alkalies? "Analysis not reliable." Cf. Ref.

GRANITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
119	74.47	15.13	n. d.	n. d.	n. d	0.72	2.01	7.06	n. d.						99.39	
C4. V																
120	74.00	14.31	n. d.	n. d.	n. d.	0.39	2.42	9.02	n. d.						100.14	
B4. V																
121	71.77	12.17	0.71	2.53	0.43	1.34	5.27	2.92	1.09						98.23	
C3. V																
122	71.23	8.68	4.73	3.42	0.74	1.25	3.70	4.69	1.70						100.14	
C3. V																
123	71.25	16.09	0.32	1.56	0.28	0.66	0.81	7.96	n. d.				0.18		99.11	
B3. IV																
124	75.59	12.93	n. d.	n. d.	n. d.	trace	3.44	7.05	0.69						99.70	
B4. V																
125	70.96	16.24	1.11	1.57	0.30	0.65	1.53	5.28	1.41				0.07		99.12	
B3. IV																
126	70.79	15.96	1.84	1.42	0.46	0.82	1.09	6.77	n. d.				0.11		99.26	
B3. IV																
127	70.75	14.03	0.42	2.94	0.53	1.66	3.51	3.87	0.96						98.67	
C3. V																
128	70.67	14.80	n. d.	3.07	trace	1.33	2.51	8.26	n. d.						100.67	
B4. V																
129	69.31	14.80	0.82	2.81	0.46	1.24	1.84	7.25	0.47						99.00	
B3. V																
130	68.04	17.29	1.68	2.58	0.67	1.67	1.20	6.42	1.16				0.07		100.78	
B3. IV																
131	67.3	15.2	1.2	3.4	1.2	3.6	3.8	3.4	1.7				0.4		101.2	
C3. V																
132	76.15	8.29	5.04	2.40	0.07	0.52	6.50	trace	0.03			trace	trace		100.15	
D4. V																
133	75.67	11.53	1.53	n. d.	0.20	2.79	3.67	1.82	0.32						97.52	
D4. V																
134	72.92	13.07	2.73	n. d.	0.23	5.83	3.20	0.51	0.61						99.10	
B4. V																
135	61.64	19.69	3.68	n. d.	0.53	6.43	4.88	0.75	0.55						98.15	
C4. V																
136	70.46	11.16	4.92	n. d.	1.23	2.34	2.88	4.31	0.62						97.92	
D4. V																
137	64.83	13.82	6.82	n. d.	0.31	4.40	4.90	4.60	0.53						100.21	
C4. V																
138	66.58	16.20	0.74	0.63	0.12	1.22	5.21	7.94	0.72						99.36	
C3. V																

GRANITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
119	Raade, Smaalenene, Norway.	L. Andersen-Aars.	J. H. L. Vogt, Sil. Schm. Lös., II, p. 120, 1904.	Graphic granite.	
120	Hi Herö, Norway.	Students.	J. H. L. Vogt, Sil. Schm. Lös., II, p. 120, 1904.	Graphic granite.	
121	Bejby, Örebro, Sweden.	A. Hasselbom.	P. J. Holmquist, B. Un. Ups., VII, p. 260, 1906.	Granite.	
122	Ullesäter, Örebro, Sweden.	A. Hasselbom.	P. J. Holmquist, B. Un. Ups., VII, p. 260, 1906.	Granite.	Al_2O_3 high or alkalies low. Cf. ref.
123	Eusta, Rydboholm, Sweden.	E. Erdman.	P. J. Holmquist, B. Un. Ups., VII, p. 260, 1906.	Granite.	
124	Silfpickarehalet, Kullen, Sweden.	L. G. Thomé.	A. Hennig, Lund. Un. A. sk., XXXV (2), No. 5, p. 28, 1899.	Pegmatite.	In W. T., p. 377.
125	Kattnäs, Hörningsholm, Sweden.	M. Stolpe.	P. J. Holmquist, B. Un. Ups., VII, p. 258, 1906.	Granite.	Al_2O_3 high or alkalies low.
126	Rackstad, Rydboholm, Upland, Sweden.	E. Erdman.	P. J. Holmquist, B. Un. Ups., VII, p. 258, 1906.	Granite.	
127	Bergaby, Linde, Sweden.	D. Hummel.	P. J. Holmquist, B. Un. Ups., VII, p. 260, 1906.	Pegmatitic granite.	
128	Vasastaden, Sweden.	H. Bäckström.	H. Bäckström, G. F. F., IX, p. 357, 1887.	Orbicular granite.	In W. T., p. 377.
129	Villeboda, Linde, Sweden.	A. Hasselbom.	P. J. Holmquist, B. Un. Ups., VII, p. 260, 1906.	Granite.	
130	Hälltorp, Vardinge, Hörningsholm, Sweden.	M. Stolpe.	P. J. Holmquist, B. Un. Ups., VII, p. 258, 1906.	Granite.	Al_2O_3 high or alkalies low.
131	Upsala, Sweden.	A. G. Högbom.	A. G. Högbom, G. F. F., X, p. 222, 1888.	Granite.	In W. T., p. 377.
132	Kivikulma, Pitkäranta, Finland.	A. Pettersen.	V. Hackman, B. C. G. Fin., No. 15, p. 26, 1905.	Rapakiwi granite.	Alkalies bad. Cf. ref.
133	Kangasniemi, Finland.	T. Hirn.	B. Frosterus, B. C. G. Fin., No. 4, p. 22, 1896.	Orbicular granite.	Outer zone. Not in W. T.
134	Kangasniemi, Finland.	H. Berghell.	B. Frosterus, B. C. G. Fin., No. 4, p. 22, 1896.	Orbicular granite.	Inner zone. Not in W. T.
135	Kangasniemi, Finland.	H. Berghell.	B. Frosterus, B. C. G. Fin., No. 4, p. 22, 1896.	Orbicular granite.	Andesine zone. Not in W. T.
136	Kangasniemi, Finland.	H. Berghell.	B. Frosterus, B. C. G. Fin., No. 4, p. 22, 1896.	Kugel granite.	Main rock. Not in W. T.
137	Kangasniemi, Finland.	Bergroth and Cedercrenz.	B. Frosterus, B. C. G. Fin., No. 4, p. 22, 1896.	Kugel granite.	Center of kugel. Not in W. T.
138	Franziska Mine, Pitkäranda, Finland.	H. Berghell.	V. Hackman, B. C. G. Fin., No. 15, p. 47, 1905.	Granite gneiss.	

GRANITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
139	74.20	12.16	1.04	0.16	0.31	0.80	6.33	2.48	0.58		0.13	0.09	trace		98.27	
D2. V																
140	71.62	12.83	0.13	0.10	n. d.	1.48	3.81	9.69	0.02						99.68	
B4. V																
141	71.53	13.70	1.79	2.34	0.48	2.08	6.71	2.82	0.34						101.79	
C3. V																
142	66.95	15.03	2.14	3.23	0.33	3.22	4.43	2.46	0.39						98.18	
D3. V																
143	70.40	15.21	0.18	1.22	0.59	1.33	2.79	6.27	0.78		0.16	0.05	trace		98.98	
C2. IV																
144	69.52	14.04	0.34	4.42	0.32	2.40	3.40	6.25	0.52						101.21	
C3. V																
145	73.13		14.35		0.19	1.03	3.23	7.13	0.68			trace			99.74	2.579
A4. IV																
146	67.70	16.08	5.26	n. d.	0.95	1.65	3.22	5.78	n. d.		0.50				101.14	
B4. V																
147	77.27	9.98	2.58	0.41	0.51	2.28	2.14	2.39	0.86		trace	trace	0.99	CO_2 trace	99.41	2.667
B3. IV																
148	76.86	10.76	1.97	n. d.	0.81	1.42	2.46	4.33	1.04		trace	trace	0.36	BaO trace	100.01	2.655
B4. V																
149	76.10	14.36	2.99	trace	1.51	trace	3.77	0.81	0.11				0.48		100.13	2.469
A4. IV																
150	74.19	12.80	2.11	1.17	0.50	0.02	2.49	4.48	0.30	0.04	0.06	0.65			98.81	
C3. V															(99.82)	
151	53.75	12.63	9.06	4.44	4.57	5.27	3.37	1.93	4.00						99.02	2.748
B3. IV																
152	75.25	13.36	0.28	1.23	0.02	0.65	2.91	4.55	0.64			0.18		Li_2O trace	99.07	2.669
B3. IV																
153	74.22	11.16	1.69	2.03	0.61	1.23	3.84	3.04	0.68		0.02	0.16			98.68	
C2. IV																
154	74.02	13.91	1.98	0.89	0.54	1.08	4.58	4.33	0.24			0.11			101.67	
C3. V																
155	73.63	10.60	5.35	1.92	0.45	1.50	2.72	4.59	0.42			0.13			101.31	
C3. V																
156	71.93	15.54	0.59	2.10	0.46	1.60	2.61	5.30	0.69		trace	0.27		Cu trace Li_2O trace	101.09	2.664
B3. IV																
157	71.58	14.39	1.40	1.27	0.93	2.01	3.31	4.82	1.18			0.31		Li_2O trace. Cu trace	101.20	2.668
C3. V																
158	70.92	9.37	11.74	0.08	trace	0.77	1.47	3.98	0.68		0.54		0.01	FeS_2 0.05	99.61	
B3. IV																

GRANITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
139	Walkea järvenvaara, Tornea, Finland.	G. Aminoff.	V. Hackman, B. C. G. Fin., No. 15, p. 29, 1905.	Granite.	
140	Söderö, Wänö, Finland.	H. Berghell.	H. Berghell, Fin. G. Und., Bl. 23, p. 18, 1892.	Granite.	In W. T., p. 145.
141	Wiborg, Finland.	H. Berghell.	H. Berghell, Fin. G. Und., Bl. 33, p. 23, 1898.	Rapakiwi granite.	In W. T., p. 377.
142	Simola, Wiborg, Finland.	H. Berghell.	H. Berghell, Fin. G. Und., Bl. 33, p. 25, 1898.	Rapakiwi granite.	In W. T., p. 377.
143	Aavasaksa, Tornea, Finland.	G. Aminoff.	V. Hackman, B. C. G. Fin., No. 15, p. 39, 1905.	Granite.	
144	Huovila, Säkkijärui, Finland.	H. Berghell.	H. Berghell, Fin. G. Und., Bl. 28, p. 15, 1896.	Rapakiwi granite.	In W. T., p. 377.
145	Michelsberg, Katzenbuckel, Odenwald.	W. Freudenberg.	W. Freudenberg, Mt. Bad. G. L.-A., V (1), p. 339, 1907.	Granite.	Inclusion in shonkinite.
146	Durbach, Schwarzwald.	Not stated.	A. Sauer, Mt. Bad. G. L.-A., II, p. 243, 1890.	Granite.	Not in W. T. Cf. No. 1, II. 5.2.2.
147	Wengenwiese, near Heuweg, Hesse.	F. W. Schmidt.	C. Chelius, Erl. G. Kt. Hes. I, Bl. Rossdorf, p. 35, 1886.	Granite.	MnO high. In W. T., p. 139.
148	Dilshofen, Hesse.	F. W. Schmidt.	C. Chelius, Erl. G. Kt. Hes., I, Bl. Rossdorf, p. 36, 1886.	Microgranite.	In W. T., p. 377.
149	Dachsberg, Hesse.	F. W. Schmidt.	C. Chelius, Erl. G. Kt. Hes., I, Bl. Rossdorf, p. 35, 1886.	Granitite.	In W. T., p. 377.
150	Gottelsberg, Aschaffenburg, Hesse.	Survey laboratory.	G. Klemm, Erl. G. Kt. Hes., Bl. Schafheim, p. 15, 1894.	Granite.	CaO and P_2O_5. In W. T., p. 377.
151	Suhl, Thuringia.	J. Fromme.	J. Fromme, Sb. Ph. Med. Ges. Erl., XXV, p. 31, 1893.	Granite.	Weathered. Not in W. T.
152	Schneeberg, Fichtelgebirge.	A. Böttger.	F. Sandberger, Sb. Bay. Ak. W., XVIII, p. 469, 1888.	Granite.	In W. T., p. 129.
153	Valetsberg, Wunsiedel, Fichtelgebirge.	H. Oberembt.	H. Oberembt, In. Diss. Erl., p. 38, 1905.	Granite gneiss.	
154	Manzelberg, Wunsiedel, Fichtelgebirge.	H. Oberembt.	H. Oberembt, In. Diss. Erl., p. 38, 1905.	Granite gneiss.	
155	Manzelberg, Wunsiedel, Fichtelgebirge	H. Oberembt.	H. Oberembt, In. Diss. Erl., p. 19, 1905.	Granite.	
156	Zwisenberg, Fichtelgebirge.	A. Böttger.	F. v. Sandberger, Sb. Bay. Ak. W., XVIII, p. 466, 1888.	Granite.	In W. T., p. 169.
157	Reuth, near Gefrees, Bavaria.	A. Böttger.	F. Sandberger, Sb. Bay. Ak. W., XVIII, p. 466, 1888.	Granite.	In W. T., p. 377.
158	Eben, near Schwarzach, Bayrischer Wald.	Not stated.	K. v. Gümbel, G. v. Bayern, II, p. 436, 1894.	Granite.	Not in W. T.

GRANITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
159 B3. IV	69.05	11.09	11.30	0.31	trace	1.12	1.30	4.95	0.33		0.33		trace	S trace	99.78	
160 B4. V	74.68	12.73	n. d.	3.00	0.35	0.09	1.47	4.64	1.17						99.50	
161 B3. IV	71.57	12.40	n. d.	7.22	0.05	1.55	1.60	2.80	1.30		0.52			SnO_2 0.69 CuO 0.27	99.97	
162 C3. V	68.90	16.80	1.77	1.64	1.34	1.80	3.90	3.11	1.91			0.24			101.41	2.681
163 C3. V	74.62	13.87	0.77	1.55	0.09	0.72	3.24	5.41	0.80			0.17		S trace	101.24	
164 B4. V	70.6	17.3	2.5	n. d.	0.5	4.1	3.2	1.6	0.5						100.3	
165 B4. V	65.17	18.65	1.53	n. d.	trace	1.24	7.29	5.03	0.09			trace		CO_2 0.86	99.86	
166 B4. V	61.86	22.58	5.96	n. d.	1.72	0.99	2.13	4.02	1.60						100.86	
167 B3. IV	75.40	13.30	1.35	2.09	0.20	1.34	4.29	2.50	0.36			0.18	trace	S 0.02	101.03	
168 B3. IV	75.27	12.92	1.89	n. d.	0.47	0.32	1.14	6.48	0.61		trace		0.29	B_2O_3 1.24	100.63	2.66
169 B4. V	74.29	15.95			0.66	0.78	2.66	5.31	0.66			trace	trace		100.31	2.68
170 B4. V	72.02	16.78	2.92	n. d.	0.57	1.79	3.40	2.08	1.52					BaO 0.02	101.10	
171 C4. V	50.17	27.89	3.50	4.74	0.83	0.52	2.66	5.79	3.35						99.45	
172 B4. V	69.26	14.13	4.38	n. d.	3.31	4.31	1.54	1.96	0.99						99.88	
173 B3. IV	62.20	19.50	3.56	2.88	1.55	4.36	3.35	2.37	1.04		trace	0.38	trace	S trace	101.19	
174 C3. V	69.24	17.46	1.12	3.10	0.99	2.86	2.74	2.97	0.56		trace	0.25	trace		101.29	
175 D3. V	67.22	11.99	5.70	1.39	0.11	4.22	5.37	2.34	1.93	1.05	0.29				101.91	2.66
176 B4. V	75.04	10.14	n. d.	2.24	1.17	1.72	4.08	5.50	0.40					CO_2 0.13	100.42	
177 D3. V	67.87	15.96	1.65	3.02	1.40	1.73	3.72	4.26	1.08	0.25				CO_2 0.55	102.09	2.687
178 D3. V	67.66	16.16	1.36	2.87	1.16	2.82	3.54	4.75	1.34	0.18				CO_2 0.36	102.20	2.651

GRANITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
159	Rattenberg, near Viechtach, Bayrischer Wald.	Not stated.	K. v. Gümbel, G. v. Bayern, II, p. 436, 1894.	Granite.	Not in W. T.
160	Altenberg, Saxony.	Rube.	K. Dalmer, Erl. G. Kt. Sachs., Bl. 119, p. 53, 1908.	Granite.	
161	Altenberg, Saxony.	Rube.	K. Dalmer, Erl. G. Kt. Sachs., Bl. 119, p. 58, 1908.	Greisen.	
162	Strehlenberg, near Redwitz, Bavaria.	A. Böttger.	F. Sandberger, Sb. Bay. Ak. W., XVIII, p. 466, 1888.	Lithionite granite.	In W. T., p. 377. Cf. No. 68, I.3.1.3.
163	Viktorshohe, Harz.	V. Hagen.	O. H. Erdmannsdoerfer, Jb. Pr. G. L.-A., XXXII, p. 185, 1912.	Granite.	
164	Ober-Buschwald, Schmiedeberg, Riesengebirge.	Not stated.	L. Milch, Rosenb. Fests., p. 138, 1906.	Granite.	
165	Schmiedeberg, Riesengebirge.	Not stated.	E. Riman, N. J. Cb., 1909, p. 768.	Granite.	CO_2 primary?
166	Klotzsche, Lausitz.	R. Reinisch.	R. Reinisch, Hab. Schr. Leip., p. 27, 1902.	Granite.	Al_2O_3 high.
167	Huch, Eisengebirge, Bohemia.	C. v. John.	Hinterlechner and v. John, Jb. G. R.-A. Wien, LIX, p. 136, 1909.	Granite gneiss.	
168	Rican, near Prague, Bohemia.	K. Preis.	F. Katzer, Jb. G. R.-A. Wien, XXXVIII, p. 411, 1888.	Tourmaline pegmatite.	In W. T., p. 125.
169	Rican, near Prague, Bohemia.	E. Kubricht.	F. Katzer, Jb. G. R.-A. Wien, XXXVIII, p. 411, 1888.	Granite.	In W. T., p. 377.
170	Veitsberg, near Karlsbad, Bohemia.	A. Schwager.	K. v. Gümbel, Geog. Jhft., VII, p. 69, 1894.	Granite.	Not in W. T.
171	Lobendau, near Hainspach, Bohemia.	R. Reinisch.	R. Reinisch, Hab. Schr. Leip., p. 27, 1902.	Granite.	Altered and squeezed.
172	Reifnig, Bachergebirge, Styria.	A. Pontoni.	A. Pontoni, T. M. P. M., XIV, p. 366, 1895.	Granite.	In W. T., p. 377.
173	Blansko, Brünn, Moravia.	C. v. John.	v. John and Suess, Jb. G. R.-A. Wien, LVIII, p. 249, 1908.	Granitite.	
174	Brixen, Tyrol.	C. v. John.	W. Petraschek, Jb. G. R.-A. Wien, LIV, p. 51, 1905.	Granitite.	
175	Rensenspitz, near Maul, Tyrol.	G. Hradil.	G. Hradil, Sb. Ak. W. Wien, CXXI, p. 869, 1912.	Granite.	
176	Stockstige, Grimsel, Aarmassif, Switzerland.	Rosicky.	A. Baltzer, Btr. G. Kt. Schw., XXIV (4), p. 20, 1888.	Granite.	Not in W. T.
177	Alpetli Glacier, Aarmassif, Switzerland.	L. Duparc.	E. Fellenberg, Btr. G. Kt. Schw., XXI, p. 45, 1893.	Granite.	Not in W. T.
178	Gasteren, Aarmassif, Switzerland.	L. Duparc.	E. Fellenberg, Btr. G. Kt. Schw., XXI, p. 45, 1893.	Granophyre.	Not in W. T.

GRANITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
179 B3. IV	69.8	17.9	2.8	1.1	0.6	3.4	1.4	2.2	0.8						100.00	
180 C3. V	66.3	16.9	5.4	1.4	1.9	2.6	2.7	0.4	1.5						99.10	
181 B3. IV	66.97	17.20	3.27	1.26	2.08	3.94	5.48	0.69	0.11						101.00	
182 B4. V	72.95	16.51	1.62	n. d.	0.43	3.27	1.04	3.12	0.98			0.23			100.15	2.623
183 C3. V	76.55	10.69	n. d.	0.73	1.18	1.71	4.20	5.34	0.46		0.06	0.12			101.04	2.60
184 D3. V	71.94	14.73	n. d.	1.43	1.01	1.39	5.38	4.68	0.79		0.14	0.10			101.59	2.67
185 C3. V	66.75	15.73	n. d.	2.58	1.67	2.15	5.22	4.90	1.70		0.48	0.07	trace		101.25	2.71
186 C4. V	72.45	16.19	0.55	n. d.	0.27	2.95	4.53	3.59	0.34	0.22		0.30			101.39	2.640
187 D4. V	70.21	15.72	5.03	n. d.	1.07	2.11	3.66	3.25	0.48			0.29	trace		101.82	
188 C4. V	69.92	15.68	4.57	n. d.	0.92	1.85	4.35	3.18	0.59			0.24	trace	ZrO_2 trace	101.30	2.69
189 B4. V	69.30	16.40	n. d.	4.50	1.18	1.12	5.02	3.46	n. d.						100.98	
190 C4. V	66.91	20.31	0.54	n. d.	0.26	1.86	9.19	0.48	0.66		trace				100.21	2.66
191 B3. IV	71.01	11.86	3.92	2.31	0.26	1.24	2.59	3.02	0.93			0.85		CO_2 0.09 Cl 0.88 F 0.93	99.89	
192 B4. V	74.59	13.27	2.87	n. d.	2.07	1.21	2.69	3.21	0.04						99.95 (99.89)	
193 C4. V	71.21	13.91	4.18	n. d.	1.21	2.13	1.31	4.79	0.14						98.88	
194 B4. V	70.99	14.53	3.78	n. d.	1.03	2.31	1.37	5.48	0.35						99.84 (99.85)	
195 D4. V	68.73	13.57	3.75	n. d.	1.78	3.14	2.25	4.73	0.06						98.52	
196 B4. V	72.60	15.48	1.52	n. d.	1.50	1.71	3.46	3.32	0.92						100.51 (99.51)	
197 D4. V	71.24	17.04	n. d.	n. d.	trace	2.87	4.54	1.76	1.54						98.99	

GRANITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
179	Roc Noir, Dent Blanche, Wallis, Switzerland.	Student.	L. Milch, N. J., I, p. 63, 1901.	Granite gneiss	
180	Besso, Dent Blanche, Wallis, Switzerland.	Student.	L. Milch, N. J., I, p. 59, 1901.	Granite gneiss.	
181	Cristallina Thal, St. Gotthard, Switzerland.	Grubenmann and Anderwert.	U. Grubenmann, Mt. Thurg. Nf. Ges., X, p. (17), 1892.	Granite.	In W. T., p. 195.
182	Monte Deruta, Umbria.	A. Ricciardi.	A. Verri, B. Soc. G. It., V, p. 54, 1886.	Granite.	In W. T., p. 139.
183	Groppo Maggio, Apennino Parmense, Italy.	M. Ferrari.	M. Ferrari, Mem. Ac. Linc. (5), VIII, No. 4, p. 176, 1910.	Granite.	Alkalies high, or Al_2O_3 low.
184	Groppo Maggio, Apennino Parmense, Italy.	M. Ferrari.	M. Ferrari, Mem. Ac. Linc. (5), VIII, No. 4, p. 176, 1910.	Granite.	
185	Groppo Maggio, Apennino Parmense, Italy.	M. Ferrari.	M. Ferrari, Mem. Ac. Linc. (5), VIII, No. 4, p. 176, 1910.	Granite.	
186	Crocetta, San Piero in Campo, Elba.	E. Manasse.	E. Manasse, Pr. Soc. Tosc., XII, p. 220, 1901.	Granite.	
187	Monte Capanne, Elba.	E. Manasse.	E. Manasse, Mem. Soc. Tosc., XVII, p. 223, 1900.	Microgranite.	Inclusion in granite below. Not in W. T.
188	Monte Capanne, Elba.	E. Manasse.	E. Manasse, Mem. Soc. Tosc., XVII, p. 223, 1900.	Granite.	Not in W. T.
189	Mola, Serra di Longone, Elba.	A. Funaro.	A. Funaro, B. C. G. It., XVII, p. 381, 1886.	Granite.	In W. T., p. 379.
190	Monte Sta. Lucia, Elba.	P. Aloisi.	P. Aloisi, Mem. Soc. Tosc., XXII, p. 152, 1906.	Granite.	Al_2O_3 high, alkalies?
191	Dagö, Esthonia, Russia.	Schridde.	J. J. Sederholm, T. M. P. M., XII, p. 21, 1891.	Rapakiwi granite.	In W. T., p. 129.
192	Gnivani, Podolia, Russia.	N. N. Soboleva.	V. A. Selsky, A. G. Min. Rus., XIV, p. 9, 1912.	Hypersthene granite.	
193	Gnivani, Podolia, Russia.	N. N. Soboleva.	V. A. Selsky, An. G. Min. Rus., XIV, p. 9, 1912.	Hypersthene granite.	
194	Gnivani, Podolia, Russia.	N. N. Soboleva.	V. A. Selsky, An. G. Min. Rus., XIV, p. 9, 1912.	Hypersthene granite.	
195	Gnivani, Podolia, Russia.	N. N. Soboleva.	V. A. Selsky, An. G. Min. Rus., XIV, p. 9, 1912.	Hypersthene granite.	
196	Kamary, near Balaclava, Crimea, Russia.	A. Lagorio.	A. Lagorio, Cong. G. Int. VII, Guide XXXIII, p. 27, 1897.	Granitite.	In W. T., p. 171.
197	Tumagor Kaja, Caucasus.	Beljankin and L. Lessing.	L. Lessing, Vh. Rus. M. Ges., XLII, p. 263, 1905.	Granite.	Leucocratic facies. Cf. next nos.

GRANITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
198	68.55	18.12	n. d.	n. d.	0.30	1.61	2.89	4.64	1.21						97.33	
D4. V																
199	59.11	16.33	n. d.	2.58	4.36	4.96	8.10		3.62						99.06	
D4. V																
200	65.77	17.26	2.69	trace	2.50	2.39	4.97	3.12	0.70	0.43		0.15	0.01		100.00	
B4. V																
201	54.31	24.15	6.53	trace	3.17	4.22	4.20	2.73	0.53	0.14		0.01	0.01		100.00	
D4. V																
202	73.25	16.80	0.95	n. d.	1.50	n. d.	3.47	4.20	0.50						100.67	
B4. V																
203	70.41	16.17	2.54	n. d.	0.86	2.11	3.45	4.29	0.66						100.49	
B4. V																
204	69.15	16.60	0.22	1.36	2.21	3.55	3.57	3.91	0.50		0.39				101.46	
C3. V																
205	64.48	18.39	4.67	n. d.	1.61	4.48	2.77	3.39	1.32						101.11	
B4. V																
206	63.54	17.24	5.72	n. d.	1.70	4.31	3.22	2.90	1.30						99.93	
B4. V																
207	76.7	11.7	1.0	0.6	trace	trace	6.5	4.5	0.2		0.2				101.4	
D4. V																
208	76.5	11.0	1.3	0.25	0.1	trace	6.6	5.1	0.2		0.3	none			101.35	
D4. V																
209	75.54	13.75	4.99	n. d.	0.69	0.94	1.55	3.34	0.28						101.08	
B4. V																
210	75.30	11.40	5.40	n. d.	0.60	0.75	1.45	6.13	n. d.						101.08	2.67
B4. V																
211	70.46	14.91	1.17	2.66	0.25	0.84	1.04	9.32	0.55						101.20	
B3. IV															(100.20)	
212	77.18	14.87	0.53	n. d.	0.10	0.80	6.37	1.84	0.98				trace		102.67	
D4. V																
213	74.92	11.92	3.72	n. d.	1.30	1.44	3.44	0.75	2.08				0.30		99.87	
B4. V																
214	71.46	12.72	n. d.	1.68	0.86	1.64	7.27	2.39	0.86				0.50		99.38	
B4. V																
215	58.94	20.30	5.50	n. d.	2.38	6.38	3.98	0.37	1.52				0.25		99.62	
C4. V																
216	57.18	18.67	7.19	n. d.	2.48	7.02	3.60	0.54	1.60				1.25		99.53	
C4. V																

GRANITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
198	Tumagor Kaja, Caucasus.	Beljankin and L. Lessing.	L. Lessing, Vh. Rus. M. Ges., XLII, p. 280, 1905.	Granite.	Leucocratic facies.
199	Tumagor Kaja, Caucasus.	D. Beljankin.	L. Lessing, Vh. Rus. M. Ges., XLII, p. 263, 1905.	Granite.	Melanocratic facies.
200	Kaputschi Dag, Armenia.	C. Schmidt.	H. Abich, G. Armen., II, p. 156, 1888.	Granite.	"SiO_2 includes loss." 3 decimals. Not in W. T.
201	Kaputschi Dag, Armenia.	C. Schmidt.	H. Abich, G. Armen., II, p. 155, 1888.	Granite.	"SiO_2 includes loss." 3 decimals. Not in W. T.
202	Filfila, near Philippeville, Algeria.	P. Termier.	P. Termier, C. R., CXXXIV, p. 373, 1902.	Granite.	
203	Cap Marsa, Menerville, Algeria.	Not stated.	Duparc, Pearce, and Ritter, Mem. Soc. Ph Gen., XXXIII, No. 2, p. 98, 1900.	Granite.	In W. T., p. 379.
204	Ain Kechera, Beni Toufout, Algeria.	P. Termier.	P. Termier, C. R., CXXXVI, p. 329, 1903.	Microgranite.	
205	Sidi Mokren, Menerville, Algeria.	Not stated.	Duparc, Pearce, and Ritter, Mem. Soc. Ph. Gen., XXXIII, No. 2, p. 18, 1900.	Granite.	In W. T., p. 381.
206	Ain Tolba, Menerville, Algeria.	Not stated.	Duparc, Pearse, and Ritter, Mem. Soc. Ph. Gen., XXXIII, No. 2, p. 18, 1900.	Granite.	In W. T., p. 381.
207	Gebel Doukhan, Egypt.	Not stated.	Couyat, C. R. CXLVII, p. 869, 1908.	Microgranite.	
208	Gebel Doukhan, Egypt.	Not stated.	Couyat, C. R., CXLVII, p. 868, 1908.	Micropegmatite.	
209	St. Thomas Mount, Madras, India.	T. L. Walker.	T. H. Holland, Mem. G. S. Ind., XXVIII, p. 142, 1900.	Charnockite.	In W. T., p. 381. Cf. No. 80, I.3.2.3.
210	St. Thomas Mount, Madras, India.	P. C. Roy.	T. H. Holland, Mem. G. S. Ind., XXVIII, p. 142, 1900.	Charnockite.	In W. T., p. 125. Cf. No. 80, I.3.2.3.
211	Angara River, Jenissei District, Siberia.	A. E. Nikitinsky.	A. Meister, Reg. Aurib. Sib., IX, p. 196, 1910.	Granite.	Center of dike. Cf. No. 71, I. 4.1.4.
212	Nandogi River, Okhotsk, Siberia.	Not stated.	K. E. Bogdanovitch, Fund. Marek., p. 54.	Granite.	
213	Wangotschan River, Okhotsk, Siberia.	Not stated.	K. E. Bogdanovitch, Fund. Marek., p. 54.	Granite.	
214	Lantar River, Okhotsk, Siberia.	Not stated.	K. E. Bogdanovitch, Fund. Marek., p. 54.	Granite.	
215	Odori River, Okhotsk, Siberia.	Not stated.	K. E. Bogdanovitch, Fund. Marek., p. 54.	Granite.	
216	Odori River, Okhotsk, Siberia.	Not stated.	K. E. Bogdanovitch, Fund. Marek., p. 54.	Granite.	

GRANITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
217 C3. V	72. 38	14. 77	1. 98	0. 70	1. 13	1. 38	3. 50	3. 95	1. 54		trace	trace	0. 26		101. 59	
218 A?3. III?	73. 56	1. 42	1. 27	14. 30	0. 79	2. 50	5. 09	0. 38	0. 84	0. 13					100. 28	
219 A?3. III?	71. 80	2. 46	1. 93	14. 28	0. 22	2. 96	3. 02	1. 54	1. 01	0. 20					99. 42	
220 C4. V	59. 40	20. 87	n. d.	5. 80	2. 21	0. 40	2. 71	2. 63	0. 85			0. 11		B_2O_3 4. 14	99. 12	
221 C4. V	76. 71	20. 08	1. 70	n. d,	0. 06	0. 56	0. 07	0. 11	0. 24	0. 21	0. 66				100. 40	2. 81
222 D4. V	73. 03	13. 56	1. 80	n. d.	0. 28	0. 82	5. 35	3. 95	3. 50		1. 20		0. 30		103. 79	

QUARTZ PORPHYRY.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 B3. IV	69. 28	15. 53	2. 88	0. 69	0. 93	2. 15	7. 16	0. 25	1. 44						100. 51	
2 B3. IV	67. 64	18. 68	1. 80	1. 38	1. 04	0. 39	4. 16	1. 61	1. 92					CO_2 trace S 1. 71	100. 33	
3 A4. IV	93. 20	2. 86	0. 79	n. d.	0. 27	0. 68	n. d.	n. d.	n. d.		0. 12	none			97. 92	
4 A4. IV	80. 63	6. 22	1. 59	n. d.	3. 27	3. 69	n. d.	n. d.	n. d.		0. 21	0. 02			95. 63	
5 A4. IV	83. 04	6. 92	1. 34	n. d.	1. 98	3. 20	n. d.	n. d.	n. d.		0. 12	0. 04			96. 64	
6 D4. V	74. 21	12. 77	2. 51	2. 04	1. 04	0. 98	2. 17	5. 44					trace		101. 16	
7 D3. V	77. 35	10. 89	1. 98	2. 82	0. 09	0. 70	4. 24	3. 38	0. 26	0. 05			0. 13		101. 89	
8 D4. V	74. 9	11. 1	1. 6	1. 5	n. d.	0. 2	8. 5	trace	0. 3		0. 5		1. 9		100. 4	
9 B3. IV	69. 54	14. 77	6. 58	0. 46	0. 29	1. 34	3. 03	4. 24	0. 18						100. 55	
10 B3. IV	68. 61	14. 84	1. 48	5. 40	0. 63	1. 65	3. 70	2. 28	0. 26						99. 08	
11 D4. V	67. 20	14. 95	5. 19	n. d.	2. 39	0. 30	4. 00	0. 89	2. 13					CO_2 0. 40	97. 45	
12 B4. V	72. 57	11. 51	5. 25	n. d.	trace	0. 44	6. 01	5. 25	n. d.						101. 03	2. 571

GRANITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
217	Masan-pho, Korea.	G. Tsukamoto.	B. Koto, J. Coll. Sci. Tok., XXVI, p. 191, 1909.	Masanite (granite).	
218	Bagan, Lepanto Province, Luzon, Philippine Islands.	Government laboratory.	A. J. Eveland, Min. Bur. Manila B. 4, p. 41, 1905.	Granite.	Al_2O_3, Fe_2O_3, and FeO uncertain.
219	Bagan, Lepanto Province, Luzon, Philippine Islands.	Government laboratory.	A. J. Eveland, Min. Bur. Manila B. 4, p. 41, 1905.	Granite.	Al_2O_3, Fe_2O_3, and FeO uncertain.
220	Lau Alas, Sumatra.	F. Riegner.	F. Riegner, In. Diss. Bres., p. 51, 1909.	Schlieren in granite.	Tourmaline bearing. Cf. No. 270, I.4.1.3.
221	Leonora, Western Australia.	C. C. Williams.	C. F. V. Jackson, W. Aust. G. S. B. 13, p. 19, 1904.	Granite.	Crushed.
222	Snares Island.	R. C. Aston.	R. C. Aston, Subant. Islds., II, p. 769, 1909.	Granite.	Weathered.

QUARTZ PORPHYRY.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Thomas Township, Porcupine Area, Ontario.	Not stated.	A. G. Burrows, Rep. Bur. Min. Ont., XXI (1), p. 218, 1912.	Granophyre.	
2	Dome Mine, Porcupine, Ontario.	Not stated.	A. G. Burrows, Rep. Bur. Min. Ont., XXI (1), p. 213, 1912.	Quartz porphyry.	
3	Mount Orient, Pelham, Massachusetts.	E. T. Allen.	B. K. Emerson, A. J. S., XL, p. 215, 1915.	Northfieldite.	Igneous quartz rock.
4	Mount Orient, Pelham, Massachusetts.	E. T, Allen.	B. K. Emerson, A. J. S., XL, p. 215, 1915.	Northfieldite.	Igneous quartz rock.
5	Mount Orient, Pelham, Massachusetts.	E. T. Allen.	B. K. Emerson, A. J. S., XL, p. 215, 1915.	Northfieldite.	Igneous quartz rock.
6	Blue Hills, Massachusetts.	Students.	W. O. Crosby, Bost. Soc. Nh., Occ. Pap., IV., p. 362, 1900.	Quartz porphyry.	Mean of many poor determinations. In W. T., p. 381.
7	East Greenwich, Rhode Island.	J. H. Perry.	Emerson and Perry, U. S. G. S. B. 311, p. 66, 1907.	Quartz porphyry.	
8	Llano, Texas.	S. H. Worrell.	J. P. Iddings, J. G., XII, p. 228, 1904.	Quartz porphyry.	Cf. No. 55, I.4.1.3.
9	French Mills, Missouri.	Technical.	E. Haworth, Mo. G. S. A. R. VIII, p. 181, 1895.	Quartz porphyry.	Not in W. T.
10	Piedmont, Missouri.	Technical.	E. Haworth, Mo. G. S. A. R. VIII, p. 181, 1895.	Quartz porphyry.	Not in W. T.
11	Flagstaff Hill, Boulder, Colorado.	Palmer and Fulton.	Palmer and Fulton, Pr. Col. Sc. Soc., III, p. 356, 1890.	Quartz porphyry.	In W. T., p. 381
12	Copper Mountain, Similkameen District, British Columbia.	O. N. Scott.	O. N. Scott, Can. Min. Inst., V, p. 496, 1902.	Quartz porphyry.	

QUARTZ PORPHYRY—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
13 D4. V	71.65	14.10	4.42	n. d.	trace	0.51	6.64	4.54					trace		101.87	2.510
14 B4. V	72.01	15.51	n. d.	1.36	0.51	1.35	2.36	4.71	1.24					CO_2 0.33	99.38	
15 B3. IV	68.68	16.28	0.66	2.55	0.81	2.24	2.88	4.07	0.68		0.05			CO_2 0.17	99.07	
16 D4. V	73.97	12.09	2.90	n. d.	1.03	n. d.	3.38	3.55	1.54						98.46	
17 B3. IV	74.15	10.07	0.86	n. d.	0.30	1.28	6.64	4.44	0.71		0.93	0.09	0.26	CO_2 trace ZrO_2 none Cl 0.13 FeS_2 trace BaO 0.04 SrO 0.06 Pb none	99.96	
18 B4. V	66.25	18.74	1.36	n. d.	0.50	1.23	3.04	8.80	0.22						100.14	
19 D4. V	77.72	11 53	n. d.	2.18	2.40	0.53	4.37	2.57	0.48		trace	0.19	trace		101.97	
20 C3. V	68.35	17.61	3.44	0.65	1.03	1.22	3.12	2.22	1.12		trace	0.17			98.93	
21 B4. V	76.74	14.07	1.12	n. d.	0.16	0.23	2.16	4.02	0.78						99.28	
22 C3. V	72.66	18.98	0.57	0.21	0.47	0.03	0.21	5.91	0.86					SO_3 0.02	99.94	
23 B4. V	67.9	15.7	3.0	n. d.	1.5	1.4	1.5	5.6	3.7						100.3	
24 C3. V	58.3	22.7	3.2	0.9	0.5	7.5	4.8	1.4	0.8						100.1	
25 C4. V	78.50	14.08	0.51	n. d.	1.12	n. d.	0.33	2.55	4.20						101.29	
26 C4. V	72.23	15.10	1.95	n. d.	1.17	0.30	1.20	6.95	2.37						101.25	
27 D4. V	71.55	14.80	2.60	n. d.	1.38	0.29	3.05	6.25	1.65						101.57	
28 D4. V	70.80	16.55	2.42	n. d.	1.40	0.31	1.72	5.20	3.10						101.50	
29 D4. V	75.30	11.01	1.12	n. d.	0.60	1.01	8.82	2.97	1.18						102.01	
30 D3. V	81.6	13.3	1.6	0.8	0.1	0.2	0.8	0.9	2.5						101.8	
31 D4. V	88.40	4.85	1.61	n. d.	0.39	n. d.	0.54	2.45	1.30						99.54	

QUARTZ PORPHYRY—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
13	Copper Mountain, Similkameen District, British Columbia.	O. N. Scott.	O. N. Scott, Can. Min. Inst., V, p. 496, 1902.	Porphyry.	
14	Eureka District, Nevada.	A. A. Blair.	A. Hague, U. S. G. S. Mon. 20, p. 228, 1892.	Granite porphyry.	Not in W. T.
15	Wood Cone, Eureka District, Nevada.	A. A. Blair.	A. Hague, U. S. G. S. Mon. 20, p. 228, 1892.	Granite porphyry.	Not in W. T.
16	Regis Point, St. Thomas, West Indies.	P. T. Cleve.	P. T. Cleve, Sv. Vet. Ak. Hndl., IX, No. 12, p. 34, 1871.	Quartz porphyry.	Not in W. T.
17	Mazaruni District, British Guiana.	J. B. Harrison (assistant of).	J. B. Harrison, Goldf. Br. Gui., p. 76, 1908.	Aplite.	Alkalies incorrect. In W. T., p. 219.
18	Rio Pardo, Serra de Caldas, Brazil.	E. Hussak.	E. Hussak, N. J., 1900, I, p. 25.	Leucite granite porphyry.	Calculated partial anals. In W. T., p. 199.
19	Estancia Machuca, Pitonoaga River, Paraguay.	M. Goldschlag.	M. Goldschlag, In. Diss. Jena, p. 14, 1913.	Aplite.	
20	Estancia La Paz, Sierra Quinze, Puntas, Paraguay.	M. Goldschlag.	M. Goldschlag, In. Diss. Jena, p. 19, 1913.	Quartz porphyry.	
21	Craigan-oan, Invernesshire, Scotland.	W. Mackie.	W. Mackie, Tr. G. Soc. Edin., VIII, p. 56, 1901.	Quartz porphyry.	
22	Linhope, Cheviot Hills, Scotland.	I. Macadam.	H. Kynaston, Tr. G. Soc. Edin., VII, p. 401, 1899.	Quartz felsite.	In W. T., p. 215.
23	Coquet, Cheviot Hills, Scotland.	Waller.	J. J. H. Teall, G. Mag., XXII, p. 111, 1885.	Quartz felsite.	In W. T., p. 381.
24	Semaphore, St. Quay, Brittany.	Not stated.	J. de Lapparent, B. Soc. M. Fr., XXXIII, p. 265, 1910.	Aplite.	
25	Gueret, La Creuse, France.	Pisani.	L. de Launay, B. Sv. Ct. G. Fr., XI, No. 83, p. 76, 1902.	Porphyry	
26	Roche d'Oradoux, La Creuse, France.	Pisani.	L. de Launay, B. Sv. Ct. G. Fr., XII, No. 83, p. 76, 1902.	Porphyry.	
27	Villotelle, La Creuse, France.	Pisani.	L. de Launay, B. Sv. Ct. G. Fr., XI, No. 83, p. 76, 1902.	Porphyry.	
28	Naleichard, La Creuse, France.	Pisani.	L. de Launay, B. Sv. Ct. G. Fr., XI, No. 83, p. 77, 1902.	Porphyry.	
29	La Rivoire, Pelvoux, Dauphiny, France.	Rüst.	P. Termier, B. Soc. G. Fr., XXVII, p. 404, 1899.	Aplite.	
30	Saint Pierre du Chemin, Vendée, France.	J. de Lapparent.	J. de Lapparent, B. Soc. M. Fr., XXXII, p. 220, 1909.	Porphyroid.	
31	Defends-Boutouris, Esterel, France.	Pisani.	A. Michel-Levy, B. Soc. G. Fr., XXI.	Pyromeride.	

QUARTZ PORPHYRY—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
32 D4. V	78.25	13.22	n. d.	1.11	0.26	1.29	3.88	4.00	0.48						102.49	
33 B4. V	75.81	13.70	n. d.	2.24	trace	0.72	3.96	4.13	n. d.						100.56	
34 B4. V	75.81	13.15	n. d.	1.16	0.35	0.89	3.66	5.43	0.40						100.85	
35 B4. V	75.23	16.13	n. d.	trace	0.13	0.88	3.87	3.77	0.83						100.84	
36 B4. V	75.21	13.88	n. d.	0.91	0.25	1.19	3.96	4.50	0.24						100.14	
37 B4. V	73.85	15.23	n. d.	1.14	0.29	1.68	3.27	4.10	0.36						99.92	
38 D4. V	73.25	14.39	n. d.	2.21	0.53	2.36	3.02	5.94	1.11						102.81	
39 D4. V	71.64	17.12	n. d.	trace	n. d.	1.62	3.87	3.95	n. d.						98.20	
40 B4. V	71.48	14.82	n. d.	2.42	0.27	0.93	4.00	5.69	0.35						99.96	
41 C4. V	71.03	15.24	n. d.	2.58	0.43	1.39	4.29	6.12	0.27						101.35	
42 D4. V	68.87	16.49	n. d.	2.62	0.32	2.25	4.13	5.89	0.83						101.40	
43 B4. V	69.81	14.78	n. d.	3.15	0.98	2.94	3.23	4.63	0.78						100.80	
44 D4. V	67.78	15.88	n. d.	3.97	1.25	2.90	3.95	4.95	1.32						102.00	
45 C4. V	73.69	14.26	0.73	0.41	trace	trace	3.76	7.84	0.31						101.00	2.626
46 C4. V	74.40	11.25	2.01	n. d.	2.00	2.40	3.27	3.40	2.37		0.13				101.23	
47 C2. IV	75.44	12.33	0.49	1.00	0.52	trace	2.38	7.13	1.26		0.07		0.11	FeS_2 0.66	101.73	
48 C4. V	76.40	15.68	0.78	n. d	n. d.	n. d.	4.92	1.10	0.88					S trace	99.76	2.603
49 C4. V	72.08	16.15	2.21	n. d.	0.68	0.18	0.21	5.23	2.40						99.14	2.594
50 C4. V	73.03	14.33	2.64	n. d.	0.41	0.74	2.97	2.07	2.58			trace	0.69		99.46	2.654
51 C2. IV	76.27	11.94	1.66	0.21	0.62	0.08	4.40	2.90	0.30	0.08	0.22	1.19		CO_2 0.19 SO_3 0.12	100.18	

QUARTZ PORPHYRY—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
32	Arete du Chatelet, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 107, 1898.	Quartz porphyry.	Whole series unreliable. In W. T., p. 381.
33	Arete de la Breya, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 107, 1898.	Quartz porphyry.	In W. T., p. 381.
34	Chalets de Planereuse, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 107, 1898.	Quartz porphyry.	In W. T., p. 381.
35	Les Rognes, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 82, 1898.	Aplite.	In W. T., p. 377.
36	Aiguille du Tacul, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 82, 1898.	Aplite.	In W. T., p. 379.
37	Aiguille du Charmoz, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 82, 1898.	Aplite.	In W. T., p. 379.
38	Col du Gréhillon, Mont Blanc.	L. Duparc.	L. Duparc and Mrazec, Mass. Mt. Blanc, p. 108, 1898.	Quartz porphyry.	In W. T., p. 383.
39	Glacier du Trient, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 82, 1898.	Aplite.	In W. T., p. 379.
40	Les Six-Niers, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 108, 1898.	Quartz porphyry.	In W. T., p. 383.
41	La Maya, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 108, 1898.	Quartz porphyry.	In W. T., p. 383.
42	La Maya, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 107, 1898.	Quartz porphyry.	In W. T., p. 383.
43	Arete du Chatelet, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 107, 1898.	Quartz porphyry.	In W. T., p. 383.
44	L'Amone, Mont Blanc.	L. Duparc.	Duparc and Mrazec, Mass. Mt. Blanc, p. 108, 1898.	Quartz porphyry.	In W. T., p. 383.
45	Ajaccio, Corsica.	G. Rupprecht.	G. Rupprecht, In. Diss. Erl., p. 11, 1889.	Quartz porphyry.	In W. T., p. 381.
46	Arditurri, La Haya, Guipuzcoa, Spain.	Pisani.	P. Termier, B. Soc. G. Fr. (4), VII, p. 13, 1907.	Aplite.	
47	Drammen, Norway.	P. Jannasch.	W. C. Brögger, Z. K., XVI, p. 77, 1890.	Quartz porphyry.	In W. T., p. 143.
48	Goldstein, Bruchhäuser Steine, Westphalia.	A. Bömer.	O. Mügge, N. J. B. B., X, p. 776, 1896.	Quartz porphyry.	In W. T., p. 381.
49	Near Goldstein, Bruchhäuser Steine, Westphalia.	A. Bömer.	O. Mügge, N. J. B. B., X, p. 776, 1896.	Quartz porphyry.	In W. T., p. 381.
50	Oberhunden, Westphalia.	A. Bömer.	O. Mügge, N. J. B. B., VIII, p. 568, 1893.	Quartz porphyry.	Metamorphosed. In W. T., 381.
51	Ludwigsweg, Rossdorf, Hesse.	F. Stadler.	G. Klemm, Erl. G. Kt. Hes., Bl. Rossdorf, p. 46, 1912.	Aplite.	P_2O_5 high, CaO low.

QUARTZ PORPHYRY—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
52 C2. IV	75.61	10.80	1.25	0.73	0.73	0.32	1.78	5.54	0.33	0.11	0.22	2.00		CO_2 0.25 SO_3 0.09	99.76	2.60
53 D4. V	75.76	12.24	n. d.	2.06	0.29	2.51	3.13	4.22	n. d.				0.44	CO_2 0.83	101.48	
54 D3. V	70.92	14.62	3.74	0.61	0.43	1.75	5.00	2.38	1.60			0.38	0.25		101.63	
55 B4. V	69.40	15.79	2.15	n. d.	2.36	4.68	1.34	2.76	1.44						99.92	
56 C3. V	66.83	16.40	3.17	1.89	1.07	2.59	4.65	4.21	0.51						101.32	
57 D4. V	66.45	20.85	2.67	1.73	trace	2.53	trace	3.88	0.21				0.45		98.77	
58 C4. V	65.23	15.10	5.01	3.99	n. d.	3.19	1.85	5.67	0.18				0.74		100.96	
59 C4. V	68.45	12.40	4.20	n. d.	0.67	1.53	4.36	5.91	1.24						98.76	
60 C3. V	65.37	17.06	1.70	1.12	0.40	2.47	4.81	6.94	1.41						101.28	
61 D4. V	75.51	18.10	2.69	n. d.	0.12	0.36	0.16	1.23	n. d.				0.82		98.99	
62 C3. V	71.10	15.92	3.17	0.34	trace	0.88	3.17	6.11	0.11					CO_2 0.45	101.25	
63 B4. V	77.94	11.78	1.21	n. d.	0.32	0.74	1.56	4.17	1.91						99.63	2.557
64 B4. V	77.61	13.34	2.07	n. d.	0.52	3.67	0.61	2.04	0.55						100.41	2.556
65 B4. V	76.94	12.20	2.34	n. d.	0.32	0.57	1.47	4.65	1.15						99.64	2.451
66 B4. V	72.10	13.98	2.08	2.38	1.02	2.41	1.07	3.29	1.65						99.98	2.551
67 B3. IV	76.59	11.43	0.47	2.12	0.64	2.78	0.97	3.76	1.39						100.15	2.565
68 B4. V	76.33	12.84	2.22	n. d.	0.37	2.96	1.09	3.42	0.83						100.06	2.557
69 B3. IV	75.05	13.16	1.63	3.07	0.38	1.80	0.92	2.58	1.57						100.16	2.468
70 B4. V	74.81	13.87	1.68	n. d.	0.52	1.49	1.46	4.68	1.48						99.99	2.541
71 B4. V	74.58	13.31	1.31	n. d.	0.54	1.48	1.34	4.73	2.84						100.13	2.505

QUARTZ PORPHYRY—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
52	Bollersbach, Hesse-Nassau.	F. Stadler.	R. Brauns, N. J. B. B., XXVII, p. 315, 1909.	Quartz porphyry.	P_2O_5 high. CaO low.
53	Libsic, Moldauthal, Bohemia.	Plaminck.	J. Klvana, Ref. N. J., I, p. 485, 1898.	Felsophyre.	In W. T., p.381.
54	Premyzlauer Schlucht, Moldauthal, Bohemia.	Kolar.	J. Klvana, Ref. N. J., I, p. 485, 1898.	Felsophyrite.	In W. T., p. 395.
55	Radworza, Bachergebirge, Styria.	A. Pontoni.	A. Pontoni, T. M. P. M., XIV, p. 370, 1895.	Granite porphyry.	In W. T., p. 141.
56	Javoria, Carinthia.	H. V. Grater.	H. V. Grater, Jb. G. R.-A. Wien. XLVII, p. 278, 1897.	Quartz porphyry.	In W. T., p. 381.
57	Rozsnyo Valley, Erzgebirge, Hungary.	E. Ernyei.	F. Schafarzik, Math. Nh. Ber. Ung., XXIII, p. 232, 1905.	Quartz porphyry.	
58	Csucsom Valley, Erzgebirge, Hungary.	E. Ernyei.	F. Schafarzik, Math. Nh. Ber. Ung., XXIII, p. 232, 1905.	Quartz porphyry.	
59	Zalas, near Cracow, Galicia.	R. Zuber.	R. Zuber, Jb. G. R.-A. Wien, XXXV, p. 747, 1885.	Quartz porphyry.	In W. T., p. 381.
60	Allochet, Monzoni, Tyrol.	C. Doelter.	C. Doelter, Anz. Ak. W. Wien, XXXIX, p. 231, 1902.	Aplite.	
61	Golabara River, Serbia.	A. B. Griffiths.	A. B. Griffiths, Q. J. G. S., XLII, p. 566, 1886.	Porphyry.	In W. T., p. 381.
62	Malga Serra Caprile, Adamello, Piedmont.	C. Riva.	C. Riva, Ref., N. J., II, p. 63, 1897.	Quartz porphyry.	In W. T., p. 381.
63	Buccione, Lago d'Orta, Piedmont.	L. Ricciardi.	L. Ricciardi, At. Ac. Gioen., XVIII, p. (16), 1885.	Porphyry.	Alkalies? Whole series unreliable. In W. T., p. 135.
64	Buccione, Lago d'Orta, Piedmont.	L. Ricciardi.	L. Ricciardi, At. Ac. Gioen., XVIII, p. (17), 1885.	Porphyry.	In W. T., p. 143.
65	Arona, Lago Maggiore, Piedmont.	L. Ricciardi.	L. Ricciardi, At. Ac. Gioen., XVIII, p. (8), 1885.	Porphyry.	In W. T., p. 125.
66	Arona, Lago Maggiore, Piedmont.	L. Ricciardi.	L. Ricciardi, At. Ac. Gioen., XVIII, p. (8), 1885.	Porphyry.	In W. T., p. 139.
67	Near Bolzano, Lago d'Orta, Piedmont.	L. Ricciardi.	L. Ricciardi, At. Ac. Gioen. XVIII, p. (18), 1885.	Porphyry.	In W. T., p. 139.
68	Near Bolzano, Lago d'Orta, Piedmont.	L. Ricciardi.	L. Ricciardi, At. Ac. Gioen., XVIII, p. (17), 1885.	Porphyry.	In W. T., p. 139.
69	Angera, Lago Maggiore, Piedmont.	L. Ricciardi.	L. Ricciardi, At. Ac. Gioen., XVIII, p. (9), 1885.	Porphyry.	In W. T., p. 123.
70	Briga, Piedmont.	L. Ricciardi.	L. Ricciardi, At. Ac. Gioen. XVIII, p. (12), 1885.	Porphyry.	In W. T., p. 133.
71	Arolo, Lago Maggiore, Piedmont.	L. Ricciardi.	L. Ricciardi, At. Ac. Gioen., XVIII, p. (9), 1885.	Porphyry.	In W. T., p. 133.

QUARTZ PORPHYRY—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
72 B4. V	73. 03	13. 51	3. 12	n. d.	0. 26	1. 61	1. 52	4. 87	2. 03				trace		99. 95	2. 563
73 B3. IV	72. 03	14. 87	3. 11	2. 21	1. 37	1. 41	0. 78	2. 32	2. 02				trace		100. 12	2. 523
74 B3. IV	71. 91	13. 51	2. 14	1. 14	1. 18	2. 19	1. 58	3. 72	2. 39				trace		99. 76	2. 618
75 B4. V	70. 10	16. 25	n. d.	4. 05	0. 54	1. 32	4. 27	4. 20	n. d.						100. 73	
76 C3. V	74. 25	16. 20	0. 07	0. 92	0. 90	0. 77	3. 87	3. 40	0. 87						101. 25	
77 C3. V	72. 6	13. 9	0. 8	0. 8	trace	0. 2	6. 2	3. 7	0. 8						99. 0	
78 C3. V	74. 36	13. 56	0. 67	1. 19	0. 29	0. 89	4. 51	4. 93	1. 01			trace		CO_2 trace	101. 41	
79 B4. V	73. 21	$\underbrace{\hspace{3em}}_{14.17}$			0. 23	2. 21	6. 10	4. 15	n. d.						100. 07	
80 C4. V	65. 59	14. 05	2. 94	2. 35	0. 62	3. 35	4. 37	5. 27	n. d.						98. 54	
81 C4. V	70. 12	16. 65	0. 37	none	none	1. 21	4. 91	4. 41	1. 21						98. 88	
82 C3. V	74. 49	13. 58	0. 69	1. 72	1. 40	0. 84	2. 87	3. 49	1. 84			0. 09	trace	CO_2 0. 20	101. 21	2. 67
83 C3. V	69. 29	14. 47	n. d.	2. 81	0. 32	0. 58	6. 92	2. 94	n. d.		0. 52	trace			101. 24	
84 B3. IV	72. 12	9. 75	4. 11	3. 22	trace	2. 99	3. 42	2. 76	0. 10				1. 83		100. 30	2. 706
85 B3. IV	61. 50	16. 79	3. 48	2. 23	1. 96	5. 44	4. 78	2. 38	trace	0. 36			1. 22	CO_2 trace	100. 14	2. 727
86 B3. IV	77. 88	12. 05	0. 93	n. d.	0. 62	trace	3. 16	2. 36	0. 69	0. 06	0. 04			FeS_2 1. 35	99. 14	2. 70

RHYOLITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 B3. IV	73. 62	12. 22	2. 08	4. 03	0. 26	0. 34	3. 57	2. 57	0. 40						99. 09	
2 C3. V	73. 65	11. 19	1. 31	3. 25	0. 51	2. 78	3. 74	1. 86	0. 44						98. 73 (99. 23)	
3 D4. V	73. 09	13. 43	2. 57	1. 03	2. 29	3. 85	1. 58	0. 76							98. 60	

QUARTZ PORPHYRY—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
72	Ponte di Grata, Gozzano, Piedmont.	L. Ricciardi.	L. Ricciardi, At. Ac. Gioen., XVIII, p. (14), 1885.	Porphyry.	In W. T., p. 133.
73	Invorio Superiore, Lago d'Orta, Piedmont.	L. Ricciardi.	L. Ricciardi, At. Ac. Gioen., XVIII, p. (21), 1885.	Porphyry.	In W. T., p. 123.
74	Invorio Superiore, Lago d'Orta, Piedmont.	L. Ricciardi.	L. Ricciardi, At. Ac. Gioen., XVIII, p. (21), 1885.	Porphyry.	In W. T., p. 135.
75	Mola, Serra Longone, Elba.	A. Funaro.	A. Funaro, B. C. G. It., XVII, p. 381, 1886.	Quartz porphyry.	In W. T., p. 383.
76	Ain Kechera, Beni Toufout, Algeria.	P. Termier.	P. Termier. C. R., CXXXVI, p. 329, 1903.	Aplite.	
77	Kawalib, Kordofan.	M. Schweig.	G. Linck, N. J. B. B., XVII, p. 417, 1903.	Granite porphyry.	
78	Addi Salli, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 71, 1909.	Aplite.	
79	Kara Tioubé, near Samarkand, Turkestan.	Not stated.	K. I. Timofeef, Ann. G. M. Rus., XII, p. 82, 1910.	Aplite.	
80	Kara Tioubé, near Samarkand, Turkestan.	Not stated	K. I. Timofeef, Ann. G. M. Rus., XII, p. 82, 1910.	Granite porphyry.	
81	Angara River, Jenissei District, Siberia.	N. E. Podkopaev.	A. Meister, Reg. Aurif. Sib., IX, p. 205, 1910.	Aplite.	
82	Ta-ho-yi, Nan Shan, Tibet.	C. Pfeil.	K. Futterer, Durch Asien, II (2), p. 32, 1909.	Quartz porphyry.	
83	Astüria, Thian Shan, Tibet.	C. Pfeil.	K. Futterer, Durch Asien, II (1), p. 220, 1905.	Quartz porphyry.	
84	Two Mile Flat, Cudgegong River, New South Wales.	A. Liversidge.	A. Liversidge, J. R. Soc. N. S. W., XVI, p. 44, 1883.	Felsite.	MnO high. In W. T., p. 219.
85	Mount Lambie, Rydal, New South Wales.	A. Liversidge.	A. Liversidge, J. R. Soc. N. S. W., XVI, p. 44, 1883.	Quartz porphyry.	MnO high. In W. T., p. 245.
86	Norseman, Western Australia.	E. S. Simpson.	W. D. Campbell, W. Aust. G. S. B. 21, p. 119, 1906.	Felsite.	

RHYOLITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Pine Mountain, South Mountain, Pennsylvania.	C. H. Henderson.	C. H. Henderson, Tr. Am. Inst. M. E., XII, p. 90, 1884.	Rhyolite.	In W. T., p. 131.
2	Berlin, Wisconsin.	S. Weidman.	S. Weidman, Wisc. G. S. B. III, p. 2, 1898.	Rhyolite gneiss.	In W. T., p. 141.
3	Utley, Green Lake County, Wisconsin.	S. Weidman.	S. Weidman, Wisc. G. S., B. III, p. 14, 1898.	Metarhyolite.	Cf. U. S. G. S. B. 150, p. 169, 1898. In W. T., p. 383.

RHYOLITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
4 B3. IV	71.14	19.58	1.25	0.88	0.37	2.14	2.34	2.62	n. d.					CO_2 0.04	100.36	
5 A4. IV	71.01		15.17		0.34	1.19	2.77	2.97	6.34						99.79	
6 B4. V	75.07	12.15	1.62	n. d.	0.14	0.86	4.12	4.57	1.34				0.05		99.92	
7 B4. V	69.85	13.34	0.73	n. d.	trace	0.87	5.58	2.68	6.15						99.20	2.32
8 B4. V	75.69	12.26	n. d.	2.93	n. d.	1.13	3.01	4.74	n. d.			0.06			99.82	
9 B4. V	73.09	14.47	n. d.	2.99	n. d.	1.13	2.77	5.07	n. d.						99.52	
10 A4. IV	73.91	15.29	n. d.	0.89	n. d.	0.77	3.62	4.79	1.19			0.07			100.53	
11 B4. V	73.20	14.59	n. d.	1.92	1.24	0.47	0.12	4.32	2.98					CO_2 0.32	99.16	
12 B3. IV	68.15	15.00	1.18	0.60	0.87	1.91	3.13	0.96	8.70						100.50	2.497
13 B3. IV	76.36	10.43	0.54	0.98	0.88	0.97	6.01	3.07	0.33					S 0.07	99.64	2.489
14 B4. V	74.59	12.88	0.80	n. d.	0.30	0.76	3.30	5.35	1.03						99.01	2.324
15 B4. V	72.14	15.93	1.99	n. d.	0.40	1.93	3.97	2.55	n. d.				0.43		99.34	
16 B3. IV	71.14	12.98	3.35	n. d.	0.34	1.10	4.97	3.84	0.82		0.48				99.02	
17 D3. V	69.70	14.78	2.98	n. d.	0.59	1.07	4.77	4.45	n. d.		0.38				98.72	
18 C3. V	62.72	15.69	5.25	n. d.	1.34	3.33	5.45	4.19	n. d.		1.06				99.03	
19 B4. V	75.31	13.62	2.31	n. d.	0.20	0.97	3.02	4.07	1.48					S trace	100.98	2.525
20 C3. V	72.37	11.64	1.42	1.08	0.52	1.30	4.15	3.98	4.86						101.32	2.365
21 C3. V	72.6	12.4	0.7	1.1	trace	0.9	1.7	4.7	5.2						99.3	2.340
22 B4. V	67.9	15.7	3.0	n. d.	1.5	1.4	1.5	5.6	3.7						100.3	

RHYOLITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
4	Alloa, Fox River valley, Wisconsin.	W. W. Daniels.	Hobbs and Leith, B. Un Wisc. No. 158, p. 262, 1907.	Aporhyolite breccia.	
5	Bozeman, Montana.	F. W. Clarke.	A. C. Peale, U. S. G. S. B. 148, p. 141, 1897.	Rhyolite dust.	In W. T., p. 383.
6	Summit County, Colorado.	Teplitz.	A. Lagorio, T. M. P. M., VIII, p. 454, 1887.	Nevadite.	In W. T., p. 383.
7	Berkeley, California.	C. Palache.	C. Palache, B. Dep. G. Un. Cal., I, p. 67, 1894.	Soda rhyolite.	In W. T., p. 385.
8	Rescue Canyon, Eureka District, Nevada.	R. W. Mahon.	A. Hague, U. S. G. S. Mon. 20, p. 264, 1892.	Rhyolite.	Not in W. T.
9	South Hill, Eureka District, Nevada.	R. W. Mahon.	A. Hague, U. S. G. S. Mon. 20, p. 264, 1892.	Rhyolite.	Not in W. T.
10	Pinto Peak, Nevada.	E. Hart.	J. P. Iddings, U. S. G. S. B. 150, p. 162, 1898.	Liparite.	In W. T., p. 385.
11	Tonopah, Nevada.	G. S. Young.	J. A. Burgess, Ec. G., IV, p. 693, 1909.	Rhyolite.	Altered.
12	Oaxaca, Mexico.	A. Röhrig.	H. Lenk in Felix and Lenk, Btr. G. Mex., II, p. 129, 1899.	Rhyolite.	In W. T., p. 137.
13	Tablon de Itulgache, Guamania Volcano, Ecuador.	F. v. Wolff.	E. Esche in W. Reiss, Ecuador, I, p. 70, 1901.	Liparite.	
14	Tablon de Itulgache, Guamani Volcano, Ecuador.	A. Lagorio.	A. Lagorio, T. M. P. M., VIII, p. 444, 1887.	Obsidian.	In W. T., p. 385.
15	Kaldadalur, Iceland.	R. Breon.	R. Breon, G. d'Islands, p. 29, 1884.	Obsidian.	In W. T., p. 385.
16	Raudhfossafjoll, Iceland.	H. Bäckström.	H. Bäckström, G. F. F., XIII. p. 658, 1891.	Obsidian.	In W. T., p. 155.
17	Hrafntinnuhraun, near Hecla, Iceland.	H. Bäckström.	H. Bäckström. G. F. F., XIII, p. 641, 1891.	Liparite.	In W. T., p. 385.
18	Namshraun, Iceland.	H. Bäckström.	H. Bäckström, G. F. F., XIII, p. 645, 1891.	Liparite.	In W. T., p. 385.
19	Cir Mhor Dike, Arran, Scotland.	Under Thorpe.	J. W. Judd, Q. J. G. S., XLIX, p. 545, 1893.	Quartz felsite.	Center of dike. In W. T., p. 385.
20	Cir Mhor Dike, Arran, Scotland.	Under Thorpe.	J. W. Judd, Q. J. G. S., XLIX, p. 545, 1893.	Pitchstone porphyry.	In W. T., p. 385.
21	Arran, Scotland.	J. H. Player.	J. J. H. Teall, Brit. Petrog., p. 347, 1888.	Pitchstone.	In W. T., p. 385.
22	The Coquet, Cheviot Hills, Scotland.	T. Waller.	J. J. H. Teall, G. Mag., XXII, p. 111, 1885.	Quartz felsite.	Also in G. S. G. B. Mem. Sh. 5, p. 25, 1888. In W. T., p. 385.

RHYOLITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
23 D4. V	77.5	9.7	6.1	n. d.	n. d.	n. d.	0.3	5.8	0.4						99.8	
24 C4. V	79.35	12.65	2.00	n. d.	0.43	0.82	1.43	2.39	0.77		trace	0.02	trace	BaO trace SrO 0.28	100.14	
25 C3. V	74.09	14.98	1.80	1.50	trace	6.09	1.27	1.31							101.02	
26 B4. V	72.30	12.09	2.16	2.02	trace.	3.41	4.80	1.69						FeS_2 0.90	99.37	
27 B4. V	72.33	13.78	4.02	n. d.	1.59	trace	1.64	5.05	1.34						99.75	
28 B4. V	72.06	14.87	1.33	n. d.	1.26	trace	4.11	5.90	0.26						99.79	
29 B4. V	76.4	14.2	1.6	n. d.	n. d.	0.6	1.8	4.2	1.5						100.3	
30 D4. V	75.97	15.29	2.54	n. d.	0.24	1.15	2.86	3.89	0.57						102.51	
31 C4. V	74.80	15.81	1.24	n. d.	0.38	0.42	3.67	4.04	0.30		0.06				101.17	
32 C4. V	72.75	13.20	1.16	n. d.	0.25	2.60	4.00	5.00	2.25						101.25	
33 D3. V	77.05	12.32	0.42	0.10	0.36	0.25	5.70	1.50	0.41						98.11	
34 D3. V	71.00	16.57	0.57	0.39	0.22	1.61	4.70	4.30	2.40						101.76	
35 C3. V	75.47	11.21	0.44	n. d.	0.30	0.80	2.98	7.98	0.85		none		0.11		100.14	
36 B4. V	71.44		12.90		n. d.	0.82	4.24	2.19	8.42						100.01	
37 D3. V	70.92	14.62	3.74	0.61	0.43	1.75	5.00	2.38	1.60			0.38	0.25		101.68	
38 B4. V	75.82		13.67		0.05	0.58	1.69	6.59	1.07						99.47	2.451
39 B4. V	72.98		14.13		0.17	1.73	3.44	3.45	3.85						99.45	2.408
40 B4. V	71.39		15.57		0.51	1.29	2.28	5.43	3.95						100.42	2.394
41 B4. V	76.66	10.85	0.96	n. d.	trace	0.32	0.49	9.58	0.61				trace	Li_2O trace	99.47	
42 B4. V	72.30	15.52	2.98	n. d.	trace	1.25	2.95	4.73	none						99.73	

RHYOLITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
23	Cwm-Silyn, Nantlle, Caernarvon, Wales.	Acton and Hewett.	A. Harker, Bala Volc. Ser., p. 13, 1889.	Rhyolite.	In W. T., p. 385.
24	Vadre, Deganwy, Caernarvon, Wales.	H. W. Greenwood.	C. B. Travis, Pr. Liv. G. Soc.. X (5), p. 315, 1909.	Rhyolite.	
25	Pen-y-foel, St. Davids, Wales.	C. Gibbins.	C. L. Morgan, Q. J. G. S., XLVI, p. 262, 1890.	Felsitic tuff.	In W. T., p. 385.
26	Pen-y-foel, St. Davids, Wales.	C. Gibbins.	C. L. Morgan, Q. J. G. S., XLVI, p. 262, 1890.	Felsite.	In W T p. 385.
27	Carn Pica, near Fishguard, Pembrokeshire, Wales.	F. E. Tadman.	F. R. C. Reed, Q. J. G. S., LI, p. 178, 1895.	Felsite.	In W. T., p. 385.
28	Carn Gelli, near Fishguard, Pembrokeshire, Wales.	F. E. Tadman.	F. R. C. Reed, Q. J. G. S., LI, p. 177, 1895.	Felsite.	In W. T., p. 385.
29	Tardree, County Antrim, Ireland.	J. H. Player.	J. J. H. Teall, Brit. Petrog., p. 348, 1888.	Liparite.	In W. T., p. 385.
30	Cloughwater, County Antrim, Ireland.	A. P. Hoskins.	G. A. J. Cole, Tr. R. Dub. Soc. (2), VI, p. 112, 1896.	Rhyolite.	Not. in W. T.
31	Banne d'Ordanche, Mont Dore, Auvergne.	Pisani.	Michel-Levy and Lacroix, C. R., CXLVIII, p. 1721, 1909.	Rhyolite.	
32	Lusclade, Mount Dore, Auvergne.	Pisani.	Michel-Levy and Lacroix, C. R., CXLVIII, p. 1721, 1909.	Rhyolite.	
33	Cavicchia, Corsica.	J. Deprat.	J. Deprat, B. Sv. Ct. G. Fr., XVII, No. 117, p. 60, 1907.	Rhyolite.	
34	Astenica, Corsica.	J. Deprat.	J. Deprat, B. Sv. Ct. G. Fr., XVII, No. 117, p. 57, 1907.	Rhyolite.	
35	Kolsjön, Smaland, Sweden.	H. Santesson.	O. Nordenskjold, B. G. Inst. Ups., I, p. 216, 1894.	Hälleflinta (rhyolite).	Alkalies high. In W. T., p. 143.
36	Meissen, Saxony.	A Lagorio.	A. Lagorio, T. M. P. M., VIII, p. 490, 1887.	Pitchstone.	In W. T., p. 387.
37	Near Premyslau, Moldauthal, Bohemia.	Kolar.	J. Klvana, Ref. N. J., 1898, I, p. 485.	Felsophyrite.	In W. T., p. 395.
38	Schemnitz, Hungary.	A. Lagorio.	A. Lagorio, T. M. P. M., VIII, p. 448, 1887.	Liparite.	In W. T., p. 387.
39	Hliniker Thal, Hungary.	A. Lagorio.	A. Lagorio, T. M. P. M., VIII, p. 454, 1887.	Liparite pitchstone.	In W. T., p. 387.
40	Hlinik, Hungary.	A. Lagorio.	A. Lagorio, T. M. P. M., VIII, p. 444, 1887.	Liparite perlite.	In W. T., p. 387.
41	Czeremosz River, Galicia.	J. Schramm.	R. Zuber, T. M. P. M., VII, p. 196, 1886.	Hälleflinta (rhyolite).	In W. T., p. 381.
42	Conti, Ponza, Ponza Islands.	Aichino.	V. Sabatini, B. C. G. It., XXIV, p. 246, 1893.	Rhyolite.	In W. T., p. 387.

RHYOLITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
43 C4. V	71.50	20.31	6.79	n. d.	n. d.	1.51	1.92	3.58	0.70						100.31	
44 B4. V	71.41	15.07	3.68	n. d.	trace	1.72	1.18	2.95	4.05						100.06	
45 B4. V	64.32	17.87	2.55	n. d.	trace	3.06	1.63	4.52	6.19						100.14	
46 B4. V	74.30	16.56			0.16	1.35	2.62	4.32	0.23						99.54	
47 B4. V	72.35	13.97	1.29	n. d.	0.46	0.72	3.58	5.38	1.37						99.12	2.33
48 B4. V	73.64	15.07	n. d.	1.63	0.65	2.63	3.06	2.91	0.54			0.34	trace		100.47	
49 C4. V	79.1	8.9	1.9	n. d.	0.7	trace	3.9	3.1	0.8				1.1		99.5	
50 C4. V	79.1	8.2	1.3	n. d.	0.9	1.1	3.4	2.2	(3.8)						100.00	
51 B4. V	76.84	5.87	3.92	0.87	0.52	3.34	5.41		1.69				0.73		99.19	
52 D4. V	70.03	18.63	0.11	n. d.	0.10	2.62	3.15		4.28						99.12	
53 C4. V	69.2	8.3	5.4	n. d.	trace	0.1	6.9	2.9	7.0						99.8	
54 C4. V	68.5	14.5	1.0	3.0	0.1	trace	9.2	3.0	n. d.						99.3	
55 B3. IV	70.30	6.32	9.23	1.40	0.89	0.84	7.70	2.50	0.82						100.00	2.69
56 B3. IV	69.61	8.02	7.17	2.83	0.65	0.88	7.47	2.88	0.74						100.25	2.44
57 B3. IV	69.02	10.09	4.42	4.56	0.76	1.45	6.29	3.70						CuO 0.29	100.58	2.46
58 B3. IV	68.75	5.91	5.81	5.33	0.08	2.11	7.52	4.28	n. d.					CuO 0.28	100.02	2.47
59 C3. V	68.33	10.94	3.74	5.41	0.16	1.36	7.09	4.08	n. d.					CuO 0.25	101.36	2.48
60 B3. IV	67.89	11.53	4.51	4.52	0.62	1.51	5.79	3.91	0.33						100.41	2.43
61 B3. IV	67.48	9.70	7.42	2.21	0.77	1.45	7.21	2.94	0.96						100.14	2.68
62 B4. V	67.18	14.18	4.00	2.48	n. d.	2.78	5.89	4.01	n. d.				0.34		100.86	2.40

RHYOLITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
43	Montagniello, Ponza, Ponza Islands.	Aichino.	V. Sabatini, B. C. G., It., XXIV, p. 246, 1893.	Rhyolite.	In W. T., p. 387.
44	Cala d'Inferno, Ponza, Ponza Islands.	Aichino.	V. Sabatini, B. C. G. It., XXIV, p. 245, 1893.	Rhyolite tuff.	In W. T., p. 387.
45	Scogliatelle, Ponza, Ponza Islands.	Aichino.	V. Sabatini, B. C. G. It., XXIV, p. 252, 1893.	Retinite (rhyolite).	In W. T., p. 183.
46	Lipari, Aeolian Islands.	A. Lagorio.	A. Lagorio, T. M. P. M., VIII, p. 491, 1887.	Obsidian.	In W. T., p. 387.
47	Monte Campo, Bianco, Lipari, Aeolian Islands.	A. Lagorio.	A. Lagorio, T. M. P. M., VIII, p. 440, 1887.	Obsidian.	In W. T., p. 387.
48	Pietre Cotte, Monte della Fossa, Vulcano, Aeolian Islands.	L. Ricciardi.	G. Mercalli, Gior. Min., III, p. 104, 1892.	Rhyolite.	In W. T., p. 135.
49	Comende, San Pietro, Sardinia.	S. Bertolio.	S. Bertolio, B. C. G. It., XXV, p. 417, 1894.	Perlite.	Cf. No. 222, I.4.1.3. In W. T., p. 337.
50	Carloforte, San Pietro, Sardinia.	S. Bertolio.	S. Bertolio, B. C. G. It., XXV, p. 411, 1894.	Rhyolite.	H_2O by difference. In W. T., p. 387.
51	Spalmatore, San Pietro, Sardinia.	H. Fürth.	F. Eigel, T. M. P. M., VIII, p. 67, 1887.	Rhyolite.	In W. T., p. 387.
52	San Pietro, Sardinia.	Boetsch.	F. Eigel, T. M. P. M., VIII, p. 70, 1887.	Obsidian.	In W. T., p. 387.
53	Pescetti, San Pietro, Sardinia.	S. Bertolio.	S. Bertolio, B. C. G. It., XXVII, p. 186, 1896.	Perlite.	In W. T., p. 387.
54	Comende, San Pietro, Sardinia.	S. Bertolio.	S. Bertolio, Rend. Ac. Linc., V, p. 151, 1896.	Comendite.	Cf. No. 222, I.4.1.3. In W. T., p. 383.
55	Khartibugal, Cuddia Nera, Pantelleria.	H. Foerstner.	H. Foerstner, Z. K., VIII, p. 173, 1884.	Pantellerite.	Cf. J. G., XXII, p. 20, 1914. In W. T., p. 219.
56	Khartibugal, Cuddia Nera, Pantelleria.	H. Foerstner.	H. Foerstner, Z. K., VIII, p. 173, 1884.	Pantellerite.	Cf. J. G., XXII, p. 20, 1914. In W. T., p. 221.
57	Cuddia Mida, Pantelleria.	H. Foerstner.	H. Foerstner, Z. K., VIII, p. 182, 1884.	Pantellerite.	Cf. J. G., XXII, p. 20, 1914. In W. T., p. 221.
58	Khagiar, Pantelleria.	H. Foerstner.	H. Foerstner, Z. K., VIII, p. 179, 1884.	Pantellerite.	Cf. J. G., XXII, p. 20, 1914. In W. T., p. 311.
59	Khania, Pantelleria.	H. Foerstner.	H. Foerstner, Z. K., VIII, p. 170, 1884.	Pantellerite.	Cf. J. G., XXII, p. 20, 1914. Not in W. T.
60	Monte Sant' Elmo, Pantelleria.	H. Foerstner.	H. Foerstner, Z. K., VIII, p. 186, 1884.	Pantellerite.	Cf. J. G., XXII, p. 20, 1914. In W. T., p. 221.
61	Monte Sant' Elmo, Pantelleria.	H. Foerstner.	H. Foerstner, Z. K., VIII, p. 186, 1884.	Pantellerite.	Cf. J. G., XXII, p. 20, 1914. In W. T., p. 221.
62	Cala Porticello, Pantelleria.	H. Foerstner.	H. Foerstner, Z. K., VIII, p. 133, 1884.	Liparite.	Cf. J. G., XXII, p. 20, 1914. Not in W. T.

RHYOLITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
63	76.41	13.08	1.99	n. d.	0.61	0.82	4.41	1.02	0.70		0.40				99.40	
B3. IV																
64	75.00	14.96	1.12	n. d.	1.41	0.83	4.83	0.70	1.62						100.47	
B3. IV																
65	66.70	18.30	2.12	n. d.	0.50	none	3.10	5.14	3.80						99.66	
B4. V																
66	76.40	12.08	0.76	0.45	0.58	0.19	0.15	7.65	1.14	0.47		0.13			100.00	
B3. IV																
67	63.96	16.68	1.98	1.54	0.58	1.54	4.67	3.96	3.94	0.91		0.24			100.00	
B3. IV																
68	77.99	12.50	1.20	n. d.	0.09	1.21	2.99	4.95	0.48						101.41	
C4. V																
69	77.50	12.83	1.66	n. d.	0.24	1.50	3.44	3.45	0.43						101.05	
B4. V																
70	76.68	13.63	1.44	n. d.	0.23	0.99	2.85	4.91	0.36						101.09	
B4. V																
71	75.49	15.27			0.18	1.26	2.61	4.12	0.82						99.75	
B4. V																
72	73.58	13.73			0.17	1.85	2.41	3.32	5.62						100.68	
B4. V																
73	71.08	13.46	1.57	1.38	0.31	0.95	6.38	4.55	2.10			trace	trace	SO_3 trace Cl trace	101.78	
D4. V																
74	75.9	11.5	3.4	0.9	0.1	n. d.	4.0	4.4	1.0						101.2	
D4. V																
75	74.85	11.30	4.78	n. d.	1.53	1.01	2.34	4.25	1.29						101.35	
C4. V																
76	74.87	14.23	1.75	n. d.	1.16	1.99	3.03	2.35	1.60						100.98	
B4. V																
77	76.44	13.72	2.28	n. d.	trace	0.74	3.11	2.94	n. d.				0.08		100.11	2.55
B4. V																
78	74.16	12.55	5.34	n. d.	0.46	2.32	2.31	0.62	1.56						99.32	
B4. V																
79	75.36	14.21	0.13	n. d.	trace	0.84	4.78	2.72	1.04						99.13	
B4. V																
80	72.78	14.15	0.17	n. d.	trace	0.82	4.51	2.48	4.35						99.26	
B4. V																
81	78.15	11.94	0.72	0.33	0.20	1.32	0.67	5.71	0.14				1.58		100.76	2.355
B4. V																

RHYOLITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
63	Mount Kastel, Crimea.	R. Prendel.	R. Prendel, Ref. N. J., II, p. 95, 1887.	Liparite.	In W. T., p. 137.
64	Mount Kastel, Crimea.	R. Prendel.	R. Prendel, Ref. N. J., II, p. 96, 1887.	Liparite.	In W. T., p. 139.
65	Hagia Paraskevi, Mytilene, Aegean Sea.	L. de Launay.	L. de Launay, Ann. Mines (9), XIII, p. 187, 1898.	Obsidian.	Not in W. T.
66	Alagez, Pambak Valley, Armenia.	C. Schmidt.	H. Abich, G. Armen., II, p. 155, 1888.	Rhyolite.	SiO_2 includes loss. 3 places. Not in W. T.
67	Chomi, Kara Borjom Valley, Armenia.	C. Schmidt.	H. Abich, G. Armen., II, p. 154, 1888.	Pitchstone.	SiO_2 includes loss. 3 places. Not in W. T.
68	Cap Marsa, Menerville, Algeria.	Duparc and Pearce.	Duparc, Pearce, and Ritter, Mem. Soc. Ph. Gen., XXXIII, No. 2, p. 77, 1900.	Liparite.	In W. T., p. 387.
69	Sidi Zerzor, Menerville, Algeria.	Duparc and Pearce.	Duparc, Pearce, and Ritter, Mem. Soc. Ph. Gen., XXXIII, No. 2, p. 115, 1900.	Liparite.	In W. T., p. 387.
70	Cap Marsa, Menerville, Algeria.	Duparc and Pearce.	Duparc, Pearce, and Ritter, Mem. Soc. Ph. Gen., XXXIII, No. 2, p. 77, 1900.	Liparite.	In W. T., p. 387.
71	Bon Konfor, Menerville, Algeria.	Duparc and Pearce.	Duparc, Pearce, and Ritter, Mem. Soc. Ph. Gen., XXXIII, No. 2, p. 26, 1900.	Liparite.	In W. T., p. 387.
72	Sidi Zerzor, Menerville, Algeria.	Duparc and Pearce.	Duparc, Pearce, and Ritter, Mem. Soc. Ph. Gen., XXXIII, No. 2, p. 115, 1900.	Liparite.	In W. T., p. 387.
73	Alid Volcano, Buia, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 116, 1909.	Anorthoclasite pumice.	
74	Hol-hol, near Djibouti, French Somali.	H. Arsandaux.	H. Arsandaux, C. R., CXXXVII, p. 878, 1903.	Rhyolite.	
75	Somaliland.	Pisani.	Gennes and Bonard, C. R., CXXXI, p. 198, 1900.	Rhyolite.	Not in W. T.
76	Derike, near Teheran, Persia.	E. Drasche.	C. v. John, Jb. G. R.-A. Wien, XXXIV, p. 115, 1884.	Porphyry.	In W. T., p. 389.
77	Okhotsk, Siberia.	Y. F. Gervé.	K. E. Bogdanovitch, Fund. Marek., p. 25.	Liparite.	
78	Okhotsk, Siberia.	Y. F. Gervé.	K. E. Bogdanovitch, Fund. Marek., p. 19.	Marekanite.	
79	Marekanka River, Okhotsk, Siberia.	P. Wenjukoff.	P. Wenjukoff, Ref. N. J., I, p. 281, 1891.	Liparite glass.	In W. T., p. 389.
80	Marekanka River Okhotsk, Siberia.	P. Wenjukoff.	P. Wenjukoff, Ref. N. J., I, p. 281, 1891.	Perlite.	In W. T., p. 131.
81	Bongsoe Volcano, Palembang District, Sumatra.	J. G. Kramers.	R. D. M. Verbeek, Sum. Westk., p. 516, 1883.	Obsidian.	Not in W. T.

RHYOLITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
82 D4. V	76.51	12.37	0.48	1.58	trace	0.95	4.21	4.96	1.43		0.03				102.52	
83 D4. V	75.84	9.96	0.49	1.71	0.18	1.11	1.82	2.26	5.36						98.73	
84 B4. V	75.51	14.30	1.01	n. d.	0.24	1.81	1.21	2.89	2.84						99.81	
85 B3. IV	68.15	16.49	3.26	none	none	4.01	3.88	1.59	1.82				0.26		99.46	2.107
86 B3. IV	69.02	15.32	4.29	0.51	0.11	0.32	5.47	4.34	1.86		0.40			ZrO_2 0.16	101.80 (100.80)	

QUARTZ DIORITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 D4. V	57.50	23.44	5.07	n. d.	2.76	5.62	2.01	0.45	2.25			2.02			101.12	2.856
2 B3. IV	52.25	17.97	0.81	8.89	6.46	7.27	3.61	1.71	1.80	0.04					100.81	
3 B4. V	56.69	15.48	6.22	n. d.	6.53	7.59	3.41	3.43	n. d.		0.62				99.97	
4 B4. V	56.18		22.79		6.53	6.49	3.40	3.27	n. d.		1.60				100.26	
5 B3. IV	64.98	20.51	0.50	2.35	0.93	4.23	5.22	1.84	0.11						100.67	
6 C4. V	55.47	22.63	3.96	n. d.	2.97	6.62	4.59	2.09	0.69						99.02	
7 B3. IV	64.45	17.18	3.32	0.60	0.75	4.31	4.24	2.98	0.59		trace	trace	1.62		100.04	
8 B3. IV	61.38	14.33	7.64	1.02	2.98	5.42	4.71	2.58	0.13				trace		100.19	
9 B3. IV	61.55	17.48	1.49	3.50	3.00	3.12	8.47	0.07	1.21	0.12		0.28			100.29	
10 B3. IV	61.73	18.87	2.63	2.64	1.09	5.93	4.24	3.16	0.22						100.51	
11 A4. IV	65.61	17.26	2.47	n. d.	2.50	7.66	4.19	1.09	n. d.						100.78	2.72
12 A4. IV	64.71	15.09	2.56	n. d.	1.16	4.51	5.29	1.38	4.86						99.56	2.72

RHYOLITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
82	Wai Polang, Leitimor, Ambon Island.	S. J. Vermaes.	R. D. M. Verbeek, Jb. Mijuw., XXXIV, p. 230, 1905.	Ambonite (liparite).	French edition, p. 243.
83	Wai Toula, Hitou, Ambon Island.	O. Brunck.	R. D. M. Verbeek, Jb. Mijuw., XXXIV, p. 233, 1905.	Obsidian.	French edition, p. 246.
84	Tweed River, New South Wales.	W. F. Smeeth.	W. F. Smeeth, Pr. R. Soc. N. S. W., XXVIII, p. 311, 1894.	Pitchstone.	In W. T., p. 389.
85	Bondi, near Sydney, New South Wales.	A. Liversidge.	A. Liversidge, Pr. R. Soc. N. S. W., XX, p. 236, 1887.	Pumice.	Floated block. In W. T., p. 389.
86	Filhol Point, Campbell Island.	P. Marshall.	P. Marshall, Subant. Islds., II, p. 694, 1909.	Pantellerite.	

QUARTZ DIORITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Stop Island, Rainy Lake, Ontario.	F. T. Shutt.	A. C. Lawson, Am. G., VII, p. 158, 1891.	Quartz diorite.	Center of dike. Cf. No. 6, p. 1065. In W. T., p. 407.
2	James Township, Nipissing, Ontario.	R. E. Hore.	R. E. Hore, J. G., XVIII, p. 275, 1910.	Quartz diorite.	
3	South Leverett, Hampden County, Massachusetts.	W. Orr, jr.	B. K. Emerson, U. S. G. S. Mon. 29, p. 336, 1898.	Tonalite.	In W. T., p. 407.
4	Three Rivers, Belchertown, Massachusetts.	F. H. Fitts.	B. K. Emerson, U. S. G. S. Mon. 29, p. 336, 1898.	Tonalite.	In W. T., p. 407.
5	New York City New York.	V. Ziegler.	V. Ziegler. Ann. N. Y. Ac. Sci., XXI, p. 6, 1911.	Quartz diorite.	
6	Milledgeville Georgia.	T. L. Watson.	T. L. Watson, Ga. G. S. B. 9 A, p. 173, 1902.	Granodiorite.	
7	Pine Flats, San Gabriel Mountains, California.	A. M. Strong.	Arnold and Strong, B. G. S. A., XVI, p. 195, 1905.	Granodiorite.	MnO high.
8	Mount Wilson, San Gabriel Mountains, California.	A. M Strong.	Arnold and Strong, B. G. S. A., XVI, p. 193, 1905.	Granodiorite.	Not fresh. Iron oxides incorrect. Cf. ref.
9	Oak Ridge, Calaveras Valley California.	W. O. Clark.	J. P. Smith, Pr. Am. Phil. Soc., XLV, p. 209, 1907.	Quartz diorite.	Alkalies? No quartz in norm.
10	Carrizal, Nuevo Leon, Mexico.	Not stated.	J. G. Aguilera, B. Soc. G. Mex., V, p. 85, 1909.	Quartz diorite.	
11	Philipsburg, St. Martin, West Indies.	P. T. Cleve.	P. T. Cleve, Sv. Vet. Ak. Hnd., IX, No. 12, p. 36, 1871.	Quartz diorite.	Cf. A. G. Högbom, B. G. Inst. Ups., VI, p. 230, 1905. Not in W. T.
12	Bucks Island, West Indies.	T. Nordstrom.	P. T. Cleve, Sv. Vet. Ak. Hnd., IX, No. 12, p. 33, 1871.	Quartz diorite.	Cf. A. G. Högbom, B. G. Inst. Ups., VI, p. 230, 1905. Not in W. T.

QUARTZ DIORITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
13 B4. V	64.02	20.45	2.85	n. d.	1.28	4.51	3.34	3.54	n. d.						99.59	
14 B3. IV	64.69	17.32	1.23	3.01	1.54	2.18	6.36	2.30	2.09		0.44	trace	trace		101.16	2.65
15 B3. IV	51.53	21.55	3.61	3.07	2.70	8.62	3.07	2.02	3.28	1.26	0.01				100.72	2.80
16 D3. V	57.57	16.61	1.19	4.82	5.25	2.94	4.25	1.02	4.40						98.05	2.8
17 C2. IV	66.56	15.67	0.39	3.98	0.59	3.51	4.82	1.72	0.64		0.51	0.18			98.67	
18 C2. IV	57.06	17.49	1.33	7.04	2.22	4.63	3.96	2.06	1.12		1.44	0.57	0.90		98.82	
19 D2. V	51.28	16.26	1.68	9.85	4.22	6.51	5.13	1.04	0.81		4.64	0.11	0.27		101.80	2.87
20 D3. V	65.73	16.20	2.66	1.68	1.28	3.12	4.12	1.89	1.47						98.15	
21 C3. V	56.45	20.15	4.36	5.00	2.66	6.59	2.95	1.00	1.61		trace	0.24	trace		101.01	
22 C4. V	62.22		23.29		3.22	6.21	2.69	1.27	0.14						99.04	
23 B4. V	56.61	15.55	12.66	n. d.	2.07	5.90	3.15	1.07	3.50						100.51	
24 C4. V	56.17	16.50	10.60	n. d.	2.21	6.97	2.94	0.75	3.01						99.15	
25 C4. V	55.69	14.20	11.52	n. d.	1.62	8.14	4.01	1.00	3.15						99.33	
26 B4. V	63.93	17.25	5.90	n. d.	2.03	4.74	2.93	3.29	0.80						100.87	
27 B4. V	62.95	17.61	4.59	n. d.	2.15	5.06	3.30	3.34	0.68						99.68	
28 B4. V	60.70	18.55	6.21	n. d.	2.56	5.10	2.54	3.70	1.18						100.54	
29 C2. IV	61.84	18.84	1.10	3.87	2.83	2.80	2.47	0.95	2.49	0.36	1.44	0.55	trace	FeS_2 0.49	100.03	2.68
30 C2. IV	60.34	24.65	0.27	4.42	1.46	2.47	4.40	1.34	0.30	0.21	0.18	0.24	0.06		100.34	
31 D3. V	55.10	16.19	4.30	5.30	6.50	9.33	3.00	1.49	0.84			1.01	trace		101.73	2.871
32 B3. IV	52.03	20.57	1.60	6.97	5.39	7.80	2.37	1.34	1.27						99.34	2.855

QUARTZ DIORITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
13	Kockenhus, Kullen, Sweden.	A. Hennig.	A. Hennig, Ref. N. J., I, p. 224, 1900.	Banatite.	In W. T., p. 407.
14	Ködelschutzteich, near Nordhalben, Thuringia.	R. Pöhlmann.	R. Pöhlmann, N. J. B. B., III, p. 86, 1885.	Quartz diorite porphyrite.	In W. T., p. 203.
15	Kofelspitzgrat, near Maul, Tyrol.	G. Hradil.	G. Hradil, Sb. Ak. W. Wien, CXXI, p. 873, 1912.	Tonalite.	
16	Timau, Carnic Alps, Veneto.	M. Gortani.	M. Gortani, Mem. Soc. Tosc., XXII p. 176, 1906.	Quartz porphyrite.	
17	Morignone, Valtellina, Lombardy.	A. Zapf.	A. Zapf, In. Diss. Jena, p. 27, 1910.	Tonalite.	
18	Near Ceppina, Valtellina, Lombardy.	A. Zapf.	A. Zapf, In. Diss. Jena, p. 19, 1910.	Quartz diorite.	
19	San Antonio,, Valtellina, Lombardy.	M. Dittrich.	W. Rasch, N. J. B. B., XXXII, p. 211, 1911.	Quartz diorite.	
20	Rino, Valcamonica, Piedmont.	C. Riva.	C. Riva, At. Soc. It. Mil., XXXVI, p. 141, 1896.	Quartz diorite.	In W. T., p. 407.
21	Ivrea, Piedmont.	L. v Wervecke.	F. R. van Horn, T. M. P. M., XVII, p. 407, 1898.	Quartz diorite.	In W. T., p. 407.
22	Kamary, near Balaclava, Crimea.	A. Lagorio.	A. Lagorio, Cong. G. Int. VII, Guide XXXIII, p. 27, 1897.	Quartz diorite.	In W. T., p. 407.
23	Aiou Dag, Crimea.	A. Lagorio.	A. Lagorio, Cong. G. Int. VII, Guide XXXIII, p. 27, 1897.	Quartz diorite.	In W. T., p. 407.
24	Tschamny Burun, Crimea.	A. Lagorio.	A. Lagorio, Cong. G. Int., VII, Guide XXXIII, p. 27, 1897.	Quartz diorite.	In W. T., p. 407.
25	Buyuk Ouraga, Crimea.	A. Lagorio.	A. Lagorio, Cong. G. Int., VII, Guide XXXIII, p. 27, 1897.	Quartz diorite.	In W. T., p. 409.
26	Cap Marsa, Menerville, Algeria.	Duparc and Pearce.	Duparc, Pearce, and Ritter, Mem. Soc. Ph. Gen., XXXIII, No. 2, p. 106, 1900.	Microtonalite.	In W. T., p. 409.
27	Cap Marsa, Menerville, Algeria.	Duparc and Pearce.	Duparc, Pearce, and Ritter, Mem. Soc. Ph. Gen., XXXIII, No. 2, p. 101, 1900.	Tonalite.	In W. T., p. 409.
28	Cap Marsa, Menerville Algeria.	Duparc and Pearce.	Duparc, Pearce, and Ritter, Mem. Soc. Ph. Gen., XXXIII, No. 2, p. 106, 1900.	Microtonalite.	In W. T., p. 409.
29	Zeia River, Amur District, Siberia.	W. Giers.	E. Ahnert, Reg. Aurif. Sib., X, Tab. VII, 1910.	Quartz diorite.	
30	Anabar River, Siberia.	H. Backlund.	H. Backlund, Trav. Mus. G. St. Pet., I, p. 128, 1907.	Quartz diorite.	
31	Siloenkang, Sumatra.	Reuter.	R. D. M. Verbeek, Sum. Westk., p. 232, 1883.	Quartz diorite.	Not in W. T.
32	Dargo, Victoria.	A. W. Howitt.	A. W. Howitt, Tr. R. Soc. Vict., XXIII, p. 141, 1887.	Quartz diorite.	In W. T., p. 293.

QUARTZ DIORITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
33 D4. V	67.37	18.23	3.57	n. d.	2.71	trace	1.68	1.14	2.03	0.27		0.58		CO_2 none S none	97.58	
34 A4. IV	60.21	12.28	13.84	n. d.	1.96	6.72	2.55	1.32	1.16						100.04	

DACITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 D4. V	65.34	13.01	8.51	n. d.	0.53	6.30	5.14		1.17	trace					100.00	
2 B4. V	58.97	18.60	5.94	n. d.	6.89	2.84	3.05	2.24	1.35						99.88	
3 D4. V	66.85	14.08	3.06	n. d.	0.91	4.69	3.80	2.57	2.07						98.03	2.53
4 B4. V	69.54	12.68	4.01	n. d.	3.52	4.41	3.71	1.43			trace				99.30	
5 D3. V	66.03	14.57	2.57	1.19	1.89	3.38	3.71	2.70	2.07			0.09			98.20	
6 B3. IV	65.39	15.49	2.80	1.99	2.06	4.48	4.56	1.59	0.55			0.11			99.02	2.61
7 C4. V	68.32	19.61			1.95	4.24	4.06	1.45	0.54						100.17	2.765
8 B3. IV	63.73	17.17	4.06	0.61	1.29	2.65	4.53	2.11	0.83		2.48				99.46	2.67
9 B4. V	68.97	17.03	1.30	n. d.	0.79	3.26	5.15	1.70	1.10						99.30	
10 C3. V	65.29	20.15	5.57	1.13	0.16	2.11	2.52	1.24	1.19						99.36	
11 B3. IV	65.19	16.04	1.16	2.48	0.99	2.92	2.26	6.11	1.85						99.00	
12 B4. V	77.55	14.61	n. d.	2.21	0.32	2.12	1.43	1.62	n. d.			0.57	0.08		100.51	
13 B4. V	74.57	12.58	2.77	n. d.	0.30	0.35	3.98	3.70	1.04						99.29	2.604
14 C3. V	66.18	18.71	1.49	2.00	0.87	3.28	3.63	2.84	0.72						99.72	
15 D3. V	65.75	18.38	2.00	1.30	1.52	3.70	4.04	4.11	1.20				0.20		(98.29) 102.20	
16 C3. V	65.62	17.19	0.23	3.19	1.41	3.42	3.75	3.09	0.85						98.75	
17 D4. V	70.7	16.0	2.8	n. d.	0.2	1.1	5.0	1.5	0.9						98.2	

QUARTZ DIORITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
33	Tallangalook, Victoria.	H. C. Jenkins.	H. C. Jenkins, A. R. Secy. Min. Vict., p. 39, 1902.	Quartz diorite.	
34	Waiaro, Moehau Range, New Zealand.	W. H. Baker.	J. Park, Tr. N. Z. Inst., XXXIII, p. 341, 1901.	Quartz diorite.	

DACITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	China Bend, Columbia River, Washington.	R. W. Thatcher.	S. Shedd, Wash. G. S. A. R. II, p. 53, 1902.	Dacite tuff.	
2	Lassen Peak, California.	T. M. Chatard.	J. S. Diller, U. S. G. S. B. 148, p. 193, 1897.	Segregation in dacite.	In W. T., p. 419.
3	Seal Harbor, San Clemente Island, California.	W. S. T. Smith.	W. S. T. Smith, U. S. G. S. A. R. 18, II, p. 488, 1898.	Dacite.	In W. T., p. 417.
4	White Wall, St. Eustatius, West Indies.	G. A. F. Molengraaf.	G. A. F. Molengraaf, G. St. Eust., p. 47, 1886.	Dacite pumice.	H_2O=2.68. Not in W. T.
5	Hondon, Chiles Volcano, Colombia.	R. Küch.	R. Küch, G. Stud. Colomb., I, p. 179, 1892.	Dacite.	In W. T., p. 417.
6	Cumbal Volcano, Colombia.	R. Küch.	R. Küch. N. J., 1886, I, p. 40.	Dacite.	In W. T., p. 239.
7	Mojauda, near Quito, Ecuador.	A. Lagorio.	A. Lagorio, T. M. P. M., VIII, p. 458, 1887.	Dacite.	In W. T., p. 417.
8	Chimborazo Volcano, Ecuador.	A. Lindner.	F. Tannhäuser in W. Reiss, Ecuador, II, p. 145, 1904.	Dacite.	
9	Cerros Blancos, San Juan, Argentina.	R. G. Teichgräber.	A. Stelzner, Btr. G. Argent., I, p. 184, 1885.	Dacite.	In W. T., p. 417.
10	Garbanzal, Cabo de Gata, Spain.	Hauff.	A. Osann, Z. D. G. G., XLIII, p. 706, 1891.	Dacite.	In W. T., p. 417.
11	Tolfa, Italy.	H. S. Washington.	H. S. Washington, J. G., V, p. 49, 1897.	Toscanite.	In W. T., p. 159.
12	Eruption of 1889, Vulcano, Aeolian Islands.	L. Ricciardi.	G. Mercalli, Giorn. Min., III, p. 107, 1892.	Quartz andesite (dacite).	In W. T., p. 123.
13	Kamary, near Sebastopol, Crimea.	A. Lagorio.	A. Lagorio, T. M. P. M., VII, p. 448, 1887.	Dacite.	In W. T., p. 153.
14	Kalko, near Blo, Caucasus.	Makerow.	Loewinson-Lessing, Ref. N. J., II, p. 237, 1899.	Dacite.	In W. T., p. 193.
15	Mount Elbruz, Caucasus.	A. Dannenberg.	A. Dannenberg, T. M. P. M., XIX, p. 233, 1900.	Dacite.	In W. T., p. 417.
16	Chrety, Kasbek, Caucasus.	Loewinson-Lessing.	Loewinson-Lessing, Mat. Geol. Rus., XXI, p. 107, 1901.	Dacite.	
17	Kurt Boghaz, Galatia, Asia Minor.	Schaefer and Herz.	L. Milch, N. J. B. B., XVI, p. 115, 1903.	Dacite.	

DACITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
18 C4. V	63.50	18.80	4.72	n. d.	1.80	3.54	3.95	4.45	0.60						101.36	
19 B3. IV	61.29	17.68	6.03	0.30	2.45	5.61	4.28	1.38	0.96		0.65				100.63	2.440
20 C4. V	68.47	14.67	3.93	n. d.	0.32	3.89	2.34	3.42	2.59					(S 2.32)	100.63	
21 C4. V	67.47	19.07	1.05	n. d.	0.24	4.87	3.87	3.89	0.84						101.30	
22 C4. V	63.00	17.40	5.03	n. d.	1.02	5.71	3.89	4.81	0.48						101.34	
23 D4. V	67.71	17.25	4.21	n. d.	1.43	4.38	3.13	2.90	1.35						102.36	
24 B4. V	59.24	18.45	4.58	n. d.	2.06	6.08	3.15	3.22	3.66						100.44	
25 B4. V	58.29		23.66		1.93	6.75	1.59	2.32	5.63						100.17	
26 C3. V	69.64	16.16	1.39	2.74	0.59	4.33	4.64	0.50	1.64						101.63	
27 B3. IV	64.54	16.24	5.88	0.11	1.17	5.17	3.71	1.05	1.99		0.53				100.39	2.60
28 B4. V	64.38	13.62	9.17	n. d.	2.18	1.99	6.28	3.51	n. d.						101.13	

SYENITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 B4. V	72.20	12.50	n. d.	3.70	n. d.	0.90	5.30	3.88	0.60						99.08	2.62
2 C2. IV	61.93	13.03	0.56	8.00	1.76	4.02	3.18	2.80	1.95		0.84	0.32	0.18		98.76	2.757
3 D3. V	61.65	18.91	2.37	1.48	1.11	2.10	5.59	4.20	0.60						98.01	
4 B3. IV	58.60	19.94	4.25	2.42	1.71	2.76	3.24	4.84	2.29						100.05	
5 B4. V	60.30	25.70	none	none	0.15	5.33	4.28	3.80	n. d.		0.25				99.81	
6 B4. V	62.96	13.45	3.54	n. d.	0.61	1.28	5.46	5.19	2.77				5.29		100.55	
7 C4. V	59.48	13.46	6.71	n. d.	1.64	1.83	11.67	6.03	0.20		0.17				101.19	
8 B4. V	54.15	18.92	6.79	n. d.	1.90	3.72	5.47	8.44						Cl 0.42	99.81	

DACITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
18	Mount Phako, Lemnos Island, Aegean Sea.	L. de Launay.	L. de Launay, An. Min. (9), XIII, p. 223, 1898.	Dacite.	Not in W. T.
19	Anzeiou, Aegina, Greece.	A. Röhrig.	H. S. Washington, J. G., III, p. 150, 1895.	Dacite.	In W. T., p. 243.
20	Cap Blanc, Menerville, Algeria.	Duparc and Pearce.	Duparc, Pearce, and Ritter, Mem. Soc. Ph. Gen., XXXIII, No. 2, p. 59, 1900.	Dacite.	In W. T., p. 417.
21	Cap Blanc, Menerville, Algeria.	Duparc and Pearce.	Duparc, Pearce, and Ritter, Mem. Soc. Ph. Gen., XXXIII, No. 2, p. 59, 1900.	Dacite.	In W. T., p. 419.
22	Cap Blanc, Menerville, Algeria.	Duparc and Pearce.	Duparc, Pearce, and Ritter, Mem. Soc. Ph. Gen., XXXIII, No. 2, p. 59, 1900.	Dacite.	In W. T., p. 419.
23	Dra Zeg Etter, Menerville, Algeria.	Duparc and Pearce.	Duparc, Pearce, and Ritter, Mem. Soc. Ph. Gen., XXXIII, No. 2, p. 129, 1900.	Dacite.	In W. T., p. 419.
24	Dra Zeg Etter, Menerville, Algeria.	Duparc and Pearce.	Duparc, Pearce, and Ritter, Mem. Soc. Ph. Gen., XXXIII, No. 2, p. 129, 1900.	Dacite.	In W. T., p. 419.
25	Dra Zeg Etter, Menerville, Algeria.	Duparc and Pearce.	Duparc, Pearce, and Ritter, Mem. Soc. Ph. Gen., XXXIII, No. 2, p. 129, 1900.	Dacite.	In W. T., p. 419.
26	Zaimokuiwa, Kunashiri, Chinshima, Japan.	Takaminé.	Pr. C. Soc. Jap., 1885.	Dacite.	Not in W. T.
27	Sapeh, Sumbawa, Island.	Tillmans.	G. Rack, N. J. B. B., XXXIV, p. 47, 1912.	Dacite.	
28	Willinigongong, Victoria.	R. J. Lewis.	J. W. Gregory, Pr. R. Soc. Vict., XIV, p. 201, 1902.	Geburite-dacite.	

SYENITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Greenville, Quebec.	O. E. Le Roy.	O. E. Le Roy, B. G. S. A., XII, p. 392, 1901.	Quartz syenite porphyry.	
2	Onaping, Sudbury, Ontario.	E. G. A. Ardagh.	A. P. Coleman, J. G., XV, p. 770, 1907.	Syenite?	
3	Swastika Area, Ontario.	Not stated.	E. L. Bruce, Rep. Bur. Min. Ont., XXI (1), p. 260, 1912.	Syenite porphyry.	
4	Red Sucker, Port Coldwell, Ontario.	Not stated.	H. L. Kerr, Rep. Bur. Min. Ont., XIX (1), p. 222, 1910.	Quartz syenite.	
5	Roseland, Nelson County, Virginia.	F. P. Dunnington.	Watson and Taber, Va. G. S. B. III A, p. 76, 1913.	Syenite.	
6	Fourche Mountain, Little Rock, Arkansas.	R. N. Brackett.	J. F. Williams, Ign. R. Ark., p. 99, 1891.	Quartz syenite.	MnO high. In W. T., p. 389.
7	Sawtooth Mountains, Trans-Pecos, Texas.	Not stated.	A. Osann, T. M. P. M., XV, p. 428, 1895.	Syenite.	Al_2O_3 low, alkalies high. In W. T., p. 389.
8	South Boulder Creek, Montana.	G. P. Merrill.	G. P. Merrill, Pr. U. S. Nat. Mus., XVII, p. 672, 1895.	Syenite.	In W. T., p. 389.

SYENITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
9 D4. V	63.48	20.74	4.00	n. d.	1.17	2.16	2.24	4.99	2.47						101.25	
10 D3. V	53.80	19.20	n. d.	7.60	4.80	5.70	2.16	5.08	1.28		0.77	1.20			101.59	
11 C3. V	67.00	9.17	10.78	3.60	0.06	0.09	8.24	2.31							101.25	
12 D3. V	67.07	16.53	1.62	2.10	1.64	1.32	4.43	1.89	3.58	0.98	0.51				101.67	
13 C3. IV	64.04	17.92	0.96	2.08	0.59	1.00	6.67	6.08	1.18		0.62		0.23		101.37	2.646
14 B3. IV	62.35	19.50	3.05	2.25	1.46	2.40	2.71	3.28	0.75		1.25		0.18		99.18	
15 C3. V	59.56	17.60	2.90	3.38	1.87	3.67	4.88	4.40	1.37		1.22		0.03		101.32	2.729
16 B3. IV	58.88	20.30	3.63	2.58	0.79	3.03	5.73	4.50	1.01			0.54			100.99	2.721
17 B4. V	58.48	19.24	5.75	n. d.	0.99	5.02	5.52	3.06	0.47		0.96		trace		99.41	
18 B3. IV	55.18	17.44	5.56	1.36	0.27	5.10	6.83	5.48	0.88		2.38				100.48	
19 D?3. V?	55.00	20.81	3.29	3.83	2.33	5.44	5.87	0.16	0.55						97.28 (100.28)	
20 C2. IV	43.60	11.95	3.79	2.30	0.75	11.11	0.80	10.21	2.27	0.35	5.19	8.36	0.20	CO_2 trace Cl 0.05	100.93	2.57
21 B3. IV	57.76	18.64	3.88	0.18	1.79	6.56	7.44	1.52	1.08		0.08		1.06		99.99	2.684
22 C4. V	61.40	16.66	7.46	n. d.	3.65	2.08	4.75	2.93	0.76					CO_2 1.54 S 0.20	101.43	
23 D?2. V?	60.19	15.34	1.32	1.48	2.44	0.55	2.52	9.39	1.10		0.37	0.18		CO_2 0.11 SO_3 trace Org. 0.02	95.01 (100.01)	2.723
24 B3. IV	55.49	14.57	8.68	0.66	3.61	0.68	1.86	7.87	3.96		1.78	0.27		SO_3 trace	99.43	
25 B3. IV	66.48	7.71	11.43	0.90	0.77	4.26	1.77	4.85	0.61			trace	1.98	CO_2 trace	100.76	
26 C3. V	62.52	23.54	2.15	1.38	0.26	1.65	4.16	4.02	0.03					SO_3 trace	99.71	
27 B4. V	48.94	15.89	n. d.	14.25	1.27	8.76	5.20	3.82	1.13					ZrO_2 1.30	100.56	
28 B4. V	66.74	13.57	3.42	n. d.	0.74	1.00	5.81	9.01	0.75						101.04	

SYENITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
9	Puy St. André, Pelvoux, Dauphiny, France.	Rüst?	P. Termier, B. Soc. G. Fr., XXVII, p. 408, 1899.	Microsyenite.	Not in W. T.
10	Rochail, Lake Lawvitel, France.	Not stated.	P. Termier, C. R., CXXIV, p. 319, 1897.	Mica syenite.	Inclusion in granite. In W. T., p. 389.
11	Capoalla Cuculla, Corsica.	J. Deprat.	J. Deprat, B. Sv. Ct. G. Fr., XVII, No. 114, p. 44, 1906.	Riebeckite-quartz syenite.	
12	Turo del Pardals, Barcelona, Spain.	Maier.	Maier, Ber. Nf. Ges. Freib., XVII, 1908.	Syenite porphyry.	Altered.
13	Tonsenas, near Christiania, Norway.	P. Jannasch.	O. Lang, Myt Mag., XXX, p. 40, 1886.	Syenite (nordmarkite).	In W. T., p. 195.
14	Thinghoud, Norway.	G. Särnström.	W. C. Brögger, Z. K., XVI, p. 46, 1890.	Akerite.	In W. T., p. 167.
15	Vettakollen, near Christiania, Norway.	P. Jannasch.	O. Lang, Myt Mag., XXX, p. 40, 1886.	Syenite (akerite, W. C. Brögger).	In W. T., p. 263.
16	Farrisvand, Laurvik, Norway.	Stahl and Mansfeld.	A. Merian, N. J. B. B., III, p. 266, 1885.	Augite syenite.	Alkalies uncertain. Cf. ref. In W. T., p. 203.
17	Ramnäs, Norway.	R. Mauzelius.	W. C. Brögger, Z. K., XVI, p. 46, 1890.	Akerite.	In W. T., p. 263.
18	Hedrum, near Sandefjord, Norway.	G. Pajkull.	W. C. Brögger, Z. K., XVI, p. 31, 1890.	Mica syenite.	In W. T., p. 295.
19	Ullernas, Norway.	G. Forsberg.	W. C. Brögger, Z. K., XVI, p. 49, 1890.	Akerite.	
20	Michelsberg, Katzenbuckel, Odenwald.	W. Freudenberg.	W. Freudenberg, Mt. Bad. G. L.-A., V, p. 329, 1907.	Aplitic shonkinite.	Altered?
21	Lindenberg, Hesse.	F. W. Schmidt.	C. Chelius, Erl. G. Kt. Hes., Bl Rossdorf, p. 54, 1886.	Syenite.	Border of granite dike. In W. T., p. 265.
22	Rothschönberg, Deutschenbroda, Saxony.	Fritsch and Venator.	J. M. C. Henderson, Z. D. G. G., XLVII, p. 539, 1895.	Mica syenite.	In W. T., p. 389.
23	Grube, Brocken, Harz.	Lorenz.	O. H. Erdmannsdoerfer, Jb. Pr. G. L.-A., XXVII, p. 354, 1906.	Syenite.	Sum incorrect.
24	Winterbach, near St. Wendel, Harz.	Fischer.	K. A. Lossen, Jb. Pr. G. L.-A., X, p. 266, 1892.	Syenite porphyry.	In W. T., p. 251.
25	Wolynkathal, Böhmerwald, Bohemia.	J. Mählbauer.	J. N. and J. Woldrich, Arch. Landdf. Böhm., XII (4), p. 65, 1904.	Syenite porphyry.	
26	Ditro, Siebenbürgen, Hungary.	J. v. Szadeczky.	J. v. Szadeczky, Ref. N. J., I, p. 402, 1901.	Nordmarkite.	In W. T., p. 391.
27	Ditro, Siebenbürgen, Hungary.	Not stated.	V. C. Butureanu, B. Soc. Sc. Buk., p. 278, 1897.	Syenite.	In W. T., p. 391.
28	Boscampo, Predazzo, Tyrol.	J. A. Ippen.	J. A. Ippen, N. J. Cb., p. 640, 1903.	Quartz syenite porphyry.	

SYENITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
29	53.30	21.30	1.40	2.92	0.90	6.30	5.83	8.17	0.75		0.50	trace		Cl 0.03	101.40 (100.46)	
C?2. IV																
30	54.43	20.57	4.52	n. d.	3.47	5.89	5.30	4.98	0.69						99.85	
B4. V																
31	66.5	18.9	3.6	1.3	0.4	0.2	4.8	4.5	0.9						101.1	2.65
C3. V																
32	39.88	20.33	5.24	7.60	6.48	11.51	4.64	2.44	0.95		0.95	0.43			100.45 (99.70)	
B?2. III?																
33	72.0	7.0	7.14	n. d.	n. d.	n. d.	8.0	2.0	2.0				trace		98.14	
D4. V																
34	66.0	12.0	2.9	n. d.	n. d.	n. d.	5.0	10.0	2.5					CaF_2 0.9	99.3	
D4. V																
35	58.77	17.62	3.40	2.37	1.76	1.28	7.69	4.19	0.42		1.11		0.12		98.73	2.69
C3. V																

PORPHYRY.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	56.25	18.42	1.56	2.41	2.38	6.13	8.10	0.32	0.22					CO_2 4.58 S 0.10	100.47	
B3. IV																
2	75.80	13.80	0.68	n. d.	0.86	n. d.	1.52	4.82	1.74						99.22	
B4. V																
3	69.20	16.62	2.85	n. d.	1.52	n. d.	1.25	6.38	2.90						100.72	
B4. V																
4	63.4	17.9	8.4	n. d.	1.4	1.02	3.96	4.2	0.72				trace		101.00	
C4. V																
5	62.3	15.7	6.7	n. d.	3.1	2.1	3.77	4.21	1.3						99.18	
C4. V																
6	62.3	14.1	8.2	n. d.	3.4	1.3	4.4	3.5	2.2				trace		99.4	
B4. V																
7	62.06	13.7	8.9	n. d.	1.4	1.05	5.19	6.0	1.41				trace		99.71	
B4. V																
8	61.07	11.8	13.1	n. d.	1.9	1.99	2.8	5.5	1.6				trace		99.76	
B4. V																
9	59.5	11.8	13.1	n. d.	2.7	2.2	3.96	4.32	1.55				trace		99.13	
C4. V																
10	59.50	18.49	6.38	n. d.	2.15	5.65	4.19	1.69	3.57			0.35			101.97	
D4. V																
11	54.0	18.9	7.8	n. d.	0.7	3.8	6.5	3.9	2.3				0.4		100.3	
B4. V																
12	67.40	15.62	3.15	n. d.	0.56	1.87	2.51	7.10	0.50						98.71	
D4. V																

SYENITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
29	Monte Somnia, near Naples, Italy.	Pisani.	A. Lacroix, N. Arch. Mus. (4), IX, p. 146, 1907.	Microsyenite.	Sum incorrect.
30	Mount Vitosa, near Sofia, Bulgaria.	L. Dimitrow.	L. Dimitrow, Ds. Ak. W. Wien, LX, p. 493, 1893.	Pyroxene syenite.	In W. T., p. 391.
31	Karsa, French Somali.	H. Arsandaux.	H. Arsandaux, C. R., CXXXVII, p. 878, 1903.	Microsyenite.	
32	Topsail Point, Tamara Island, Los Islands, French Guinea.	Lassieur.	A. Lacroix, N. Arch. Mus., III, p. 76, 1911.	Microshonkinite.	Sum incorrect.
33	Nooitgedacht, Pilandsberg, Transvaal.	G. S. Laboratory.	W. A. Humphrey, Un. S. Afr. G. S. A. R. (1911), p. 83, 1912.	Syenite.	
34	Rhenosterspruit, Pilandsberg, Transvaal.	G. S. Laboratory.	W. A. Humphrey, Un. S. Afr. G. S. A. R. (1911), p. 83, 1912.	Syenite.	
35	Rudikovka River, Jenissei District, Siberia.	A. Semenchenko.	A. Meister, Reg. Aurif. Sib., IX, p. 223, 1910.	Umptekite.	

PORPHYRY.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Swastika, Ontario.	E. L. Bruce.	E. L. Bruce, Sch. Min. Q., XXXV, p. 162, 1914.	Porphyry.	Not fresh.
2	Villetelle, La Creuse, France.	Pisani.	L. de Launay, B. Sv. Ct. G. Fr., XI, No. 83, p. 76, 1902.	Porphyry.	
3	Villetelle, La Creuse, France.	Pisani.	L. de Launay, B. Sv. Ct. G. Fr., XI, No. 83, p. 77, 1902.	Porphyry.	
4	Chateau Noir, Grandes Rousses, Dauphiny.	Fabre.	P. Termier, B. Sv. Ct. G. Fr., VI, No. 40, p. 48, 1894.	Orthophyre.	In W. T., p. 391.
5	Lac du Cerisier, Grandes Rousses, Dauphiny.	Fabre.	P. Termier, B. Sv. Ct. G. Fr., VI, No. 40, p. 49, 1894.	Orthophyre.	In W. T., p. 391.
6	Glacier St. Sorlin, Grandes Rousses, Dauphiny.	Fabre.	P. Termier, B. Sv. Ct. G. Fr., VI, No. 40, p. 48, 1894.	Orthophyre.	In W. T., p. 391.
7	Chateau Noir, Grandes Rousses, Dauphiny.	Fabre.	P. Termier, B. Sv. Ct. G. Fr., VI, No. 40, p. 49, 1894.	Orthophyre.	In W. T., p. 391.
8	Freney, Grandes Rousses, Dauphiny.	Fabre.	P. Termier, B. Sv. Ct. G. Fr., VI, No. 40, p. 49, 1894.	Orthophyre.	In W. T., p. 391.
9	Chateau Noir, Grandes Rousses, Dauphiny.	Fabre.	P. Termier, B. Sv. Ct. G. Fr., VI, No. 40, p. 49, 1894.	Orthophyre.	In W. T., p. 391.
10	Dramont, Esterel, France.	Pisani.	A. Michel-Levy, B. Sv. Ct. G. Fr., XXI, No. 130, p. 41, 1912.	Porphyry.	
11	Brumun, Hedemark, Norway.	H. Bäckström.	H. Bäckström, Sv. Vet. Ak. Hndl., XVI (II), No. 3, p. 11, 1888.	Rhomben porphyry.	In W. T., p. 391.
12	Varvnejärvi, Teisko, Finland.	H. Berghell.	J. J. Sederholm, B. C. G. Fin., No. 6, p. 68, 1897.	Orthoclase porphyry.	In W. T., p. 391.

PORPHYRY—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
13	66.42	16.76	1.22	0.62	0.37	0.32	1.26	12.55	1.05		0.05	trace		CO_2 0.03	101.56	2.56
C3. V																
14	65.77	23.51	1.95	n. d.	0.63	trace	1.44	3.72	3.35						100.37	
D4. V																
15	59.75	16.98	10.44	0.54	0.65	1.05	3.34	7.32	1.61		trace				101.68	2.71
C3. V																
16	52.10	17.68	10.43	n. d.	2.46	5.72	3.84	4.61	3.57		0.92	trace	trace		101.33	2.698
C4. V																
17	58.24	14.26	n. d.	8.75	1.59	3.68	3.22	3.60	2.87			2.62			100.03	
B4. V																
18	56.98	19.01	n. d.	9.75	0.99	3.60	3.58	3.91	1.31			1.71	trace		100.84	
B4. V																
19	62.37	21.26	3.57	6.45	0.38	0.55	1.22	2.62	0.11				0.11		99.64	
C3. V																
20	48.49	19.92	3.85	6.05	4.35	9.25	2.51	2.69	1.99						99.10	
B3. IV																
21	74.80	12.60	1.53	0.83	0.17	0.79	2.54	4.83	1.08						99.17	
B3. IV																
22	66.26	20.54	1.16	2.05	1.33	0.44	1.95	4.93	1.20	0.08	0.38				100.32	
B3. IV																
23	76.40	12.00	1.25	n. d.	0.75	0.25	2.00	4.00	2.25						98.90	
C4. V																
24	55.60	18.20	9.40	n. d.	3.78	6.87	2.53	0.45	2.62				1.13		100.58	
B4. V																
25	54.12	19.75	10.29	n. d.	2.07	8.86	2.93	0.24	1.48				0.26		100.50	
B4. V																
26	68.12	15.97	1.09	2.27	0.92	0.71	6.03	1.29	0.29	0.17	0.62		trace	CO_2 1.13 S trace	98.61	
C3. V																

TRACHYTE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1	53.40	20.82	3.92	n. d.	1.53	7.05	3.79	2.97	6.57						100.05	
B4. V																
2	67.16	14.53	4.17	n. d.	0.41	1.26	5.55	6.10	1.10						100.28	
B4. V																
3	65.76	17.18			trace	2.30	2.22	3.14	5.60	3.46					99.66	
A4. IV																
4	65.56	18.24			0.72	2.58	2.08	3.94	6.50	1.12					100.74	
A4. IV																
5	61.82	19.86			0.51	1.78	2.38	1.31	11.47						99.13	
B4. IV																

PORPHYRY—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
13	Rüdesheim, Rheinland.	K. Hampe.	K. A. Lossen, Jb. Pr. G. L.-A., V, p. 534, 1885.	Porphyry.	Metamorphosed. In W. T., p. 393.
14	Bilsburg, Eder River, Westphalia.	Bömer.	O. Mügge, N. J. B. B., VIII, p. 568, 1893.	Porphyry.	In W. T., p. 393.
15	Zimmerberg, near Friedrichroda, Thuringia.	A. Mühlenberg.	A. Mühlenberg, In. Diss. Halle, p. 42, 1908.	Orthoclase porphyry.	
16	Linsenkopf, Thuringia.	A. Mühlenberg.	A. Mühlenberg, In. Diss. Halle, p. 51, 1908.	Orthophyre.	
17	Weinberg, Upper Lausitz.	V. Steger.	V. Steger, Ref., N. J., I, p. 42, 1887.	Porphyry.	In W. T., p. 393.
18	Weinberg, Upper Lausitz.	V. Steger.	V. Steger, Ref. N. J., I, p. 42, 1887.	Porphyry.	In W. T., p. 393.
19	Nadabula, Erzgebirge, Hungary.	E. Ernyei.	F. Schafarzik, Math. Nh. Ber. Ung., XXIII, p. 240, 1905.	Porpnyroid.	Other analyses in same paper.
20	Monte Inverno, Monzoni, Tyrol.	C. Doelter.	C. Doelter, Anz. Ak. W. Wien, XXXIX, p. 231, 1902.	Segregation in syenite porphyry.	
21	Käserngrat, Windgälle Mountains, Switzerland.	J. Mai.	C. Schmidt, N. J. B. B., IV, p. 432, 1886.	Porphyry.	In W. T., p. 135.
22	Bavugls, Suretta Massif, Switzerland.	N. Sahlbom.	H. Meyer, In. Diss. Freib., p. 14, 1909.	Porphyry.	
23	Gravesano, Lake Lugano, Ticino.	A. Schwagor.	K. v. Gümbel, Geog. Jhft, VII, p. 71, 1894.	Porphyry.	Not in W. T.
24	Okhotsk, Siberia.	Not stated.	K. E. Bogdanovitch, Fund. Márek, p. 55.	Orthophyre.	
25	Fedora Bay, Okhotsk, Siberia.	Not stated.	K. E. Bogdanovitch, Fund. Marek., p. 55.	Orthophyre.	
26	Boulder, Kalgoorlie, Western Australia.	E. S. Simpson.	E. S. Simpson, W. Aust. G. S. B. 6, p. 73, 1902.	Porphyry.	

TRACHYTE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Shelburne Point, Burlington. Vermont.	Morrison.	Kemp and Marsters, U. S. G. S. B. 107, p. 20, 1893.	Bostonite.	Metamorphosed. In W. T., p, 393.
2	Indian Point, Chateaugay Lake, Clinton County, New York.	A. S. Eakle.	A. S. Eakle, Am. G., XII, p. 34, 1893.	Bostonite.	In W. T., p. 393.
3	Devils Pathway, Montana.	J. E. Whitfield.	G. P. Merrill, A. J. S., XXXII, p. 202, 1886.	Trachyte-obsidian dust.	In W. T., p. 397.
4	Little Sage Creek, Montana.	J. E. Whitfield.	G. P. Merrill, A. J. S., XXXII, p. 202, 1886.	Tracnyte-obsidian dust.	In W. T., p. 397.
5	Bozeman, Montana.	F. W. Clarke.	A. C. Peale, U. S. G. S. B. 148, p. 141, 1897.	Trachyte dust.	In W. T., p. 397.

TRACHYTE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
6 B4. IV	60.98	21.69			1.33	1.83	0.80	1.23	11.96						99.82	
7 A4. IV	68.92	16.22			trace	1.62	1.56	4.00	6.00	1.60					99.92	
8 D4. V	57.62	24.47			1.34	8.24	1.00	0.30	8.58						102.05	
9 D4. V	54.0	17.9	4.4	n. d.	n. d.	1.4	5.0	4.5	3.8			8.4			99.4	
10 D3. V	66.21	15.60	1.95	1.85	5.93	1.96	4.46	3.04	2.46						103.46	
11 C3. V	68.8	14.9	0.9	4.3	1.1	1.9	2.7	2.8	2.0						99.4	
12 B4. V	64.49	16.88	6.16	n. d.	3.10	2.45	2.19	3.89	0.55		trace		trace		99.71	
13 B4. V	68.40	14.07	7.15	n. d.	3.21	1.10	5.09	1.70	n. d.						100.72	
14 B3. IV	71.95	15.30	0.56	1.13	1.12	trace	5.80	4.42	0.83		trace				101.11	
15 C3. V	61.97	17.35	1.41	0.78	trace	1.45	2.49	5.21	8.30		0.82				99.78	
16 D4. V	56.36	21.32	7.29	n. d.	2.06	5.07	6.17	3.65							101.92	
17 B3. IV	59.20	20.20	0.94	1.74	1.43	2.26	6.20	5.52	2.47		0.52			SO_3 0.08 Cl 0.03	101.09	
18 B3. IV	58.60	21.60	0.96	1.50	1.78	1.42	4.32	6.48	2.75		0.57				99.98	
19 C2. IV	46.39	19.03	9.79	0.96	5.33	7.02	5.47	2.47	2.04		0.72	0.88		CO_2 0.26 SO_3 0.47 Cl 0.38	101.21	
20 B4. V	58.32	20.88	4.15	n. d.	1.10	2.19	4.11	3.91	5.87						100.53	
21 B4. V	58.15	23.23	1.46	n. d.	trace	2.40	6.93	6.63	1.72						100.52	
22 B3. IV	57.40	23.09	1.94	n. d.	0.13	1.66	8.12	5.70	1.18		0.41		trace	CO_2 trace SO_3 0.57	100.20	
23 C2. IV	66.74	16.91	1.95	0.62	0.15	1.19	6.55	4.11	2.08		0.53		0.08	X 0.40 SO_3 0.10 SrO trace	101.41	
24 C2. IV	61.01	18.45	2.09	0.80	0.94	1.91	7.33	4.75	3.09		0.45		trace	X 0.40 SO_3 0.03	101.25	2.562
25 B4. V	54.58	21.85	4.87	n. d.	0.68	1.89	3.51	5.02	8.47				none		100.87	

TRACHYTE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
6	Fort Ellis, Montana.	F. W. Clarke.	A. C. Peale, U. S. G. S. B. 148, p. 141, 1897.	Trachyte dust.	In W. T., p. 397.
7	Marsh Creek Valley, Idaho.	J. E. Whitfield.	G. P. Merrill, A. J. S., XXXII, p. 202, 1886.	Trachyte-obsidian dust.	In W. T., p. 397.
8	St. Matthew Island, Alaska.	R. M. Chapin.	B. K. Emerson, Harriman Alaska Exp., IV, p. 35, 1904.	Trachyte.	
9	Clipperton Island, Atlantic Ocean.	J. J. H. Teall.	J. J. H. Teall, Q. J. G. S., LIV, p. 230, 1898.	Trachyte.	Phosphatized. Not in W. T.
10	Puente del Inca, Cordillera Mendoza, Argentina.	R. Müller.	A. Stelzner, Btr. G. Argent., I, p. 183, 1885.	Trachyte.	In W. T., p. 397.
11	Arenig, Wales.	J. H. Player.	J. J. H. Teall, Brit. Petrog., p. 339, 1889.	Orthofelsite.	In W. T., p. 135.
12	Newtown head, County Waterford, Ireland.	Jones and Robinson.	F. R. C. Reed, Q. J. G. S., LVI, p. 686, 1900.	Trachyte.	In W. T., p. 397.
13	Begon, near Entrammes, Laval Basin, France.	L. Bertraud.	A. Michel-Levy, C. R., CXXII, p. 265, 1896.	Albitophyre.	In W. T., p. 391.
14	La Bourboule, Mont Dore, Auvergne.	Pisani.	Michel-Levy and Lacroix, C. R., CXLVIII, p. 1721, 1909.	Bostonite.	
15	Route de Guéry, Mont Dore, Auvergne.	Lassieur.	Michel-Levy and Lacroix, C. R., CLII, p. 1202, 1911.	Trachyte pumice.	
16	La Quenille, Mont Dore, Auvergne.	E. Bonjean.	E. Bonjean, C. R., CXXVIII, p. 1097, 1899.	Trachyte.	In W. T., p. 397.
17	Mont Griounot, Cantal, France.	Pisani.	A. Lacroix, C. R., CXLV, p. 496, 1907.	Trachyte.	
18	Mont Griounot, Cantal, France.	Pisani.	A. Lacroix, C. R., CXLV, p. 496, 1907.	Bostonite.	
19	Ferrera, Columbretes Islands, Spain.	R. Pfohl.	F. Becke, T. M. P. M., XVI, p. 173, 1896.	Inclosure in trachyte.	In W. T., p. 299.
20	Brohlthal, Laacher See, Rheinland.	W. Bruhus.	W. Bruhus, Ref., N. J., II, p. 418, 1892.	Trachyte pumice.	In W. T., p. 397.
21	Laacher See, Rheinland.	W. Bruhus.	W. Bruhns, Ref., N. J., II, p. 418, 1892.	Trachyte pumice.	In W. T., p. 397.
22	Laacher See, Rheinland.	W. Bruhus.	W. Bruhus, Ref. N. J., II, p. 418, 1892.	Trachyte.	In W. T., p. 215.
23	Dachberg, Rhöngebirge.	Knoevenagel.	F. Rinne, Jb. Pr. G. L.-A., VII, p. 20, 1887.	Soda trachyte.	In W. T., p. 397.
24	Dachberg, Rhöngebirge.	Deicke.	F. Rinne, Jb. Pr. G. L.-A., VII, p. 21, 1887.	Soda trachyte.	In W. T., p. 397.
25	Schiffenberg, Giessen, Hesse.	F. Roth.	F. Roth, In. Diss. Gies., 1892.	Trachyte pumice.	In W. T., p. 399.

TRACHYTE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2.	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
26 C3. V	64. 47	20. 30	3. 57	0. 91	0. 30	2. 23	3. 34	4. 21	1. 74						101. 07	2. 54
27 B4. V	61. 39	20. 98	4. 15	n. d.	trace.	1. 87	3. 36	4. 67	3. 65						100. 63	2. 48
28 B4. V	70. 59	13. 08	4. 84	n. d.	0. 16	1. 77	3. 09	2. 95	3. 15			trace			99. 63	
29 C4. V	62. 74	22. 30	1. 22	n. d.	trace	0. 71	2. 60	2. 73	8. 16						100. 46	
30 B4. V	60. 70	19. 70	9. 20	n. d.	1. 20	1. 92	2. 40	4. 53	0. 99			trace			100. 64	
31 B4. V	60. 17	17. 40	10. 20	n. d.	trace	3. 55	4. 20	4. 64	0. 43			trace			100. 59	2. 666
32 B4. V	59. 80	18. 30	7. 10	n. d.	trace	4. 30	4. 47	3. 50	1. 85			trace			99. 32	2. 509
33 C4. V	58. 20	21. 40	8. 60	n. d.	trace	4. 50	6. 22		1. 42			trace			100. 34	
34 B4. V	55. 80	20. 00	10. 80	n. d.	trace	5. 22	3. 00	5. 20	0. 58			trace			100. 60	
35 B3. IV	57. 51	20. 37	4. 13	1. 32	1. 99	2. 69	2. 88	3. 38	5. 06		0. 99				100. 32	
36 B4. V	67. 30	20. 75			1. 05	2. 63	2. 75	4. 60	0. 34						99. 42	2. 541
37 B4. V	65. 79	16. 58	5. 18	n. d.	0. 98	3. 05	2. 34	4. 63	1. 83						100. 37	
38 B3. IV	63. 26	16. 05	1. 04	6. 13	1. 29	5. 50	1. 62	3. 18	1. 57			0. 51	0. 14		100. 29	2. 416
39 B3. IV	63. 22	16. 26	1. 41	3. 84	1. 25	4. 75	2. 42	4. 18	1. 87			1. 07	trace		100. 27	2. 481
40 D4. V	59. 36	27. 27	n. d.	3. 16	n. d.	3. 99	1. 11	1. 65	3. 38				0. 14		100. 06	
41 B3. IV	57. 97	17. 65	0. 63	7. 50	1. 71	5. 53	1. 50	5. 31	1. 82			0. 42	0. 09		100. 13	2. 451
42 B3. IV	61. 49	17. 02	5. 15	2. 86	2. 62	6. 18	0. 85	4. 09	0. 10						100. 36	2. 66
43 B3. IV	58. 78	16. 97	1. 13	2. 10	1. 46	7. 27	3. 67	4. 18	3. 60			0. 32	0. 17	SO_3 0.44 Cl trace	100. 09	
44 B3. IV	55. 44	18. 60	2. 09	4. 48	4. 75	6. 76	1. 79	6. 63	0. 25		0. 16	trace			100. 75	2. 700

TRACHYTE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
26	Auerbach, Nördlingen, Ries, Bohemia.	E. Schowalter.	E. Schowalter, In. Diss., Erl., p. 16, 1904.	Trachyte.	
27	Polsing, Nördlingen, Ries, Bohemia.	E. Schowalter.	E. Schowalter, In. Diss. Erl., p. 31, 1904.	Trachyte.	
28	Kaprioriskathal, Bulza, Krasso, Hungary.	K. Roka.	E. Pinkert, F. K., XXXVII, p. 299, 1907.	Trachyte.	
29	Karcsáva, Hungary.	C. v. John.	v. John and Eichleiter, Jb. G. R.-A. Wien, L, p. 689, 1901.	Trachyte.	
30	Fintaer Straz, Eperies Mountains, Hungary.	Steiner.	S. Roth, F. K., XIV, p. 533, 1884.	Trachyte.	In W. T., p. 399.
31	Krivi Javor, Eperies Mountains, Hungary.	Steiner.	S. Roth, F. K., XIV, p. 540, 1884.	Trachyte.	In W. T., p. 399.
32	Klauzura, Eperies Mountains, Hungary.	Steiner.	S. Roth, F. K., XIV, p. 544, 1884.	Trachyte.	In W. T., p. 399.
33	Josefstollen, Dubnik, Hungary.	Steiner.	S. Roth, F. K., XIV, p. 547, 1884.	Trachyte.	In W. T., p. 399.
34	Sosujfalu, Eperies Mountains, Hungary.	Steiner.	S. Roth, F. K., XIV, p. 541, 1884.	Trachyte.	In W. T., p. 399.
35	Repistye, Hungary.	Z. Weyberg.	Z. Weyberg, Ref., N. J., I, p. 398, 1912.	Trachyte.	
36	Monte Amiata, Italy.	A. Lagorio.	A. Lagorio, T. M. P. M., VIII, p. 458, 1887.	Trachyte.	In W. T., p. 399.
37	Monte Amiata, Italy.	L. Ricciardi.	L. Ricciardi, Gazz. Chim. It., XVIII, p. (6), 1888.	Trachyte.	In W. T., p. 185.
38	San Lorenzo, Lake Bolsena, Italy.	L. Ricciardi.	C. Klein, N. J. B. B., VI, p. 3, 1889.	Olivine trachyte.	In W. T., p. 399.
39	Torre Alfina, Lake Bolsena, Italy.	L. Ricciardi.	C. Klein, N. J. B. B., VI, p. 3, 1889.	Olivine trachyte.	In W. T., p. 399.
40	Valle Vidona, Lake Bolsena, Italy.	L. Ricciardi.	C. Klein, N. J. B. B., VI, p. 13, 1889.	Trachyte tuff.	In W. T., p. 399.
41	Bolsena, Lake Bolsena, Italy.	L. Ricciardi.	C. Klein, N. J. B. B., VI, p. 8, 1889.	Trachyte.	In W. T., p. 399.
42	Soriano, Cimino Volcano, near Viterbo, Italy.	G. Aichino.	V. Sabatini, Vulc. Cim., p. 506, 1912.	Labroligoclasite (vulsinite).	
43	Bagnaia, near Viterbo, Italy.	L. Ricciardi.	L. Ricciardi, Gazz. Chim. It., XVIII, 1888.	Trachyte.	In W. T., p. 271.
44	Fontana Fiescoli, near Viterbo, Italy.	H. S. Washington.	H. S. Washington, J. G., IV, p. 837, 1896.	Ciminite.	Al_2O_3 high, MgO low. Cf. No. 8, II.5.2.2. In W. T., p. 399.

TRACHYTE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
45 B4. V	62.50	18.44	3.88	n. d.	0.47	0.83	7.17	4.98	n. d.					Cl 0.22	99.49	
46 B4. V	61.55	19.06	4.14	n. d.	0.62	1.28	6.72	5.31	n. d.						99.78	
47 C4. V	59.65	17.82	4.46	n. d.	0.61	2.35	5.95	7.29	n. d.					Cl 0.88	99.01	
48 D4. V	57.68	22.15	4.74	n. d.	$\underbrace{\qquad}_{1.42}$		2.04	12.06	n. d.			0.12	trace	Cl 0.85	101.06	2.613
49 D4. V	59.38	18.40	4.33	n. d.	0.57	2.24	5.42	6.68	0.24		trace		0.38	Cl 0.84	98.48	
50 D4. V	58.18	18.29	4.63	n. d.	0.68	2.47	5.27	6.93	n. d.		0.25		0.27	Cl 0.89	97.87	
51 C2. IV	57.91	15.79	6.81	0.01	1.66	2.99	6.01	7.27	0.34		0.65	0.01	0.23	Cl 0.61	100.29	2.516
52 D4. V	59.47	18.65	4.50	n. d.	0.59	2.62	4.79	7.12	0.81				0.20	Cl 0.17	98.92	
53 D4. V	59.34	18.48	4.59	n. d.	0.77	2.54	5.12	6.75	n. d.		0.19		0.31	Cl 0.81	98.90	
54 D4. V	59.17	18.65	4.50	n. d.	0.59	2.62	4.82	7.12	0.81				0.20	Cl 0.17	98.65	
55 C4. V	59.12	18.25	12.00	n. d.	0.46	2.35	1.96	3.47	3.45						101.06	
56 D3. V	57.25	19.93	4.83	2.27	1.78	3.40	4.43	6.96	0.49			trace	0.09	Cl 0.29	101.72	
57 C4. V	60.76	20.08	4.46	n. d.	trace	2.07	5.70	6.31	1.37					Cl trace	100.75	
58 B4. V	59.48	16.87	8.55	n. d.	2.30	5.29	3.79	3.85							100.13	
59 D4. V	71.5		$\underbrace{\qquad}_{16.9}$		0.3	1.2	6.5	2.8							99.6	
60 C4. V	60.2	10.0	11.9	n. d.	2.9	6.1	6.0	3.1							100.2	
61 D4. V	64.46	21.09	n. d.	n. d.	0.60	11.07	0.72	0.32							98.57	
62 C4. V	61.49	20.82	5.03	n. d.	0.51	1.98	3.10	7.03				0.03	0.01		100.00	
63 B4. V	68.00	18.50	2.44	n. d.	trace	0.71	4.28	4.80	1.40						100.13	
64 B4. V	66.00	17.30	2.31	n. d.	0.60	0.71	2.22	5.17	6.20						100.61	

TRACHYTE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
45	Vomero, Naples, Italy.	G. Freda.	C. de Stefani, Pet. Mt. Ergh., CLVI, p. 162, 1907.	Piperno (trachyte).	
46	Vomero, Naples, Italy.	G. Freda.	C. de Stefani, Pet. Mt. Ergh., CLVI, p. 162, 1907.	Piperno (trachyte).	
47	St. Elmo, Naples, Italy.	G. Freda.	G. Freda, Rend. Ac. Nap., III, 1889.	Trachyte.	In W. T., p. 399.
48	St. Elmo, Naples, Italy.	L. dell'Erba.	L. dell'Erba, Rend. Ac. Sc. Nap., IV (2), p. 6, 1890.	Sanidinite (trachyte).	In W. T., p. 399.
49	Monte Santo, Naples. Italy.	G. Freda.	G. Freda, Rend. Ac. Sc. Nap., III, 1889.	Trachyte.	In W. T., p. 399.
50	Monte Santo, Naples, Italy.	G. Freda.	G. Freda, Rend. Ac. Sc. Nap., III, 1889.	Trachyte.	In W. T., p. 399.
51	Monte Santo, Naples, Italy.	H. J. Johnston-Lavis.	H. J. Johnston-Lavis, G. Mag. (III), VI, p. 77, 1889.	Trachyte.	In W. T., p. 251.
52	Piazzo Amedeo, Naples, Italy.	G. Freda.	C. de Stefani, Pet. Mt. Ergh., CLVI, p. 162, 1907.	Piperno (trachyte).	
53	Rione Amedeo, Naples, Italy.	G. Freda.	G. Freda, Rend. Ac. Sc. Nap., III, 1889.	Trachyte.	In W. T., p. 399.
54	Rione Amedeo, Naples, Italy.	G. Freda.	G. Freda, Rend. Ac. Sc. Nap., III, 1889.	Trachyte.	In W. T., p. 399.
55	Monte Rotaro, Ischia, near Naples, Italy.	F. Angel.	F. Angel, N. J. B. B., XXX, p. 457, 1910.	Trachyte pitchstone.	Cf. No. 26, I.5.1.3.
56	Concola, Fondo Riccio, Phlegrean Fields, Italy.	E. Manasse.	C. de Stefani, Pet. Mt. Ergh., CLVI, p. 162, 1907.	Trachyte.	Lapilli.
57	Punta di Ricciola, Procida Island, Bay of Naples, Italy.	A. Lagorio.	A. Lagorio, T. M. P. M., VIII, p. 475, 1887.	Trachyte obsidian.	In W. T., p. 399.
58	Grotta dei Palizzi, Vulcano, Aeolian Islands.	Heidepriem.	A. Bergeat, Abh. Bay. Ak. W., XX, p. 166, 1899.	Olivine trachyte.	In W. T., p. 401.
59	Capo Rosso, San Pietro, Sardinia.	S. Bertolio.	S. Bertolio, B. C.,G. It., XXV, p. 418, 1894.	Trachyte.	In W. T., p. 401.
60	Acqua Fredda, Siliqua, Sardinia.	S. Bertolio.	S. Bertolio, B. Soc. G. Fr. (3), XXIII, p. 454, 1895.	Trachyte.	In W. T., p. 401.
61	Angara River, Nijni Tagilsk, Perm, Russia.	D. Beljankin.	L. Lessing, Vh. Rus. M. Ges., XLIII, p. 562, 1905.	Albitite.	
62	Golabara River, Serbia.	A. B. Griffiths.	A. B. Griffiths, Q. J. G. S., XLII, p. 566, 1886.	Trachyte.	In W. T., p. 401.
63	Hagia Paraskevi, Mytilene, Aegean Sea.	L. de Launay.	L. de Launay, Ann. d. Mines (9), XIII, p. 187, 1898.	Rhyolitic trachyte.	Not in W. T.
64	Pyrrha, Mytilene, Aegean Sea.	L. de Launay,	L. de Launay, Ann. d. Mines (9), XIII, p. 187, 1898.	Obsidian.	Not in W. T.

TRACHYTE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
65 B3. IV	70.27	10.59	2.34	0.09	0.51	2.94	1.79	1.70	5.70	4.01		0.04	0.01		100.00	
66 B3. IV	64.70	14.19	3.38	0.35	3.03	5.49	4.38	1.89	2.57			0.02			100.00	
67 B4. V	63.30	19.36	4.81	trace	2.22	4.41	3.77	1.92	0.03	0.17		trace	trace		100.00	
68 B4. V	62.82	22.09	3.98	trace	1.23	3.58	3.37	2.00	0.75	0.18		trace	0.01		100.00	
69 D4. V	65.5	20.0	5.0	n. d.	2.6	0.7	0.4	7.0	0.8		trace				102.0	
70 C?3. V?	60.10	18.80	2.87	0.95	1.15	1.08	8.15	4.65	2.00		1.02	trace			101.77 (100.57)	
71 C3. V	58.0	16.1	4.0	6.2	1.8	5.1	5.5	3.4	1.1						101.2	
72 C4. V	69.32	16.06	1.42	0.88	0.06	0.31	(6.01)	4.23	1.09		0.62				100.00	
73 B3. IV	65.09	14.43	3.21	0.13	0.10	1.18	7.26	3.24	2.42		2.50				99.56	
74 B3. IV	64.38	17.13	5.62	0.28	0.03	0.61	4.59	6.49	1.63		0.56			BaO none SrO none	101.32	
75 D2. V	60.73	18.16	4.63	0.20	0.31	0.10	4.88	6.21	1.33	0.72	0.60	none	0.10	CO_2 trace Cl 0.03 NiO trace	98.00	
76 B3. IV	57.39	16.88	1.09	6.10	1.01	3.16	(6.71)	(5.89)	0.11	0.49	1.11		0.05	NiO 0.04	100.00	
77 D4. V	68.22	16.89	2.75	n. d.	trace	trace	5.30	4.47	0.95						98.58	
78 D4. V	65.97	18.11	trace	4.82	trace	0.98	10.17	trace	0.56						100.61	
79 C4. V	55.87	18.21	n. d.	8.01	0.46	4.54	3.36	5.75	2.28				2.61		101.09	
80 C3. V	70.34	10.13	0.56	4.02	1.74	5.18	5.01	2.06	2.14						101.18	2.525
81 D4. V	70.34	15.40	4.65	n. d.	0.55	trace	4.35	4.65	0.57						100.21	2.57
82 D4. V	61.38	20.60	2.57	n. d.	0.40	2.18	9.70	none	1.98				1.19		100.00	2.590

TRACHYTE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
65	Alget Valley, Armenia.	C. Schmidt.	H. Abich, G. Armen., II, p. 154, 1888.	Quartz trachyte.	SiO_2 includes loss. 3 decimals. Not in W. T.
66	Achalzik Basin, Armenia.	C. Schmidt.	H. Abich, G. Armen., II, p. 155, 1888.	Tridymite trachyte.	SiO_2 includes loss. 3 decimals. Not in W. T.
67	Samsar Volcano, Armenia.	C. Schmidt.	H. Abich, G. Armen., II, p. 156, 1888.	Obsidian.	SiO_2 includes loss. 3 decimals. Not in W. T.
68	Samsar Volcano, Armenia.	C. Schmidt.	H. Abich, G. Armen., II, p. 155, 1888.	Trachyte.	SiO_2 includes loss. 3 decimals. Not in W. T.
69	San Miguel, Azores.	S. Traverso.	S. Traverso. Gior. Min., V, p. 197, 1894.	Trachyte.	In W. T., p. 401.
70	Cap des Biches, Cap Verde, Senegal.	Pisani.	J. Chantard, C. R., CXLIII, p. 921, 1906.	Trachyte.	Sum incorrect. Also in B. Soc. M. Fr., VII, p. 437, 1907.
71	Kadero, Kordofan.	Schweig.	G. Linck, N. J. B. B., XVII, p. 423, 1903.	Gauteite.	
72	Mount Flinders, Queensland.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXIV, p. 88, 1909.	Trachyte.	Na_2O by difference.
73	Little Liverpool Range, Queensland.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXIV, p. 98, 1909.	Soda trachyte.	
74	Dripping Rock, Nandewar Mountains, New South Wales.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXII, p. 903, 1908.	Trachyte.	
75	Berum Buckle, Warrumbungle Mountains, New South Wales.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXII, p. 617, 1907.	Trachyte.	
76	Pinnacle Road, Canobolas Mountains, New South Wales.	H. I. Jensen.	Sussmilch and Jensen, Pr. Linn. Soc. N. S. W., XXXIV, p. 191, 1909.	Phonolitic trachyte.	Alkalies by difference.
77	Mounts Adam and Eve, Brit Brit, Victoria.	J. Dennant.	J. Dennant, Pr. R. Soc. Vict., XIV, p. 11, 1901.	Trachyte.	
78	Camels Hump, Mount Macedon, Victoria.	Newberry.	J. W. Gregory, Pr. R. Soc. Vict., XIV, p. 201, 1902.	Sölvsbergite.	
79	Regatta Point, Port Cygnet, Tasmania.	White.	Macleod and White, Pr. R. Soc. Tasm. (1899), p. 25, 1900.	Sölvsbergite.	MnO high. Cf. No. 9, I.5.2.2. Not in W. T.
80	Tawheterangi, Hauraki, New Zealand.	W. A. McLeod.	W. A. McLeod, Tr. N. Z. Inst., XXXI, p. 490, 1899.	Trachyte.	In W. T., p. 401.
81	Cass Peak, Banks Peninsula, New Zealand.	Students.	R. Speight, Tr. N. Z. Inst., XL, p. 180, 1908.	Trachyte.	
82	Lyttleton Crater, New Zealand.	Survey laboratory.	H. Filhol, III, p. 115, 1885.	Soda trachyte.	Border of dike. In W. T., p. 401.

TRACHYTE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
83 D4. V	60.69	17.75	3.83	n. d.	1.43	1.20	13.10	trace	0.79				1.21		100.00	
84 D4. V	52.18	20.00	5.00	n. d.	1.03	4.92	14.57	2.30	n. d.						100.00	
85 C4. V	66.03	20.52	3.24	n. d.	n. d.	1.32	2.43	2.47	4.24						100.25	
86 C4. V	64.71	18.40	3.72	n. d.	trace	1.83	5.01	4.20	2.26						100.13	
87 C3. V	63.56	15.32	4.29	2.85	0.21	1.90	6.48	2.09	1.21		0.40				98.31 (100.83)	

KERATOPHYRE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 D4. V	73.00	15.61	n. d.	1.95	n. d.	0.79	4.95	0.88	1.06					SO_3 0.76	99.00	2.63
2 B3. IV	71.24	12.20	1.71	5.44	0.13	0.98	4.29	1.86	0.81				0.97		99.63	
3 D4. V	59.36	26.85			0.16	1.85	5.57	4.07	n. d.						99.82	
4 D4. V	62.00	14.80	6.95	n. d.	0.92	3.65	2.96	0.95	5.60						97.83	
5 C4. V	79.36	11.54	0.63	n. d.	n. d.	0.50	6.20	0.51	0.95				1.35	S trace	101.04	2.620
6 C4. V	76.05	14.75	1.55	n. d.	0.95	0.07	0.39	3.26	2.65		trace			S trace	99.67	2.702
7 C4. V	75.60	13.46	3.14	n. d.	0.61	0.25	0.79	2.71	2.75						99.31	2.638
8 C4. V	72.83	14.92	2.28	n. d.	0.32	2.07	2.87	1.46	2.00					CO_2 1.23	100.27	2.676
9 C4. V	72.38	13.63	2.83	n. d.	trace	1.10	3.64	1.37	1.87				1.69	CO_2 1.23 S trace	99.74	2.651
10 C4. V	71.00	17.49	2.55	n. d.	0.87	0.25	1.45	3.30	2.96		trace			CO_2 0.15	100.02	2.684
11 C4. V	70.10	18.93	2.62	n. d.	0.41	0.38	2.75	1.93	2.70		trace	0.35			100.17	2.662
12 D4. V	65.53	22.75	1.79	n. d.	0.18	0.26	0.74	3.16	3.51						97.92	2.711
13 C4. V	64.04	20.98	3.15	n. d.	1.17	0.39	0.43	5.22	3.94		trace	0.38			99.70	2.670
14 C4. V	63.05	25.14	1.23	n. d.	0.36	0.68	5.79	1.81	2.30						100.36	2.638

TRACHYTE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
83	Lyttleton Crater, New Zealand.	Survey laboratory.	H. Filhol, III, p. 115, 1885.	Soda trachyte.	Center of dike. In W. T., p. 401.
84	Lyttleton Crater, New Zealand.	Survey laboratory.	H. Filhol, III, p. 116, 1885.	Soda trachyte.	Center of dike. In W. T., p. 401.
85	Matofao, Tutuila Island, Samoa.	Hobein.	M. Weber, Abh. Bay. Ak. W., XXIV, p. 296, 1909.	Phonolitic trachyte.	
86	Pola Island, Vatia, Tutuila Island, Samoa.	Hobein.	M. Weber, Abh. Bay. Ak. W., XXIV, p. 300, 1909.	Trachyte.	
87	Mount Lyall, Campbell Island.	P. Marshall.	P. Marshall, Subant. Islds., II, p. 692, 1909.	Trachyte.	

KERATOPHYRE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Baraboo, Wisconsin.	C. F. Austin.	S. Weidman, B. Un. Wisc., Sci. Ser., I, p. 47, 1895.	Quartz keratophyre.	In W. T., p. 393.
2	Baraboo Bluffs, Wisconsin.	W. Daniels.	S. Weidman, B. Un. Wisc., I, p. 47, 1895.	Quartz keratophyre.	In W. T., p. 219.
3	Cerro de Cacheuta, Argentina.	Not stated.	O. Stieglitz, T. M. P. M., XXX, p. 357, 1911.	Keratophyre.	Many other analyses in paper, all inferior.
4	Grand Evo, Belgium.	Lindemann.	E. Mathieu, B. Soc. Belg. G., XVII, p. 552, 1903.	Keratophyre.	
5	Kupferberg, Wipperfurth, Westphalia.	Bömer.	O. Mügge, N. J. B. B., VIII, p. 606, 1893.	Keratophyre.	In W. T., p. 393.
6	Schameder, Westphalia.	Bömer.	O. Mügge, N. J. B. B., VIII, p. 667, 1893.	Keratophyre tuff.	In W. T., p. 393.
7	Steimel, Westphalia.	Bömer.	O. Mügge, N. J. B. B., VIII, p. 657, 1893.	Keratophyre tuff.	In W. T., p. 395.
8	Eichacker, near Hofolpe, Westphalia.	Bömer.	O. Mügge, N. J. B. B., VIII, p. 691, 1893.	Keratophyre tuff.	In W. T., p. 395.
9	Wiebelsaal, Westphalia.	Bömer.	O. Mügge, N. J. B. B., VIII, p. 616, 1893.	Keratophyre tuff.	In W. T., p. 395.
10	Kromel, near Schameder, Westphalia.	Bömer.	O. Mügge, N. J. B. B., VIII, p. 668, 1893.	Keratophyre tuff.	In W. T., p. 395.
11	Steimel, Westphalia.	Bömer.	O. Mügge, N. J. B. B., VIII, p. 651, 1893.	Keratophyre tuff.	In W. T., p. 395.
12	Züschen, Westphalia.	Bömer.	O. Mügge, N. J. B. B., VIII, p. 676, 1893.	Keratophyre tuff.	In W. T., p. 395.
13	Steimel, Westphalia.	Bömer.	O. Mügge, N. J. B. B., VIII, p. 651, 1893.	Keratophyre tuff.	In W. T., p. 395.
14	Kupferberg, Wipperfurth, Westphalia.	Bömer.	O. Mügge, N. J. B. B., VIII, p. 606, 1893.	Keratophyre.	In W. T., p. 395.

KERATOPHYRE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
15 C4. V	54.38	32.70	1.86	n. d.	0.20	0.35	1.30	5.40	4.22						100.41	2.742
16 C4. V	49.38	22.31	3.60	10.96	3.35	trace	4.16	0.59	4.50				0.83	S 0.14	99.82	2.740
17 C4. V	78.17	15.29	1.03	n. d.	0.48	n. d.	0.43	2.61	1.33						99.34	
18 B4. V	77.31	10.31	3.18	n. d.	0.88	0.43	6.31	0.89	1.08						100.39	
19 A4. V	76.51	12.92	0.58	n. d.	0.33	n. d.	2.93	6.51	0.72						100.50	
20 B4. V	75.99	14.22	0.92	n. d.	0.54	n. d.	2.62	4.91	1.58						100.78	
21 C4. V	66.43	18.07	1.57	n. d.	0.48	0.36	1.06	11.45	0.56						99.98	
22 B3. IV	66.09	18.85	0.91	n. d.	1.53	1.09	10.84	0.48	1.17		0.23				101.19	
23 C4. V	76.23		15.11		0.12	0.60	5.38	1.90	1.17						100.41	
24 C4. V	74.92	13.21	0.87	n. d.	0.71	0.40	4.92	0.66	3.57						99.26	
25 D4. V	74.27	13.59	2.03	n. d.	1.32	0.73	4.66	0.81	1.42						98.83	
26 C4. V	74.09	12.48	2.15	n. d.	1.08	0.60	5.01	1.52	2.42						99.35	
27 C4. V	72.34	14.07	2.92	n. d.	1.27	0.41	6.28	1.13	1.41						99.83	
28 D4. V	71.39	10.20	6.52	n. d.	0.91	0.61	5.28	2.21	1.94						99.07	
29 D4. V	70.50	15.90	1.03	n. d.	1.42	1.57	4.90	2.70	1.21						99.23	
30 C4. V	81.29	11.59	0.39	n. d.	0.26	0.15	0.28								99.83	
31 C4. V	70.78	16.21	3.06	n. d.	trace	1.26	6.31	0.84	0.87				0.21		99.54	
32 C4. V	69.81	16.02	3.31	n. d.	0.36	0.97	6.71	0.93	0.74				0.25		99.10	

KERATOPHYRE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
15	Siesel, near Pasel, Westphalia.	Bömer.	O. Mügge, N. J. B. B., VIII, p. 622, 1893.	Quartz keratophyre.	Altered. In W. T., p. 395.
16	Kupferberg, Wipperfurth, Westphalia.	Bömer.	O. Mügge, N. J. B. B., VIII, p. 606, 1893.	Keratophyre.	Altered. In W. T., p. 395.
17	Fleckberg, Thuringia.	A. Johnsen.	A. Johnsen, N. J. B. B., XXVII, p. 387, 1909.	Keratophyre tuff.	
18	Lindig, Thuringia.	A. Johnsen.	A. Johnsen, N. J. B. B., XXVII, p. 369, 1909.	Keratophyre.	
19	Masserthal, Thuringia.	Partheil and Johnsen.	A. Johnsen, XXVII, p. 359, 1909.	Quartz keratophyre.	
20	Jagdschirm, Thuringia.	Johnsen and Partheil.	A. Johnsen, N. J. B., XXVII, p. 376, 1909.	Keratophyre tuff.	
21	Olzer Stieg, Thuringia.	A. Johnsen.	A. Johnsen, N. J. B. B., XXVII, p. 385, 1909.	Keratophyre tuff.	
22	Koswinsky Kamen, Ural Mountains.	L. Duparc.	Duparc and Pearce, Oural Nord, I, p. 169, 1902.	Albitite.	
23	Ai Danil, Crimea.	A. Lagorio.	A. Lagorio, Cong. G. Int., VII, Guide XXXIII, p. 27, 1897.	Keratophyre.	In W. T., p. 395.
24	Monastery of St. George, Crimea.	A. Lagorio.	A. Lagorio, Cong. G. Int., VII, Guide XXXIII, p. 27, 1897.	Keratophyre.	In W. T., p. 395.
25	Monastery of St. George. Crimea.	A. Lagorio.	A. Lagorio, Cong. G. Int., VII, Guide XXXIII, p. 27, 1897.	Keratophyre.	In W. T., p. 395.
26	Monastery of St. George, Crimea.	A. Lagorio.	A. Lagorio, Cong. G., Int., VII, Guide XXXIII, p. 27, 1897.	Keratophyre.	In W. T., p. 131.
27	Monastery of St. George, Crimea.	A. Lagorio.	A. Lagorio, Cong. G. Int., VII, Guide XXXIII, p. 27, 1897.	Keratophyre.	In W. T., p. 157.
28	Seragoz, near Ouraga, Crimea.	A. Lagorio.	A. Lagorio, Cong. G. Int., VII, Guide XXXIII, p. 27, 1897.	Taurite (keratophyre).	In W. T., p. 395.
29	Cape Parthenit, Crimea.	A. Lagorio.	A. Lagorio, Cong. G. Int., VII, Guide XXXIII, p. 27, 1897.	Keratophyre.	In W. T., p. 395.
30	Debaroa, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p.110, 1909.	Keratophyre.	Altered.
31	Shuang-Miao, Chi-li, China.	O. Mann.	O. Fleischmann, In. Diss. Leip., p. 21, 1903.	Quartz keratophyre.	
32	Lo-tho-liang, Chi-li, China.	O. Mann.	O. Fleischmann, In. Diss. Leip., p. 21, 1903.	Quartz keratophyre.	

MONZONITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 B3. V	37.32	19.30	n. d.	16.10	10.81	1.47	0.33	8.55	3.01	0.14	0.87	0.19	0.10	CO_2 trace S 0.56 Cu trace	98.75	
2 B4. V	57.11	17.00	12.48	n. d.	1.78	3.99	3.96	2.59			1.59				100.50	
3 D3. V	49.25	16.97	15.21	n. d.	3.00 (Ca)	7.17	4.91	2.01	0.30 (Ca)		1.41	0.76		CO_2 trace	100.99 (Ca)	
4 C2. IV	50.35	15.76	2.32	7.30	7.40	10.12	2.75	3.89	0.45		0.30	0.39	0.35		101.38	
5 B3. IV	48.75	20.10	1.70	6.50	8.42	3.12	2.18	5.71	1.45			0.06		CO_2 1.30	100.45	

DIORITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 D3. V	46.09	17.89	14.22	n. d.	5.04	10.30	3.82	1.10	0.26		3.45	0.05	0.28	S 0.47	102.87	
2 D4. V	52.47	25.54	6.31	n. d.	2.31	6.62	3.23	0.54	1.28			1.16			99.46	2.870
3 B3. IV	49.80	12.89	18.19	0.10	2.85	5.87	4.58	0.24	2.16		1.82	0.58	1.08	BaO 0.28	99.94	2.91
4 B4. V	46.75	17.61	16.79	n. d.	5.12	9.46	2.56	0.55	0.92			0.25			100.01	
5 B4. V	42.44	25.51	19.20	n. d.	0.21	0.37	0.56	0.49	10.92			0.29			99.99	
6 B3. IV	46.65	16.29	n. d.	10.54	8.13	13.22	2.78	trace	1.56		1.03		trace	CO 0.57 S trace	100.77	
7 B4. V	62.41	13.91	9.87	n. d.	2.22	3.15	3.34	3.19	2.57						100.66	
8 C3. V	58.44	17.06	1.36	5.06	2.96	5.82	3.40	2.84	2.12	0.38	0.15	1.41	0.50		101.50	
9 C4. V	58.67	14.89	7.56	n. d.	1.79	5.68	7.69	2.69	0.57				1.00		100.54	
10 B3. IV	48.49	18.99	9.59	1.00	5.05	10.78	3.47	1.42	0.55	0.10					99.44	
11 D2. V	67.97	15.16	1.14	3.48	1.80	3.57	4.48	1.34	1.79		0.74		trace	Cl 0.04 S 0.03 SrO trace	101.54	2.663
12 D2. V	63.00	16.43	1.06	3.40	2.38	4.09	3.89	3.66	2.73		0.89	0.19	0.05	S 0.06 SrO trace	101.83	2.671
13 C2. IV	62.63	16.89	2.58	2.60	3.57	6.33	3.39	1.58	0.61		0.82	0.25		S 0.06	101.26	2.751
14 C2. IV	59.66	18.45	2.17	3.30	1.84	4.70	5.21	2.70	2.33		0.53	0.34	trace	S 0.04	101.29	2.696

MONZONITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Le Roi Mine, Trail Creek District, British Columbia.	M. F. Connor.	R. W. Brock, pers. com.	Monzonite.	Altered.
2	Farsund, Norway.	C. F. Kolderup.	C. F. Kolderup, Berg. Mus. Aarb., No. 5, p. 124, 1896.	Quartz monzonite.	In W. T., p. 391.
3	Dignaes, Gran, Norway.	Damm and Schmelck.	W. C. Brögger, Q. J. G. S., L, p. 19, 1894.	Olivine monzonite.	Cf. Eg. Kg., II, p. 49, 1895. In W. T., p. 391.
4	Smalingen, Fahlun, Sweden.	L. Schmelck.	W. C. Brögger, Eg. Kg., II, p. 46, 1895.	Olivine monzonite.	In W. T., p. 317.
5	Monte Somma, Italy.	Pisani.	A. Lacroix, N. Arch. Mus., (4), IX, p. 150, 1907.	Monzonite.	

DIORITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Havne Fjord, Jones Sound, Ellesmere Land.	P. Schei.	C. Bugge, Rep. 2d Fram Exp., No. 22, p. 37, 1910.	Diorite porphyrite.	
2	Whitefish Bay, Rainy Lake, Ontario.	F. T. Shutt.	A. C. Lawson, Am. G., VII, p. 161, 1891.	Diorite.	In W. T., p. 409.
3	Port Coldwell, Ontario.	F. N. Sheller.	A. P. Coleman, Rep. Bur. Min. Ont., VII, (2), p. 148, 1898.	Diorite.	Not in W. T.
4	North Garden, Albemarle County, Virginia.	G. P. Merrill.	G. P. Merrill, Rocks and soils, p. 225, 1897.	Diorite.	Fresh. Not in W. T.
5	North Garden, Albemarle County, Virginia.	G. P. Merrill.	G. P. Merrill, Rocks and soils, p. 225, 1897.	Diorite.	Weathered. Not in W. T.
6	Summit of Mount St. Elias, Alaska.	E. Mattirolo.	V. Novarese in Filippi and Stella, Sped. Duca Abruz. a Mt. St. E., p. (5), 1897.	Diorite.	In W. T., p. 409.
7	Santa Anita Canyon, San Gabriel Mountains, California.	A. M. Strong.	Arnold and Strong, B. G. S. A., XVI, p. 201, 1905.	Diorite gneiss.	
8	Bodega Peninsula, Marin County, California.	V. C. Osmont.	V. C. Osmont, Un. Cal. B. Dep. G., IV, p. 47, 1904.	Diorite.	
9	Washoe County, Nevada.	J. W. Phillips.	W. C. Day, U. S. G. S. A. R. 18, V, p. 969, 1897.	Diorite.	In W. T., p. 409.
10	San José, Tamaulipas, Mexico.	G. I. Finlay.	G. I. Finlay, An. N. Y. Ac. Sci., XIV, p. 268, 1904.	Diorite.	
11	Cuesta de la Yareta, Argentina.	P. Jannasch.	F. Tannhäuser, N. J. B. B., XXII, p. 610, 1906.	Diorite porphyrite.	
12	Corral Negro, Jujuy, Argentina.	P. Jannasch.	F. Tannhäuser, N. J. B. B., XXII, p. 611, 1906.	Diorite porphyrite.	
13	Caldera, Rioja, Argentina.	Rethwisch.	F. Tannhäuser, N. J. B. B., XXII, p. 612, 1906.	Diorite porphyrite.	
14	Cuesta de la Cienega, San Juan, Argentina.	P. Jannasch.	F. Tannhäuser, N. J. B. B., XXII, p. 613, 1906.	Diorite porphyrite.	

DIORITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
15 C3. V	60.13	17.49	2.89	3.35	5.30	3.72	4.42	3.02	1.04						101.36	
16 B3. IV	58.44	21.43	6.88	0.31	3.66	4.84	0.59	1.14	2.01		trace	0.23	trace	CO_2 0.19 Cl 0.16	99.88	
17 B4. V	53.22	16.84	n. d.	9.27	6.48	8.53	3.54	1.39	0.95						100.22	
18 B3. IV	51.78	19.74	11.20	n. d.	4.52	7.17	1.76	0.99	1.32		0.80	0.07		Cl 0.18 FeS_2 0.54	100.07	
19 B3. IV	55.68	20.94	3.72	3.09	4.75	5.07	2.49	1.74	2.63			0.16		Cl 0.03	100.30	
20 B3. IV	54.09	16.72	n. d.	9.38	5.58	8.35	1.23	0.97	2.58			0.39	0.52	Cl 0.05	99.86	
21 C2. IV	47.1	18.1	3.0	8.5	7.3	6.6	2.4	2.8	3.6		0.4		0.1		99.9	
22 C4. V	50.16	14.00	14.04	n. d.	7.62	9.60	3.97	n. d.	0.39						99.78 (99.69)	
23 C3. V	49.55	12.72	5.28	9.57	4.45	7.37	3.15	trace	3.31				trace	CO_2 4.75	100.15	
24 C3. V	48.50	14.15	7.15	8.26	6.65	10.77	1.97	0.12	3.10				0.33	CO_2 trace FeS_2 0.10	101.10	
25 D4. V	48.40	14.30	16.20	n. d.	6.94	11.09	1.55	0.06	3.25				trace	CO_2 trace S 1.61	103.40	
26 B3. IV	56.1	19.8	5.4	4.1	1.3	7.5	2.9	2.4	0.9						100.4	
27 D3. V	61.10	15.60	trace	5.38	4.52	4.32	2.90	4.12	2.00		1.03	0.31			101.28	
28 C3. V	51.80	22.70	1.74	5.45	5.01	7.12	2.58	2.07	0.87						99.34	
29 B3. IV	49.70	22.10	3.17	5.95	4.97	9.31	2.32	1.75	0.75						100.02	
30 D3. V	48.10	20.10	3.71	6.45	7.61	9.45	2.10	2.50	1.20						101.27	
31 B3. IV	48.80	20.50	4.20	6.35	8.65	8.15	1.52	1.40	1.00						100.57	
32 B3. IV	46.40	21.90	3.87	5.80	3.97	7.96	4.81	3.84	1.08						99.63	
33 C4. V	64.02	20.45	2.85	n. d.	1.28	4.51	3.34	3.54	n. d.						99.99	
34 B3. IV	55.72	21.35	n. d.	8.81	0.63	5.10	5.71	1.23	0.46		0.57		0.36		99.94	

DIORITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
15	Rio Colorado, Juncal Valley, Argentina.	R. Müller.	A. Stelzner, Btr. G. Argent., I, p. 212, 1885.	Andendiorite.	In W. T., p. 409.
16	Netherley Rothes, Morayshire, Scotland.	W. Mackie.	W. Mackie, Tr. G. Soc. Edin., VIII, p. 55, 1901.	Diorite.	Border of boss.
17	Netherley Rothes, Morayshire, Scotland.	W. Mackie.	W. Mackie, Tr. G. Soc. Edin., VIII, p. 55, 1901.	Diorite.	Near center of boss.
18	Netherley Rothes, Morayshire, Scotland.	W. Mackie.	W. Mackie, Tr. G. Soc. Edin., VIII, p. 55, 1901.	Diorite.	Center of boss.
19	Glen Liath, Morayshire, Scotland.	W. Mackie.	W. Mackie, Tr. G. Soc. Edin., VIII, p. 55, 1901.	Diorite.	
20	Dandaleith, Morayshire, Scotland.	W. Mackie.	W. Mackie, Tr. G. Soc. Edin., VIII, p. 55, 1901.	Diorite.	
21	Swinyards Hill, Malvern, England.	J. H. Player.	C. Callaway, Q. J. G. S., XLIX, p. 420, 1893.	Diorite.	In W. T., p. 269.
22	Killiney, County Dublin, Ireland.	S. Templeton.	J. P. O'Reilly, Pr. R. Ir. Ac. (3), VI, p. 22, 1900.	Epidiorite.	Not in W. T.
23	Revin, Faux Valley, Belgium.	C. Klement.	C. Klement, Ref., N. J., I, p. 71, 1890.	Diorite.	In W. T., p. 409.
24	Notre Dame de Meuse, Belgium.	C. Klement.	C. Klement, Ref., N. J., I, p. 71, 1890.	Diorite.	In W. T., p. 409.
25	Between Mairus and Laifour, Belgium.	C. Klement.	C. Klement, Ref., N. J., I, p. 71, 1890.	Diorite.	In W. T., p. 409.
26	Semaphore, St. Quay, Brittany.	Not stated.	J. de Lapparent, B. Soc. M. Fr., XXXIII, p. 265, 1910.	Diorite.	
27	Coume de Nere, Vallée du Lys, Pyrenees.	Pisani.	A. de Romeu, B. Soc. M. Fr., XXX, p. 147, 1907.	Microdiorite.	
28	Vallée de Valbonne, Pyrenees.	Pisani.	A. Lacroix, B. Sv. Ct. G. Fr., XI, No. 71, p. 31, 1900.	Diorite.	Inclusion in granite. Not in W. T.
29	Vallée de Valbonne, Pyrenees.	Pisani.	A. Lacroix, B. Sv. Ct. G. Fr., XI, No. 71, p. 31, 1900.	Diorite.	In W. T., p. 291.
30	Vallée de Valbonne, Pyrenees.	Pisani.	A. Lacroix, B. Sv. Ct. G. Fr., XI, No. 71, p. 31, 1900.	Diorite.	In W. T., p. 287.
31	Vallée de Valbonne, Pyrenees.	Pisani.	A. Lacroix, B. Sv. Ct. G. Fr., XI, No. 71, p. 31, 1900.	Diorite.	In W. T., p. 287.
32	Ullernas, Norway.	G. Forsberg.	W. C. Brögger, Z. K., XVI, p. 49, 1910.	Syenite diorite.	In W. T., p. 301.
33	Kockenhus, Kullen, Sweden.	L. Ramberg.	A. Hennig, Lund. Un. Aars., XXXIV (2), No. 6, p. 41, 1898.	Banatite.	Not in W. T.
34	Kortfors, Orebro, Sweden.	H. Santesson.	H. Bäckström, G. F. F., XVI, p. 108, 1894.	Diorite.	Kugel in granite. In W. T., p. 409.

DIORITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
35 C3. V	53.77	20.86	n. d.	5.93	2.76	5.04	5.01	2.87	1.86		1.21				99.31	
36 C3. V	54.59	21.26	2.76	3.41	1.61	4.84	6.36	4.96	1.32						101.11	
37 C3. V	65.73	17.85	0.93	3.88	1.59	2.81	4.06	3.83	0.79						101.47	
38 C3. V	64.76	17.06	1.06	3.63	2.99	2.74	3.67	3.60	1.74						101.25	
39 C3. V	62.4	20.4	3.9	1.8	2.3	3.1	3.2	1.7	0.8						99.6	
40 B3. IV	56.68	18.00	4.46	4.60	2.92	5.30	4.91	2.81	0.70			0.65	trace	S trace	101.03	
41 C2. IV	47.10	20.40	3.47	7.86	5.62	9.41	2.74	1.37	1.68		0.36	0.29	trace	S 0.05	100.35	
42 C3. V	46.72	26.33	1.34	3.52	3.83	14.00	3.04	0.51	1.02		trace		trace	S 0.11	100.42	2.884
43 B3. IV	62.83	18.66	1.05	4.44	2.37	3.65	3.60	1.28	2.69						100.57	
44 B3. IV	55.43	20.02	2.73	5.06	6.58	3.59	2.98	1.86	1.65		0.76				100.66	
45 B3. IV	48.95	19.48	10.37	1.26	5.71	6.18	4.06	2.00	1.36		0.58				99.95	
46 C3. V	45.06	23.45	1.38	3.82	10.34	9.45	3.26	0.73	1.23		0.30				99.02	
47 B4. V	55.40	16.80	9.25	n. d.	5.19	7.60	3.60	1.39	1.25						100.48	
48 C4. V	46.95	20.35	9.65	n. d.	4.60	12.07	3.38	1.02	1.00						99.02	
49 C3. V	42.44	21.05	4.67	8.61	3.17	15.90	2.84	1.21	1.09						100.98	
50 B3. IV	66.75	15.90	3.73	1.84	1.23	3.11	3.38	1.98	1.22						99.14	
51 B3. IV	51.80	19.05	11.86	1.52	3.53	8.10	3.23	0.99	0.17						101.15	
52 B4. V	57.48	16.82	8.49	n. d.	4.64	5.45	2.63	4.57	0.25						100.33	
53 C4. V	56.77	20.02	6.40	n. d.	3.70	5.40	4.01	3.94	0.13						100.36	
54 D4. V	68.19		20.43		0.50	4.25	6.83	0.89	n. d.						101.09	

DIORITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
35	Slätmossa, Sweden.	H. Bäckström.	H. Bäckström, G. F. F., IX, p. 360, 1887.	Diorite.	Kugel in granite. In W. T., p. 409.
36	Wirvik, Finland.	B. Frosterus.	B. Frosterus, T. M. P. M., XIII, p. 188, 1892.	Diorite.	Kugel in granite. In W. T., p. 409.
37	Lippenhof, near Tryberg, Schwarzwald.	Alibegoff.	G. H. Williams, N. J. B. B., II, p. 624, 1883.	Diorite.	In W. T., p. 409.
38	Lippenhof, near Tryberg, Schwarzwald.	Gattermann.	G. H. Williams, N. J. B. B., II, p. 624, 1883.	Diorite.	In W. T., p. 223.
39	Fuchsberg, Riesengebirge.	W. Herz.	L. Milch, N. J. B. B., XV, p. 184, 1902.	Diorite.	
40	Sopot, Eisengebirge, Bohemia.	C. v. John.	Hinterlechner and v. John, Jb. G. R.-A. Wien, LIX, p. 149, 1909.	Diorite.	
41	Deutsch-Branitz, Brünn, Moravia.	C. v. John.	v. John and Suess, Jb. G. R.-A. Wien, LVIII (1), p. 249, 1908.	Diorite.	
42	Senftenberg, Lower Austria.	J. Morozewicz.	J. Morozewicz, Ref. N. J., 1903, II, p. 367.	Diorite.	
43	Trattenscharte, Schladminger Tauern, Styria.	J. A. Ippen.	J. A. Ippen, Mt. Nw. Ver. Steierm., p. 131, 1901.	Diorite.	Methods poor.
44	Preinthale Hütte, Schladminger Tauern, Styria.	J. A. Ippen.	J. A. Ippen, Mt. Nw. Ver. Steierm., p. 131, 1901.	Diorite.	Methods poor.
45	Trattenscharte, Schladminger Tauern, Styria.	J. A. Ippen.	J. A. Ippen, Mt. Nw. Ver. Steierm., p. 131, 1901.	Diorite.	Methods poor.
46	Kaltenbach Hütte, Schladminger Tauern, Styria.	J. A. Ippen.	J. A. Ippen, Mt. Nw. Ver. Steierm., p. 131, 1901.	Diorite.	Schliere. Methods poor.
47	Kisowa, Schemnitz, Hungary.	C. v. John.	C. v. John, Jb. G. R.-A. Wien, XXXVIII, p. 350, 1888.	Diorite.	In W. T., p. 409.
48	Jablanica, Herzegowina.	C. v. John.	C. v. John, Jb. G. R.-A. Wien, XXXVIII, p. 349, 1888.	Diorite.	In W. T., p. 411.
49	Mal Inverno, Monzoni, Tyrol.	C. Doelter.	C. Doelter, T. M. P. M., XXI, p. 75, 1902.	Diorite.	
50	Val Moja, near Edolo, Lombardy.	C. Riva.	C. Riva, At. Soc. It. Mil., XXXVI, p. 141, 1896.	Diorite.	In W. T., p. 411.
51	Val Moja, near Edolo, Lombardy.	C. Riva.	C. Riva. Ref. N. J., II, p. 64, 1897.	Diorite porphyrite.	In W. T., p. 411.
52	Passo di Campo, Lago d'Arno, Lombardy.	C. Riva.	C. Riva, At. Soc. It. Mil., XXXVII, p. 84, 1897.	Diorite.	In W. T., p. 411.
53	Lago d'Arno, Lombardy.	C. Riva.	C. Riva, At. Soc. It. Mil., XXXVII, p. 84, 1897.	Diorite.	In W. T., p. 411.
54	Koswinsky Kamen, Ural Mountains.	L. Duparc.	Duparc and Pearce, Oural Nord. I, p. 154, 1902.	Diorite.	

DIORITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
55 D4. V	62.00	22.71	0.85	n. d.	0.21	7.12	6.70	0.43	1.38						101.40	
56 D4. V	60.42	23.38	0.52	n. d.	0.36	7.68	6.93	0.48	1.81						101.58	
57 D4. V	56.87		25.62		0.66	9.55	6.18	0.81	1.79						101.48	
58 D4. V	56.65	25.59	0.57	n. d.	0.34	8.22	6.62	0.25	2.38						100.62	
59 D3. V	62.20	19.63	1.13	5.93	1.51	6.64	4.54	1.06	0.86						101.50 (100.70)	
60 D3. V	56.03	21.43	1.48	1.97	2.05	11.03	1.01	0.91	2.85						98.76	
61 C3. V	48.57	22.40	4.69	3.49	3.95	13.25	2.80	0.17	0.98						100.30	
62 D3. V	49.50	19.61	2.38	6.66	5.28	10.75	4.99	2.35	0.64						102.20	
63 D3. V	44.74	14.29	2.84	7.49	11.48	13.70	1.56	0.45	1.99						98.59	
64 B3. IV	46.88	13.84	0.20	9.20	12.63	13.13	1.89	0.25	2.40		0.71		0.03		101.16	
65 C3. V	60.56	17.00	1.98	3.22	2.55	2.96	2.72	4.26	4.14						99.39	
66 C3. V	57.69	17.38	1.15	7.83	2.59	4.30	2.24	4.94	1.11						99.23	
67 B4. V	47.32	14.96	5.09	9.88	6.44	9.50	3.15	n. d.	2.80						99.14	
68 C3. V	47.25	12.19	1.11	9.83	6.76	11.74	2.20	0.07	7.85						99.00	
69 B4. V	60.23	15.96	7.47	n. d.	2.64	8.19	3.73	0.98	0.89						100.09	
70 B3. IV	64.4	15.5	1.1	2.5	2.1	3.6	7.0	2.9	0.5		1.2				100.8 (99.6)	
71 D4. V	53.06	18.41	9.12	n. d.	4.74	8.98	(4.27)		0.37						100.00	
72 C3. V	53.73	23.68	4.11	1.94	3.65	3.05	3.34	4.80	0.48	0.09	0.30	0.13	0.16		99.46	
73 A4. IV	48.88	16.45	9.76	n. d.	7.16	11.90	2.95	0.44	1.88				0.60		100.02	
74 C4. V	63.77	16.30	7.49	n. d.	2.49	6.33	3.68	1.21	none						101.27	

DIORITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
55	Koswinsky Kamen, Ural Mountains.	L. Duparc.	Duparc and Pearce, Oural Nord, I, p. 134, 1902.	Plagiaplite.	
56	Koswinsky Kamen, Ural Mountains.	L. Duparc.	Duparc and Pearce, Oural Nord, I, p. 134, 1902.	Diorite aplite.	
57	Koswinsky Kamen. Ural Mountains.	L. Duparc.	Duparc and Pearce, Oural Nord, I, p. 134, 1902.	Diorite aplite.	Not fresh.
58	Koswinsky Kamen, Ural Mountains.	L. Duparc.	Duparc and Pearce, Oural Nord: I, p. 134, 1902.	Plagiaplite.	Not fresh.
59	Gladkaia Sopka, Wagran Basin, Ural Mountains.	Not stated.	Duparc and Pearce, C. R., CXL, p. 1615, 1905.	Gladkaite (quartz diorite).	
60	Dshaksy, Tau Mountains, Ural Mountains.	L. Lessing.	E. Jeremina, Btr. Exp. Mugo., p. 130, 1905.	Diorite.	
61	Bochtybai, Mugodjaren, Ural Mountains.	Leberta.	Jeremina and Loewinson-Lessing, Trav. Soc. Nat. St. P., XXXIII, p. 155, 1905.	Microdiorite.	
62	Beresowska, Ural Mountains.	Loewinson-Lessing.	Loewinson-Lessing, G. Sk. Jushno. Dorpat., p. 244, 1900.	Syenite-diorite.	In W. T., p. 411.
63	Supreya, Deneshkin Kamen, Ural Mountains.	Loewinson-Lessing.	Loewinson-Lessing, G. Sk. Jushno. Dorpat., p. 166, 1900.	Microdiorite.	In W. T., p. 411.
64	Golaia Gora, Tagil District, Ural Mountains.	Not stated.	Duparc and Pamfil, B. Soc. M. Fr., XXXIII, p. 360, 1910.	Diorite.	Not fresh.
65	Ssadon, Caucasus.	Loewinson-Lessing and Beljankin.	Loewinson-Lessing, Vh. Rus. M. Ges., XLII, p. 245, 1905.	Chlorite banatite.	Not fresh.
66	Darial, Kasbek, Caucasus.	Loewinson-Lessing and Sewastjanow.	Loewinson-Lessing, Mat. G. Rus., XXI, p. 107, 1901.	Syenite-diorite.	Segregation in granite.
67	Assa, Caucasus.	Loewinson-Lessing and Krikmeyer.	Loewinson-Lessing, Ref., N. J., II, p. 234, 1899.	Metadiorite.	In W. T., p. 411.
68	Caucasus.	Loewinson-Lessing and Krikmeyer.	Loewinson-Lessing, Ref., N. J., II, p. 234, 1899.	Metadiorite.	In W. T., p. 411.
69	Menerville, Algeria.	Duparc and Pearce.	Duparc, Pearce, and Ritter, Mem. Soc. Ph. Gen., XXXII, No. 2, p. 32, 1900.	Microdiorite.	In W. T., p. 411.
70	Gebel Doukhan, Egypt.	Not stated.	Couyat, C. R., CXLVII, p. 868, 1908.	Diorite.	
71	Mount Stanley, Ruwenzori, Uganda.	A. Roccati.	A. Roccati in Duca Abruzzi, Il Ruwenzori, p. 224, 1909.	Diorite.	
72	Anabar River, Siberia.	H. Backlund.	H. Backlund, Trav. Mus. G. Pet. Gr., I, p. 141, 1907.	Diorite?	
73	Taimgeya River, Okhotsk, Siberia.	Not stated.	K. E. Bogdanovitch, Fund. Marek., p. 56.	Diorite.	
74	Arthur's Seat, Shevaroy Hills, Madras, India.	T. L. Walker.	T. H. Holland, Mem. G. S. Ind., XXVIII, p. 151, 1900.	Hypersthene diorite.	In W. T., p. 411. Cf. No. 213, II. 4.3.4.

DIORITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
75 B3. IV	54.34	17.53	8.21	0.20	3.07	7.54	2.74	1.59	2.51		0.59	2.23			100.55	2.90
76 B3. IV	51.48	20.31	6.24	3.46	4.29	8.86	3.01	2.07	0.75	0.16					100.63	
77 C3. V	51.08	1.47	3.57	25.30	4.12	8.15	2.13	0.22	3.54	0.32					99.90	
78 C3. V	50.71	4.74	2.26	20.64	4.21	13.48	1.03	0.18	3.24	0.18					100.27	
79 C3. V	49.89	1.87	2.61	23.47	6.57	10.75	2.01	0.09	3.16	0.37					100.79	
80 C3. V	49.20	3.64	0.84	25.00	6.76	10.66	0.76	0.06	3.24	0.46					100.62	
81 C3. V	50.67	21.21	11.31	0.21	4.10	6.86	1.41	0.10	2.74	0.50					99.11	
82 C3. V	47.94	21.96	2.48	3.42	6.83	12.63	1.49	0.19	2.26	0.12					99.35	
83 B3. IV	48.12	16.57	2.60	3.27	6.67	10.42	5.79	1.16	4.04		0.36				99.00	
84 C3. V	50.00	20.96	3.29	7.32	4.84	8.02	3.17	1.50	0.83				0.11		100.04	2.893
85 C4. V	41.66	17.46	10.40	n. d.	4.54	8.54	0.44	0.74	14.76	0.76					99.30	

PORPHYRITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 C2. IV	46.91	16.67	11.46	5.57	3.61	6.06	3.86	0.78	n. d.		3.23	1.08	trace		99.23	
2 B4. V	51.93	18.13	8.92	n. d.	5.30	9.82	4.34	1.42	0.69						100.75	
3 B3. IV	49.65	16.36	4.39	7.19	8.00	9.18	2.49	1.17	2.39						100.82	
4 C2. IV	40.02	16.13	n. d.	14.98	12.90	1.05	0.67	8.17	2.82	0.13	0.46	0.30	0.11	CO_2 0.24 S 0.39	98.37	
5 C3. V	60.84	20.03	1.47	0.42	0.45	1.56	9.12	4.43	1.15					CO_2 0.11 SO_3 0.06	99.64	2.683
6 C4. V	62.20	21.18	1.42	n. d.	trace	2.20	9.60	2.60	(0.80)						100.00	
7 C4. V	57.50	27.61	2.00	n. d.	2.17	2.10	6.11	1.30	1.91			trace			100.70	
8 C4. V	52.59	18.57	8.62	n. d.	9.18	1.94	1.12	3.99	3.11						99.11	

DIORITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
75	Chin-chao yi, West Kansu, China.	C. Pfeil.	K. Futterer, Durch Asien, III, (4), p. 23, 1911.	Diorite.	Iron oxides? P_2O_5 high.
76	Gold Creek, Benguet, Luzon, Philippine Islands.	P. J. Fox.	A. J. Eveland, Phil. J. Sci., (A), II, p. 224, 1907.	Diorite.	
77	Antamok River, Benguet, Luzon, Philippine Islands.	R. F. Bacon.	A. J. Eveland, Phil. J. Sci., (A), II, p. 224, 1907.	Diorite.	Al_2O_3 and iron oxides?
78	Baguio District, Benguet, Luzon, Philippine Islands.	R. F. Bacon.	A. J. Eveland, Phil. J. Sci, (A), II, p. 224, 1907.	Diorite.	Al_2O_3 and iron oxides?
79	Baguio District, Benguet, Luzon, Philippine Islands.	R. F. Bacon.	A. J. Eveland, Phil. J. Sci., (A), II, p. 224, 1907.	Diorite.	Al_2O_3 and iron oxides?
80	Antamok, River, Benguet Luzon, Philippine Islands.	R. F. Bacon.	A. J. Eveland, Phil. J. Sci., (A), II, p. 224, 1907.	Diorite.	Al_2O_3 and iron oxides?
81	Mancayan, Lepanto, Luzon, Philippine Islands.	L. S. Salinger.	A. J. Eveland, Min. Bur. Manila B. 4, p. 39, 1905.	Diorite.	
82	Mancayan, Lepanto, Luzon, Philippine Islands.	L. S. Salinger.	A. J. Eveland, Min. Bur. Manila B. 4, p. 39, 1905.	Diorite.	
83	Kabaena Island, Celebes.	Tillmann.	W. Wunderlein, Samml. G. Mus. Leid., IX, p. 248, 1913.	Diorite.	
84	Ajer Loewoh, Sumatra.	Reuter.	R. D. M. Uerbeek, Sum. Westk., p. 232, 1883.	Diorite.	Not in W. T.
85	All Nations mine, Matlock, Victoria.	F. E. A. Stone.	J. W. Gregory, Vict. Dep Min. Spec. Rep., p. 31, 1905.	Diorite.	

PORPHYRITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Nain, Labrador.	A. Wichmann.	A. Wichmann, Z. D. G. G., XXXVI, p. 494, 1884.	Mica porphyrite.	In W. T., p. 285.
2	Kennebunkport, Maine.	H. A. Flint.	J. F. Kemp, Am. G., V, p. 138, 1890.	Augite porphyrite.	In W. T., p. 413.
3	Frogrock Lake, Minnesota.	Dodge and Sidener.	M. E. Wadsworth, Minn. G. S. B. 2, p. 126, 1887.	Porphyrite.	In W. T., p. 331.
4	War Eagle mine, Trail Creek District, British Columbia.	M. F. Connor.	R. W. Brock, pers. com.	Porphyrite.	
5	Dunmoor Hill, Cheviot Hills, Scotland.	I. Macadam.	H. Kynaston, Tr. G. Soc. Edin., VII, p. 401, 1899.	Biotite porphyrite.	Na_2O high. Cf. ref. In W. T., p. 211.
6	Clermain, near Cluny, Saone-et-Loire, France.	Not stated.	Michel-Levy and Lacroix, B. Sv. Ct. G. Fr., VII, No. 45, p. 6, 1895.	Mica porphyrite.	H_2O by difference. In W. T., p. 413.
7	Clermain, near Cluny, Saone-et-Loire, France.	Not stated.	Michel-Levy and Lacroix, B. Sv. Ct. G. Fr., VII, No. 45, p. 7, 1895.	Mica porphyrite.	In W. T., p. 413.
8	Pelvoux, Dauphiny, France.	P. Termier?	P. Termier, C. R., CXXIV, p. 635, 1897.	Porphyrite.	Not fresh. In W. T., p. 413.

PORPHYRITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
9 C4. V	47. 60	19. 10	11. 55	n. d.	6. 95	7. 82	3. 50	1. 94	2. 98						101. 44	
10 B4. V	49. 34	14. 52	16. 05	n. d.	5. 72	9. 11	3. 02	1. 23	1. 60						100. 59	
11 D3. V	49. 17	14. 59	3. 91	12. 94	4. 32	8. 78	3. 68	0. 79	0. 58						98. 76	
12 C3. V	48. 87	12. 11	3. 17	10. 21	3. 52	15. 18	5. 11	1. 81	0. 58		0. 72		trace		101. 28	3. 1
13 D3. V	65. 35	15. 78	2. 39	3. 18	2. 62	1. 59	3. 45	4. 94	2. 29						101. 59	2. 648
14 B3. IV	53. 29	18. 87	4. 09	4. 53	2. 47	5. 71	4. 07	3. 66	2. 66						99. 35	2. 765
15 B4. V	64. 86	16. 67	6. 92	n. d.	2. 52	2. 19	4. 21	2. 15	n. d.		0. 14	0. 13			99. 79	2. 663
16 B3. IV	60. 22	16. 96	6. 34	0. 80	1. 05	3. 19	5. 53	4. 32	1. 53		trace	0. 44		SO_3 0. 07	100. 45	2. 662
17 A4. IV	54. 60	18. 52	5. 90	n. d.	7. 20	1. 44	4. 10	1. 99	6. 20						99. 95	2. 66
18 C4. V	50. 22	20. 18	10. 46	n. d.	2. 87	2. 25	7. 21	2. 73	1. 40					CO_2 4. 03	100. 35	2. 60
19 B3. IV	64. 23	14. 88	8. 46	0. 44	2. 35	1. 85	2. 11	3. 01	3. 19						100. 52	2. 56
20 B3. IV	59. 44	18. 97	5. 25	1. 72	0. 85	6. 85	3. 08	2. 46	1. 22						99. 84	2. 65
21 B3. IV	54. 44	19. 97	7. 52	0. 52	5. 15	3. 11	2. 26	3. 58	4. 18						100. 73	2. 62
22 D4. V	45. 45	16. 78	n. d.	15. 66	3. 07	10. 19	2. 77	1. 42	2. 85					CO_2 2. 03	100. 22	
23 B3. IV	75. 21	11. 78	2. 89	0. 55	0. 31	1. 94	2. 84	2. 63	1. 85			0. 74	0. 26		101. 00	
24 C3. V	72. 36	12. 88	4. 54	0. 27	0. 93	2. 31	4. 63	1. 99	1. 19			0. 13	0. 12		101. 35	
25 B3. IV	48. 81	17. 14	13. 83	0. 87	1. 84	9. 08	1. 70	0. 92	3. 24				trace	CO_2 0. 29 FeS_2 1. 76	99. 48	
26 B4. V	63. 44	16. 66	6. 94	n. d.	3. 15	5. 14	1. 81	2. 24	0. 85						100. 23	
27 B3. IV	62. 90	16. 58	2. 15	1. 70	1. 50	4. 29	4. 29	1. 09	1. 82					S 0. 89 CuO 2. 73	99. 94	
28 D4. V	52. 90	18. 54	7. 03	n. d.	8. 22	6. 11	n. d.	n. d.	1. 07						93. 87	

PORPHYRITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
9	Pelvoux, Dauphiny, France.	P. Termier?	P. Termier, C. R., CXXIV, p. 635, 1897.	Porphyrite.	Fresh. In W. T., p. 413.
10	Työläjärvenoja, near Tammerfors, Finland.	H. Berghell.	J. J. Sederholm, B. C. G. Fin., No. 6, p. 66, 1899.	Uralite porphyrite.	Not in W. T.
11	Föglö, Finland.	H. Berghell.	B. Frosterus, Fin. G. Und., Bl. 25, p. 23, 1894.	Labradorite porphyrite.	In W. T., p. 413.
12	Poutelitschorr, Umptek, Kola. Finland.	H. Berghell.	V. Hackman, Fennia, XI, No. 2, p. 193, 1894.	Augite porphyrite.	In W. T., p. 349.
13	St. Ameriner Thal, Vogesen.	P. Eitner.	A. Osann, Abh. G. Kt. Els. Loth., III, p. 132, 1887.	Labradorite porphyrite.	In W. T., p. 413.
14	Barnabas Bridge, Murbach, Vogesen.	A. Denniger.	A. Osann, Abh. G. Kt. Els. Loth., III, p. 123, 1887.	Labradorite porphyry.	In W. T., p. 281.
15	Hasenberg, near Magdeburg, Hesse.	Bodländer.	F. Klockmann, Jb. Pr. G. L.-A., XI, p. 210, 1892.	Augite porphyrite.	In W. T., p. 413.
16	Wambacher Hof, Pfalz, Bavaria.	K. Klüss.	A. Leppla, Jb. Pr. G. L.-A., XIV, p. 139, 1894.	Porphyrite.	In W. T., p. 263.
17	Schniftenberg, near Oberwiesen, Pfalz, Bavaria.	P. Weidinger.	M. Schuster, Geog. Jbft., XXVI, p. 245, 1914.	Augite porphyrite.	
18	Morsfeld, Pfalz, Bavaria.	H. Niklas.	M. Schuster, Geog. Jbft., XXVI, p. 259, 1914.	Porphyrite.	
19	Wilsdruff, Saxony.	W. Bruhns.	W. Bruhns, Z. D. G. G., XXXVIII, p. 749, 1886.	Mica porphyrite.	In W. T., p. 219.
20	Kaufbach, Saxony.	W. Bruhns.	W. Bruhns, Z. D. G. G., XXXVIII, p. 754, 1886.	Augite porphyrite.	In W. T., p. 191.
21	Potschapel, Saxony.	W. Bruhns.	W. Bruhns, Z. D. G. G., XXXVIII, p. 748, 1886.	Hornblende porphyrite.	In W. T., p. 413.
22	Mühlenthal, Harz.	Streng.	K. A. Lossen, Jb. Pr. G. L.-A., VI, p. 213, 1886.	Labradorite porphyrite.	In W. T., p. 413.
23	Near Cimic, Moldauthal, Bohemia.	Neumann.	J. Klvana, Ref. N. J., 1898, I, p. 485.	Radiolite porphyrite.	In W. T., p. 415.
24	Near Klecanky, Moldauthal, Bohemia.	Neumann.	J. Klvana, Ref. N. J., 1898, I, p. 485.	Radiolite porphyrite.	In W. T., p. 415.
25	Lohovicthal, near Kladno, Bohemia.	J. Friedrich.	F. Slavik, Arch. Landdf. Böhm., XIV (2), p. 80, 1908.	Augite porphyrite.	
26	Cernygraben, Bachergebirge, Styria.	A. Pontoni.	A. Pontoni, T. M. P. M., XIV, p. 371, 1895.	Mica porphyrite.	In W. T., p. 415.
27	St. Wolfgang, Bachergebirge, Styria.	B. Trobei.	B. Trobei, Mt. N. v. Ver. Steierm., XLIV, p. 179, 1908.	Quartz porphyrite.	CuO high.
28	Miessling, Bachergebirge, Styria.	A. Pontoni.	A. Pontoni, T. M. P. M., XIV, p. 372, 1895.	Porphyrite.	In W. T., p. 415.

PORPHYRITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
29	63.85	20.76	2.09	0.60	0.25	0.66	7.69	1.96	0.71	1.30					99.87	
B3. IV																
30	70.92	16.56	0.91	1.56	0.58	3.65	3.18	1.71	1.08			0.93	trace		101.14	
C3. V																
31	58.85	18.15	4.03	4.22	2.52	6.00	3.01	2.78	1.97						101.55	
D3. V																
32	57.25	17.35	3.03	4.20	3.04	6.75	3.04	3.48	1.52			0.86		S 0.69	101.21	
C3. V																
33	59.73	20.39	1.41	3.39	1.01	1.98	8.24	1.10	2.22	0.33	1.16				100.96	2.72
B3. IV																
34	53.82	17.65	8.49	1.93	4.42	2.98	5.34	0.82	2.82	0.20	1.98				100.45	2.76
B3. IV																
35	68.77	15.93	4.52	n. d.	2.04	2.88	2.52	2.21	1.86			trace			100.73	2.9
B4. V																
36	53.71	25.51	7.19	1.74	1.24	4.60	4.50	1.15	0.20						99.84	
C3. V																
37	47.77	20.95	12.27	n. d.	0.54	8.18	4.31	1.88	2.26			0.43	1.05		99.64	
D4. IV																
38	57.00	17.71	7.92	n. d.	1.39	2.96	6.66	4.08	1.69			trace	trace		100.05	2.68
B4. V																
39	48.18	16.55	11.05	n. d.	7.35	11.19	3.66	0.46	1.48		trace				99.92	3.04
B4. V																
40	47.77	15.87	13.82	n. d.	5.97	11.95	3.97	0.22	1.02		trace				100.59	3.05
B4. V																
41	68.00	12.56	3.26	n. d.	4.20	5.28	4.57	0.95	2.11						100.93	
B4. V																
42	47.43	16.65	11.29	1.28	5.77	10.84	1.58	2.37	3.50						100.71	
B4. V																
43	56.71	17.92	8.13	n. d.	4.27	7.67	2.59	0.44	3.22						100.35	
B4. V																
44	54.10	15.91	7.18	n. d.	5.83	6.91	3.76	0.64	3.98						98.31	
D4. V																
45	49.57	19.59	13.83	n. d.	7.25	3.82	1.20	0.36	5.19						100.81	
C4. V																
46	48.97	21.32	0.58	7.20	10.55	4.94	2.04	0.42	3.90						99.92 (99.52)	
C4. V																
47	46.27	16.87	14.70	n. d.	5.97	3.73	7.86	0.87	3.08						99.35	
B4. V																
48	(55.29)	20.33	6.34	trace	6.62	5.89	2.97	1.63	0.38	0.55		trace	0.02		100.00	
D4. V																

PORPHYRITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
29	Varfalva, Tur-Toroczko range, Hungary.	S. v. Szentpetry.	S. v. Szentpetry, Muz. Füz., I, p. 238, 1912.	Albite-oligoclase porphyrite.	
30	Ultenthal, Vintschgau, Tyrol.	C. v. John.	W. Hammer, Jb. G. R.-A. Wien, LIII, p. 80, 1904.	Aplitic porphyrite.	
31	Pradaccio, Tyrol.	C. v. John.	W. Hammer, Jb. G. R.-A. Wien, LIII, p. 71, 1904.	Porphyrite.	
32	Ultenthal, Vintschgau, Tyrol.	C. v. John.	W. Hammer, Jb. G. R.-A. Wien, LIII, p. 71, 1904.	Hornblende porphyrite.	
33	Engiseelein, Verrucano, Switzerland.	L. Hezner?	R. Beder, In. Diss. Zür., p. 26, 1909.	Andesine porphyrite.	
34	Funckenstock, Verrucano, Switzerland.	L. Hezner?	R. Beder, In. Diss. Zür., p. 25, 1909.	Augite porphyrite.	
35	Cima Fontana Fredda, Carnic Alps, Veneto.	M. Gortani.	M. Gortani, Mem. Soc. Tosc., XXII, p. 172, 1906.	Quartz porphyrite.	
36	Val Moja, Adamello, Lombardy.	C. Riva.	C. Riva, Ref., N. J., II, p. 64, 1897.	Hornblende porphyrite.	In W. T., p. 415.
37	Valdieri, Alpi Marittimi, Piedmont.	G. Aichino.	S. Franchi, B. C. G. It., XXV, p. 245, 1894.	Hornblende porphyrite.	In W. T., p. 415.
38	Provaglio, Val Sabbia, Brescia, Italy.	C. Riva.	C. Riva, Gior. Min., IV, p. 200, 1893.	Hornblende porphyrite.	In W. T., p. 415.
39	Colle Sagnette, Po Valley, Italy.	G. Aichino.	S. Franchi, B. C. G. It., XXXI, p. 127, 1900.	Porphyrite.	In W. T., p. 415.
40	Lobbia di Viso, Po Valley, Italy.	G. Aichino.	S. Franchi, B. C. G. It., XXXI, p. 127, 1900.	Porphyrite.	In W. T., p. 415.
41	Jalguba, Olonez, Russia.	Not stated.	Loewinson-Lessing, Ref., N. J., 1890, II, p. 267.	Augite porphyrite.	In W. T., p. 415.
42	Jalguba, Olonez, Russia.	Not stated.	Loewinson-Lessing, Ref., N. J., 1890, II, p. 267.	Augite porphyrite.	In W. T., p. 415.
43	Alouchta, Crimea.	A. Lagorio.	A. Lagorio, Cong. G. Int., VII, Guide XXXIII, p. 27, 1897.	Quartz porphyrite.	In W. T., p. 415.
44	Kourtzy, Simferopol, Crimea.	A. Lagorio.	A. Lagorio, Cong. G. Int., VII, Guide XXXIII, p. 27, 1897.	Quartz porphyrite.	In W. T., p. 415.
45	Caucasus.	Jastrzembsky.	Loewinson-Lessing, Ref., N. J., 1899, II, p. 234.	Porphyritoid.	In W. T., p. 415.
46	Caucasus.	Jastrzembsky.	Loewinson-Lessing, Ref., N. J., 1899, II, p. 234.	Hornblende porphyrite.	In W. T., p. 415.
47	Roschka, Caucasus.	Makerow.	Loewinson-Lessing, Ref., N. J., 1899, II, p. 234.	Augite porphyrite.	In W. T., p. 415.
48	Goldabegh, Goktschai Lake, Armenia.	C. Schmidt.	H. Abich, G. Armen., II, p. 156, 1888.	Augite porphyrite.	SiO_2 includes loss. 3 decimals. Not in W. T.

PORPHYRITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
49 D3. V	(45. 70)	26. 29	5. 57	1. 21	4. 16	8. 58	4. 07	2. 29	1. 47	0. 44	trace	0. 22	0. 01		100. 00	
50 D4. V	(46. 64)	21. 26	12. 40	n. d.	3. 51	7. 67	2. 73	1. 30	1. 57	2. 86		0. 05	0. 02		100. 00	
51 D3. V	(46. 30)	22. 57	3. 35	5. 39	4. 65	8. 69	2. 45	1. 26	4. 59	0. 58		0. 16	0. 02		100. 00	
52 B3. IV	56. 12	21. 37	5. 03	1. 97	1. 65	7. 80	3. 80	0. 62	1. 62				trace		99. 98	2. 77
53 B3. IV	49. 86	20. 35	7. 36	1. 51	5. 89	6. 18	2. 39	1. 23	5. 02						99. 79	2. 70
54 D2. V	55. 28	16. 68	3. 07	4. 40	2. 38	5. 90	3. 45	2. 03	2. 86	0. 26	1. 54	0. 31	0. 33	FeS_2 0. 03	98. 52	2. 72
55 D1. IV	59. 27	17. 80	2. 46	3. 39	2. 39	5. 39	4. 87	2. 51	1. 18	0. 31	0. 62	0. 44	0. 10	CO_2 0. 69 ZrO_2 0. 05 Cl 0. 07 S 0. 33 Cr_2O_3 none NiO 0. 01 BaO none SrO none	101. 88	2. 86
56 B3. IV	72. 39	14. 42	0. 56	0. 30	1. 85	0. 85	5. 93	1. 23	1. 13	0. 55		trace			99. 22	2. 632
57 C3. V	64. 00	19. 11	2. 22	2. 80	2. 17	5. 13	1. 12	0. 14	1. 01					CO_2 1. 71 FeS_2 1. 58	100. 99 (101. 19)	

ANDESITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 B4. V	53. 75	18. 37	8. 28	n. d.	5. 63	3. 22	7. 05	1. 20	3. 34			trace	trace	CO_2 trace	100. 04	
2 C3. V	61. 11	19. 28	1. 87	3. 96	1. 38	4. 40	4. 53	1. 07	1. 20				0. 44		99. 24	
3 C3. V	60. 61	16. 61	1. 97	5. 09	3. 10	4. 46	3. 11	0. 25	2. 45					CO_2 1. 57	99. 22	
4 C3. V	52. 94	14. 70	2. 52	7. 80	4. 49	6. 56	3. 09	0. 04	2. 04					CO_2 4. 86	99. 04	
5 D4. V	68. 54		21. 27		0. 46	n. d.	3. 45	4. 15	2. 12						99. 99	
6 D4. V	68. 53		21. 31		0. 43	n. d.	3. 47	4. 16	2. 11						100. 01	
7 D4. V	68. 49		21. 35		0. 39	n. d.	3. 49	4. 17	2. 10						99. 99	
8 B3. IV	57. 38	16. 30	3. 70	2. 66	1. 61	5. 12	3. 58	2. 29	1. 08		2. 22		1. 70	CO_2 2. 66	100. 30	2. 745

PORPHYRITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
49	Chomi-Borjom Valley, Armenia.	C. Schmidt.	H. Abich, G. Armen., II, p. 153, 1888.	Labradorite porphyry.	SiO_2 includes loss. 3 decimals. Not in W. T.
50	Kura Valley, near Tiflis, Armenia.	C. Schmidt.	H. Abich, G. Armen., II, p. 158, 1888.	Augite porphyrite.	SiO_2 includes loss. 3 decimals. Not in W. T.
51	Somkethien, Armenia.	C. Schmidt.	H. Abich, G. Armen., II, p. 155, 1888.	Labradorite porphyry.	SiO_2 includes loss. 3 decimals. Not in W. T.
52	Tukchi River, Okhotsk, Siberia.	Not stated.	K. E. Bogdanovitch, Fund. Marek., p. 56, 1904.	Porphyrite.	
53	Kivangra River, Okhotsk, Siberia.	Not stated.	K. E. Bogdanovitch, Fund. Marek., p. 56, 1904.	Porphyrite.	
54	Zeia River, Amur District, Siberia.	P. Todakis.	E. Ahnert, Reg. Aurif. Sib., X, Taf. VII, 1910.	Porphyrite.	
55	Port Arkwright, Queensland.	H. I. Jensen.	H. I. Jensen, Pr. Linn. Soc. N. S. W., XXXI, p. 169, 1906.	Porphyrite.	
56	Tambo River, Noyang, Victoria.	A. W. Howitt.	A. W. Howitt, Tr. R. Soc. Vict., XX, p. 38, 1884.	Quartz mica porphyrite.	In W. T., p. 157.
57	Dandenong, Victoria.	H. C. Jenkins.	J. W. Gregory, Pr. R. Soc. Vict., XIV, p. 201, 1902.	Porphyrite.	Not fresh.

ANDESITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Neponset Valley, Massachusetts.	W. H. Walker.	F. Bascom, J. Ac. Sc. Phila. (2), XV, p. 153, 1912.	Soda andesite.	Cf. No. 2, II.5.2.5.
2	Marcellon, Wisconsin.	W. W. Daniels.	Hobbs and Leith, B. Un. Wisc., Sci. Ser., III, p. 262, 1907.	Augite andesite.	
3	Ely, Minnesota.	C. F. Sidener.	N. H. Winchell, Minn. G. S. A. R., XXIII, p. 204, 1895.	Felsite.	Not fresh. In W. T., p. 245.
4	Ely, Minnesota.	C. F. Sidener.	N. H. Winchell, Minn. G. S. A. R., XXIII, p. 204, 1895.	Felsite.	Not fresh. In W. T., p. 419.
5	Ravalli County, Montana.	O. J. Berry.	J. P. Rowe, B. Un. Mont. No. 17, p. 9, 1903.	Volcanic ash (andesite?).	Calculated to 100.
6	Ravalli County, Montana.	O. J. Berry.	J. P. Rowe, B. Un. Mont. No. 17, p. 9, 1903.	Volcanic ash (andesite?).	Calculated to 100.
7	Ravalli County, Montana.	O. J. Berry.	J. P. Rowe, B. Un. Mont. No. 17, p. 9, 1903.	Volcanic ash (andesite?).	Calculated to 100.
8	Boulder Mountain, Silverton, Colorado.	Gebhardt and Haldane.	F. R. Van Horn, B. G. S. A., XII, p. 8, 1901.	Andesite.	

ANDESITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
9 B3. IV	57.29	19.93	2.95	3.39	1.55	5.67	3.34	1.92	1.53		1.42		0.75	CO_2 none	99.74 (99.94)	2.66
10 B3. IV	56.93	17.61	3.04	3.24	1.77	5.03	3.97	2.93	0.74		0.98		2.23	CO_2 1.45	99.72	2.70
11 B3. IV	54.22	16.69	3.63	3.39	2.72	5.86	4.82	2.20	1.55		1.65		1.43	CO_2 2.53	100.69	2.695
12 B3. IV	56.36	15.46	5.00	1.85	2.00	5.28	4.91	2.73	1.34		0.83		1.49	CO_2 1.92	99.17	2.735
13 B3. IV	55.68	17.09	5.26	1.98	1.56	5.05	2.83	1.95	1.50		1.45		2.23	CO_2 2.97	99.55	2.725
14 C4. V	52.33	18.80	10.21	n. d.	4.19	8.22	3.84	3.62	n. d.				none		101.21	
15 B4. V	50.48	13.92	15.04	n. d.	4.08	11.28	3.61	0.36	n. d.				0.01	S 1.11	99.57	2.857
16 C3. V	52.17	16.59	8.32	n. d.	3.87	8.25	3.91	4.00	1.17	0.13	0.80	0.24	0.11	CO_2 0.56 BaO 0.15 SrO 0.05	101.69	2.852
17 D4. V	60.58	18.42	7.90	n. d.	1.53	8.16	n. d.	n. d.	1.83	1.81					100.23	
18 C4. V	54.86	15.04	4.92	3.11	1.88	9.19	11.30					0.46			100.76	
19 D3. V	60.00	19.01	3.20	0.68	1.28	4.10	6.97	2.79	4.30				trace		102.33	2.51–2.54
20 B3. IV	52.83	17.67	7.50	1.68	2.47	7.35	6.61	2.52	2.32						100.95	2.80
21 B4. V	59.75	19.08	n. d.	2.91	4.72	6.15	4.31	0.92	2.64		trace	0.15			100.63	2.62
22 B3. IV	59.74	19.94	1.81	5.41	1.18	3.74	4.65	1.02	2.09		trace	0.35			99.93	2.64
23 C3. V	56.47	22.55	0.95	1.97	4.48	10.89	0.88	0.52	1.03						99.74	
24 B4. V	55.80	18.22	8.98	n. d.	2.23	4.40	6.34	1.90	2.30						100.17	
25 C4. V	64.50	16.82	n. d.	n. d.	1.76	1.08	3.00	3.80	1.63					CO_2 1.77 FeS_2 5.70	100.06	
26 C4. V	56.40	20.12	n. d.	5.87	1.99	3.55	4.87	2.56	2.41					CO_2 2.59 FeS_2 0.09	100.45	
27 C4. V	63.30	17.90	n. d.	1.83	2.53	10.45	2.30	n. d.	1.18						100.18	
28 C3 V.	58.31	16.69	none	n. d.	1.27	5.29	0.20	6.11	2.42			0.31	0.19	CO_2 3.47 Cl trace FeS_2 5.06 BaO 0.35	99.67	

ANDESITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
9	Middleton, near Silverton, Colorado.	Gebhardt and Haldane.	F. R. Van Horn, B. G. S. A., XII, p. 8, 1901.	Andesite.	
10	Galena Mountain, Silverton, Colorado.	Gebhardt and Haldane.	F. R. Van Horn, B. G. S. A., XII, p. 8, 1901.	Andesite.	Not fresh.
11	Galena Mountain, Silverton, Colorado.	Gebhardt and Haldane.	F. R. Van Horn, B. G. S. A., XII, p. 8, 1901.	Andesite.	Not fresh.
12	King Solomon Mountain, Silverton, Colorado.	Gebhardt and Haldane.	F. R. Van Horn, B. G. S. A., XII, p. 8, 1901.	Andesite.	Not fresh.
13	King Solomon Mountain, Silverton, Colorado.	Gebhardt and Haldane.	F. R. Van Horn, B. G. S. A., XII, p. 8, 1901.	Andesite.	Not fresh.
14	Copper Mountain, Similkameen District, British Columbia.	O. N. Scott.	O. N. Scott, Can. Min. Inst., V, p. 496, 1902.	Andesite.	
15	Copper Mountain, Similkameen District, British Columbia.	O. N. Scott.	O. N. Scott, Can. Min. Inst., V, p. 494, 1902.	Andesite.	Not fresh.
16	Sayward, Rossland Mountains, British Columbia.	M. F. Connor.	R. A. Daly, Can. G. S. Mem. 38 (1), p. 329, 1912.	Latite.	
17	Liliwaup, Washington.	R. W. Thatcher.	S. Shedd, Wash. G. S. A. R. II, p. 50, 1902.	Andesite tuff.	
18	Mount Tacoma, Washington.	F. Collischon.	K. Oebbeke, N. J., 1885, I, p. 226.	Andesite.	In W. T., p. 419.
19	Carmelo Bay, California.	J. Posada.	A. C. Lawson, B. Dep. G. Un. Cal., I, p. 42, 1893.	Carmeloite (augite andesite).	In W. T., p. 419.
20	Sunium Point, Carmelo Bay, California.	J. Posada.	A. C. Lawson, B. Dep. G. Un. Cal., I, p. 38, 1893.	Carmeloite.	In W. T., p. 419.
21	Frowning Ridge, Berkeley Hills, California.	C. Palache,	Lawson and Palache, B. Dep. G. Un. Cal., II, p. 426, 1901.	Andesite.	
22	Grizzly Peak, Berkeley Hills, California.	C. Palache.	Lawson and Palache, B. Dep. G. Un. Cal., II, p. 426, 1901.	Andesite.	
23	Pie Knob, Berkeley Hills, California.	Dickerman.	Lawson and Palache, B. Dep. G. Un. Cal., II, p. 426, 1901.	Andesite.	Corrected for 6.12 limonite.
24	Point Sal, California.	H. W. Fairbanks.	H. W. Fairbanks, B. Dep. G. Un. Cal., II, p. 50, 1896.	Andesite.	In W. T., p. 419.
25	Tonopah, Nevada.	G. J. Young.	J. A. Burgess, Ec. G., IV, p. 699, 1909.	Andesite.	Altered.
26	Mizpah shaft, Tonopah, Nevada.	G. J. Young.	J. A. Burgess, Ec. G., IV, p. 692, 1909.	Calcite andesite.	Altered.
27	Chairman mine, Robinson District, Nevada.	H. Ross.	A. C. Lawson, B. Dep. G. Un. Cal., IV, p. 324, 1906.	Augite andesite.	
28	Lane Valley, Robinson District, Nevada.	H. Ross.	A. C. Lawson, B. Dep. G. Un. Cal., IV, p. 322, 1906.	Porphyry.	Altered.

ANDESITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
29	59.22	18.20	n. d.	6.69	2.90	5.51	1.39	3.31	2.80						100.02	
A4. IV																
30	58.44	18.17	n. d.	6.03	2.40	6.19	3.20	1.97	0.76					CO_2 2.87	100.03	
A4. IV																
31	56.71	18.36	n. d.	6.45	3.92	6.11	3.52	2.38	1.94						99.39	
A4. IV																
32	65.03	18.83	2.35	n. d.	2.06	4.43	4.38	2.24	1.00						100.32	2.589
B4. V																
33	64.48	16.50	3.47	n. d.	1.60	4.42	3.13	3.72	2.94						100.26	
B4. V																
34	61.06	15.42	8.01	n. d.	3.55	7.11	2.66	1.40	0.68		trace	trace	trace		99.89	2.658
A4. IV																
35	61.24	18.32	6.17	n. d.	3.76	5.06	3.15	2.37	0.67						100.74	2.612
B4. V																
36	59.84	18.57	4.76	n. d.	2.95	4.69	2.85	2.72	4.10						100.48	2.177
B4. V																
37	53.68	16.96	5.00	2.41	1.79	10.18	3.55	0.76	0.48		0.88	0.51		CO_2 4.40 SO_3 trace	100.60	2.736
B3. IV																
38	66.41	19.74	1.31	n. d.	0.92	3.20	4.41	2.99	0.06						99.04	
C4. V																
39	56.73	20.44	5.71	n. d.	2.58	7.23	3.73	2.45	0.54						99.41	
C4. V																
40	55.72	16.01	7.41	n. d.	2.81	8.59	4.79	3.30							98.63	2.41
D4. V																
41	60.31	23.20	0.89	4.20	3.42	5.58	2.12	0.62	0.12		1.18	0.12			101.76	
C2. IV																
42	51.52	21.65	6.37	n. d.	4.72	10.00	3.55	0.68	0.06	0.19	1.00	0.14		SO_3 0.12	100.30	
B3. IV																
43	50.72	12.55	9.48	4.68	5.91	10.10	3.45	0.53	0.55	0.13	1.15	0.19	0.45	SO_3 0.11	100.00	
C2. IV																
44	56.50	28.20			0.98	2.83	6.68	4.25	n. d.						99.44	
C4. V																
45	59.13	17.00	7.03	n. d.	n. d.	6.67	4.80	1.37	0.16						96.16	
D4. V																
46	57.24	18.02	3.46	4.13	3.77	7.78	(5.54)		0.06						100.00	
C4. V																
47	62.80	16.36	n. d.	7.11	3.05	3.63	4.50	0.80	1.00						99.25	2.561
B4. V																
48	62.30	14.46	n. d.	7.71	2.14	5.35	4.80	1.72	0.98						99.46	2.664
B4. V																

ANDESITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
29	Silver Terrace, Washoe, Nevada.	W. G. Mixter.	G. F. Becker, U. S. G. S. Mon. 3, p. 152, 1882.	Andesite.	In W. T., p. 419.
30	American Flat, Washoe, Nevada.	W. G. Mixter.	G. F. Becker, U. S. G. S. Mon. 3, p. 152, 1882.	Andesite.	In W. T., p. 419.
31	Eldorado, Washoe, Nevada.	R. W. Woodward.	G. F. Becker, U. S. G. S. Mon. 3, p. 152, 1882.	Andesite.	In W. T., p. 419.
32	Nevado de Toluca, Mexico.	A. Lagorio.	A. Lagorio, T. M. P. M., VIII, p. 458, 1887.	Andesite.	In W. T., p. 191.
33	N. S. de Guadelupe, near Mexico, Mexico.	A. Lagorio.	A. Lagorio, T. M. P. M., VIII, p. 458, 1887.	Andesite.	In W. T., p. 185.
34	Cerro Guerrero, near Mexico, Mexico.	König.	H. Lenk in Felix and Lenk, Btr. G. Mex., I, p. 100, 1890.	Hypersthene andesite.	In W. T., p. 421.
35	Mount Iztaccihuatl, Mexico.	H. Lenk?	H. Lenk in Felix and Lenk, Btr. G. Mex., II, p. 229, 1899.	Hornblende andesite.	In W. T., p. 421.
36	Near Amecameca, Mexico.	H. Lenk?	H. Lenk in Felix and Lenk, Btr. G. Mex., II, p. 229, 1899.	Pumice.	In W. T., p. 421.
37	Ejutla, Oaxaca, Mexico.	A. Röhrig.	H. Lenk in Felix and Lenk, Btr. G. Mex., II, p. 140, 1899.	Hypersthene andesite.	In W. T., p. 421.
38	Eruption of October, 1902, Sta. Maria Volcano, Guatemala.	Siebenschenk.	A. Bergeat, N. J. Cb., 1903, p. 291.	Andesite pumice.	
39	Irazu Volcano, Carthago, Costa Rica.	A. Lagorio.	A. Lagorio, T. M. P. M., VIII, p. 467, 1887.	Andesite.	In W. T., p. 421.
40	Signal Hill, St. Eustatius, West Indies.	G. A. F. Molengraaf.	G. A. F. Molengraaf, G. St. Eust., p. 40, 1886.	Andesite.	Not in W. T.
41	St. Vincent, West Indies.	Pisani.	A. Lacroix, Mont Pelée, p. 599, 1904.	Cordierite andesite.	Inclusion in andesite.
42	Eruption of May, 1902, St. Vincent, West Indies.	D'Albuquerque.	J. S. Flett, Phil. Trans., CCVIII (A), p. 327, 1908.	Andesite ash.	Collected at Barbados. 3 decimals.
43	Eruption of May, 1902, St. Vincent, West Indies.	D'Albuquerque.	J. S. Flett, Phil. Trans., CCVIII, A, p. 327, 1908.	Andesite dust.	Collected at Barbados. 3 decimals.
44	Chatham Bay, Cocos Island, Galapagos Islands.	G. P. Merrill.	G. P. Merrill, B. Mus. Comp. Zool., XVI, No.13, p. 237, 1893.	Andesite.	In W. T., p. 421.
45	Cerro Negro de Mayasquer, Colombia.	Buntzel.	R. Küch, G. Stud. Colomb., I, p. 183, 1892.	Pyroxene andesite.	In W. T., p. 421.
46	Pasto Volcano, Colombia.	R. Küch.	R. Küch, G. Stud. Colomb., I, p. 141, 1892.	Pyroxene andesite.	In W. T., p. 421.
47	Zechzech, Alausi, Ecuador.	J. Siemiradzki.	J. Siemiradzki, N. J. B. B., IV, p. 209, 1886.	Hornblende andesite.	In W. T., p. 421.
48	Zechzech, Alausi, Ecuador.	J. Siemiradzki.	J. Siemiradzki, N. J. B. B., IV, p. 209, 1886.	Augite andesite.	In W. T., p. 421.

ANDESITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
49 B4. V	60. 34	15. 66	n. d.	8. 13	2. 11	6. 97	5. 12	0. 90	0. 87						100. 10	
50 D4. V	60. 10	15. 56	n. d.	7. 83	1. 22	5. 97	5. 11	1. 69	0. 95						98. 43	
51 D3. V	55. 64	21. 45	5. 41	6. 58	3. 10	5. 59	3. 08	1. 60	n. d.						102. 45	
52 C4. V	68. 18	16. 86	6. 12	n. d.	0. 71	5. 35	2. 40	0. 21	0. 73			trace	trace		100. 56	
53 D4. V	65. 39	17. 20	6. 39	n. d.	trace	5. 74	2. 73	0. 47	0. 59			trace	trace		98. 51	
54 D4. V	63. 86	16. 52	5. 91	n. d.	1. 60	3. 71	3. 16	2. 47	0. 93				trace		98. 16	
55 B4. V	68. 05	17. 95	2. 97	n. d.	1. 40	3. 65	3. 56	1. 25	1. 78			trace	trace		100. 61	
56 D4. V	54. 58	23. 21	5. 33	2. 44	0. 76	11. 37	2. 69	n. d.	n. d.						100. 38	
57 C2. IV	66. 68	18. 36	1. 63	2. 58	1. 15	4. 95	5. 33	2. 89	2. 39		0. 49	0. 22	trace	CO_2 0. 74 S 0. 03	101. 44	2. 663
58 D2. V	61. 99	17. 10	3. 17	1. 72	1. 76	4. 74	4. 52	3. 80	1. 10		1. 18	0. 25		CO_2 0. 48	101. 81	2. 720
59 C2. IV	63. 60	16. 20	4. 02	0. 82	2. 24	4. 29	3. 84	4. 13	1. 61		0. 52	0. 19		S 0. 04	101. 50	2. 640
60 C2. IV	58. 85	16. 74	3. 91	2. 64	3. 82	5. 93	3. 41	3. 26	1. 49		0. 81	trace	trace	S 0. 03 SrO trace	101. 33	2. 681
61 C2. IV	57. 35	17. 54	3. 33	3. 87	4. 29	6. 91	4. 01	2. 54	0. 79		0. 64	0. 08	trace	S 0. 03	101. 38	2. 766
62 C2. IV	61. 30	14. 15	0. 91	2. 86	2. 46	4. 63	5. 47	3. 62	2. 03	0. 24	0. 54	0. 71	0. 08	CO_2 none S 0. 03	99. 03 (98. 99)	
63 A4. IV	66. 62	14. 02	5. 73	n. d.	0. 33	2. 74	6. 93	1. 51	2. 83				trace		100. 71	
64 C4. V	52. 68	12. 66	17. 34	n. d.	0. 93	11. 45	2. 49	1. 91	0. 70						100. 16	
65 B4. V	62. 89	14. 84	9. 20	n. d.	0. 37	3. 61	4. 01	2. 91	1. 41						99. 24	
66 A4. IV	66. 03	12. 55	2. 75	n. d.	2. 33	2. 80	5. 02	4. 13	4. 20						99. 81	
67 B4. V	55. 79	15. 97	12. 50	n. d.	2. 22	7. 06	2. 21	1. 86	2. 43					S 0. 45	100. 49	2. 705
68 B4. V	65. 81	14. 01	4. 43	n. d.	0. 89	2. 01	4. 15	6. 08	2. 70						100. 08	

ANDESITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
49	Zechzech, Alausi, Ecuador.	J. Siemiradzki.	J. Siemiradzki, N. J. B. B., IV, p. 209, 1886.	Hornblende-augite andesite.	In W. T., p. 421.
50	Zechzech, Alausi, Ecuador.	J. Siemiradzki.	J. Siemiradzki, N. J. B. B., IV, p. 209, 1886.	Hornblende-augite andesite.	In W. T., p. 421.
51	Rio de Alausi and Rio Chanchan, Ecuador.	J. Siemiradzki.	J. Siemiradzki, N. J., I, p. 156, 1885.	Hypersthene andesite.	In W. T., p. 421.
52	Sajama Volcano, Bolivia.	F. Rudolph.	F. Rudolph, T. M. P. M., IX, p. 306, 1888.	Hornblende andesite.	In W. T., p. 421.
53	Sajama Volcano, Bolivia.	F. Rudolph.	F. Rudolph, T. M. P. M., IX, p. 306, 1888.	Hornblende andesite.	In W. T., p. 421.
54	Sajama Volcano, Bolivia.	F. Rudolph.	F. Rudolph, T. M. P. M., IX, p. 299, 1888.	Hornblende-pyroxene andesite.	In W. T., p. 421.
55	Cerro Quimsachata, Bolivia.	F. Rudolph.	F. Rudolph, T. M. P. M., IX, p. 311, 1888.	Quartz andesite.	In W. T., p. 421.
56	Osorno Volcano, Chile.	W. Bruhns.	W. Bruhns, Ref. N. J., II, p. 85, 1899.	Augite andesite.	In W. T., p. 421.
57	Cerro Tomaslata, San Luis, Argentina.	P. Jannasch.	F. Tannhäuser, N. J. B. B., XXII, p. 597, 1906.	Hornblende andesite.	
58	Canada Honda, Cerro del Valle, San Luis, Argentina.	Möller.	F. Tannhäuser, N. J. B. B., XXII, p. 595, 1906.	Hornblende andesite.	
59	San Geronimo, Salta, Argentina.	P. Jannasch.	F. Tannhäuser, N. J. B. B., XXII, p. 588, 1906.	Mica andesite.	
60	Tambo, Salta, Argentina.	P. Jannasch.	F. Tannhäuser, N. J. B. B., XXII, p. 601, 1906.	Pyroxene andesite.	
61	Hoyada, Catamarca, Argentina.	P. Jannasch.	F. Tannhäuser, N. J. B. B., XXII, p. 598, 1906.	Hornblende andesite.	
62	Miramar, Argentina.	J. G. Fairchild.	Wright and Fenner, Bur. Am. Ethn., B. 52, p. 75, 1912.	Andesite scoria.	
63	Beinn Hiant, Mull, Scotland.	T. H. Holland.	J. W. Judd, Q. J. G. S., XLVI, p. 379, 1890.	Andesite.	In W. T., p. 423.
64	Beinn Hiant, Mull, Scotland.	W. Tate.	J. W. Judd, Q. J. G. S., XLVI, p. 379, 1890.	Tholeite.	In W. T., p. 423.
65	Beinn Talaidh, Mull, Scotland.	T. H. Holland.	J. W. Judd, Q. J. G. S., XLVI, p. 349, 1890.	Propylite.	In W. T., p. 423.
66	Tormore, Arran, Scotland.	M. M. Tait.	J. W. Judd, Q. J. G. S., XLIX, p. 558, 1893.	Pitchstone.	In W. T., p. 423.
67	Cir Mhor Dike, Arran, Scotland.	Under Thorpe.	J. W. Judd, Q. J. G. S., XLIX, p. 545, 1893.	Andesite.	In W. T., p. 423.
68	Scuir of Eigg, Scotland.	B. North.	J. W. Judd, Q. J. G. S., XLVI, p. 379, 1890.	Andesite.	In W. T., p 423.

ANDESITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
69 D3. V	61.17	16.87	2.10	2.94	3.00	4.86	2.67	1.81	3.09						98.51	2.543
70 D3. V	57.57	14.42	6.04	3.95	4.24	6.87	2.98	1.08	1.55				0.27		98.97	
71 B3. IV	59.43	16.00	4.49	3.67	4.05	8.03	2.22	1.28	n. d.						99.17	
72 C3. V	59.40	19.57	3.89	2.18	2.28	5.22	1.22	2.47	(3.10)		0.55	trace	0.09		100.00	
73 D4. V	58.07	13.22	10.10	n. d.	4.46	7.04	2.59	1.58	1.50						98.56	
74 B4. V	57.80	16.18	10.07	n. d.	4.68	6.18	2.38	0.77	1.70						99.76	2.81
75 B3. IV	53.30	20.99	1.66	6.34	3.96	8.51	2.46	0.93	1.12			0.10		CO_2 0.32	99.69	
76 B3. IV	52.60	17.32	1.72	12.04	3.25	7.73	2.62	1.49	1.16			0.15		CO_2 0.14	100.22	
77 C3. V	48.37	20.74	6.56	0.63	6.35	7.77	1.70	n. d.	1.60			0.94		CO_2 6.00	100.66	
78 B4. V	61.8	16.5	6.7	n. d.	1.2	4.5	7.2	1.4	0.6						99.9	
79 C3. V	59.40	19.57	3.89	2.18	2.28	5.22	1.22	2.47	(3.10)		0.55	trace	0.09	SO_3 0.03	100.00	
80 C3. V	57.25	19.40	2.50	3.84	6.40	5.10	1.74	2.36	2.75						101.34	
81 C4. V	54.55	19.89	5.90	n. d.	4.05	3.72	3.65	3.42	5.95						101.01	
82 C3. V	66.56	19.77	0.96	1.00	1.97	0.10	6.63	3.99	(0.47)		0.46				101.44	2.536
83 C3. V	60.88	22.63	1.30	2.94	1.39	3.10	4.56	2.95	(0.39)		1.14				100.89	2.585
84 C3. V	56.29	24.12	2.47	3.20	1.39	6.13	5.36	1.90	(1.74)		0.41				101.17	2.674
85 C3. V	55.88	20.92	3.46	4.10	3.52	5.49	5.34	1.66	(0.26)		1.09				101.46	2.654
86 C4. V	57.50	27.61	2.00	n. d.	2.17	2.10	6.11	1.30	1.91			trace			100.70	
87 C4. V	63.47	18.76	3.74	n. d.	1.12	7.10	3.93	1.09	1.47			0.40	trace		101.08	
88 D4. V	62.91	18.31	5.55	n. d.	1.97	5.93	3.67	1.66	2.17			0.37			102.54	

ANDESITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
69	Carhope, Cheviot Hills, Scotland.	Petersen.	J. J. H. Teall, G. Mag., XXII, p. 118, 1885.	Hypersthene andesite.	In W. T., p. 423.
70	Cleveland Dike, Scotland.	Stock.	J. W. Judd, Q. J. G. S., XLVI, p. 379, 1890.	Tholeite.	In W. T., p. 423.
71	Bardon, Charnwood Forest, England.	Lord.	Hill and Bonney, Q. J. G. S., XLVII, p. 89, 1891.	Andesite.	In W. T., p. 423.
72	The Batch, Shropshire, England.	Reade and Holland.	Reade and Holland, Pr. G. Soc. Liv., X (4), Table IV, 1908.	Andesite tuff.	H_2O includes loss.
73	Armathwaite, England.	W. F. K. Stock.	J. J. H. Teall, Q. J. G. S., XL, p. 224, 1884.	Andesite.	In W. T., p. 423.
74	Acklington, England.	J. E. Stead.	J. J. H. Teall, Q. J. G. S., XL, p. 243, 1884.	Andesite.	In W. T., p. 423.
75	Eycott Hill, Lake District, England.	J. Hughes.	Cited by J. J. H. Teall, Brit. Petrog., p. 228, 1888.	Lava.	In W. T., p. 291.
76	Eycott Hill, Lake District, England.	J. Hughes.	Cited by J. J. H. Teall, Brit. Petrog., p. 228, 1888.	Lava.	In W. T., p. 291.
77	Killerton, Devonshire, England.	E. Haworth.	B. Hobson, Q. J. G. S., XLVIII, p. 507, 1892.	Andesite.	In W. T., p. 423.
78	Carn Boduan, Caernarvonshire, Wales.	E. H. Acton.	H. Harker, Bala Vol. Ser., p. 69, 1889.	Andesite.	In W. T., p. 423
79	Longmynd, Wales.	Not stated.	Reade and Holland, Pr. Liv. G. Soc., X, Table IV, 1908.	Andesite tuff.	H_2O includes loss.
80	Espinasse, La Creuse, France.	Pisani.	L. de Launay, B. Sv. Ct. G. Fr., XI, No. 83, p. 77, 1902.	Andesite.	
81	Fourneaux, La Creuse, France.	Pisani.	L. de Launay, B. Sv. Ct. G. Fr., XI, No. 83, p. 77, 1902.	Andesite.	
82	Viaguin, Cantal, Auvergne.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr , XXV, p. 329, 1902.	Andesite.	
83	Lioran, Cantal, Auvergne.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 332, 1902.	Andesite.	
84	Sévérac, Cantal, Auvergne.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 337, 1902.	Andesite.	
85	Fraisse-haut, La Bourgade, Auvergne.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 333, 1902.	Andesite.	
86	Near Clermain, Maconnais, France.	Not stated.	Michel-Levy and Lacroix, B. Sv. Ct. G. Fr., VII, No. 45, p. 7, 1895.	Porphyrite.	Not in W. T.
87	Boulevie, Esterel, France.	Rüst.	A. Michel-Levy, B. Sv. Ct. G. Fr., IX, No. 57, p. 19, 1897.	Esterellite.	In W. T., p. 423.
88	La Touchque, Esterel, France.	Rüst.	A. Michel-Levy, B. Sv. Ct. G. Fr., IX, No. 57, p. 21, 1897.	Esterellite.	In W. T., p. 423.

ANDESITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
89 C4. V	61.58	18.84	4.68	n. d.	2.04	6.59	4.27	1.49	1.61			0.27	trace		101.37	
90 D4. V	59.50	18.49	6.38	n. d.	2.15	5.65	4.19	1.69	3.57			0.35			101.97	
91 C4. V	57.63	18.43	4.59	n. d.	2.38	7.18	3.92	1.30	5.20			0.28	trace		100.91	
92 D4. V	43.66	26.79	5.81	n. d.	5.80	15.64	1.97	0.55	1.76			0.44			102.42	
93 C3. V	51.7	20.7	2.2	5.5	3.8	9.9	2.1	0.4	3.8						100.1	
94 C3. V	51.61	19.31	trace	8.93	4.35	3.83	5.37	1.90	3.12		2.17	0.64			101.23	
95 D4. V	62.02	21.65	1.22	trace	2.70	4.40	6.90	1.10	1.60						101.59	
96 D3. V	55.01	15.69	4.78	5.79	6.20	11.21	1.19	1.55	0.65						102.07	2.837
97 C3. V	54.26	15.93	6.80	5.53	3.35	11.32	1.94	1.10	0.99				0.27		101.49	2.770
98 C3. V	53.13	15.61	2.33	8.23	5.80	11.75	1.86	1.78	0.73						101.22	2.555
99 C2. IV	57.19	16.27	6.85	0.70	2.28	4.89	6.08	4.79	n. d.		0.32	0.09			99.46	
100 C4. V	57.73	19.26	8.00	n. d.	0.14	4.22	6.78	4.68	2.50			trace	trace		100.31	2.739
101 B4. V	55.50	19.81	2.47	n. d.	0.95	1.13	8.51	5.72	3.99	0.41		0.21	1.22		99.92	
102 C4. V	52.27	19.27	n. d.	8.82	3.18	5.86	3.44	4.69			2.47				100.00	
103 C4. V	62.54	23.56			1.15	4.75	3.16	2.43	1.75						99.35	2.694
104 C4. V	62.30	17.45	5.50	n. d.	1.21	4.20	2.95	2.90	2.70						99.21	2.595
105 B4. V	63.92	21.09	n. d.	3.88	0.72	4.61	1.04	2.86	1.50				trace		99.62	
106 B4. V	54.20	19.72	n. d.	10.49	2.46	9.40	2.05	0.64	0.68						99.64	
107 B4. V	53.99	24.27	n. d.	7.35	2.39	9.23	1.59	0.75	0.55						100.10	
108 B4. V	56.65	22.11	3.31	n. d.	3.42	6.67	4.10	1.86	2.20			trace	0.16		100.48	

ANDESITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
89	Dramont, Esterel, France.	Rüst.	A. Michel-Levy, B. Sv. Ct. G. Fr., IX, No. 57, p. 19, 1897.	Esterellite.	In W. T., p. 423.
90	Dramont, Esterel, France.	Rüst.	A. Michel-Levy, B. Sv. Ct. G. Fr., IX, No. 57, p. 21, 1897.	Esterellite.	In W. T., p. 425.
91	Les Cours, Esterel, France.	Rüst.	A. Michel-Levy, B. Sv. Ct. G. Fr., IX, No. 57, p. 19, 1897.	Esterellite.	In W. T., p. 425.
92	Dramont, Esterel, France.	Rüst.	A. Michel-Levy, B. Sv. Ct. G. Fr., IX, No. 57, p. 36, 1897.	Inclusion in esterellite.	In W. T., p. 433.
93	Pic du Midi d'Ossan, Pyrenees.	Not stated.	J. de Lapparent, B. Soc. M. Fr., XXXIV, p. 284, 1911.	Andesite.	
94	L'Arbizon, Pyrenees.	Pisani.	A. de Romeu, B. Soc. M, Fr., XXX, p. 179, 1907.	Andesite.	
95	Locality not stated. Northwestern Corsica.	J. Deprat.	J. Deprat, B. Sv. Ct. G. Fr., XVII, No. 167, p. 54, 1907.	Trachy-andesite.	
96	Alboran Island, Spain.	H. Graber.	F. Becke, T. M. P. M., XVIII, p. 544, 1899.	Alboranite.	In W. T., p. 425.
97	Alboran Island, Spain.	H. Graber.	F. Becke, T. M. P. M., XVIII, p. 544, 1899.	Alboranite.	In W. T., p. 425.
98	Isla de la Nube, Alboran Island, Spain.	H. Graber.	F. Becke, T. M. P. M., XVIII, p. 544, 1899.	Alboranite.	In W. T., p. 425.
99	Brüngelsberg, Siebengebirge.	Rössler.	H. Laspeyres, D. Siebengeb., p. 221, 1901.	Andesite.	
100	Löwenberg, Siebengebirge.	Deiters.	H. Laspeyres, D. Siebengeb., p. 185, 1901.	Andesite.	
101	Brohlthal, Laacher See, Eifel.	K. Völzing.	K. Völzing, Jb. Pr. G. L.-A., XXVIII, p. 25, 1910.	Pumice.	
102	Horberig, Kaiserstuhl, Baden.	A. Knop.	A. Knop. D. Kaiserstuhl, p. 259, 1892.	Andesite.	2.27 H_2O and 3.18 $CaCO_3$ deducted. In W. T., p. 425.
103	Hliniker Thal, Hungary.	A. Lagorio.	A. Lagorio, T. M. P. M., VIII, p. 467, 1887.	Andesite.	In W. T., p. 425.
104	Bohunitz, Hungary.	A. Lagorio.	A. Lagorio, T. M. P. M., VIII, p. 467, 1887.	Andesite.	In W. T., p. 425.
105	Bujaker Wald, Czerhat, Hungary.	A. Kalecsinsky.	F. Schafarzik, Mt. Ung. G. A., IX, p. 301, 1895.	Andesite.	In W. T., p. 425.
106	Peleske, Czerhat, Hungary.	A. Kalecsinsky.	F. Schafarzik, Mt. Ung. G. A., IX, p. 258, 1895.	Andesite.	In W. T., p. 425.
107	Peleske, Czerhat, Hungary.	A. Kalecsinsky.	F. Schafarzik, Mt. Ung. G. A., IX, p. 258, 1895.	Andesite.	In W. T., p. 425.
108	Bulza, Krasso, Hungary.	K. Roka.	E. Pinkert, F. K., XXXVII, p. 296, 1907.	Hornblende andesite.	

ANDESITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
109 B4. V	51.32	16.62	9.28	n. d.	5.36	9.62	2.96	2.15	2.60			0.25	0.55		100.71	
110 D2. V	62.46	16.07	1.67	3.26	1.56	3.10	4.18	3.75	1.57		0.52	0.62	0.11		98.87	
111 B3. IV	59.73	16.79	1.44	3.21	1.47	3.27	4.31	6.09	3.93				0.17		100.31	
112 B3. IV	55.23	14.06	5.06	4.12	4.00	9.34	2.07	2.43	1.07			1.33	0.57	SO_3 0.84 Cl trace	100.12	
113 B3. IV	53.63	14.17	1.46	8.07	7.05	8.52	1.80	2.03	2.01			0.93	trace	SO_3 0.62 Cl trace	100.29	2.789
114 B3. IV	60.39	16.96	1.50	3.42	3.81	5.41	3.37	2.01	3.03		(0.21)	trace		Cl trace	99.11	2.580
115 D3. V	59.06	16.40	2.88	4.18	2.63	4.32	5.29	1.49	2.06			trace		Cl trace	98.31	2.606
116 B3. IV	56.42	16.81	3.26	6.92	3.50	5.64	1.21	3.07	2.25			1.08	0.23		100.39	2.625
117 B3. IV	59.55	18.08	2.15	3.13	1.40	9.36	1.53	2.06	2.27			0.39	0.24	SO_3 0.35 Cl trace	100.51	
118 B3. IV	57.69	17.43	0.94	4.09	4.80	7.18	1.69	3.06	2.83			0.43	0.18	SO_3 trace	100.32	
119 B3. IV	58.78	16.97	1.13	2.10	1.46	7.27	3.67	4.18	3.60			0.32	0.17	SO_3 0.44	100.09	
120 B3. IV	53.82	16.19	4.30	3.26	7.02	7.28	1.70	6.28	0.10						99.95	2.78
121 B4. V.	69.52	13.12	5.27	n.d.	0.47	7.18	2.06	1.08	0.42			1.46	0.17		100.75	
122 B4. V	68.85	13.02	2.67	n. d.	1.57	4.72	1.90	1.80	3.03			1.36	0.21	SO_3 1.04 Cl trace	100.17	
123 B4. V	67.38	15.46	3.66	n. d.	1.03	4.72	4.98	2.14	0.41			0.04	0.29		100.11	
124 C3. V	66.99	17.56	1.41	3.39	0.93	4.25	3.35	0.34	1.53			trace	trace		99.75	
125 B4. V	66.83	11.79	7.86	n. d.	0.80	2.52	5.54	3.81	0.64						99.79	
126 B4. V	62.26	12.35	9.79	n. d.	0.67	3.62	5.58	4.40	0.58						99.25	
127 D4. V	63.85	13.14	9.39	n. d.	0.56	4.00	6.13	4.08	0.30						101.45	

ANDESITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
109	Bulza, Krasso, Hungary.	K. Roka.	E. Pinkert, F. K., XXXVII, p. 292, 1907.	Olivine-augite andesite.	
110	Cattajo, Euganean Hills, Italy.	M. Stark.	M. Stark, T. M. P. M., XXV, p. 327, 1906.	Hypersthene andesite.	
111	Monte Amiata, Tuscany.	L. Ricciardi.	A. Verri, B. Soc. G. It., VIII, p. 408, 1889.	Andesite.	In W. T., p. 259.
112	Radicofani, Tuscany.	L. Ricciardi.	G. Mercalli, At. Soc. It. Mil., XXX, p. 375, 1897.	Andesite.	In W. T., p. 231. Cf. No. 56, II.5.3.3.
113	Radicofani, Tuscany.	L. Ricciardi.	G. Mercalli, At. Soc. It. Mil., XXX. p. 371, 1897.	Andesite.	In W. T., p. 329. Cf. No. 57, II.5.3.3.
114	Monte Patello, Capraia Island.	A. Röhrig.	H. Emmons, Q. J. G. S., XLIX, p. 141, 1893.	Andesite.	In W. T., p. 243.
115	Punta della Manza, Capraia Island.	A. Röhrig.	H. Emmons, Q. J. G. S., XLIX, p. 142, 1893.	Andesite.	In W. T., p. 425.
116	Monte Rado, near Lake Bolsena, Italy.	L. Ricciardi.	C. Klein, N. J. B. B., VI, p. 33, 1889.	Andesite.	In W. T., p. 247.
117	Monte Cimino, near Viterbo, Italy.	L. Ricciardi.	A. Verri, B. Soc. G. It., VIII, p. 403, 1889.	Andesite.	In W. T., p. 247.
118	Monte Cimino, near Viterbo, Italy.	L. Ricciardi.	A. Verri, B. Soc. G. It., VIII, p. 403, 1889.	Andesite.	In W. T., p. 247.
119	Bagnaia, near Viterbo, Italy.	L. Ricciardi.	G. Mercalli, Mem. Ac. Linc., XX, p. 12, 1903.	"Peperino" (latite).	
120	San Loreto, Monte Cimino, near Viterbo, Italy.	G. Aichino.	V. Sabatini, Vulc. Cim., p. 506, 1912.	Oligoclasite, (ciminite).	
121	Lava of 1888, Vulcano, Aeolian Islands.	L. Ricciardi.	G. Mercalli, Gior. Min., III, p. 110, 1892.	Andesite.	In W. T., p. 427.
122	Eruption of August, 1888, Vulcano, Aeolian Islands.	L. Ricciardi.	G. Mercalli, Gior. Min., III, p. 112, 1892.	Andesite ash.	In W. T., p. 427.
123	Bomb of 1888, Vulcano, Aeolian Islands.	L. Ricciardi.	G. Mercalli, Gior. Min., III, p. 107, 1892.	Andesite.	In W. T., p. 227.
124	Bomb of 1888, Vulcano, Aeolian Islands.	L. Kahlenberg.	W. H. Hobbs, B. G. S. A., V p. 601, 1894.	Vulcanite.	Alkalies incorrect. Cf. No. 325, I.4.2.3. In W. T., p. 143.
125	Eruption of 1889, Vulcano, Aeolian Islands.	Silvestri (?)	Silvestri and Mercalli, Ann. Uff. Met. It., X (IV), p. 235, 1891.	Andesite.	Interior of bomb. Not in W. T.
126	Eruption of 1889, Vulcano, Aeolian Islands.	Silvestri (?)	Silvestri and Mercalli, Ann. Uff. Met. It., X (IV), p. 235, 1891.	Andesite.	Crust of bomb. Not in W. T.
127	Bomb of 1889, Vulcano, Aeolian Islands.	Not stated.	Silvestri and Mercalli, Ann. Uff. Met. It., X (IV), p. 235, 1891.	Andesite.	Not in W. T.

ANDESITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
128 B4. V	63. 44	12. 88	7. 64	n. d.	2. 45	6. 04	4. 02	3. 09	0. 31			0. 16	0. 29	SO_3 trace, Cl trace	100. 32	
129 C3. V	63. 27	12. 34	7. 32	n. d.	3. 99	8. 06	1. 29	2. 67	0. 30			0. 23	0. 34	SO_3 0. 41, Cl 0. 08	100. 36	
130 D4. V	62. 94	13. 96	7. 61	n. d.	0. 59	2. 08	5. 42	3. 64	0. 55						97. 79	
131 C3. V	62. 42	17. 15	1. 02	5. 91	2. 14	6. 39	2. 09	1. 21	0. 53			1. 45	0. 29		100. 00	
132 C3. V	60. 50	15. 05	1. 43	6. 07	3. 11	8. 61	1. 83	2. 02	0. 21			1. 12	0. 34		100. 29	
133 C3. V	58. 05	12. 06	8. 42	n. d.	3. 62	8. 76	1. 46	2. 38	1. 42			1. 12	0. 44	SO_3 0. 21, Cl 2. 42	100. 30	
134 A4. IV	62. 20	15. 40	7. 74	n. d.	2. 09	5. 95	3. 25	2. 45	0. 13	0. 13		0. 46			99. 80	
135 A4. IV	57. 38	18. 13	9. 23	n. d.	1. 93	8. 50	2. 44	1. 36	0. 41	0. 20		0. 34			99. 92	
136 A4. IV	57. 60	14. 71	8. 55	n. d.	4. 98	7. 54	3. 46	1. 87	0. 73	0. 05		0. 82			100. 31	
137 C3. V	61. 47	18. 09	5. 14	3. 06	1. 32	3. 00	5. 85	2. 83	n. d.						100. 76	
138 D3. V	60. 24	20. 28	2. 32	3. 88	0. 50	1. 96	7. 80	4. 28	n. d.						101. 26	
139 C3. V	61. 43	17. 51	5. 11	2. 30	0. 54	2. 45	6. 22	3. 95	n. d.						99. 51	2. 34
140 C3. V	51. 37	23. 71	1. 01	3. 01	4. 06	9. 76	2. 53	1. 81	0. 70		1. 12		1. 65		100. 82	
141 C4. V	73. 73	14. 77			0. 94	1. 93	3. 27	2. 75	1. 76						99. 15	
142 C4. V	71. 05	17. 61			trace	4. 45	3. 04	2. 56	1. 42						100. 13	
143 C4. V	68. 00	17. 91			trace	5. 63	3. 35	2. 58	2. 60						100. 07	
144 C4. V	58. 42	18. 08	5. 30	n. d.	1. 78	6. 15	3. 46	0. 91	5. 31		1. 03				100. 44	2. 620
145 B4. V	60. 95	16. 42	7. 02	n. d.	2. 05	6. 99	3. 35	0. 83	2. 20		0. 80				100. 59	2. 74
146 D4. V	58. 35	24. 92			0. 77	2. 31	6. 47	3. 55	1. 66						99. 00	

ANDESITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
128	Eruption of November, 1888, Vulcano, Aeolian Islands.	L. Ricciardi.	G. Mercalli, Gior. Min., III, p. 112, 1892.	Andesite ash.	In W. T., p. 427.
129	Eruption of September, 1888, Vulcano, Aeolian Islands.	L. Ricciardi.	G. Mercalli, Gior. Min., III, p. 112, 1892.	Andesite ash.	In W. T., p. 427.
130	Bomb of 1889, Vulcano, Aeolian Islands.	Not stated.	Silvestri and Mercalli, Ann. Uff. Met. It., X (IV), p. 235, 1891.	Andesite.	Not in W. T.
131	Lava of 1888, Vulcano, Aeolian Islands.	L. Ricciardi.	G. Mercalli, Gior. Min., III, p. 110, 1892.	Andesite.	In W. T., p. 249.
132	Lava of 1888, Vulcano, Aeolian Islands.	L. Ricciardi.	G. Mercalli, Gior. Min., III, p. 110, 1892.	Andesite.	In W. T., p. 247.
133	Eruption of 1888, Vulcano, Aeolian Islands.	L. Ricciardi.	G. Mercalli, Gior. Min., III, p. 112, 1892.	Andesite ash.	In W. T., p. 427.
134	Capo Graziano, Filicudi, Aeolian Islands.	F. Glaser.	A. Bergeat, Abh. Bay. Ak. W., XX, p. 214, 1899.	Cordierite andesite.	In W. T., p. 425.
135	Filicudi, Aeolian Islands.	F. Glaser.	A. Bergeat, Abh. Bay. Ak. W., XX, p. 208, 1899.	Andesite.	In W. T., p. 425.
136	Alicudi, Aeolian Islands.	F. Glaser.	A. Bergeat, Abh. Bay. Ak. W., XX, p. 219, 1899.	Andesite.	In W. T., p. 425.
137	Montagna Grande, Pantelleria.	H. Foerstner.	H. Foerstner, Z. K., VIII, p. 155, 1884.	Andesite.	Cf. No. 35, I.5.1.4. Cf. J. G., XXII, p. 19, 1914. In W. T., p. 203.
138	Montagna Grande, Pantelleria.	E. Maegis.	H. Foerstner, Z. K., VIII, p. 155, 1884.	Andesite.	Cf. as above. In W. T., p. 203.
139	Porto Scauri, Pantelleria.	H. Foerstner.	H. Foerstner, Z. K., VIII, p. 164, 1884.	Andesite.	Cf. as above. In W. T., p. 203.
140	Pala Manteda, Florinas, Sardinia.	F. Millosevitch.	F. Millosevitch, Mem. Ac. Linc. (5), VIII, No. 15, p. 616, 1911.	Augite andesite.	
141	Kara Dag, Crimea.	A. Lagorio.	A. Lagorio, Cong. G. Int., VII, Guide XXXI, p. 13, 1897.	Pyroxene andesite.	In W. T., p. 427.
142	Kara Dag, Crimea.	A. Lagorio.	A. Lagorio, Cong. G. Int., VII, Guide XXXI, p. 13, 1897.	Pyroxene andesite.	In W. T., p. 427.
143	Kara Dag, Crimea.	A. Lagorio.	A. Lagorio, Cong. G. Int., VII, Guide XXXI, p. 13, 1897.	Pyroxene andesite.	In W. T., p. 427.
144	Kara Dag, Crimea.	A. Lagorio.	A. Lagorio, T. M. P. M., VIII, p. 473, 1887.	Andesite.	In W. T., p. 427.
145	Bujuk Uragi, Crimea.	R. Prendel.	R. Prendel, Ref., N. J., II, p. 97, 1887.	(Andesite.)	In W. T., p. 427.
146	Near Kara Dag, Crimea.	A. Lagorio.	A. Lagorio, Cong. G. Int., VII, Guide XXXI, p. 13, 1897.	Pyroxene andesite.	In W. T., p. 427.

ANDESITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
147 B4. V	69. 87	17. 26	2. 29	n. d.	0. 08	2. 82	4. 52	1. 92	0. 76	0. 22		0. 26	0. 02		100. 00	
148 B4. V	65. 74	18. 76	4. 18	n. d.	1. 90	2. 89	4. 52	1. 64	0. 24	0. 10		trace	0. 02		100. 00	
149 B4. V	57. 01	19. 02	n. d.	5. 82	5. 47	6. 92	4. 49	1. 63	0. 20						100. 56	
150 B4. V	56. 99	19. 58	n. d.	5. 44	5. 34	6. 80	3. 36	1. 79	0. 13						99. 43	
151 C3. V	52. 43	25. 44	2. 98	1. 90	2. 36	2. 95	6. 90	1. 48	2. 59	0. 92		0. 04	0. 02		100. 00	
152 B3. IV	63. 52	13. 99	2. 02	0. 21	1. 20	4. 26	0. 93	2. 29	7. 56	3. 80	0. 11	0. 12			100. 00	
153 C3. V	51. 73	21. 41	6. 06	0. 43	1. 72	2. 09	6. 82	1. 61	n. d.			0. 12			100. 00	
154 C3. V	51. 23	22. 33	5. 74	0. 15	1. 75	4. 23	3. 60	4. 63	5. 57	2. 41		0. 16	0. 01		100. 00	
155 B3. IV	62. 99	18. 69	2. 36	2. 20	1. 59	3. 71	4. 18	2. 38	1. 09	0. 64		0. 13	0. 06		100. 00	
156 C3. V	59. 12	20. 34	5. 52	0. 51	3. 38	3. 44	4. 14	2. 81	0. 41	0. 14		0. 19			100. 00	
157 C3. V	59. 10	20. 48	4. 76	0. 20	2. 97	5. 23	4. 88	0. 85	0. 20	0. 33		0. 20	0. 20		100. 00	
158 C3. V	58. 59	21. 29	4. 74	0. 71	2. 49	6. 36	4. 42	0. 94	0. 27	0. 04		0. 19	0. 18		100. 00	
159 D3. V	55. 49	10. 45	6. 81	0. 63	6. 10	17. 11	0. 96	0. 69	0. 91	0. 68	0. 10	0. 04	0. 02		100. 00	
160 C4. V	58. 80	17. 70	6. 77	n. d.	3. 54	5. 83	2. 70	2. 60	2. 80						100. 74	
161 C4. V	61. 40	21. 30	4. 28	n. d.	2. 24	3. 67	3. 11	2. 55	2. 40						100. 95	
162 C4. V	61. 00	20. 80	4. 37	n. d.	2. 56	4. 50	3. 27	2. 15	2. 30						100. 95	
163 B3. IV	59. 93	16. 99	3. 58	1. 28	1. 51	5. 92	3. 23	1. 55	4. 28		0. 96			Cl trace	99. 23	2. 327

ANDESITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
147	Achatis Mta, Caucasus.	C. Schmidt.	H. Abich, G. Armen., II, p. 158, 1888.	Quartz andesite.	SiO_2 includes loss. 3 decimals. Not in W. T.
148	Keli, Caucasus.	C. Schmidt.	H. Abich, G. Armen., II, p. 158, 1888.	Augite andesite.	SiO_2 includes loss. 3 decimals. Not in W. T.
149	Mleti, Caucasus.	Loewinson-Lessing and Krikmeyer.	Loewinson-Lessing, Ref., N. J., II, p. 237, 1899.	Andesite.	In W. T., p. 427.
150	Mleti, Caucasus.	Loewinson-Lessing and Krikmeyer.	Loewinson-Lessing, Ref., N. J., II, p. 237, 1899.	Andesite.	In W. T., p. 427.
151	Salalaki Valley, near Tiflis, Caucasus.	C. Schmidt.	H. Abich, G. Armen., II, p. 153, 1888.	Augite andesite.	SiO_2 includes loss. 3 decimals. Not in W. T.
152	Mzchettra Pass, Armenia.	C. Schmidt.	H. Abich, G. Armen., II, p. 154, 1888.	Andesite tuff.	SiO_2 includes loss. 3 decimals. Not in W. T.
153	Mzchettra Pass, Armenia.	C. Schmidt.	H. Abich, G. Armen., II, p. 154, 1888.	Andesite tuff.	SiO_2 includes loss. 3 decimals. Not in W. T.
154	Mzchettra Pass, Armenia.	C. Schmidt.	H. Abich, G. Armen., II, p. 153, 1888.	Trachyandesite tuff.	SiO_2 includes loss. 3 decimals. Not in W. T.
155	Kipgöll, Armenia.	C. Schmidt.	H. Abich, G. Armen., II, p. 154, 1888.	Augite andesite.	SiO_2 includes loss. 3 decimals. Not in W. T.
156	Alagez, Ziarat, Armenia.	C. Schmidt.	H. Abich, G. Armen., II, p. 154, 1888.	Andesite.	SiO_2 includes loss. 3 decimals. Not in W. T.
157	Little Ararat, Armenia.	C. Schmidt.	H. Abich, G. Armen., II, p. 153, 1888.	Andesite.	SiO_2 includes loss. 3 decimals. Not in W. T.
158	Little Ararat, Armenia.	C. Schmidt.	H. Abich, G. Armen., II, p. 153, 1888.	Andesite fulgurite.	SiO_2 includes loss. 3 decimals. Not in W. T.
159	Arguri Valley, Greater Ararat, Armenia.	C. Schmidt.	H. Abich, G. Armen., II, p. 155, 1888.	Andesite.	SiO_2 includes loss. 3 decimals. Not in W. T.
160	Mount Phako, Lemnos Island, Aegean Sea.	L. de Launay.	L. de Launay, Ann. Mines (9), XIII, p. 223, 1898.	Andesite.	Not in W. T.
161	Pithari, Mytilene Island, Aegean Sea.	L. de Launay.	L. de Launay, Ann. Mines (9), XIII, p. 187, 1898.	Trachyandesite.	Not in W. T.
162	Mesotopos, Mytilene Island, Aegean Sea.	L. de Launay.	L. de Launay, Ann. Mines (9), XIII, p. 187, 1898.	Trachyandesite.	Not in W. T.
163	Spasmeno Vouno Aegina, Greece.	A. Röhrig.	H. S. Washington, J. G., III, p. 150, 1895.	Hornblende andesite.	Sp. gr. low. In W. T., p. 193.

ANDESITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
164 C3. V	55.87	22.40	2.52	1.80	2.99	9.20	1.80	0.39	2.66		0.16				99.79	2.268
165 C3. V	54.86	23.08	4.41	1.50	1.29	6.98	3.35	1.48	2.80		0.05				99.81	2.503
166 D3. V	56.1	20.4	2.3	3.0	6.5	8.6	2.7	0.9	n. d.		0.8				101.3	2.845
167 D4. V	73.2	13.8	2.4	n. d.	1.1	0.6	4.9	2.1	n. d.		3.2				101.3	-
168 D3. V	70.7	16.3	0.1	0.2	0.4	1.6	7.2	3.5	n. d.						100.0	
169 B3. IV	68.71	18.19	1.20	2.25	0.52	3.61	4.23	1.34	n. d.		0.52				100.57	2.499
170 D3. V	64.6	18.7	2.1	4.1	1.5	2.8	4.7	1.5	n. d.						100.0	
171 D3. V	63.6	20.2	2.0	3.9	0.6	2.5	5.0	2.2	n. d.						100.0	
172 D3. V	60.9	21.6	1.9	2.4	1.5	4.2	4.6	2.9	n. d.						100.0	
173 D4. V	57.2	19.5	9.2	n. d.	3.1	5.7	5.2	0.1	n. d.						100.0	
174 D3. V	57.2	19.1	2.2	4.7	3.5	7.1	4.2	2.0	n. d.						100.0	
175 D3. V	56.3	18.5	2.7	3.3	5.5	9.4	3.6	0.7	n. d.						100.0	
176 D4. V	56.0	23.5	5.3	n. d.	2.6	6.7	5.5	0.4	n. d.						100.0	
177 D3. V	53.9	25.6	2.0	3.7	1.9	6.8	3.4	2.7	n. d.						100.0	
178 D3. V	52.4	21.3	4.2	4.5	3.9	11.8	1.8	0.1	n. d.						100.0	
179 D3. V	51.9	22.2	3.2	3.9	5.2	9.3	3.7	0.6	n. d.						100.0	2.764
180 D3. V	51.8	20.1	4.6	7.0	3.4	11.9	1.1	0.1	n. d.						100.0	
181 D3. V	51.7	22.4	3.4	4.0	4.3	10.4	3.4	0.4	n. d.						100.0	
182 D3. V	51.5	24.5	3.9	4.9	2.3	10.9	1.2	0.8	n. d.						100.0	

ANDESITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
164	Kakoperato, Aegina, Greece.	A. Röhrig.	H. S. Washington, J. G., III, p. 150, 1895.	Hornblende andesite.	Sp. gr. low. Segregation in No. 42, II.4.2.4. In W. T., p. 251.
165	Stavro Vouno, Aegina, Greece.	A. Röhrig.	H. S. Washington, J. G., III, p. 150, 1895.	Hornblende andesite.	In W. T., p. 427.
166	Kaimeni? Methana, Greece.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 315, 1902.	Alboranite.	
167	Acrotiri, Thera, Santorini, Aegean Sea.	F. Fouqué.	F. Fouqué, Santorin, p. 365, 1879.	Trass.	Not in W. T.
168	Balos, Thera, Santorini, Aegean Sea.	F. Fouqué.	F. Fouqué. B. Soc. M. Fr., XXV, p. 320, 1902.	Andesite perlite.	Calculated to 100.
169	Acrotiri, Thera, Santorini, Aegean Sea.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 318, 1902.	Andesite.	
170	Thera, Santoriuni, Aegean Sea.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 302, 1902.	Santorinite.	Calculated to 100.
171	Thera, Santorini, Aegean Sea.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 303, 1902.	Santorinite.	Calculated to 100.
172	Thera, Santorini, Aegean Sea.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 304, 1902.	Santorinite.	Calculated to 100.
173	Balos, Thera, Santorini, Aegean Sea.	F. Fouqué.	F. Fouqué, Santorin, p. 343, 1879.	Lava.	Calculated to 100. Not in W. T.
174	Thera, Santorini, Aegean Sea.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 305, 1902.	Lava.	Calculated to 100.
175	Thera, Santorini, Aegean Sea.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 306, p. 1902.	Santorinite.	Calculated to 100.
176	Base of St. Elias, Thera, Santorini, Aegean Sea.	F. Fouqué.	F. Fouqué, Santorin, p. 334, 1879.	Anorthite lava.	Calculated to 100. Not in W. T.
177	Thera, Santorini, Aegean Sea.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 307, 1902.	Santorinite.	Calculated to 100.
178	Thera, Santorini, Aegean Sea.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 313, 1902.	Alboranite.	Calculated to 100.
179	Thera, Santorini, Aegean Sea.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 312, 1902.	Alboranite.	Calculated to 100.
180	Thera, Santorini, Aegean Sea.	F. Fouqué,	F. Fouqué, B. Soc. M. Fr., XXV, p. 309, 1902.	Alboranite.	Calculated to 100.
181	Thera, Santorini, Aegean Sea.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 310, 1902.	Alboranite.	Calculated to 100.
182	Thera, Santorini, Aegean Sea.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 311, 1902.	Alboranite.	Calculated to 100.

ANDESITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
183 C3. V	65.80	19.43	2.13	2.86	1.18	1.99	5.53	1.45	(0.42)		0.16				100.53	2.588
184 C3. V	59.15	20.50	4.50	5.52	0.93	2.25	6.52	1.04	n. d.		0.21				100.62	2.618
185 C3. V	57.08	20.35	2.31	5.75	1.39	9.04	3.82	0.72	n. d.		0.36				100.82	2.765
186 C3. V	68.02	16.73	1.90	4.04	0.92	2.33	4.90	0.92	n. d.		0.31				100.07	2.498
187 C3. V	64.97	19.52	0.95	3.05	1.26	4.61	5.04	0.93	(0.17)		0.16				100.49	2.553
188 C3. V	64.32	21.11	0.56	4.09	1.37	2.39	5.20	1.07	n. d.		0.69				100.80	2.581
189 C3. V	65.97	19.70	2.00	2.67	1.05	2.68	5.04	1.47	(0.06)		0.47				101.05	2.577
190 D3. V	71.0	16.8	0.3	0.5	0.7	0.8	7.4	2.0	n. d.		0.5				100.0	
191 D3. V	67.6	16.5	1.6	3.4	2.2	2.6	4.9	1.8	0.7						101.3	
192 D3. V	67.3	17.2	1.4	3.2	2.0	2.5	4.7	2.1	1.1						101.5	
193 D3. V	66.1	17.6	1.7	3.7	2.1	3.1	3.9	1.6	0.9						100.7	
194 C3. V	65.42	20.61	1.45	2.40	1.04	3.43	5.19	0.88	n. d.		0.26				100.68	2.496
195 D3. V	66.0	18.1	1.2	2.9	2.2	2.2	4.0	4.2	0.7						101.5	
196 C3. V	53.59	23.82	0.31	5.75	3.62	10.53	2.39	0.37	(0.51)		0.05				100.43	2.764
197 C3. V	66.40	19.05	1.20	4.15	1.20	3.40	4.50	1.25	n. d.						101.15	
198 C4. V	67.66	15.30	2.37	n. d.	1.53	4.95	3.68	2.69	2.90						101.08	
199 D3. V	56.70	19.57	2.96	1.70	3.34	6.17	3.59	1.71	3.20						98.94	
200 D4. V	55.55	17.14	6.39	n. d.	3.30	6.78	2.88	3.87	1.76						97.67	
201 D3. V	46.20	14.75	9.67	0.75	6.07	9.53	4.43	1.39	2.40		2.28	0.45			97.92 (100.52)	
202 D4. V	57.16	20.06	2.84	1.95	1.55	4.41	5.84	4.52	1.09		2.67		trace		102.09	

ANDESITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
183	Therasia, Santorini, Aegean Sea.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 298, 1902.	Santorinite.	Cf. No. 172, I.4.2.4.
184	Upper flow, Aspronisi, Santorini, Aegean Sea.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 299, 1902.	Santorinite.	
185	Lower flow, Aspronisi, Santorini, Aegean Sea.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 300, 1902.	Santorinite.	
186	Palaea Kaimeni, Santorini, Aegean Sea.	F. Fouqué.	F. Fouqué, B. Soc M. Fr., XXV, p. 297, 1902.	Santorinite.	Cf. No. 173, I.4.2.4.
187	Palaea Kaimeni, Santorini, Aegean Sea.	F. Fouqué.	F. Fouqpé, B. Soc. M. Fr., XXV, p. 296, 1902.	Santorinite.	Cf. No. 173, I.4.2.4.
188	Palaea Kaimeni, Santorini, Aegean Sea.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 295, 1902.	Santorinite.	
189	Mikra Kaimeni, Santorini, Aegean Sea.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 293, 1902.	Santorinite.	
190	Santorini, Aegean Sea.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 316, 1902.	Santorinite pumice.	
191	Bomb of 1866, Giorgio Kaimeni, Santorini, Aegean Sea.	H. Arsandaux.	H. Arsandaux, B. Soc. M. Fr., XXIV, p. 467, 1901.	Andesite.	
192	Bomb of 1868, Giorgio Kaimeni, Santorini, Aegean Sea.	H. Arsandaux.	H. Arsandaux, B. Soc. M. Fr., XXIV, p. 467, 1901.	Andesite.	Interior.
193	Bomb of 1868, Giorgio Kaimeni, Santorini, Aegean Sea.	H. Arsandaux.	H. Arsandaux, B. Soc. M. Fr., XXIV, p. 467, 1901.	Andesite.	Crust.
194	Bomb of 1868, Giorgio Kaimeni, Santorini, Aegean Sea.	F. Fouqueé.	F. Fouqué. B. Soc. M. Fr., XXV, p. 292, 1902.	Santorinite.	Crust.
195	Bomb of 1867, Giorgio Kaimeni, Santorini Aegean Sea.	H. Arsandaux.	H. Arsandaux, B. Soc. M. Fr., XXIV, p. 467, 1901.	Andesite.	
196	Giorgio Kaimeni, Santorini, Aegean Sea.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 314, 1902.	Alboranite.	Inclusion in santorinite.
197	May Island, Santorini, Aegean Sea.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 286, 1902.	Santorinite.	
198	Cap Marsa, Menerville, Algeria.	Duparc and Pearce.	Duparc, Pearce, and Ritter, Mem. Soc. Ph. Gen., XXXIII, No. 2, p. 89, 1900.	Hornblende andesite.	In W. T., p. 427.
199	Cap Marsa, Menerville, Algeria.	Duparc and Pearce.	Duparc, Pearce, and Ritter, Mem. Soc. Ph. Gen., XXXIII, No. 2, p. 84, 1900.	Hypersthene andesite.	Mean of 3. In W. T., p. 427.
200	Cap Marsa, Menerville, Algeria.	Duparc and Pearce.	Duparc, Pearce, and Ritter, Mem. Soc. Ph. Gen., XXXIII, No. 2, p. 84, 1900.	Hypersthene andesite.	Mean of 3. In W. T., p. 427.
201	Les Mamelles, Cap Verde, Senegal.	Pisani.	J. Chantard, C. R., CXLIII, p. 921, 1906.	Andesite.	Also in B. Soc. Gr. (4), VII, p. 437, 1907.
202	Nightingale Island, Tristan d'Acunha.	Klement.	A. Renard, Chall. Rep. Oc. Islds., p. 92, 1889.	Andesite tuff.	In W. T., p. 427.

ANDESITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
203 D4. V	64.54	19.16	7.23	n. d.	3.39	2.47	0.57	1.13	2.25		0.79				101.53	
204 A4. IV	55.67	16.06	10.89	n. d.	2.93	5.92	3.81	0.51	4.15			0.83			100.77	
205 B4. V	55.10	19.57	8.52	n. d.	2.01	5.90	3.67	4.77	1.19						100.73	
206 B4. V	60.12	18.25	5.43	n. d.	1.11	3.83	5.81	1.69	3.52						99.76	2.58
207 C3. V	54.80	22.31	2.47	4.33	3.28	7.08	4.47	1.03	0.30				trace		100.07 (100.77)	2.76
208 C2. IV	59.70	16.68	5.43	2.09	2.35	5.20	2.67	0.99	0.90			0.15	0.98	SO_3 0.95 S 2.25	100.34	
209 C3. V	59.56	16.10	6.28	3.02	3.08	6.32	3.09	0.80	0.44			0.18	1.80		100.67	
210 B3. IV	57.32	22.67	1.28	5.61	5.43	0.12	3.89	1.35	2.60						100.67	
211 B3. IV	51.85	21.97	4.64	2.87	1.88	8.24	4.04	1.64	3.84						100.97	
212 B3. IV	51.34	21.21	1.75	9.16	2.56	9.92	3.22	0.25	0.85						100.26	
213 D4. V	54.66	14.79	8.59	n. d.	0.80	6.08	3.62	2.30	3.93			0.10	0.63	Cl 0.29 S 3.16	98.95	
214 B3. V	49.89	20.01	1.75	9.16	3.58	10.45	4.17	0.42	0.80						100.23	
215 C3. V	61.28	18.16	5.97	1.76	0.79	3.55	5.51	2.75	1.72				trace		101.49	
216 B4. V	59.87	17.23	9.96	n. d.	0.77	2.96	6.21	2.92	0.61						100.53	
217 C3. V	50.87	21.98	5.85	5.09	1.38	9.12	2.85	0.22	0.43				1.45		99.24	
218 B4. V	54.44	12.90	7.08	n. d.	12.75	5.12	2.06	0.35	5.54						100.24	2.75
219 B4. V	53.18	16.18	10.30	n. d.	6.72	10.12	1.85	0.35	1.65						100.35	2.725
220 A4. IV	58.14	17.93	5.46	n. d.	2.61	7.63	4.08	2.16	1.76	0.10					99.87	

ANDESITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
203	Harrismith, Orange River Colony.	W. P. Jorissen.	G. A. F. Molengraaf, N. J., I, p. 82, 1894.	Cordierite vitrophyrite.	In W. T., p. 427.
204	Chemerin, Kushkek, Elburz Mountains, Persia.	E. Drasche.	E. Drasche, Vh. G. R.-A. Wien, p. 196, 1884.	Andesite.	In W. T., p. 427.
205	Buhemin, Elburz Mountains, Persia.	E. Drasche.	E. Drasche, Vh. G. R.-A. Wien, p. 196, 1884.	Andesite.	In W. T., p. 429.
206	Nikolaievska, Amur River, Siberia.	Not stated.	K. E. Bogdanovitch, Fund. Marek., p. 57.	Hornblende andesite.	
207	Kljutschwesk, Korjaka Volcano, Kamchatka.	Not stated.	K. Bogdanovitch, Pet. Mt., L, p. 173, 1904.	Augite andesite.	
208	Bandaisan, Japan.	Shimidzu.	T. Wada, Mt. D. Ges. Ost.-As., V, p. 74, 1889.	Andesite ash.	Alkalies interchanged. Cf. N. J., 1890, II, p. 102. In W. T., p. 429.
209	Bandaisan, Japan.	Shimidzu.	T. Wada, Mt. D. Ges. Ost.-As., V, p. 74, 1889.	Andesite.	Alkalies interchanged. Cf. N. J., 1890, II, p. 102. In W. T., p. 245.
210	Iwaonobori, Shiribeshi, Hokkaido, Japan.	Takamine.	B. G. Soc. Jap., 1885?	Andesite.	Not in W. T.
211	Kabashite, Oshima, Hokkaido, Japan.	Takamine.	B. G. Soc. Jap., 1885?	Andesite.	Not in W. T.
212	Usu, Iburi, Hokkaido, Japan.	Takamine.	B. G. Soc. Jap., 1885?	Andesite.	Not in W. T.
213	Kirishimayama, Kiu Shiu, Japan.	M. Fesca.	M. Fesca, Mt. D. Ges. Ost.-As., VI, p. 347, 1896.	Andesite ash.	Incorrect in N. J., 1897, I, p. 288. In W. T., p. 429.
214	Naiho, Etrof, Chishima, Japan.	Takamine.	B. G. Soc. Jap., 1885?	Andesite.	Not in W. T.
215	Sulphur Island, Japan.	J. Petersen.	J. Petersen, Jb. Hamb. W. Anst., VIII, p. 13, 1891.	Augite andesite.	In W. T., p. 429.
216	Sulphur Island, Japan.	J. Petersen.	J. Petersen, Jb. Hamb. W. Anst., VIII, p. 15, 1891.	Augite andesite.	In W. T., p. 429.
217	Miiakeshima, Bonin Islands, Japan.	J. Petersen.	J. Petersen, Jb. Hamb. W. Anst., VIII, p. 50, 1891.	Mijakite.	In W. T. p. 429.
218	Miyanura, Chichishima, Bonin Islands, Japan.	Fukuda.	Y. Kikuchi, J. Coll. Sci. Jap., III, p. 73, 1890.	Andesite.	"Boninite" in Petersen, ref. above. In W. T., p. 429.
219	Kurose, Ototoshima, Bonin Islands, Japan.	Fukuda.	Y. Kikuchi, J. Coll. Sci. Jap., III, p. 73, 1890.	Andesite perlite.	"Boninite" in Petersen, ref. above. In W. T., p. 429.
220	Aroyroy, Masbate, Philippine Islands.	A. J. Cox.	A. J. Cox, Phil. J. Sci. (A), III, p. 404, 1908.	Andesite.	

ANDESITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
221 A4. IV	56.55	22.34	1.87	n. d.	2.36	4.74	2.38	4.84	4.86	2.51					100.44	
222 B4. V	55.97	20.35	6.26	n. d.	3.40	7.92	3.52	2.48	0.38	0.33					100.61	
223 A4. IV	53.69	18.00	9.11	n. d.	4.59	8.64	3.07	1.63	1.08	0.31					100.12	
224 C3. V	63.9	17.8	3.7	0.4	1.4	4.2	4.2	3.4	0.2						99.2	
225 C3. V	55.5	20.5	6.8	0.6	4.2	7.9	3.4	1.5	0.1						100.5	
226 D3. V	61.42	15.21	2.43	1.88	1.19	8.34	5.53	1.90	0.97						98.87	2.585
227 B3. IV	60.66	17.86	2.21	4.01	1.59	6.38	0.67	4.43	2.46						100.87	2.712
228 B3. IV	60.47	17.81	5.79	2.09	4.47	4.51	0.50	4.13	0.22		trace		0.94		100.93	2.722
229 D3. V	59.13	12.98	6.08	0.52	2.13	11.90	3.99	2.12	0.05						98.90	
230 C3. V	56.00	22.8	4.2	0.2	1.8	6.5	6.1	1.6	1.0						100.2	
231 C3. V	52.6	22.5	6.8	0.6	2.3	8.8	4.2	2.1	0.5						100.4	
232 C3. V	58.2	20.4	4.6	0.3	3.0	7.7	3.2	2.0	0.4						99.8	
233 B3. IV	56.89	15.81	6.52	3.76	2.62	6.79	1.35	1.61	0.51				3.64		99.50	2.774
234 B3. IV	53.77	15.01	5.07	3.07	1.97	16.50	3.99	1.26	0.17						100.81	2.779
235 B3. IV	58.31	18.90	3.65	3.62	1.64	7.19	3.01	1.03	0.91				1.82		100.08	2.683
236 B3. IV	57.84	18.40	6.22	2.41	3.33	8.19	0.89	2.61	0.86				0.23		100.98	2.736
237 B4. V	57.76	18.39	7.51	n. d.	3.34	6.21	3.63	2.61	0.94						100.89	2.664
238 B3. IV	69.4	15.9	1.2	2.2	1.1	3.4	4.2	2.3	1.0						100.7	
239 C3. V	62.10	23.90	2.16	1.01	0.19	4.09	4.10	2.10	n. d.		0.37				99.63	2.345
240 D3. V	57.76	18.29	3.99	3.31	1.90	6.70	4.15	1.59	0.48		0.59				98.76	2.47

ANDESITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
221	Guadalupe, near Manila, Luzon, Philippine Islands.	A. J. Cox.	A. J. Cox, Phil. J. Sci. (A), III, p. 404, 1908.	Andesite? tuff.	
222	Canlaon Volcano, Negros Island, Philippine Islands.	A. J. Cox.	A. J. Cox, Phil. J. Sci. (A), III, p. 404, 1908.	No name (andesite?).	
223	Canlaon Volcano, Negros Island, Philippine Islands.	A. J. Cox.	A. J. Cox, Phil. J. Sci. (A), III, p. 404, 1908.	No name (andesite?).	
224	Kaba Volcano, Sumatra.	H. Hoppe.	H. Hoppe, In. Diss. Bres., p. 54, 1903.	Pyroxene andesite.	
225	Kaba Volcano, Sumatra.	H. Hoppe.	H. Hoppe, In. Diss. Bres., p. 56, 1903.	Pyroxene andesite.	
226	Gunung Tiga, Sumatra.	A. Clausnitzer.	R. D. M. Verbeek, Sum. Westk., p. 516, 1883.	Hornblende andesite.	Not in W. T.
227	Apenberg, Sumatra.	J. J. Pennink.	R. D. M. Verbeek, Sum. Westk., p. 516, 1883.	Augite andesite.	Alkalies incorrect. Not in W. T.
228	Golgoeg, Talang Volcano, Sumatra.	J. G. Kramers.	R. D. M. Verbeek, Sum. Westk., p. 518, 1883.	Augite andesite.	Alkalies incorrect. Not in W. T.
229	Merapi Volcano, Sumatra.	A. Clausnitzer.	R. D. M. Verbeek, Sum. Westk., p. 518, 1883.	Augite andesite.	Bomb. Not in W. T.
230	Merapi Volcano, Sumatra.	H. Hoppe.	H. Hoppe, In. Diss. Bres., p. 45, 1903.	Hornblende pyroxene andesite.	
231	Merapi Volcano, Sumatra.	H. Hoppe.	H. Hoppe, In Diss. Bres., p. 42, 1903.	Pyroxene andesite.	
232	Manindjan Volcano, Sumatra.	H. Hoppe.	H. Hoppe, In. Diss. Bres., p. 50, 1903.	Pyroxene andesite.	
233	Danan Paoeh, Limau Manias Volcano, Sumatra.	J. G. Kramers.	R. D. M. Verbeek, Sum. Westk., p. 516, 1883	Augite andesite.	MnO high? Not in W. T.
234	Kotta Toea, Singalang Volcano, Sumatra.	A. Clausnitzer.	R. D. M. Verbeek, Sum. Westk., p. 518, 1883.	Augite andesite.	CaO and MgO? Not in W. T.
235	Pasar-Arbaa Volcano, Sumatra.	J. G. Kramers.	R. D. M. Verbeek, Sum. Westk., p. 518, 1883.	Augite andesite.	MnO high. Not in W. T.
236	Singkarah Volcano, Sumatra.	J. G. Kramers.	R. D. M. Verbeek, Sum. Westk., p. 518, 1883.	Augite andesite.	Alkalies? Not in W. T.
237	Eruption of 1876, Merapi Volcano, Java.	A. Lagorio.	A. Lagorio, T. M. P. M., VIII, p. 467, 1887.	Andesite.	In W. T., p. 429.
238	Eruption of 1883, Krakatoa.	T. H. Waller.	J. W. Judd, Erupt. Krak., p. 38, 1888.	Andesite pumice.	Not in W. T.
239	Tandjoeng Santigi, Sumbawa Island.	Tillmans.	G. Rack, N. J. B. B., XXXIV, p. 50, 1912.	Amphibole desite.	
240	Kawinda, Sumbawa Island.	Tillmans.	G. Rack, N. J. B. B., XXXIV, p. 56, 1912.	Biotite-augite andesite.	

ANDESITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
241 D3. V	48.25	19.76	5.77	6.11	3.28	10.26	2.79	1.64	2.92		0.94				101.62	2.78
242 D4. V	60.94	17.80	n. d.	5.20	2.33	3.35	(2.77)	(2.46)	3.21						98.06	2.524
243 C3. V	80.76	9.71	0.40	0.36	0.32	2.07	3.46	1.40	0.31		0.92				99.70	2.61
244 D3. V	60.34	15.58	4.24	2.66	2.39	5.45	3.24	1.37	0.69		0.93				96.89	2.71
245 D3. V	49.70	14.70	5.28	7.98	3.24	9.30	3.53	0.51	1.06		2.18				97.38	2.94
246 D3. V	49.26	18.30	4.95	5.89	1.36	8.83	4.01	0.70	2.57		1.31				97.18	2.77
247 C2. IV	55.20	20.14	3.55	3.46	1.10	9.17	4.80	0.96	1.25	0.10	1.17	trace	0.09	CO_2 none	100.99	–
248 C3. V	64.49	14.26	3.91	3.28	1.25	3.67	6.60	0.40	1.22						99.08	
249 B2. III	57.60	20.35	4.24	2.39	1.61	7.06	3.55	1.88	0.65		0.73		0.24		100.30	
250 B2. III	56.60	20.61	3.13	2.30	1.52	5.81	2.08	4.59	2.20		1.20		0.09		100.13	
251 D4. V	52.60	18.30	12.70	n. d.	4.65	11.05	0.67	0.09	n. d.			0.06			100.12	
252 D4. V	51.35	18.20	14.50	n. d.	3.10	10.26	0.84	0.16	0.25			0.13		SO_3 0.41 Cl 0.05	99.25	
253 D4. V	50.90	20.00	14.10	n. d.	2.77	10.38	0.70	0.14	n. d.			0.16		SO_3 0.22 Cl 0.04	99.41	
254 D4. V	55.12	20.41	7.74	n. d.	2.75	5.35	3.80	2.50	3.13						100.80	
255 B2. IV	50.53	20.18	0.64	5.54	3.39	8.75	2.45	0.61	6.71		1.02		0.18	BaO none	100.00	
256 C3. V	57.47	19.20	3.83	3.22	0.49	9.35	2.47	1.36	0.39	0.12			0.97	SO_3 0.23	99.10	2.738
257 C4. V	56.57	17.82	2.91	2.65	trace	5.11	3.09	2.61	5.98	2.03			0.84		99.61	2.359
258 C4. V	57.04	19.51	5.50	2.71	none	8.16	2.83	2.38	0.20				2.05		100.38	2.720
259 C4. V	56.76	21.10	4.52	3.02	trace	9.01	2.80	3.27	0.24				trace		100.72	2.666
260 B4. V	60.95	15.97	9.08	n. d.	1.40	2.92	2.34	1.61	4.95						99.22	

ANDESITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
241	Doro Kompo, Sumbawa Island.	Tillmans.	G. Rack, N. J. B. B., XXXIV, p. 62, 1912.	Labrador-andesite (basalt).	
242	Mount Touna, Hiton, Ambon Island.	E. C. Lieber.	R. D. M. Verbeek, Jb. Mijnw., XXXIV, p. 231, 1905.	Ambonite (bronzite andesite).	French edition, p. 244. Alkalies corrected, p. 245.
243	Langa-weka River, Flores Island.	Tillmans.	G. Rack, N. J. B. B., XXXIV, p. 77, 1912.	Augite andesite.	"Silicified."
244	Ndoera River, Flores Island.	Tillmans.	G. Rack, N. J. B. B., XXXIV, p. 79, 1912.	Pyroxene andesite.	Sum low?
245	Manoe-Bola River, Flores Island.	Tillmans.	G. Rack, N. J. B. B., XXXIV, p. 76, 1912.	Augite andesite.	
246	Ota-weka River, Flores Island.	Tillmans.	G. Rack, M. J. B. B., XXXIV, p. 77, 1912.	Augite andesite.	
247	Pokolbin, New South Wales.	Not stated.	Browne and Walkom, Pr. R. Soc. N. S. W., p. 403, 1911.	Andesite.	
248	White Island, New Zealand.	W. A. McLeod.	W. A. McLeod, Tr. N. Z. Inst., XXXI, p. 488, 1899.	Hypersthene andesite.	Alkalies? In W. T., p. 227.
249	Sentry Hill, New Plymouth, Taranaki, New Zealand.	J. S. Maclaurin.	E. D. Clarke, N. Z. G. S. B. 14, p. 23, 1912.	Andesite?	Al_2O_3 and MgO.
250	Inglewood, New Plymouth, Taranaki, New Zealand.	J. S. Maclaurin.	E. D. Clarke, N. Z. G. S. B. 14, p. 23, 1912.	Andesite?	Al_2O_3 and MgO.
251	Rotoehu, Tarawera, New Zealand.	J. A. Pond.	S. P. Smith, Erupt. Taraw., p. 76, 1887.	Lapilli (andesite?).	Alkalies and CaO? In W. T., p. 429.
252	Pareheru, Tarawera, New Zealand.	J. A. Pond.	S. P. Smith, Erupt. Taraw., p. 76, 1887.	Lapilli (andesite?).	Alkalies and CaO? In W. T., p. 429.
253	Wairoa, Tarawera, New Zealand.	J. A. Pond.	S. P. Smith, Erupt. Taraw., p. 76, 1887.	Andesite lapilli.	Alkalies and CaO? In W. T., p. 431.
254	Port Hills, Christ Church, Banks Peninsula, New Zealand.	R. Speight.	R. Speight, Tr. N. Z. Inst., XXV, p. 369, 1893.	Olivine andesite.	"Best of 4 bad analyses." In W. T., p. 431.
255	Thames, Hauraki, Auckland, New Zealand.	J. S. Maclaurin.	C. Fraser, N. Z. G. S. B. 10, p. 24, 1910.	Hornblende-pyroxene andesite.	Calculated to 100.
256	Volcano, New Britain, Bismarck Archipelago.	A. Liversidge.	A. Liversidge, J. R. Soc. N. S. W., XVI, p. 50, 1883.	Lava (andesite?).	Al_2O_3 and MgO. In W. T., p. 251.
257	New Britain, Bismarck Archipelago.	A. Liversidge.	A. Liversidge, J. R. Soc. N. S. W., XVI, p. 50, 1883.	Pumice (andesite?).	Al_2O_3 and MgO. In W. T., p. 429.
258	Tanna Island, New Hebrides.	A. Liversidge.	A. Liversidge, J. R. Soc. N. S. W., XX, p. 236, 1887.	Lava (andesite?).	Al_2O_3 and MgO? MnO high. In W. T., p. 429.
259	Tanna Island, New Hebrides.	A. Liversidge.	A. Liversidge, J. R. Soc. N. S. W., XX, p. 237, 1887.	Lava (andesite?).	In W. T., p. 429.
260	Lat. 35° 41′ N., Long. 157° 42′ E., South Pacific Ocean.	A. F. Renard.	Murray and Renard, Chall. Rep., Deep Sea Dep., p. 296, 1891.	Andesite pumice.	Dredged block. Not in W. T.

LAMPROPHYRES.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 B3. IV	52.29	19.38	4.40	6.00	3.54	7.79	2.12	4.12	0.95						100.59	
2 C3. V	53.69	25.86	n. d.	1.71	1.91	0.65	0.89	8.11	3.66			0.25		CO_2 0.11 F 0.07 FeS_2 1.89 BaO 0.37	99.17	
3 C4. V	58.99	9.79	10.07	4.96	2.30	6.74	3.78	3.81	n. d.				0.20		100.64	
4 D4. V	49.34	16.47	4.08	n. d.	3.54	12.13	4.53	4.35	(8.31)				0.25		100.00	
5 D4. V	47.2	19.7	2.4	n. d.	5.8	11.2	4.9	2.3	(7.7)						100.00	
6 B4. V	47.46	18.99	8.66	n. d.	8.78	5.41	1.72	5.67	3.37						100.06	
7 C3. V	59.87	21.23	4.04	3.34	2.62	1.20	1.14	3.62	2.75						99.81	
8 C3. V	59.26	9.21	6.91	1.69	3.57	12.02	1.88	2.31	1.34			trace	2.77	CO_2 trace	100.96	
9 B3. IV	54.51	14.98	2.76	7.95	2.55	1.74	0.17	6.15	3.52	0.21	3.19	2.73	0.13		100.49	2.90
10 B3. IV	55.56	18.42	2.23	4.04	3.96	5.53	2.87	3.08	2.84		0.74	0.25			99.52	2.777
11 C3. V	63.30	18.60	2.33	1.35	1.66	3.76	3.45	1.76	5.00						101.21	
12 C3. V	52.30	17.45	1.80	4.80	8.50	4.78	2.12	3.23	3.70					CO_2 2.40	101.08	
13 D3. V	51.80	18.90	1.81	5.25	8.32	4.72	0.75	6.75	3.10						101.40	
14 D3. V	64.12	19.20	0.66	2.95	2.85	3.45	2.64	3.80	1.62						101.39	
15 D3. V	59.90	17.80	1.20	3.87	6.71	2.20	1.91	3.18	4.98						101.75	
16 C4. V	67.50	14.50	7.00	n. d.	2.30	1.10	3.38	3.38	1.60						100.76	
17 C4. V	66.04	13.30	8.40	n. d.	2.20	1.60	3.40	4.70	1.10						100.74	
18 C4. V	66.30	15.30	5.40	n. d.	2.60	0.90	2.80	4.60	1.20						99.10	
19 C2. IV	48.45	15.57	5.07	4.86	4.28	10.48	3.57	2.15	2.23		2.15	0.80		CO_2 1.57	101.18	
20 C4. V	43.84	15.30	17.16	n. d.	8.30	6.19	2.17	trace	4.80		1.72				99.48	

LAMPROPHYRES.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Blanche River, Swastika, Ontario.	E. L. Bruce.	E. L. Bruce. Sch. Min. Q., XXXV, p. 163, 1914.	Augite lamprophyre.	
2	Butte mine, Robinson District, Nevada.	H. Ross.	A. C. Lawson, B. Dep. G. Un. Cal., IV, p. 346, 1906.	Minette.	Altered.
3	Storrs, Ingleton, Yorkshire, England.	T. Tate.	A. Harker, The Naturalist, p. 153, 1899.	Mica lamprophyre.	Not in W. T.
4	Helm Gill, near Sedbergh, Yorkshire, England.	T. Tate.	A. Harker, The Naturalist, p. 153, 1899.	Mica lamprophyre.	H_2O=loss. Not in W. T.
5	Helm Gill, near Sedbergh, Yorkshire, England.	T. Tate.	A. Harker, The Naturalist, p. 153, 1899.	Mica lamprophyre.	Not in W. T.
6	Kapelle, near Weiler, Elsass.	G. Linck.	G. Linck, Abh. G. Kt. Els. Loth., III (I), p. 57, 1884.	Minette.	In W. T., p. 397.
7	Metzdorf, Erzgebirge.	R. Reinisch.	C. Gabert, Z. D. G. G., LIX, p. 348, 1907.	Mica trap.	
8	Walynkathal, Böhmerwald, Bohemia.	J. Mühlbauer.	J. N. and J. Woldrich, Arch. Landf. Böhm., XII (4), p. 65, 1904.	Minette.	
9	Piz Chalchagn, Bernina District, Switzerland.	L. Hezner.	U. Grubenmann, pers. com.	Dark dike (minette?).	P_2O_5 high.
10	Altgersdorf, near Aachen, Rheinland.	Linder.	E. Dathe, Jb. Pr. G. L.-A., XIX, p. CXXIX, 1899.	Vogesite.	Cf. No. 65, II.5.2.4. Not in W. T.
11	Hopital Camfront, Brittany.	Not stated.	C. Barrois, Cong. G. Int. VIII, Guide VII, p. 19, 1900.	Kersantite.	In W. T., p. 411.
12	Hopital Camfront, Brittany.	Not stated.	G. Barrois, Cong. G. Int. VIII, Guide VII, p. 19, 1900.	Kersantite.	In W. T., p. 411.
13	Hopital Camfront, Brittany.	Not stated.	C. Barrois, Cong. G. Int. VIII, Guide VII, p. 19, 1900.	Kersantite.	In W. T., p. 411.
14	Roche d'Agoux, La Creuse, France.	Pisani.	L. de Launay, B. Sv. Ct. G. Fr., XI, No. 83, p. 77, 1902.	Kersantite.	
15	Espinasse, La Creuse, France.	Pisani.	L. de Launay, B. Sv. Ct. G. Fr., XI, No. 83, p. 77, 1902.	Kersanitte.	
16	Croix de Fer, Grandes Rousses, Dauphiny.	Fabre.	P. Termier, B. Sv. Ct. G. Fr., VI, No. 40, p. 50, 1894.	Kersantite.	In W. T., p. 411.
17	Croix de Fer, Grandes Rousses, Dauphiny.	Fabre.	P. Termier, B. Sv. Ct. G. Fr., VI, No. 40, p. 50, 1894.	Kersantite.	In W. T., p. 413.
18	La Balme, Grandes Rousses, Dauphiny.	Fabre.	P. Termier, B. Sv. Ct. G. Fr., VI, No. 40, p. 50, 1894.	Kersantite.	In W. T., p. 413.
19	Stoitrenna, Gran, Norway.	V. Schmelck.	W. C. Brögger, Eg. Kg., III, p. 81, 1899.	Kersantite.	In W. T., p. 413.
20	Rotmurg, Württemberg.	Not stated.	K. Regelmann, Erl. G. Kt. Würt., Bl. 91, p. 39, 1907.	Kersantite.	Schliere in granite.

LAMPROPHYRES—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
21 B3. IV	47.60	20.49	7.36	4.01	4.66	8.75	3.80	2.66	0.34						99.67	
22 B3. IV	47.49	20.13	3.88	6.04	5.62	8.70	5.13	2.43	0.56						99.98	
23 D3. V	56.95	17.70	2.73	4.22	4.80	6.58	2.93	3.33	1.48	0.29		0.59			101.73	2.76
24 B3. IV	63.08	15.61	2.38	2.55	2.48	1.90	4.77	3.54	1.90		1.24		1.17		100.72	
25 B4. V	60.52	16.99	8.07	n. d.	2.52	1.21	7.03	2.01	1.94					CO_2 0.40	100.69	
26 B3. IV	60.38	15.54	6.39	1.71	2.64	1.12	7.30	1.92	2.82					CO_2 0.48	100.30	
27 B3. IV	61.24	19.45	1.08	2.84	2.37	1.22	4.85	2.86	3.64		0.16		0.09		99.80	
28 B3. IV	56.38	14.83	2.85	1.53	2.84	6.78	3.16	3.08	5.94					CO_2 3.52	100.91	
29 B3. IV	60.52	17.73	2.08	2.75	5.27	1.10	3.96	3.08	3.38				trace	CO_2 0.02	99.89	
30 B4. V	59.68	15.65	7.22	n. d.	5.33	1.20	4.49	3.65	3.30				0.21		100.73	
31 B3. IV	53.44	16.19	2.80	5.49	6.76	2.24	4.17	3.51	3.57		1.60	0.31	0.16	CO_2 0.15	100.39	
32 D2. V	52.10	16.51	2.19	2.31	3.07	2.62	3.07	4.37	1.29	0.14	1.08	0.31		CO_2 0.25 SO_3 0.18	89.89 (98.84)	
33 C3. V	52.5	23.0	6.6	2.0	4.6	8.4	1.7	0.9	0.7						100.4	
34 B4. V	57.48	16.82	8.49	n. d.	4.64	5.45	2.63	4.57	0.25						100.33	
35 B4. V	56.77	20.02	6.40	n. d.	3.70	5.40	4.01	3.94	0.13						100.36	
36 C4. V	60.90	18.67	n. d.	5.38	1.48	4.70	2.90	2.27	1.90		0.80				99.00	
37 C3. V	56.75	20.58	0.53	6.11	2.73	4.82	4.65	0.90	1.78		1.15				100.00	
38 D3. V	49.00	23.22	1.37	8.51	2.95	4.25	3.29	2.08	2.35		1.60				98.62	
39 D3. V	61.90	17.20	1.90	2.71	2.82	4.44	3.82	2.90	2.89		trace	trace	trace	CO_2 0.92	101.50	
40 B3. IV	51.04	21.43	5.86	2.27	3.54	2.14	5.92	2.71	3.65	0.50	1.11				100.17	2.79

LAMPROPHYRES—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
21	Lastei da Monzoni, Monzoni, Tyrol.	J. A. Ippen.	J. A. Ippen, N. J. Cb., 1903. p. 637,	Kersantite.	
22	Monte Mulatto, Predazzo, Tyrol.	J. A. Ippen.	J. A. Ippen, N. J. Cb., 1904. p. 419,	Kersantite.	
23	Hospice, St. Gotthard, Switzerland.	K. M. Jene.	P. Waindziok, In. Diss. Zür., p. 34, 1906.	Kersantite.	Metamorphosed.
24	Herrnburg, Oberstaufenbach, Pfalz, Bavaria.	A. Schwager.	Schuster and Schwager, Geog. Jhft., XXII, p. 54, 1910.	Cuselite.	Series not satisfactory.
25	Herrnburg, Oberstaufenbach, Pfalz, Bavaria.	A. Schwager.	Schuster and Schwager, Geog. Jhft., XXII, p. 54, 1910.	Cuselite.	
26	Herrnburg, Oberstaufenbach, Pfalz, Bavaria.	A. Schwager.	Schuster and Schwager, Georg. Jhft., XXII, p. 54, 1910.	Cuselite.	
27	Rammelskopf, Pfalz, Bavaria.	S. Schwager.	Schuster and Schwager, Geog. Jhft., XXII, p. 53, 1910.	Cuselite.	
28	Rammelsbusch, near Ulmet, Pfalz, Bavaria.	A. Schwager.	Schuster and Schwager, Geog. Jhft., XXII, p. 55, 1910.	Cuselite.	Not fresh.
29	Remigiusberg, Pfalz, Bavaria.	A. Schwager.	Schuster and Schwager, Geog. Jhft., XXII, p. 53, 1910.	Cuselite.	
30	Remigiusberg, Pfalz, Bavaria.	A. Schwager.	Schuster and Schwager, Geog. Jhft., XXII, p. 53, 1910.	Cuselite.	
31	Hühnerkopf, Herschweiler, Pfalz, Bavaria.	A. Schwager.	Schuster and Schwager, Geog. Jhft., XXII, p. 55, 1910.	Cuselite.	
32	Strahlenberg, Schriesheim, Odenwald.	Stadler.	G. Klemm, Nb. Ver. Erdk. (4), XXVIII, p. 30, 1907.	Malchite.	Sum?
33	Niederarusdorf, Riesengebirge.	W. Herz.	L. Milch, N. J. Cb., p. 676, 1902.	Malchite.	
34	Passo di Campo, Adamello, Lombardy.	C. Riva.	C. Riva, At. Soc. It. Mil., XXVII, p. 265, 1897.	Malchite.	In W. T., p. 425.
35	Lago d'Arno, Adamello, Lombardy.	C. Riva.	C. Riva, At. Soc. It. Mil., XXVII, p. 265, 1897.	Malchite.	In W. T., p. 425.
36	Mergozzo, Lake Mergozzo, Piedmont.	F. Hinden.	H. Preiswerk, Rosenb. Fests., p. 326, 1906.	Mica malchite.	
37	Mergozzo, Lake Mergozzo, Piedmont.	F. Hinden.	H. Preiswerk, Rosenb. Fests., p. 326, 1906.	Malchite.	
38	Mergozzo, Lake Mergozzo, Piedmont.	F. Hinden.	H. Preiswerk, Rosenb. Fests., p. 326, 1906.	Malchite.	
39	Amba Chefut, Digsa, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 104, 1909.	Malchite.	Not fresh.
40	Sonnenberg, Verrucano, Switzerland.	L. Hezner?	R. Beder, In. Diss. Zür., p. 25, 1909.	Olivine weiselbergite.	

LAMPROPHYRES—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
41 **C2. IV**	47.93	20.19	3.51	6.69	5.83	7.88	2.61	1.79	1.68	0.17	0.74	0.10		CO_2 0.29 SO_3 0.42	99.83	
42 **D3. V**	50.9	25.5	2.6	6.7	1.3	10.5	1.7	0.7	0.2						100.1	
43 **D3. V**	46.93	11.83	7.58	6.03	12.28	13.26	3.12	0.44	0.92						102.39	
44 **D4. V**	41.00	21.36	13.44	n. d.	3.85	10.40	2.86	1.31	5.00						99.22	
45 **C4. V**	48.19	16.79	18.37	n. d.	1.32	6.85	5.59	1.11	2.31						100.53	
46 **C4. V**	44.85	17.20	11.20	n. d.	5.12	7.52	1.39	2.99	2.39		6.58		trace		99.58	
47 **C4. V**	43.50	17.02	13.68	n. d.	6.84	8.15	2.84	3.02	4.35						99.40	
48 **D3. V**	44.48	20.43	9.72	2.18	5.51	10.35	3.61	1.59	3.21		0.57				101.65	
49 **D3. V**	42.05	12.30	3.81	9.52	4.83	11.55	2.18	1.11	2.88		5.60			CO_2 2.68	98.51	
50 **D3. V**	41.40	13.28	6.54	8.63	5.26	10.05	2.43	0.75	3.17		2.75			CO_2 4.18	98.44	
51 **D3. V**	54.67	12.68	11.69	2.13	6.11	4.96	3.85	3.65	2.10						101.84	
52 **D2. IV**	45.53	18.37	4.85	3.43	4.11	8.15	3.93	4.16	2.62	1.68	1.50	0.86	0.72	CO_2 1.54	101.45	2.657
53 **B3. IV**	49.46	19.82	5.69	5.82	1.93	10.62	3.38	0.71	0.06		1.88			CO_2 0.31	99.68	
54 **C3. V**	49.40	20.71	3.04	3.62	5.28	8.27	5.64	1.39	1.98						99.33	
55 **C2. IV**	49.03	12.10	7.64	3.87	6.56	9.02	4.21	1.67	3.52		2.48	0.22	trace	CO_2 1.17	101.49	
56 **C3. V**	45.52	21.56	8.57	5.60	3.56	5.74	3.39	2.66	2.78						99.38	
57 **D3. V**	51.38	17.15	1.12	6.54	6.18	9.24	2.72	0.80	1.57	0.10	1.25			CO_2 0.84	98.99	
58 **D3. V**	47.40	20.14	0.58	6.64	6.34	7.78	2.76	2.65	2.98	0.12	1.54				98.93	
59 **C3. V**	55.95	19.47	4.09	1.08	4.24	7.84	2.64	3.78		1.60					100.69	

LAMPROPHYRES—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
41	Melibocus, Zwingenberg, Odenwald.	G. Butzbach.	G. Klemm, Nb. Ver. Erdk. (4), XXVIII, p. 30, 1907.	Orbite.	
42	Portrieux, Brittany.	Not stated.	J. de Lapparent, B. Soc. M. Fr., XXXIII, p. 265, 1910.	Beerbachite.	
43	Tilai-Kanjakowsky Mountains, Iow District, Ural Mountains.	Not stated.	Duparc and Pearce, Oural Nord, II, p. 493, 1905.	Olivine beerbachite.	
44	Proctor, Vermont.	J. F. Kemp.	Kemp and Marsters, Am. G., IV, p. 101, 1889.	Camptonite.	Not fresh. In W. T., p. 417.
45	Forest of Dean, Orange County, New York.	J. F. Kemp.	J. F. Kemp, A. J. S., XXXV, p. 332, 1888.	Camptonite.	In W. T., p. 417.
46	Fort Montgomery, Hudson River, New York.	L. M. Dennis.	Kemp and Dennis, Am. Naturalist, 1888.	Camptonite.	In W. T., p. 417.
47	Fairhaven, Hampton County, New York.	J. F. Kemp.	Kemp and Marsters, Am. G., IV, p. 101, 1889.	Camptonite.	In W. T., p. 417.
48	Las Vegas, New Mexico.	G. A. Goodell.	I. H. Ogilvie, J. G., X, p. 506, 1902.	Camptonite.	
49	Egge, Brandberget, Gran, Norway.	L. Schmelck.	W. C. Brögger, Q. J. G. S., L, p. 26, 1894.	Camptonite.	Not fresh. In W. T., p. 417.
50	Hougen, Gran, Norway.	L. Schmelck.	W. C. Brögger, Eg. Kg., III, p. 60, 1899.	Camptonite.	Not fresh. In W. T., p. 417.
51	Waldmichelbach, Spessart, Bavaria.	E. Goller.	E. Goller, N. J. B. B., VI, p. 566, 1889.	Camptonite.	In W. T., p. 417.
52	Mädstein, Neschwitz, Bohemia.	F. Hanusch.	J. E. Hibsch, T. M. P. M., XIV, p. 103, 1894.	Camptonite.	Not fresh. In W. T., p. 301.
53	Ditro, Siebenbürgen, Hungary.	J. v. Szadeczky.	J. v. Szadeczky, Ref., N. J., 1901, I, p. 402.	Camptonite.	In W. T., p. 293.
54	Jasswa, Nijni Tagilsk, Ural Mountains.	Loewinson-Lessing.	Loewinson-Lessing, Vh. Rus. M. Ges. (2), XLIII, p. 556, 1905.	Camptovogesite.	
55	Mai Enda Maruglo, Adi Caieh, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 108, 1909.	Camptonite.	
56	Siwo River, Witim Plateau, Lake Baikal, Siberia.	Not stated.	B. Polenow, Ref., N. J., 1902, I, p. 230.	Lamprophyre.	
57	Jacksonville, Oregon.	S. W. French.	A. N. Winchell, Min. Res. Oreg., I (5), p. 141, 1914.	Spessartite.	
58	Braden Mine, Jackson County, Oregon.	S. W. French.	A. N. Winchell, Min. Res. Oreg., I (5), p. 172, 1914.	Spessartite.	
59	Zahbelice, near Prague, Bohemia.	J. Nevole.	B. Macha, G. Cb., I, p. 513, 1901.	Spessartite.	Ref. N. J., 1902, I, p. 60. In W. T., p. 413.

GABBRO.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 D4. V	52.75	28.63			4.80	7.86	4.93	1.80	0.41			0.09	0.18	FeS_2 1.50	102.95	
2 D3. V	41.10	15.60	4.51	9.90	8.85	14.45	2.02	0.82	0.87		3.58				101.70	
3 D3. V	47.32	30.36	1.36	1.55	2.44	15.45	1.88	0.66	0.10					CO_2 0.58	101.69	2.73
4 C3. V	46.24	29.85	1.30	2.12	2.41	16.24	1.98	0.18	n. d.				trace	CO_2 1.03	101.35	2.85
5 B3. IV	40.61	25.90	2.18	5.37	7.69	14.50	2.31	0.25	0.78		0.65					
6 C4. V	65.65	16.84	n. d.	4.01	0.13	2.47	5.27	5.04	0.30						99.71	
7 C4. V	57.00	16.01	n. d.	10.30	1.62	6.20	4.35	3.53	0.15						99.16	
8 C3. V	54.72	17.79	2.08	6.03	5.85	6.84	3.02	3.01	n. d.						99.34	
9 B3. IV	46.85	18.00	6.16	8.76	8.43	10.17	2.19	0.09	0.30						100.95	3.097
10 D4. V	49.93	24.64	n. d.	2.74	2.43	6.27	2.20	3.80	1.20		6.01				99.22	
11 D4. V	49.30	22.46	12.04	n. d.	2.14	9.30	3.01	1.27	0.78						100.30	
12 D4. V	43.35	29.75	5.61	n. d.	2.03	12.46	trace	5.93	0.73						99.86	
13 D4. V	45.35	16.11	3.42	3.50	12.32	18.04	(1.26)								100.00	
14 D4. V	44.11	24.45	7.89	6.52	3.84	11.96	1.67	0.22	0.60			0.51	trace		101.27	3.044
15 D3. V	46.01	16.95	5.14	9.83	6.20	6.71	2.22	1.71	n. d.		2.48				97.25	
16 D2. V	45.30	11.81	9.94	9.31	8.09	8.05	0.93	4.07	2.70	0.30	1.15	0.80	0.84	CO_2 1.49 SO_3 0.72	105.50	2.913
17 D4. V	64.04	2.11	2.81	22.14	4.04	0.60	0.30	0.11	0.67	3.73					100.55	
18 D4. V	58.94	2.72	3.01	22.94	4.74	0.71	0.24	0.09	3.35					CO_2 3.72	100.46	
19 D3. V	61.09	15.34	5.74	3.69	1.33	3.10	3.41	3.65	1.80						99.15	

GABBRO.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Cape Rutherford, Buchanan Bay, Ellesmere Land.	R. Schei.	C. Bügge, Rep. 2d Fram Exp., No. 22, p. 18, 1910.	Norite.	
2	Mount Royal, Montreal, Quebec.	A. Pisani.	A. Lacroix, Mat. Min. Mad., I, p. 193, 1902.	Gabbro.	
3	South Sherbrooke, Ontario.	W. Lawson.	W. G. Miller, Rep. Bur. Min. Toronto, VIII (II), p. 227, 1899.	Corundum anorthosite.	Also in Am. G., XXIV, p. 280, 1899. In W. T., p. 207.
4	Seine River, Rainy Lake District, Ontario.	W. Lawson.	A. P. Coleman, Rep. Bur. Min. Toronto, V, p. 99, 1896.	Anorthosite.	Also in J. G., IV, p. 909, 1896. In W. T., p. 207.
5	Monhegan Island, Maine.	E. C. E. Lord.	E. C. E. Lord, A. G., XXVI, p. 340, 1900.	Olivine norite	In W. T., p. 435.
6	Harrisville, Adirondack Mountains, New York.	C. H. Smyth.	C. H. Smyth, B. G. S. A., VI, p. 274, 1895.	Gabbro.	In W. T., p. 199.
7	Natural Bridge, Adirondack Mountains, New York.	C. H. Smyth.	C. H. Smyth, B. G. S. A., VI, p. 274, 1895.	Gabbro.	In W. T., p. 431.
8	Salt Hill, near Peekskill, New York.	H. T. Vulté.	J. F. Kemp, Handb. of Rocks, p. 72, 1908.	Gabbro.	
9	Wilmurt Lake, Hamilton County, New York.	C. H. Smyth.	C. H. Smyth, A. J. S., XLVIII, p. 61, 1894.	Gabbro.	In W. T., p. 331.
10	Rosetown, near Stony Point, New York.	L. M. Dennis.	J. F. Kemp, A. J. S., XXXVI, p. 249, 1888.	Hornblende gabbro.	In W. T., p. 431.
11	Rosetown, near Stony Point, New York.	J. F. Kemp.	J. F. Kemp, A. J. S., XXXVI, p. 249, 1888.	Hornblende gabbro.	In W. T., p. 431.
12	Rosetown, near Stony Point, New York.	L. M. Dennis.	J. F. Kemp, A. J. S., XXXVI, p. 250, 1888.	Hornblende gabbro.	In W. T., p. 431.
13	Gwinns Falls, near Baltimore, Maryland.	W. S. Bayley.	G. H. Williams, U. S. G. S. B. 28, p. 37, 1886.	Hypersthene gabbro.	In W. T., p. 431.
14	Mount Hope, Baltimore, Maryland.	L. McCay.	G. H. Williams, U. S. G. S. B. 28, p. 37, 1886.	Hypersthene gabbro.	In W. T., p. 431.
15	Mount Bohemia, Michigan.	L. Kirschbaum.	A. C. Lane, Korng. Auvergn., p. 8, 1906.	Oligoclase gabbro.	Sum!
16	Mount Bohemia, Michigan.	N. Cook.	F. E. Wright, Mich. G. S. A. R. (1908), p. 369, 1908.	Oligoclase gabbro.	Sum!
17	Muscovado Lake Cook County, Minnesota.	A. D. Meeds.	N. H. Winchell, G. S. Minn. A. R. 23, p. 212, 1895.	Norite.	Igneous? Al_2O_3 and iron oxides? In W. T., p. 435.
18	Muscovado Lake, Cook County, Minnesota.	A. D. Meeds.	N. H. Winchell, G. S. Minn. A. R. 23, p. 212, 1895.	Norite.	Igneous? Al_2O_3 and iron oxides? In W. T., p. 435
19	Pigeon Point, Minnesota.	Dodge and Sidener.	M. E. Wadsworth, G. S. Minn. B. 2, p. 82, 1887.	Gabbro.	In W. T., p. 223.

GABBRO—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
20 D3. V	53.43	13.81	5.08	9.86	4.64	8.25	2.51	1.12	0.27				trace		98.97	
21 D4. V	50.43	23.83	17.63	n. d.	2.46	4.79	1.66	0.22			trace				101.02 (98.63)	
22 D3. V	49.42	24.47	3.13	6.13	1.00	8.45	4.98	1.15	0.55	0.06	1.87	0.04	0.11	S 0.11	101.48	
23 D3. V	35.81	14.32	7.38	15.25	10.49	17.23	2.06	0.37	5.25		2.30		0.18		100.62	3.08
24 C3. V	52.84	23.62	0.65	10.00	3.16	3.92	2.64	0.67	1.87		trace		0.43	BaO none SrO none	99.80	2.83
25 B3. IV	50.86	15.72	9.77	2.48	3.55	10.52	3.89	0.90	2.53						100.22	
26 C4. V	47.43	23.66	13.06	n. d.	3.15	11.21	0.15	0.20	0.90						99.76	
27 D4. V	47.40	29.74	n. d.	1.94	0.57	13.30	4.99	1.56	1.64						101.14	2.704
28 D4. V	65.17	21.04	0.74	n. d.	0.04	1.20	9.20	1.70	0.80		trace				99.89	
29 A4. IV	45.43	12.55	n. d.	6.50	13.41	12.39	1.71	0.11	2.74	2.41		0.04	0.21	CO_2 2.35 SO_3 0.24 Cl trace	100.09	
30 D4. V	43.28	33.69			11.77		n. d.	n. d.	n. d.						100.76	
31 C4. V	40.08	22.86	n. d.	11.96	12.40	11.41	1.26	0.38	n. d.						100.35	
32 D4. V	53.46	13.35	n. d.	16.74	3.07	10.94	n. d.	n. d.	1.64					CO_2 0.80	100.00	
33 B4. V	50.78	17.16	3.15	7.61	7.16	10.28	2.61		1.20						99.59	2.82
34 D4. V	43.86	10.63	0.74	10.15	16.64	6.68	n. d.	n. d.	1.51						90.21	3.00
35 C2. IV	29.5	3.8	17.8	18.2	8.7	10.0	0.2	0.1	1.0		9.2		0.3	FeS_2 0.4	99.2	3.87
36 B3. IV	45.23	18.88	4.49	8.89	7.42	8.77	1.36	0.88	3.60		none	0.16			99.68	
37 B3. IV	43.84	24.64	3.97	6.73	4.95	10.24	2.58	0.99	1.83		0.27				100.33	
38 B3. IV	39.87	24.30	1.59	4.09	11.30	7.61	1.93	1.11	8.12						99.92	
39 D2. V	53.50	22.20	3.60	2.64	2.00	9.45	4.26	0.61	1.50		0.45		0.35		100.59	2.800

GABBRO—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
20	Wind Lake, Minnesota.	Dodge and Sidener.	M. E. Wadsworth, G. S. Minn. B. 2, p. 97, 1887.	Gabbro.	In W. T., p. 431.
21	Duluth, Minnesota.	J. A. Dodge.	M. E. Wadsworth, G. S. Minn. B. 2, p. 75, 1887.	Gabbro.	In W. T., p. 431.
22	Duluth, Minnesota.	G. H. Stone.	F. F. Grout, J. G., XVIII, p. 656, 1910.	Gabbro.	
23	Duluth, Minnesota.	A. N. Winchell.	A. N. Winchell, Am. G., XXVI, p. 284, 1900.	Troctolite.	In W. T., p. 435.
24	Snowbank Lake, Minnesota.	A. N. Winchell.	A. N. Winchell, Am. G., XXVI, p. 303, 1900.	Cordierite norite.	In W. T., p. 309.
25	Baptism River, Minnesota.	Dodge and Sidener.	M. E. Wadsworth, G. S. Minn. B. 2, p. 79, 1887.	Gabbro.	In W. T., p. 273.
26	Granite Falls, Minnesota.	E. J. Babcock.	C. W. Hall, U. S. G. S. B. 157, p. 89, 1899.	Gabbro.	In W. T., p. 431.
27	Encampment Island, Minnesota.	C. Palache.	A. C. Lawson, G. S. Minn. B. 8, p. 6, 1893.	Anorthosite.	In W. T., p. 431.
28	San Diego, California.	L. v. Chrustchoff.	L. v. Chrustchoff, B. Soc. M. Fr., VIII, p. 8, 1885.	Hyperite.	In W. T., p. 435.
29	Bagley Canyon, Mount Diablo, California.	W. H. Melville.	W. H. Melville, B. G. S. A., II, p. 404, 1891.	Gabbro.	Not fresh. In W. T., p. 436.
30	Dehesa, San Diego County, California.	Horowitz.	Kesler and Hamilton, Am. G., XXXIV, p. 138, 1904.	Orbicular gabbro.	Whole mass. Incomplete?
31	Dehesa, San Diego County, California.	J. W. Howson.	A. C. Lawson, B. Dep. G. Un. Cal., III, p. 394, 1904.	Orbule from gabbro.	
32	St. Thomas, West Indies.	J. Siemiradzki.	J. Siemiradzki, N. J., II, p. 176, 1886.	Corsite.	In W. T., p. 431.
33	Allt Mhic, Leanain, Skye, Scotland.	T. Baker.	A. Harker, Rocks of Skye, p. 103, 1904.	Gabbro.	
34	Carn Dearg, Skye, Scotland.	T. Baker.	A. Harker, Rocks of Skye, p. 382, 1904.	Olivine gabbro.	"Alkalies omitted."
35	Druin an Eidhne, Skye, Scotland.	J. H. Player.	Geikie and Teall, Q. J. G. S., L, p. 653, 1894.	Basic schliere in gabbro.	In W. T., p. 369.
36	Lake Maree, Scotland.	W. Mackie.	W. Mackie, Tr. G. Soc. Edin., VIII, p. 55, 1901.	Gabbro.	
37	Glen Roy Argyllshire, Scotland.	G. Wilson.	G. S. U. K., Sum. Prog., p. 42, 1898.	Gabbro-diorite.	Not in W. T.
38	Belhelvic, Aberdeenshire, Scotland.	A. E. Brown.	T. G. Bonney, G. Mag., XXII, p. 442, 1885.	Troctolite.	Not fresh. In W. T., p. 431.
39	Carrock Fell, England.	G. Barrow.	A. Harker, Q. J. G. S., L, p. 323, 1894.	Quartz gabbro.	Anal. doubtful in reference. In W. T., p. 291.

GABBRO—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
40 C3. V	42.81	14.55	n. d.	20.52	1.62	3.96	5.57	2.01	6.38	0.40	1.90	0.51			100.23	
41 C3. V	52.4	20.7	3.2	6.4	4.2	8.3	2.9	1.2	0.3						99.6	
42 D3. V	38.47	18.89	1.92	0.78	4.33	30.34	1.15	1.54	2.89					X 0.41 Cl 0.08 S 0.31	100.31	3.05
43 D2. V	61.28	21.58	0.22	1.59	1.85	7.51	4.44	0.74	0.40		0.40	0.52	1.85		102.68 (100.77)	
44 C2. IV	53.28	23.30	4.13	3.25	3.02	5.01	3.95	1.51	n. d.		1.80	0.80			100.22	
45 C4. V	52.61	27.15	4.05	n. d.	1.55	9.96	4.53	0.78	n. d.		0.23				100.87	
46 C4. V	52.21	19.24	10.46	n. d.	2.36	7.28	3.48	1.09	n. d.		3.12	1.21			100.45	
47 C4. V	49.89	24.39	6.09	n. d.	3.91	9.61	5.30	0.29	n. d.		1.22				100.70	
48 D4. V	48.38	23.66	8.03	n. d.	6.58	11.02	2.60	1.09	n. d.						101.36	
49 C2. IV	49.03	27.89	1.47	1.89	1.89	14.11	1.33	0.49	0.74	0.07	0.60	0.29		CO_2 0.17 SO_3 0.25	100.22	
50 C2. IV	45.94	20.84	4.30	4.96	5.71	11.77	3.04	0.51	0.68	none	1.14	0.45		CO_2 0.12 SO_3 0.91	100.42	
51 C2. IV	40.25	18.86	7.03	8.21	6.78	10.45	1.44	0.36	1.41	0.06	1.72	1.65		CO_2 0.12 SO_3 1.44	99.78	
52 C2. IV	49.90	23.33	4.10	4.38	1.65	10.97	3.06	0.62	0.60	0.13	0.42	0.49		FeS_2 0.32	99.97	
53 C2. IV	49.48	20.60	4.23	3.75	4.16	13.07	2.65	0.21	0.25	0.11	0.32	0.87		FeS_2 0.28	99.98	
54 C2. IV	47.78	20.51	2.54	6.07	4.62	10.65	4.69	0.51	0.54	0.10	0.26	0.49		FeS_2 0.31	99.07 (100.07)	
55 C3. V	47.75	22.49	4.53	3.23	0.59	15.99	0.91	1.75	0.76			0.48	1.53		100.01	
56 D4. V	47.37	14.65	13.74	n. d.	0.51	13.27	3.58	1.29	1.09				4.69		100.19	2.635
57 C4. V	46.57	19.56	n. d.	5.82	9.27	13.29	3.24	0.51	2.88						101.14	
58 B3. V	45.76	20.48	1.99	4.18	8.50	11.57	3.56	0.80	2.80						99.64	
59 C3. V	63.05	14.31	1.32	6.65	4.38	3.91	2.06	0.82	2.54					SnO_2 0.22 CuO 0.94	100.20	

GABBRO—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
40	Cataclews Point, Cornwall.	J. J. Beringer.	H. Fox, Tr. G. Soc. Corn., XII, p. 71, 1896.	Biotite-plagioclase rock.	In W. T., p. 433.
41	Near St. Quay, Brittany.	Not stated.	J. de Lapparent, B. Soc. M. Fr., XXXIII, p. 265, 1910.	Hypersthene gabbro.	
42	Stazzona, Orezza, Corsica.	M. Oels.	M. Oels, Ref., N. J., I, p. 46, 1896.	Gabbro.	In W. T., p. 433.
43	Ramsaas, Norway.	C. Bugge.	C. Bugge, Fh. Vid. Selsk. Christ. (1906), No. 8, p. 19, 1907.	Kugel norite.	Groundmass. Sum?
44	Theingsvaag, Soggendal, Norway.	C. F. Kolderup.	C. F. Kolderup, Berg. Mus. Aarb., No. 5, p. 142, 1896.	Quartz norite.	In W. T., p. 435.
45	Rekefjord, Norway.	C. F. Kolderup.	C. F. Kolderup, Berg. Mus. Aarb., No. 5, p. 79, 1896.	Norite.	In W. T., p. 205.
46	Rekefjord, Norway.	C. F. Kolderup,	C. F. Kolderup, Berg. Mus. Aarb., No. 5, p. 79, 1896.	Quartz norite.	In W. T., p. 435.
47	Birkrem, Norway.	C. F. Kolderup.	C. F. Kolderup, Berg. Mus. Aarb., No. 5, p. 96, 1896.	Norite.	In W. T., p. 435.
48	Fyrtornet, Kullen, Sweden.	L. Ramberg.	A. Hennig, Lunds. Un. Aars., XXXIV (2), No. 6, p. 41, 1898.	Gabbro.	Not in W. T.
49	Bohnstadt, Odenwald.	G. Butzbach.	G. Klemm, Nb. Ver. Erdk. (4), XXVII, p. 12, 1906.	Gabbro.	
50	Waldsaum, Odenwald.	G. Butzbach.	G. Klemm, Nb. Ver. Erdk. (4), XXVII, p. 12, 1906.	Gabbro.	
51	Altereichberg, near Waschenbach, Odenwald.	G. Butzbach.	G. Klemm, Nb. Ver. Erdk. (4), XXVII, p. 12, 1906.	Gabbro-diorite.	
52	Oberkaimsbach, Hesse.	W. Sonne.	C. Chelius, Erl. G. Kt. Hes., Bl. Brensbach, p. 20, 1897.	Olivine gabbro.	In W. T., p. 433.
53	Vierstock, near Kaimsbach, Hesse.	W. Sonne.	C. Chelius, Erl. G. Kt. Hes., Bl. Brensbach, p. 20, 1897.	Olivine gabbro.	In W. T., p. 433.
54	Wallbach, Hesse.	W. Sonne.	C. Chelius, Erl. G. Kt. Hes., Bl. Brensbach, p. 20, 1897.	Olivine gabbro.	In W. T., p. 285.
55	Frankenstein, Hesse.	F. W. Schmidt.	Chelius and Klemm, Erl. G. Kt. Hes., IV, p. 39, 1896.	Olivine gabbro.	In W. T., p. 433.
56	Eichberg, Hesse.	F. W. Schmidt.	Chelius and Klemm, Erl. G. Kt. Hes., I, p. 18, 1886.	Gabbro.	In W. T., p. 433.
57	Rosswein, Saxony.	Sachsse and Becker.	Sachsse and Becker, Ref., N. J., II, p. 503, 1893.	Gabbro.	In W. T., p. 433.
58	Rosswein, Saxony.	Sachsse and Becker.	Sachsse and Becker, Ref. N. J., 1893, II, p. 503.	Gabbro.	In W. T., p. 303.
59	Burgstein, Klein Wenden, Erzgebirge.	Hilger.	F. v. Sandberger, Sb. Bay. Ak. W., XVIII, p. 444, 1888.	Gabbro.	In W. T., p. 221.

GABBRO—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
60 C3. V	50.95	7.21	1.29	7.39	6.13	20.31	5.53	1.03	0.77						100.66	3.102
61 C3. V	50.10	6.93	2.11	5.26	16.18	16.70	0.71	n. d.	2.35	0.22			trace		100.56	3.09
62 C2. IV	49.98	21.54	2.04	4.84	6.15	10.80	1.94	0.10	1.90		0.62				99.91	
63 C3. V	47.22	24.56	2.40	3.24	4.54	16.00	1.45	0.36	0.80			0.10	trace	S 0.09	100.76	
64 D3. V	46.92	20.36	2.12	5.02	7.06	15.44	1.78	1.37	0.82			0.38	trace	S 0.09	101.36	
65 D3. V	46.26	19.18	2.72	6.38	7.19	13.60	2.73	1.32	1.86			0.26	trace	S trace	101.50	
66 C3. V	44.28	22.10	2.39	3.35	8.14	16.70	0.50	0.13	2.96			0.67		S trace	101.22	
67 C3. V	41.25	18.02	3.44	3.97	14.19	10.36	2.12	0.65	6.00			0.06	trace	S 0.08	100.14	
68 C3. V	45.98	28.34	1.41	3.19	4.72	14.70	1.38	0.32	0.94			0.09		S 0.02	101.09	
69 C3. V	46.60	22.60	3.20	6.65	6.88	10.52	2.66	0.29	1.08		0.80				101.28	
70 D3. V	46.80	15.52	2.10	8.44	9.50	12.94	2.48		0.74			0.30	1.18		100.00	
71 B3. IV	48.40	15.38	4.81	6.32	8.09	11.61	2.88	0.72	1.87		0.07				100.15	
72 C3. V	47.30	23.45	6.15	0.49	11.05	7.56	1.34	0.34	1.72					S 0.16	99.56	
73 D4. V	40.49	16.20	22.10	n. d.	7.04	14.25	1.45	0.19	0.05						101.77	
74 C3. V	46.64	24.45	2.56	6.44	1.60	10.44	5.46	1.39	0.95						99.93	
75 C3. V	41.08	21.01	4.79	9.17	8.01	14.68	0.56	0.61	0.80		0.21				100.92	
76 C3. V	49.27	24.43	3.25	0.10	6.78	11.85	3.46	0.53	0.71						100.38	
77 B3. IV	48.90	18.08	2.52	3.20	11.43	14.10	1.53	0.25	0.88				trace	S trace	100.89	
78 C4. V	48.40	17.53	n. d.	4.28	16.51	11.11	1.80		0.76					FeS_2 0.52	100.91	
79 B3. IV	47.00	23.67	2.31	3.20	8.72	11.40	2.40	0.70	0.62				trace		100.02	

GABBRO—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
60	Studené, Eule, Bohemia.	V. Stanek.	E. Rade, Ref. N. J., 1899, II, p. 58.	Gabbro.	"Bronzite-rich". In W. T., p. 433.
61	Studené, Eule, Bohemia.	Barvir.	H. L. Barvir, Ref. N. J., 1904, I, p. 49.	Gabbro.	"Bronzite-free."
62	Schluckenau, Bohemia.	C. v. John.	C. v. John, Jb. G. R.-A. Wien, LI, p. 149, 1903.	Gabbro.	Inclusion in basalt.
63	Ransko, Eisengebirge, Bohemia.	C. v. John.	Hinterlechner and v. John, Jb. G. R.-A. Wien, LIX (1), p. 188, 1909.	Gabbro.	
64	Ransko, Eisengebirge, Bohemia.	C. v. John.	Hinterlechner and v. John, Jb. G. R.-A. Wien, LIX (1), p. 188, 1909.	Gabbro.	
65	Ransko, Eisengebirge, Bohemia.	C. v. John.	Hinterlechner and v. John, Jb. G. R.-A. Wien, LIX (1), p. 188, 1909.	Gabbro.	
66	Ransko, Eisengebirge, Bohemia.	C. v. John.	Hinterlechner and v. John, Jb. G. R.-A. Wien, LIX (1), p. 197, 1909.	Olivine gabbro.	
67	Ransko, Eisengebirge, Bohemia.	C. v. John.	Hinterlechner and v. John, Jb. G. R.-A. Wien, LIX (1), p. 197, 1909.	Spinel-olivine gabbro.	
68	Sopot, Eisengebirge Bohemia.	C. v. John.	Hinterlechner and v. John, Jb. G. R.-A. Wien, LIX (1), p. 197, 1909.	Olivine norite.	
69	Schluckenau, Bohemia.	C. v. John.	C. v. John, Jb. G. R.-A. Wien, LI, p. 150, 1903.	Gabbro.	Inclusion in basalt.
70	Schwarzstein, near Zöptau, Moravia.	R. Nowicki.	F. Kretschmer, Jb. G. R.-A. Wien, LXI, p. 92, 1911.	Gabbro.	Other anals. in paper.
71	Almasel, Hunyad, Hungary.	K. Emszt.	P. Rozlozsnik, F. K., XXXV, p. 508, 1905.	Microgabbro.	
72	Alvacza, Hunyad, Hungary.	G. v. Lazlo.	K. V. Papp, Jb. Ung. G. A. (1903), p. 85, 1905.	Gabbro.	
73	Jablanica, Herzegowina.	C. v. John.	C. v. John, Jb. G. R.-A. Wien, XXXVIII, p. 352, 1888.	Gabbro.	In W. T., p. 433.
74	Traversella Valley, Monzoni, Tyrol.	C. Doelter.	C. Doelter, T. M. P. M., XXI, p. 105, 1902.	Labradorite rock (gabbro?).	17 per cent nephelite in norm.
75	Ricoletta, Monzoni, Tyrol.	C. Doelter.	C. Doelter, T. M. P. M., XXI, p. 102, 1902.	Olivine gabbro.	
76	Kopilo, Bosnia.	F. Kucan.	M. Kispatic, T. M. P. M., XXIX, p. 175, 1910.	Gabbro.	
77	Monte Collon, near Arolla, Switzerland.	A. Brunet.	A. Brun, Ref. N. J. 1897, I, p. 475.	Gabbro.	In W. T., p. 335.
78	Monte Collon, near Arolla, Switzerland.	A. Brunet.	A. Brun, Ref. N. J., 1897, I, p. 475.	Gabbro.	In W. T., p. 433.
79	Monte Collon, near Arolla, Switzerland.	A. Brunet.	A. Brun, Ref. N. J., 1897, I, p. 475.	Gabbro.	In W. T., p. 433.

GABBRO—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
80 C3. V	41.55	21.40	11.38	1.35	12.20	7.80	0.80	0.24	3.65				trace	F trace FeS_2 0.50	100.87	
81 B3. IV	50.04	18.22	5.26	6.15	7.34	8.80	2.95	0.41	n. d.		0.30	0.23			99.70	
82 B3. IV	49.20	23.91	1.88	3.65	6.19	10.71	3.73	0.34	n. d.		0.18	0.08			99.87	
83 B3. IV	47.31	20.58	7.55	8.08	2.07	9.84	3.43	0.53	0.56		0.47				100.42	
84 C2. IV	48.85	18.63	4.32	8.42	3.41	8.53	3.98	1.25	1.67		1.67	0.36			101.09	
85 C2. IV	42.60	19.61	7.27	9.69	6.80	10.02	1.88	0.85	0.70		1.01	0.42	0.60		101.45	
86 D3. V	46.03	22.76	1.50	1.10	5.49	20.24	1.61	0.48	1.55	0.12	0.33	trace		Cr_2O_3 trace	101.39	
87 A4. IV	49.84	14.83	5.57	n. d.	9.84	14.05	2.92	0.23	3.61			0.01	trace		100.90	
88 B4. V	52.29	18.61	10.79	n. d.	4.69	2.36	5.16	1.86	4.65			0.28			100.69	
89 C4. V	49.42	3.37	1.30	5.75	34.97	2.11	n. d.	n. d.	1.84					CO_2 0.76 NiO 0.16	99.68	
90 B3. IV	48.65	15.95	2.49	6.32	11.53	11.66	1.96	n. d.	1.67					NiO trace	100.23	
91 B3. IV	52.00	22.95	0.21	0.47	0.44	18.50	2.40	0.42	3.24						100.42	
92 D2. V	50.47	18.98	4.22	6.16	5.62	11.72	2.75	0.56	1.06		0.12		0.12		101.78	
93 B3. IV	50.24	19.48	5.45	5.02	4.84	11.02	3.33	0.77	0.75				trace		100.70	
94 D3. V	46.85	9.10	3.43	8.75	18.00	15.52	0.76	0.19	0.15				trace		102.75	
95 D3. V	45.76	23.85	3.80	3.79	4.06	17.22	2.41	0.15	0.32				trace		101.36	
96 D3. V	45.74	5.21	6.91	8.33	21.63	12.80	1.02	0.13	0.09				trace		101.86	
97 D3. V	45.53	9.16	4.86	9.34	15.58	15.04	0.87	0.20	0.88				trace		101.46	
98 C4. V	45.35	11.27	6.44	6.42	12.68	15.28	1.42		0.56				trace		99.42	
99 C3. V	43.51	21.97	4.95	5.72	6.10	15.93	2.04	0.15	0.60						100.97	

GABBRO—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
80	Monte Collon, near Arolla, Switzerland.	A. Brunet.	A. Brun, Ref. N. J., 1897, I, p. 475.	Gabbro.	In W. T., p. 433.
81	Leprese, Valtellina, Lombardy.	O. Hecker.	O. Hecker, N. J. B. B., XVII, p. 337, 1903.	Hornblende gabbro.	
82	Leprese, Valtellina, Lombardy.	O. Hecker.	O. Hecker, N. J. B. B., XVII, p. 333, 1903.	Hornblende gabbro.	
83	Leprese, Valtellina, Lombardy.	O. Hecker.	O. Hecker, N. J. B. B., XVII, p. 325, 1903.	Hornblende-olivine gabbro.	
84	Near Sondalo, Valtellina, Lombardy.	A. Zapf.	A. Zapf, In. Diss. Jena, p. 37, 1910.	Hornblende gabbro.	
85	Val Scala, Valtellina, Lombardy.	A. Zapf.	A. Zapf, In. Diss. Jena, p. 51, 1910.	Norite.	
86	Rocca Bianca, Val Susa, Piedmont.	Not stated.	F. Zambonini, N. J., 1906, II, p. 111.	Gabbro.	
87	Monte Ferrato, Tuscany.	U. Panichi.	U. Panichi, Mem. Soc. Tosc., XXV, p. 9, 1909.	Euphotide.	
88	Romito, near Livorno, Tuscany.	E. Manasse.	E. Manasse, Pr. Soc. Tosc., XII, p. 165, 1901.	Gabbro rosso.	
89	Gaggio Montano, near Bologna, Italy.	P. E. V. de Regny.	P. E. V. de Regny, B. Soc. G. It., XVIII, p. 25, 1899.	Norite.	In W. T., p. 367.
90	Gaggio Montano, near Bologna, Italy.	P. E. V. de Regny.	P. E. V. de Regny, B. Soc. G. It., XVIII, p. 24, 1899.	Gabbro.	In W. T., p. 335.
91	Dshaksy, Tau Mountains, Mugodjaren, Ural Mountains.	Loewinson-Lessing.	E. Jeremina, Exp. Mugodj., p. 129, 1905.	Gabbro-syenite.	
92	Cerebriansky, Tilai Mountains, Ural Mountains.	Not stated.	Duparc and Pearce, Oural Nord, II, p. 464, 1905.	Norite.	
93	Cerebriansky, Tilai Mountains, Ural Mountains.	Not stated.	Duparc and Pearce, Oural Nord, II, p. 464, 1905.	Norite.	
94	Tilai Mountains, Ural Mountains.	Not stated.	Duparc and Pearce, Oural Nord., II. p. 440, 1905.	Tilaite.	
95	Cerebriansky, Tilai Mountains, Ural Mountains.	Not stated.	Duparc and Pearce, Oural Nord, II, p. 478, 1905.	Gabbro.	Uralitized.
96	Tilai Mountains, Ural Mountains.	Not stated.	Duparc and Pearce, Oural Nord, II, p. 440, 1905.	Tilaite.	
97	Tilai Mountains, Ural Mountains.	Not stated.	Duparc and Pearce, Oural Nord, II, 440, 1905.	Tilaite.	
98	Tilai Mountains, Ural Mountains.	Not stated.	Duparc and Pearce, Oural Nord, II, p. 440, 1905.	Tilaite.	
99	Cerebriansky, Tilai Mountains, Ural Mountains.	Not stated.	Duparc and Pambil, B. Soc. M. Fr., XXXIII, p. 360, 1910.	Gabbro.	Uralitized.

GABBRO—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
100 C3. V	41.75	7.92	12.46	11.56	8.40	16.84	0.92	0.63	n. d.				0.72		101.20	
101 B3. IV	41.26	20.09	6.10	7.65	8.14	14.64	1.68	0.16	0.89						100.61	
102 C3. V	41.04	9.04	7.81	9.99	11.99	17.08	0.47	0.09	3.05		0.84				101.40	
103 D4. V	48.65	17.17	1.04	10.81	7.17	10.80	4.08		1.65						101.37	
104 C4. V	48.21	18.37	1.86	9.87	5.24	12.18	3.63		1.78						101.14	
105 D3. V	47.99	17.76	4.53	8.08	5.15	12.33	3.99	0.43	1.83						102.09	
106 D3. V	49.97	13.50	3.55	11.46	6.51	10.63	2.78	0.26	1.60		1.30		trace		101.56	
107 C4. V	46.15	13.57	3.61	8.15	12.63	15.15	1.29	trace	n. d.						100.55	
108 C3. V	38.59	24.37	7.66	5.23	5.95	15.30	1.34	0.46	0.84						99.64	
109 B3. IV	45.45	17.40	4.43	7.34	11.06	11.95	1.76	trace	0.36						99.75	
110 B3. IV	42.56	21.99	4.69	5.40	6.69	17.06	1.67	0.35	0.17						100.58	
111 D3. V	37.82	19.94	3.48	12.70	10.97	14.71	1.68	n. d.	0.57						101.82	
112 C3. V	42.92	26.42	3.97	2.81	7.26	15.40	0.63	n. d.	0.80						100.21	
113 B3. IV	46.56	9.70	2.83	9.61	13.30	15.65	1.82	0.94	0.47				trace	Cr_2O_3 trace	100.88	
114 C3. V	46.56	9.24	3.92	8.69	13.85	16.09	1.52	0.93	0.36				trace	Cr_2O_3 trace	101.16	
115 C3. V	49.17	12.03	10.81	2.12	7.84	12.30	2.53	0.71	0.30			0.09	2.53	SO_3 none NiO trace CuO 0.06	100.49	
116 B3. IV	44.63	21.19	4.26	2.33	8.36	17.26	0.60	0.38	0.57			trace	0.38	SO_3 0.04 NiO 0.08 CuO 0.09	100.17	
117 B3. IV	43.58	28.18	1.73	1.84	4.82	18.34	0.10	0.23	0.90			0.08	0.21	SO_3 0.08	100.09	
118 C3. V	42.13	21.36	11.60	2.74	5.58	10.78	1.69	0.77	1.40			0.01	1.47	SO_3 0.14 NiO trace CuO 0.68	99.75	
119 D3. V	47.54	20.56	2.56	7.74	3.25	12.10	3.29	0.79	2.50		0.91		0.05		101.29	

GABBRO—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
100	Tilai Mountains, Ural Mountains.	Not stated.	Duparc and Pearce, Oural Nord, II, p. 448, 1905.	Tilaite.	
101	Cerebriansky, Tilai Mountains, Ural Mountains,	Not stated.	Duparc and Pearce, Oural Nord, II, p. 478, 1905.	Gabbro.	Uralitized.
102	Mount Katschkanar Iss District, Ural Mountains.	Not stated.	Duparc and Pamfil, B. Soc. M. Fr., XXXIII, p. 356, 1910.	Tilaite.	
103	Katechersky, Koswinsky, Ural Mountains.	L. Duparc.	Duparc and Pearce, Oural Nord, I, p. 214, 1902.	Gabbro.	
104	Katechersky, Koswinsky, Ural Mountains.	L. Duparc.	Duparc and Pearce, Oural Nord, I, p. 214, 1902.	Gabbro.	
105	Katechersky, Koswinsky, Ural Mountains.	L. Duparc.	Duparc aand Pearce, Oural Nord, I, p. 214, 1902.	Gabbro.	
106	Joubrechkine, Wichera, Ural Mountains.	Not stated.	Duparc, Pearce, and Tikanowitch, Oural Nord, III, p. 186, 1909.	Gabbro.	
107	Deneshkin Kamen, Ural Mountains.	Krekmeyer and Kultacheff.	Loewinson-Lessing, Jushno-Saosk., p. 166, 1900.	Gabbro.	In W. T., p. 335.
108	Deneshkin Kamen, Ural Mountains.	Loewinson-Lessing.	Loewinson-Lessing, Jushno-Saosk., p. 166, 1900.	Gabbro-norite.	In W. T., p. 433.
109	Supreya, Ural Mountains.	Kultacheff.	Loewinson-Lessing, Jushno-Saosk., p. 167, 1900.	Pyroxene granulite (gabbro).	In W. T., p. 335.
110	Supreya, Ural Mountains.	Loewinson-Lessing.	Loewinson-Lessing, Jushno-Saosk., p. 166, 1900.	Magnetite gaobro.	Light bands. In W. T., p. 433.
111	Supreya, Ural Mountains.	Loewinson-Lessing.	Loewinson-Lessing, Jushno-Saosk., p. 166, 1900.	Magnetite gabbro.	Dark bands. In W. T., p. 433.
112	Talaya, Ural Mountains.	Loewinson-Lessing and Kultacheff.	Loewinson-Lessing, Jushno-Saosk., p. 166, 1900.	Pyroxene granulite (gabbro)	In W. T., p. 293.
113	Pharkowsky-Ouwal Ural Mountains.	L. Duparc.	Duparc and Pearce, Oural Nord, I, p. 145, 1902.	Gabbro.	
114	Pharkowsky-Ouwal Ural Mountains.	L. Duparc.	Duparc and Pearce, Oural Nord, I, p. 145, 1900.	Gabbro.	
115	Werkh Issetsk, Mursinsk, Ural Mountains.	G. Katerfeld.	W. Nikitin, Mem. C. G. Rus., XXII, p. 84, 1907.	Gabbro.	MnO high.
116	Werkh Issetsk, Mursinsk, Ural Mountains.	G. Katerfeld.	W. Nikitin, Mem. C. G. Rus., XXII, p. 77, 1907.	Gabbro.	
117	Werkh Issetsk, Mursinsk, Ural Mountains.	G. Katerfeld.	W. Nikitin, Mem. C. G. Rus., XXII, p. 78, 1907.	Gabbro.	
118	Werkh Issetsk, Mursinsk, Ural Mountains.	G. Katerfeld.	W. Nikitin, Mem. C. G. Rus., XXII, p. 82, 1907.	Hornblende gabbro.	
119	Mount Popretschnaia, Tagil District, Ural Mountains.	Not stated.	Duparc and Pamfil, B. Soc. M. Fr., XXXIII, p. 360, 1910.	Gabbro.	

GABBRO—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
120 D3. V	43. 67	15. 68	2. 89	6. 97	14. 94	14. 93	1. 12	0. 36	0. 53		0. 34		trace		101. 43	
121 D2. V	50. 14	15. 65	1. 06	10. 11	5. 05	8. 62	2. 85	1. 19	0. 17	0. 17	2. 47	0. 38	0. 20		98. 86	
122 D4. V	50. 00	16. 51	0. 02	12. 25	5. 51	9. 47	2. 34	1. 46	1. 41						98. 97	
123 C4. V	47. 33	15. 17	1. 21	10. 67	9. 94	11. 32	3. 01	trace	0. 91						99. 56	
124 B3. IV	46. 44	19. 80	3. 20	8. 66	6. 23	9. 75	2. 11	1. 43	2. 21						99. 83	
125 B3. IV	46. 10	18. 20	5. 50	4. 95	7. 54	11. 63	4. 03	0. 42	2. 80						101. 17	
126 D4. V	49. 36	22. 95	11. 33	n. d.	2. 37	11. 07	(2. 92)		0. 19						100. 00	
127 C3. V	50. 41	20. 29	0. 33	12. 41	5. 90	7. 39	3. 05	0. 42	0. 07	0. 12	0. 24	0. 09	0. 12		100. 84	
128 D4. V	50. 45	6. 50	2. 49	8. 38	19. 02	7. 82	n. d.	n. d.	0. 97		0. 63	trace	trace		96. 26	
129 B3. IV	47. 39	22. 00	4. 00	5. 56	1. 77	13. 27	2. 52	0. 83	1. 25		1. 83				100. 42	
130 C3. V	47. 97	20. 03	8. 08	1. 29	5. 43	12. 10	1. 54	0. 17	2. 04		1. 46	trace	trace		100. 11	
131 C3. V	48. 10	20. 85	4. 85	10. 55	3. 99	7. 15	2. 73	0. 63	1. 00						99. 85	2. 68
132 C4. V	37. 87	20. 07	5. 42	n. d.	1. 01	31. 80	1. 35	1. 17	0. 56					CO_2 0. 75	100. 00	
133 A4. IV	46. 81	19. 25	n. d.	1. 85	14. 23	16. 80	0. 57	0. 13	1. 00					Cr_2O_3 0. 21	100. 85	

DIABASE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 D2. V	46. 09	17. 89	14. 22	n. d.	5. 04	10. 30	3. 82	1. 10	0. 26		3. 45	0. 05	0. 28	S 0. 47	102. 97	
2 B3. IV	52. 54	15. 14	0. 85	10. 73	5. 22	6. 92	5. 46	1. 43	1. 76		1. 00				101. 05	
3 B4. V	49. 88	15. 29	0. 43	11. 30	7. 83	4. 54	2. 17	0. 62	5. 17					CO_2 3. 20	100. 43	
4 C4. V	48. 08	23. 67	9. 07	n. d.	3. 92	10. 99	1. 92	0. 49	0. 83			1. 11			100. 08	3. 030
5 C4. V	47. 84	25. 40	6. 72	n. d.	5. 25	8. 44	2. 55	0. 60	2. 53			0. 94			100. 27	3. 080

GABBRO—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
120	Tschissopa Mountain, Ural Mountains.	F. Pearce.	Duparc and Pearce, C. R., CXLIV, p. 1289, 1907.	Tilaite.	
121	Goroschki, Volhynia, Russia.	W. Tarassenko.	W. Tarassenko, Ref. N. J., 1899, I, p. 463.	Gabbro-norite.	In W. T., p. 433.
122	Tschatsch, Kasbek, Caucasus.	Loewinson-Lessing and Sewastjanow.	Loewinson-Lessing, Mat. G. Rus., XXI, p. 107, 1901.	Hornblende gabbro.	
123	Kistinka Valley, Kasbek, Caucasus.	Loewinson-Lessing.	Loewinson-Lessing, Mat. G. Rus., XXI, p. 107, 1901.	Hornblende gabbro.	
124	Tumagorkaja, Caucasus.	D. Beljankin.	Loewinson-Lessing, Vh. Rus. M. Ges., XLII, p. 265, 1905.	Microgabbro.	
125	Voltes, Syra, Aegean Sea.	K. A. Ktenas.	K. A. Ktenas, T. M. P. M., XXVI, p. 294, 1907.	Saussurite gabbro.	
126	Duwona, Uganda.	A. Roccati.	A. Roccati in Duca Abruz., Ruwenzori, p. 184, 1909.	Hypersthene gabbro.	Other analyses in same work.
127	Anabar River, Siberia.	H. Backlund.	H. Backlund, Tr. Mus. G. St. P., I, p. 149, 1907.	Quartz gabbro.	
128	Sone River, South Rewa, India.	P. Brühl.	T. H. Holland, Rec. G. S. Ind., XXX, p. 20, 1897.	Olivine norite.	In W. T., p. 435.
129	Mount Lekaan, Motomorock, Timor.	C. Menschaar.	R. D. M. Verbeek, Jb. Mijnw., XXXVII, p. 412, 1908.	Gabbro.	Schistose.
130	Tumleo, Kaiser Wilhelm Land, New Guinea.	E. Ludwig.	S. Richarz, N. J. B. B., XXIX, p. 445, 1910.	Hornblende gabbro.	
131	Bluff, Otago, New Zealand.	L. J. Wild.	L. J. Wild, Tr. N. Z. Inst., XLIV, p. 324, 1912.	Norite.	
132	Codes Point, Dun Mountain, Nelson, New Zealand.	J. S. Maclaurin.	J. M. Bell, N. Z. G. S. B. 12, p. 33, 1911.	Rodingite.	
133	Ouen Island, New Caledonia.	Boiteau.	A. Lacroix, C. R., CLII, p. 819, 1911.	Ouenite (gabbro).	

DIABASE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Bjornesund, Haibergs Island, Eureka Sound, Ellesmere Land.	P. Schei.	C. Bugge, Rep. 2d Fram Exp., No. 22, p. 37, 1910.	Diabase.	
2	Pense Township, Gowganda District, Ontario.	N. L. Bowen.	N. L. Bowen, J. G., XVIII, p. 667, 1910.	Diabase.	
3	Dome mine, Porcupine, Ontario.	Not stated.	A. G. Burrows, Rep. Bur. Min. Ont., XXI (1), p. 212, 1912.	Diabase.	
4	Whitefish Bay, Rainy Lake, Ontario.	F. T. Shutt.	A. C. Lawson, Am. G., VII, p. 161, 1891.	Diabase.	30 feet from contact. In W. T., p. 439.
5	Stop Island, Rainy Lake, Ontario.	F. T. Shutt.	A. C. Lawson, Am. G., VII, p. 158, 1891.	Diabase.	4 feet from contact. In W. T., p. 439.

DIABASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
6	47.83	30.28	4.57	n. d.	4.32	6.72	1.30	trace	2.05			2.19			99.26	3.028
D4. V																
7	47.50	22.44	7.40	n. d.	3.71	10.21	1.62	1.29	2.85			0.34			97.36	2.927
D4. V																
8	48.79	16.97	1.69	8.97	6.98	9.98	3.30	n. d.	2.65		1.10		0.20		100.63	2.96
A4. IV																
9	48.75	17.97	0.41	13.62	3.39	8.82	1.63	2.40	0.60		0.99	0.68	0.91	CO_2 trace S trace	100.17	2.985
C2. IV																
10	47.28	20.22	3.66	8.89	3.17	7.09	3.94	2.16	2.73			0.68	0.77		100.59	
B3. IV																
11	44.44	23.19	12.70	n. d.	2.82	6.03	3.93	1.75	3.73			0.70	0.52		99.81	
C4. V																
12	48.20	14.12	2.00	7.41	8.19	11.50	2.60	0.23	2.20		1.58		1.24		99.27	3.02
B3. IV																
13	50.89	15.39	5.77	7.60	8.75	5.67	2.72	2.46							99.25	
C4. V																
14	44.51	19.99	7.22	n. d.	8.11	8.15	5.24	2.60	2.93						98.75	
D4. V																
15	45.46	19.94	15.36	2.95	8.32	2.12	3.21	2.30							99.66	
C4. V																
16	44.86	17.24	11.12	n. d.	4.98	7.53	1.50	2.81	2.44		6.66	0.41	trace		99.55	
C4. V																
17	51.46	13.98	2.66	8.92	7.59	10.49	4.75		n. d.		1.06	0.17			101.08	
B4. V																
18	50.81	13.25	14.66	n. d.	6.97	10.96	0.76	1.71	0.88						100.00	
C4. V																
19	50.61	18.34	n. d.	13.91	6.73	7.01	1.60	1.08	1.72						100.00	
C4. V																
20	46.87	13.36	9.79	2.71	4.35	14.70	4.64	2.01	n. d.		1.98				100.41	
B3. IV																
21	52.06	13.67	15.97	n. d.	5.01	8.15	3.36	0.86	1.05						100.13	2.953
B4. V																
22	51.08	23.58	6.85	n. d.	4.95	9.36	2.34		n. d.				0.39		100.00	
D4. V																
23*	47.87	14.43	11.55	n. d.	10.58	10.45	3.47	0.61	1.82						100.78	
B4. V																
24	45.73	13.48	11.60	n. d.	15.40	9.92	3.24	0.47	0.94						100.78	3.026
B4. V																
25	42.07	32.05	9.83	n. d.	1.38	0.95	1.11		12.13				0.48		100.00	
D4. V																

DIABASE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
6	Stop Island, Rainy Lake, Ontario.	F. T. Shutt.	A. C. Lawson, Am. G., VII, p. 158, 1891.	Diabase.	At contact. In W. T., p. 439.
7	Whitefish Bay, Rainy Lake, Ontario.	F. T. Shutt.	A. C. Lawson, Am. G., VII, p. 161, 1891.	Diabase.	At contact. In W. T., p. 439.
8	Pittsburg, New Hampshire.	G. W. Hawes.	G. W. Hawes, A. J. S., XII, p. 133, 1876.	Metadiabase.	Not in W. T.
9	Pine Hill, Medford, Massachusetts.	R. C. Sweetser.	W. H. Hobbs, B. Mus. Comp. Zool., XVI, p. 9, 1888.	Diabase.	In W. T., p. 287.
10	Medford, Massachusetts.	G. P. Merrill.	G. P. Merrill, B. G. S. A., VII, p. 353, 1896.	Diabase.	In W. T., p. 273.
11	Medford, Massachusetts.	G. P. Merrill.	G. P. Merrill, B. G. S. A., VII, p. 353, 1896.	Diabase.	Weathered. In W. T., p. 437.
12	Derby, Connecticut.	G. W. Hawes.	G. W. Hawes, A. J. S., XI, p. 124, 1876.	Metadiabase.	Not in W. T.
13	Indian Point, Chateaugay Lake, New York.	A. S. Eakle.	A. S. Eakle, Am. G., XII, p. 35, 1893.	Diabase.	In W. T., p.437.
14	Upper Chateaugay Lake, Clinton County, New York.	A. S. Eakle.	A. S. Eakle, Am. G., XII, p. 35, 1893.	Diabase.	In W. T., p. 437.
15	Palmer Hill, Essex County, New York.	J. F. Kemp.	Kemp and Marsters, U. S. G. S. B. 107, p. 26, 1893.	Diabase.	In W. T., p. 437.
16	Fort Montgomery, Hudson River, New York.	L. M. Dennis.	J. F. Kemp, Am. Naturalist, p. 694, 1888.	Hornblende diabase.	In W. T., p. 437.
17	Rocky Hill, New Jersey.	A. H. Phillips.	A. H. Phillips, A. J. S., VIII, p. 279, 1899.	Diabase.	In W. T., p. 437.
18	Little Falls, Passaic County, New Jersey.	W. C. Day.	W. C. Day, U. S. G. S. A. R. 20 (VI), p. 419, 1899.	Diabase.	Calculated to 100. In W. T., p. 437.
19	Mine Brook, Somerset County, New Jersey.	T. B. Stillman.	W. C. Day, U. S. G. S. A. R. 20 (VI), p. 419, 1899.	Diabase.	Calculated to 100. In W. T., p. 437.
20	Birdsboro, near Morristown, Pennsylvania.	H. Fleck.	W. C. Day, U. S. G. S. A. R. 19 (2), p. 222, 1898.	Diabase.	In W. T., p. 315.
21	Pittsylvania County, Virginia.	T. L. Watson.	T. L. Watson, Am. G., XXII, p. 87, 1898.	Quartz diabase.	In W. T., p. 437.
22	Chatham, Pittsylvania County, Virginia.	T. L. Watson.	T. L. Watson, Am. G., XXIV, p. 360, 1899.	Diabase.	In W. T., p. 437.
23	Chatham, Pittsylvania County, Virginia.	T. L. Watson.	T. L. Watson, Am. G., XXII, p. 87, 1898.	Olivine diabase.	In W. T., p. 437.
24	Chatham, Pittsylvania County, Virginia.	T. L. Watson.	T. L. Watson, Am. G., XXII, p. 87, 1898.	Olivine diabase.	In W. T., p. 437.
25	Chatham, Pittsylvania County, Virginia.	T. L. Watson.	T. L. Watson, Am. G., XXIV, p. 360, 1899.	Diabase.	Not fresh. In W. T., p. 437.

DIABASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
26 D4. V	37.09	13.19	35.69	n. d.	0.57	0.41	1.75	0.33	11.83						100.86	
27 D4. V	45.03	16.42	14.99	n. d.	6.15	7.98	2.74	0.84	n. d.						94.15	
28 C2. IV	51.34	20.07	7.03	4.03	4.18	2.83	1.83	5.53	2.90		0.38		0.38	CO_2 none	100.50	
29 C2. IV	48.20	22.10	7.61	3.95	0.86	8.86	4.90	1.16	2.31		0.24		0.35	CO_2 none	100.54	
30 D4. V	46.45	13.79	7.60	6.41	9.81	10.13	n. d.	n. d.	2.66		trace		trace	CO_2 2.27	99.12	
31 B4. V	39.55	28.76	16.80	n. d.	0.59	0.37	trace	trace	13.26		0.64	0.10	trace		100.07	
32 B3. IV	45.23	15.73	0.06	11.47	12.29	8.33	4.72	0.07	0.70	0.39	1.10	0.02	trace	S 0.08	100.19	
33 C3. V	49.27	16.75	7.78	4.86	7.44	5.47	5.42	0.48	2.80					CO_2 0.92	101.19	2.806
34 C3. V	46.45	16.60	2.72	7.25	9.21	6.32	4.05	1.02	5.01					CO_2 0.40	99.03	2.781
35 D3. V	46.25	18.39	7.70	3.52	4.65	12.19	3.76	1.04	3.41					CO_2 1.00	101.91	2.866
36 D3. V	47.01	17.80	5.32	6.59	8.75	5.31	2.00	1.58	n. d.		2.19				96.55	
37 C3. V	45.85	10.97	4.97	13.79	1.61	5.71	0.91	9.29	2.55	0.35	1.69	0.38	0.14	CO_2 trace SO_3 1.78	99.99	
38 C3. V	45.69	14.44	6.21	9.39	2.19	7.44	0.96	6.96	2.35	0.55	1.90	0.32	0.33	CO_2 trace SO_3 1.30	100.03	
39 D3. V	44.91	18.01	4.50	7.64	7.67	7.49	1.75	1.33	n. d.		2.54				95.84	
40 C2. IV	65.00	14.01	6.42	0.44	2.83	0.85	1.82	5.42	1.93	0.26	0.69	0.07	0.10	CO_2 0.07 S none BaO 0.06	99.97	2.690
41 C3. V	52.91	17.56	none	8.61	4.90	7.55	3.72	1.70	1.57	none	0.92	0.20	0.11	Cr_2O_3 0.20	99.95	2.840
42 D3. V	50.47	18.45	2.13	7.74	6.90	6.61	2.58	0.30	2.34			trace			97.52	
43 D3. V	50.51	15.30	1.79	8.14	5.94	9.04	5.18	2.00	none	1.43	2.80		0.51		102.64	
44 D2. V	49.34	13.03	2.50	13.74	3.64	7.40	4.55	1.57	0.69	0.24	3.16	0.15	0.51	CO_2 0.96 ZrO_2 0.04 S 0.12 Cr_2O_3 0.02 BaO 0.03		
45 C4. V	46.80	15.21	13.13	n. d.	8.13	11.11	1.95	0.01	2.79						99.13	

DIABASE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
26	Chatham, Pittsylvania County, Virginia.	T. L. Watson.	T. L. Watson, Am. G., XXII, p. 87, 1898.	Olivine diabase.	Not fresh. In W. T., p. 437.
27	Southwest Mountain, Monticello, Virginia.	W. A. Lambeth.	W. A. Lambeth, In. Diss. Virg., p. 10, 1901.	Diabase schist.	Low sum due to H_2O?
28	Near Virgilina, Granville County, North Carolina.	T. L. Watson.	T. L. Watson, B. G. S. A., XIII, p. 364, 1902.	"Greenstone."	
29	Virgilina, Granville County, North Carolina.	T. L. Watson.	T. L. Watson, B. G. S. A., XIII, p. 364, 1902.	"Greenstone."	
30	Virgilina, Granville County, North Carolina.	T. L. Watson.	T. L. Watson, B. G. S. A., XIII, p. 364, 1902.	"Greenstone."	Weathered.
31	Wadesboro, North Carolina.	T. M. Chatard.	I. C Russell, U. S. G. S. B. 52, p. 18, 1889.	Diabase.	Weathered. In W. T., p. 437.
32	Creighton Mine, Cherokee County. Georgia.	E. Everhardt.	S. P. Jones, Ga. G. S. B. 19, p. 68, 1909.	Olivine diabase.	
33	Isle Royale, Michigan.	F. P. Burrall.	A. C. Lane, Mich. G. S. Pub. VI (1), p. 215, 1898.	Melaphyre.	Not fresh. Not in W. T.
34	Isle Royale, Michigan.	F. P. Burrall.	A. C. Lane, Mich. G. S. Pub. VI (1), p. 143, 1898.	Melaphyre.	Not fresh. Same flow as below. Not in W. T.
35	Isle Royale, Michigan.	F. P. Burrall.	A. C. Lane, Mich. G. S. Pub. VI (1), p. 143, 1898.	Melaphyre.	Not fresh. Same flow as above. Not in W. T.
36	Mount Bohemia, Michigan.	L. Kirschbaum.	F. E. Wright, Mich. G. S. A. R. (1908), p. 377, 1909.	Ophite.	
37	Mount Bohemia, Michigan.	N. Cook.	F. E. Wright Mich. G. S. A. R. (1908), p. 377, 1909.	Ophite.	
38	Mount Bohemia, Michigan.	N. Cook.	F. E. Wright, Mich. G. S. A. R. (1908), p. 377, 1909.	Ophite.	
39	Mount Bohemia, Michigan.	L. Kirschbaum.	F. E. Wright, Mich. G. S. A. R. (1908), p. 377, 1909.	Ophite.	
40	Tamarack Creek, Pine County, Minnesota.	F. F. Grout.	F. F. Grout. J. G. XVIII, p. 648, 1910.	Diabase.	Altered.
41	Stearns County, Minnesota.	F. F. Grout.	F. F. Grout. J. G., XVIII, p. 655, 1910.	Quartz diabase.	
42	Kawishiwi River, Minnesota.	C. F. Sidener.	H. V. Winchell, Minn. G. S. A. R. XVII, p. 126, 1889.	Diabase.	Altered. Not in W. T.
43	Stearns County, Minnesota.	B. F. Nochl (student).	F. F. Grout, J. G., XVIII, p. 655, 1910.	Diabase.	
44	Carlton County, Minnesota.	W. H. Truesdale (student).	F. F. Grout, J. G., XVIII, p. 655, 1910.	Olivine diabase.	
45	Good Harbor Bay, Lake Superior, Minnesota.	C. F. Sidener.	F. F. Grout, J. G., XVIII, p. 650, 1910.	Diabase.	Altered.

DIABASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
46 B4. V	45.37	18.21	1.22	n. d.	6.98	11.49	0.84	0.02	4.66						99.77	
47 B4. V	46.28	12.96	4.67	6.06	8.71	10.12	3.75		3.34		3.54		trace		99.43	2.921
48 C4. V	45.59	20.99	2.49	4.36	8.95	7.57	4.89		5.06						99.90	2.707
49 D4. V	44.71	15.54	3.06	6.43	6.80	10.50	2.55		5.90		2.88		trace		98.37	2.858
50 B3. IV	54.07	16.30	5.75	5.84	3.41	7.63	4.00	0.90	1.35						99.26	2.895
51 C4. V	49.84	18.32	4.16	5.21	3.93	12.31	3.24	n. d.	2.05						99.06	2.960
52 B3. IV	48.12	18.60	4.00	6.30	6.16	7.36	4.11	1.09	3.63						99.37	2.854
53 D3. V	54.21	21.32	2.35	4.45	4.77	8.99	1.79	0.74	none		1.49	0.01	0.21	CO_2 0.04 S trace	100.37	3.010
54 D3. V	52.62	21.77	2.13	3.58	5.68	10.19	2.39	0.25	0.80		0.40	0.01	trace	CO_2 0.04 S trace	99.86	2.970
55 D2. V	52.20	16.10	3.56	5.68	6.70	8.58	2.40	0.89	0.60		2.60	0.37	0.22	CO_2 0.01 ZrO_2 none Cl trace BaO none CuO trace	99.94	
56 D3. V	52.00	21.61	3.01	4.06	6.53	8.80	2.81	0.18	0.35		0.53	0.01	0.05	CO_2 0.06 S trace	100.00	3.066
57 D3. V	51.37	21.79	3.60	3.38	6.30	10.36	2.42	0.06	0.50		0.32	trace	0.12	CO_2 0.10 S trace	100.32	2.996
58 D3. V	51.19	24.52	1.46	4.67	5.33	9.58	2.09	0.60	0.30		0.40	0.01	trace	CO_2 none S trace	100.15	2.968
59 B4. V	46.20	12.23	9.25	8.95	4.93	8.50	3.91		1.72		3.10		1.10		99.89	
60 D4. V	49.58	19.16	14.61	n. d.	3.94	9.10	1.08		2.87						100.34	2.981
61 D4. V	53.55	15.54	15.79	n. d.	5.79	6.71	1.41	1.96	1.83						102.58	3.02
62 C4. V	51.85	13.50	16.43	n. d.	5.49	8.80	3.10	0.91	0.93						101.01	
63 C4. V	50.17	18.03	12.96	n. d.	6.12	8.86	3.00	0.81	1.02						100.97	
64 C3. V	49.65	9.26	15.25	4.12	3.21	8.82	4.39	1.75	2.43	0.33	1.42	0.43			101.06	

DIABASE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
46	Grand Marais, Lake Superior, Minnesota.	C. F. Sidener.	F. F. Grout, J. G., XVIII, p. 650, 1910.	Diabase.	Altered.
47	Point Bonita, Marin County, California.	F. L. Ransome.	F. L. Ransome, B. Dep. G. Un. Cal., I, p. 106, 1893.	Diabase.	K_2O calculated as Na_2O. In W. T., p. 439.
48	Point Bonita, Marin County, California.	F. L. Ransome.	F. L. Ransome, B. Dep. G. Un. Cal., I, p. 106, 1893.	Diabase.	K_2O calculated as Na_2O. In W. T., p. 439.
49	Point Bonita, Marin County, California.	F. L. Ransome.	F. L. Ransome, B. Dep. G. Un. Cal., I, p. 106, 1893.	Diabase.	K_2O calculated as Na_2O. In W. T., p. 439.
50	Whistling Cay, St. John, West Indies.	P. T. Cleve.	P. T, Cleve. Sv. Vet. Ak. Hndg., IX, No. 12, p. 37, 1871.	Diabase.	Not in W. T.
51	Coral Bay, St. John, West Indies.	P. T. Cleve.	P. T. Cleve, Sv. Vet. Ak. Hndg., IX, No. 12, p. 37, 1871.	Diabase.	Not in W. T.
52	Bucks Island, St. Thomas, West Indies.	P. T. Cleve.	P. T. Cleve, Sv. Vet. Ak. Hndg., IX, No. 12, p. 37, 1871.	Diabase.	Not in W. T.
53	Average sample, Demerara River, British Guiana.	Assistant of J. B. Harrison.	J. B. Harrison, Rep. G. Ess. Riv., p. 64, 1900.	Diabase.	Correct as No. 7. III.4.4.4–5. In W. T., p. 439.
54	Average sample, Potaro River, British Guiana.	Assistant of J. B. Harrison.	J. B. Harrison, Rep. G. Ess. Riv., p. 63, 1900.	Diabase.	In W. T., p. 291.
55	Mazaruni District, British Columbia.	J. B. Harrison.	J. B. Harrison, pers. com.	Diabase-gabbro.	In W. T., p. 291.
56	Average sample, Essequibo River, British Guiana.	Assistant of J. B. Harrison.	J. B. Harrison, Rep. G. Ess. Riv., p. 63, 1900.	Diabase.	Correct as No. 63, III.5.4.4–5. In W. T., p. 291.
57	Average sample, Essequibo River, British Guiana.	Assistant of J. B. Harrison.	J. B. Harrison, Rep. G. Ess. Riv., p. 64, 1900.	Diabase.	Correct as No. 66, III.5.4.4–5. In W. T., p. 291.
58	Average sample, Potaro River, British Guiana.	Assistant of J. B. Harrison.	J. B. Harrison, Rep. G. Ess. Riv., p. 64, 1900.	Diabase.	Correct as No. 67, III.5.4.4–5. In W. T., p. 439.
59	Surinam, Dutch Guiana.	Weidig-Freiberg.	G. C. Dubois, T. M. P. M., XXII, p. 24, 1903.	Diabase.	
60	Agua Clara, Puente de Chimbo, Ecuador.	J. Siemiradzki.	J. Siemiradzki, N. J. B. B., IV, p. 200, 1886.	Melaphyre.	In W. T., p. 445.
61	Hapucu, Sao Paulo, Brazil.	Not stated.	F. de P. Oliveira, Ref. N. J., 1891, II, p. 304.	Diabase.	In W. T., p. 439.
62	Bufao, Sao Paulo, Brazil.	Not stated.	F. de P. Oliveira, Ref. N. J., 1891, II, p. 304.	Diabase.	In W. T., p. 439.
63	Saltinho do Pary, Sao Paulo, Brazil.	Not stated.	F. de P. Oliveira, Ref. N. J., 1891, II, p. 304.	Melaphrye.	In W. T., p. 445.
64	Cerro Howyi, Paraguay.	M. Goldschlag.	M. Goldschlag, In. Diss. Jena, p. 38, 1913.	Diabase porphyrite.	

DIABASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
65 D4. V	53. 81	20. 41	11. 45	n. d.	1. 76	1. 65	2. 55	3. 72	3. 98		0. 19	0. 12		Cl 0. 05	99. 78	
66 D4. V	46. 4	20. 4	6. 9	n. d.	3. 5	7. 7	6. 93	0. 54	1. 1		0. 24			CO_2 5. 8	99. 51	
67 D4. V	36. 80	22. 95	n. d.	4. 08	2. 85	9. 73	0. 50	1. 10	7. 70		2. 60	0. 75	trace	CO_2 11. 90		
68 B3. IV	57. 57	14. 25	6. 04	3. 95	4. 24	6. 87	2. 98	1. 08	1. 25		trace	0. 15	0. 27	CO_2 0. 30 S 0. 19	99. 14	
69 B4. V	53. 70	18. 21	10. 64	n. d.	5. 24	6. 66	2. 65	0. 99	1. 55						99. 64	
70 B4. V	51. 20	20. 03	7. 57	n. d.	6. 75	10. 52	1. 71	0. 51	1. 70						99. 99	2. 885
71 C3. V	48. 0	17. 8	3. 6	8. 6	5. 8	10. 5	3. 4	0. 6	1. 9						100. 2	
72 D4. V	52. 81	19. 83	11. 89	n. d.	5. 32	0. 95	3. 54	2. 71	3. 10						100. 15	
73 D4. V	51. 20	17. 34	12. 43	n. d.	4. 71	6. 35	3. 28	1. 92	2. 77		1. 08	1. 27			102. 35	
74 C2. IV	49. 41	15. 11	2. 70	9. 63	5. 11	8. 80	3. 71	0. 70	2. 90		2. 82	0. 32			101. 21	
75 C4. V	48. 60	19. 15	6. 55	n. d.	6. 40	11. 70	3. 75	0. 65	2. 25						99. 05	
76 C3. V	47. 81	19. 10	1. 35	8. 45	5. 10	6. 88	3. 57	1. 98	4. 00		2. 43	0. 63			101. 30	
77 B3. IV	47. 51	17. 81	1. 42	8. 72	8. 05	8. 20	3. 45	1. 21	2. 63		2. 02				101. 02	
78 C4. V	48. 15	20. 28	1. 31	10. 01	6. 34	0. 71	5. 30	1. 35	6. 34						99. 79	2. 72
79 C3. V	51. 52	21. 11	8. 38	n. d.	2. 69	17. 49	1. 81	0. 69	4. 00		0. 31		0. 44	CO_2 10. 98		
80 C3. V	51. 25	19. 63	5. 07	7. 24	5. 23	8. 61	1. 12	0. 36	0. 81		0. 37				99. 69	
81 C3. V	49. 16	20. 52	6. 89	7. 31	5. 64	6. 06	1. 30	1. 01	0. 34		0. 52		0. 78	CO_2 0. 36	99. 89	2. 965
82 D4. V	50. 01	18. 95	n. d.	9. 57	5. 60	10. 44	4. 66	2. 37	0. 39						101. 99	
83 C3. V	52. 91	21. 77	3. 47	4. 30	2. 19	6. 82	4. 93	2. 51	0. 91						99. 32	
84 C4. V	45. 75	13. 40	8. 21	6. 35	7. 29	12. 05	1. 33		1. 75		2. 95		0. 25		99. 32	

DIABASE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
65	Gartley, Aberdeenshire, Scotland.	W. Mackie.	W. Mackie, Tr. G. Soc. Edin., VIII, p. 56, 1901.	Diabase porphyrite.	
66	Gatelockside Burn, New Cumnock, Scotland.	J. J. H. Teall.	A. Geikie, G. S. G. B. A. R., 1897, p. 38.	Diabase.	Not in W. T.
67	Newhalls, Queensferry, England.	E. Stecher.	E. Stecher, T. M. P. M., IX, p. 190, 1898.	White trap.	Not fresh. In W. T., p. 441.
68	Cockfield Dike, Great Ayton, England.	W. F. K. Stock.	J. J. H. Teall, Q. J. G. S., XL, p. 224, 1884.	Diabase.	In W. T., p. 241.
69	High Green, Bellingham, England.	J. E. Stead.	J. J. H. Teall, Q. J. G. S., XL, p. 240, 1884.	Diabase.	In W. T., p. 439.
70	Morpeth, England.	J. E. Stead.	J. J. H. Teall, Q. J. G. S., XL, p. 239, 1884.	Diabase.	In W. T., p. 441.
71	Commune, Meuse River Ardenne. France.	J. de Lapparent.	J. de Lapparent, B. Soc. M. Fr., XXXII, p. 280, 1909.	Diabase.	
72	Pelvoux, Dauphiny.	P. Termier.	P. Termier, C. R., CXXIV, p. 635, 1897.	Diabase.	In W. T., p. 441.
73	Pelvoux, Dauphiny.	P. Termier.	P. Termier, C. R., CXXIV, p. 635, 1897.	Diabase.	In W. T., p. 441.
74	St. Denis de Gatines, Brittany, France.	Pisani.	L. Vandernotte, Mass. Armor., p. 152, 1913.	Diabase.	
75	Freychinede, Pyrenees.	M. Longchambon.	M. Longchambon, B. Sv. Ct. G. Fr., XXI, No. 131, p. 41, 1912.	Ophite.	
76	L'Arbizon, Pyrenees.	Pisani.	A. de Romeu, B. Soc. M. Fr., XXX, p. 179, 1907.	Diabase.	
77	Lac Bleu, Pyrenees.	Pisani.	A. de Romeu, B. Soc. M. Fr., XXX, p. 164, 1907.	Diabase.	
78	Ajaccio, Corsica.	M. Oels.	M. Oels, Ref. N. J., 1896, I, p. 47.	Diabase.	In W. T., p. 443.
79	Mount Edmund, Spitzbergen.	H. Backlund?	H. Backlund, Ref. N. J., 1911, II, p. 243.	Diabase.	Altered.
80	Andersson Islands, Spitzbergen.	H. Backlund?	H. Backlund, Ref. N. J., II, p. 243, 1911.	Diabase.	
81	Andersson Bay, Spitzbergen.	H. Backlund?	H. Backlund, Ref. N. J., 1911, II, p. 243.	Diabase.	
82	Elsfjeld, Holsenö, Bergen, Norway.	Not stated.	Cited by C. F. Kolderup, Berg. Mus. Aarb., No. 12, p. 36, 1903.	Diallage-labradorite rock.	
83	Holmestrand, Kristiania Fjord, Norway.	G. Särnström.	W. C. Brögger, Z. K., XVI, p. 28, 1890.	Diabase porphyrite.	In W. T., p. 441.
84	Holmestrand, Kristiania Fjord, Norway.	G. Särnström.	W. C. Brögger, Z. K., XVI, p. 27, 1890.	Melaphyre.	In W. T., p. 445.

DIABASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
85 B4. V	52.69	18.93	10.99	n. d.	2.56	5.31	4.04	2.11	2.76		0.60	0.80			100.79	
86 B4. V	50.95	17.50	14.42	n. d.	2.63	6.85	3.38	1.65	2.02		0.50	0.78			100.68	
87 B4. V	50.65	18.45	13.80	n. d.	2.68	6.22	3.71	1.92	2.02		0.50	0.78			100.73	
88 B4. V	49.20	19.13	13.60	n. d.	3.08	7.18	3.63	1.89	1.31		0.56	0.75			100.33	
89 C2. IV	48.33	16.94	5.65	12.16	4.06	5.91	3.19	1.19	0.83		0.82	1.07	trace		100.15	2.968
90 C2. IV	47.56	16.25	3.41	14.41	4.13	5.15	3.46	1.96	2.33		0.68	1.18	trace		100.52	2.921
91 A4. IV	47.97	11.26	9.09	5.46	3.95	11.76	5.14		2.54		1.68				99.72	
92 D3. V	46.54	16.86	3.20	7.41	9.77	9.54	3.14	0.63	0.69		0.96	trace			98.76	
93 C2. IV	51.11	12.75	6.90	6.81	7.22	5.87	4.67	0.65	1.68		1.28	0.03	trace		98.97	
94 C3. V	49.36	18.52	3.91	10.13	3.37	7.55	3.45	1.89	0.80						98.98	
95 C3. V	49.17	14.59	3.91	12.94	4.32	8.78	3.68	0.79	0.58						98.76	
96 C4. V	47.66	15.59	20.35	n. d.	4.78	6.91	2.24	1.54	0.57						99.64	
97 B3. IV	46.50	13.54	12.39	7.04	6.30	9.60	2.09	1.83							99.29	
98 B3. IV	46.38	12.86	12.08	8.04	6.22	10 55	2.13	1.80							100.63	
99 B3. IV	46.32	12.81	13.06	7.93	6.97	9.03	2.13	1.74							99.99	
100 B3. IV	45.75	12.41	13.23	8.23	5.07	11.41	2.18	1.71							99.94	
101 B3. IV	45.68	11.96	12.78	8.77	5.60	11.21	2.11	1.88	—						99.99	
102 B3. IV	43.74	11.99	17.64	12.20	4.39	7.61	2.19	1.80							100.56	
103 B4. V	45.78	16.65	1.40	10.09	6.41	9.68	3.12		3.40	0.70	2.32			CO_2 0.21 SO_3 0.75	100.51	

DIABASE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
85	Kullen, Sweden.	L. G. Thomé.	A. Hennig, Ref. N. J., II, p. 59, 1901.	Kullaite.	In W. T., p. 441.
86	Mölle, Kullen, Sweden.	L. G. Thomé.	A. Hennig, Ref. N. J., 1901, II, p. 59.	Konga diabase.	In W. T., p. 441.
87	Bökebolet, Kullen, Sweden.	L. G. Thomé.	A. Hennig, Ref. N. J., 1901, II, p. 59.	Konga diabase.	In W. T., p. 441.
88	Tanga, Kullen, Sweden.	L. G. Thomé.	A. Hennig, Ref. N. J., 1901, II, p. 59.	Olivine diabase.	In W. T., p. 441.
89	Silfberg, Dalarne, Sweden.	O. Larsson.	M. Weibull, Lund. Un. Aars., XXXIII (2), No. 4, p. 24, 1897.	Diabase.	Not in W. T.
90	Silfberg, Dalarne, Sweden.	O. Larsson.	M. Weibull, Lund. Un. Aars., XXXIII (2), No. 4, p. 10, 1897.	Melaphyre.	Not in W. T.
91	Ottfjall, Sweden.	P. J. Holmquist.	P. J. Holmquist, G. F. F., XVI, p. 190, 1894.	Diabase.	In W. T., p. 441.
92	Krustorp, Brefven, Sweden.	K. Winge.	K. Winge, G. F. F., XVIII, p. 195, 1896.	Olivine diabase.	In W. T., p. 441.
93	Kallioski, Vaajoki, Tervola, Finland.	N. Sahlbom.	V. Hackman, B. C. G. Fin., No. 15, p. 60, 1905.	Diabase.	
94	Föglö, Aland, Finland.	A. Berghell.	B. Frosterus, Fin. G. Und., Bl. 25, p. 23, 1894.	Diabase.	In W. T., p. 441.
95	Föglö, Aland, Finland.	H. Berghell.	B. Frosterus, G. F. F., XV, p. 285, 1893.	Diabase.	In W. T., p. 441.
96	Paljakka, Jaala, St. Michel, Finland.	H. Berghell.	B. Frosterus, G. Ofv. Kt. Fin., Bl. St. Michel, p. 72, 1902.	Diabase.	
97	Sundholm, Nystad, Finland.	Not stated.	H. Gylling, Fin. G. Und., Bl. 12, p. 55, 1888.	Diabase.	Ignited before analysis. In W. T., p. 441.
98	Padoi, Letala, Finland.	Not stated.	H. Gylling, Fin. G. Und., Bl. 12, p. 55, 1888.	Diabase.	Ignited before analysis. In W. T., p. 441.
99	Leinmäki, Letala, Finland.	Not stated.	H. Gylling, Fin. G. Und., Bl. 12, p. 55, 1888.	Diabase.	Ignited before analysis. In W. T., p. 441.
100	Rautavaori, Letala, Finland.	Not stated.	H. Gylling, Fin. G. Und., Bl. 12, p. 56, 1888.	Diabase.	Ignited before analysis. In W. T., p. 441.
101	Heuru, Honkilahti, Finland.	Not stated.	H. Gylling, Fin. G. Und., Bl. 12, p. 56, 1888.	Diabase.	Ignited before analysis. In W. T., p. 441.
102	Kivijärvi, Eura, Finland.	Not stated.	H. Gylling, Fin. G. Und., Bl. 12, p. 56, 1888.	Diabase.	Ignited before analysis. Not fresh. In W. T., p. 441.
103	Höllershagen, Wiblingswerde, Westphalia.	P. Sichtermann.	P. Sichtermann, Jb. Pr. G. L.-A., XXVIII, p. 375, 1910.	Diabase.	Also Ref., N. J., 1907, I, p. 57.

DIABASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
104 B4. V	44.83	13.47	11.79	4.49	11.60	4.79	2.34	n. d.	6.16						99.47	2.56
105 D3. V	52.40	19.47	4.15	3.80	2.26	8.60	4.45	1.11	2.77		0.19	1.98			101.61	
106 D3. V	48.91	14.31	6.24	5.25	8.91	8.36	4.02	1.45	1.79	1.07	1.71				102.02	
107 B3. IV	45.0	18.7	2.6	10.9	3.6	9.6	2.2	3.1	4.0		0.1				99.8	
108 C3. V	44.74	15.67	5.18	6.71	8.47	8.76	1.79	0.51	3.87		1.69	2.56			99.95	2.83
109 C2. IV	43.69	20.69	3.00	8.91	4.46	11.61	1.41	0.72	2.78	0.16	1.56	0.36		CO_2 0.35 SO_3 0.51	100.21	2.97
110 B3. IV	48.40	15.33	2.66	11.04	7.06	4.61	1.89	1.39	3.25					CO_2 4.94	100.57	
111 C3. V	47.89	12.07	5.73	11.08	6.56	4.94	2.14	1.37	2.99					CO_2 6.53	101.30	
112 C4. V	51.87	20.72	7.26	n. d.	1.68	8.12	5.24	1.54	2.76				0.11		99.30	
113 C2. IV	50.76	16.68	5.84	1.69	1.72	10.48	3.27	3.12	1.18		1.64	0.15	0.36	CO_2 4.02	100.91	
114 C4. V	50.59	17.81	10.66	n. d.	6.58	6.96	1.05	trace	6.36				trace		100.01	
115 C4. V	45.55	16.30	9.57	n. d.	5.14	7.98	1.24	trace	14.38						99.99	
116 C3. V	47.55	20.43	6.97	4.33	5.89	9.05	3.12	1.49	1.32		trace	trace	0.31	S trace SrO trace	100.43	2.883
117 C4. V	43.40	17.16	17.56	n. d.	0.25	17.93	0.98	1.09	2.34		trace	trace	0.28	S trace	100.99	3.196
118 C4. V	38.65	9.57	25.35	trace	3.34	18.94	1.13	1.01	1.80		trace	trace	0.55	SrO trace	100.34	3.184
119 B4. V	55.95	19.47	4.09	1.08	4.24	7.84	2.64		3.78		1.60				100.69	2.806
120 C3. V	50.03	15.46	4.25	6.19	7.73	8.25	2.82	1.48	4.28			0.29	0.53		101.31	
121 B3. IV	49.94	18.86	1.47	7.12	5.61	8.54	2.50	1.62	2.77				0.63	CO_2 0.23	99.29	2.88
122 C3. V	44.55	23.09	6.47	5.08	5.87	8.90	2.40	0.33	1.06					CO_2 2.92	100.66	

DIABASE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
104	Homertshausen, Rheinland?	Not stated.	R. Brauns, N. J. B. B., XXI, p. 310, 1906.	Diabase glass.	
105	Balkhausen, Hesse.	R. Marzahn.	Chelius and Klemm, Erl. G. Kt. Hes., IV, p. 37, 1896.	Diabase.	In W. T., p. 441.
106	Burkhardsfelden, near Giessen, Hesse.	A. Streng.	W. Schottler, Abh. G. L.-A. Darm., IV (3), p. 466, 1908.	Trap.	
107	Treisberg, Buchenau, Hesse.	W. Bollenbach.	W. Berkermann, In. Diss. Marb., p. 29, 1910.	Diabase.	
108	Oberberg, Weissenbach, Hesse-Nassau.	H. Harff.	R. Brauns, N. J. B. B., XXVII, p. 276, 1909.	Essexite diabase.	Alkalies uncertain. Cf. ref. P_2O_5 high.
109	Manderbach, Hesse-Nassau.	G. Butzbach.	R. Brauns, N. J. B. B., XXVII, p. 278, 1909.	Mica diabase.	Not fresh.
110	Ronneberg, Thuringia.	C. A. Müller.	C. A. Müller, In. Diss. Gera, p. 32, 1884.	Diabase.	Not fresh. In W. T., p. 443.
111	Ronneberg, Thuringia.	C. A. Müller.	C. A. Müller, In. Diss. Gera, p. 31, 1884.	Diabase.	Not fresh. In W. T., p. 443.
112	Niederkirchen, Kusel, Bavaria.	A. Schwager.	M. Schuster, Erl. G. Kt. Bay., Bl. Kusel, XX, p. 21, 1910.	Tholeyitic gabbro-diabase.	
113	Oslbrücken, Kusel, Bavaria.	A. Schwager.	M. Schuster, Erl. G. Kt. Bay., XX, p. 39, 1910.	Melaphyre.	
114	Mannweiler, Pfalz, Bavaria.	P. Weidinger.	M. Schuster, Geog. Jhft., XXVI, p. 242, 1914.	Tholeyite.	Not fresh.
115	Obermoschel, Pfalz, Bavaria.	P. Weidinger.	M. Schuster, Geog. Jhft., XXVI, p. 242, 1914.	Tholeyite.	Badly weathered.
116	Neubau, Fichtelgebirge.	Delré?	Delré, In. Diss. Erl., 1895.	Proterobase.	Not in W. T. Osann, II, p. 168.
117	Ochsen Kopf, Fichtelgebirge.	Delré?	Delré, In. Diss. Erl., 1895.	Proterobase.	Not fresh. Not in W. T. Osann, II, p. 168.
118	Ochsen Kopf, Fichtelgebirge.	Delré?	Delré, In. Diss. Erl., 1895.	Proterobase.	Completely epidotized. Not in W. T. Osann, II, p. 168.
119	Zahbelic, n. Prague, Bohemia.	J. Nevole.	B. Macha, Ref. N. J., 1901, I, p. 60.	Diabase.	In W. T., p. 443.
120	Podbaka, Moldauthal, Bohemia.	Strnad.	J. Klevana, Ref. N. J., 1898, I, p. 485.	Olivine diabase.	In W. T., p. 443.
121	Prisednice, near Zbirov, Bohemia.	F. Schulz.	F. Slávik, Ref. N. J., 1901, I, p. 63.	Mica diabase.	In W. T., p. 293.
122	Dobschau, Bohemia.	A. Jilek.	J. Woldrich, B. Ac. Sc. Prag., XVII, p. 387, 1912.	Diabase.	

DIABASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
123 B4. V	44.41	19.27	10.77	1.53	4.28	9.25	4.01	2.08	3.11			0.41		FeS_2 0.71	100.02	
124 C4. V	54.93	17.73	13.55	n. d.	0.80	4.35	4.94	2.89	0.96				trace		100.15	
125 C3. V	49.50	12.80	16.41	5.80	0.36	6.80	4.41	1.18	2.45	0.75					100.46	
126 C3. V	48.49	13.34	9.72	6.66	2.63	5.86	5.15	2.09	4.63	0.47					99.04	
127 D3. V	43.00	13.25	5.98	6.93	3.29	9.30	6.16	1.96	7.10	0.70		0.95			98.62	
128 D3. V	42.20	17.70	6.62	8.63	4.16	3.60	7.64	4.05	4.27	0.23		trace			99.10	
129 C4. V	49.37	16.19	9.77	n. d.	0.66	13.82	3.20	6.40	0.54						99.95	
130 C3. V	43.41	13.20	7.00	5.66	13.12	12.88	1.84	0.99	3.02						101.12	
131 B3. V	48.50	16.59	7.13	n. d.	7.47	11.50	2.36	0.44	2.70		0.70	0.24		CO_2 1.65	99.28	
132 C3. V	45.98	19.93	8.62	6.04	5.46	6.29	3.41	1.29	2.40						99.42	
133 C3. V	45.67	21.01	7.07	4.40	4.52	11.93	1.02	0.82	2.78	0.43	trace				99.65	
134 D3. V	44.59	20.76	7.89	4.72	5.61	11.05	2.96	0.95	3.05		trace.				101.58	
135 C4. V	44.45	14.02	14.24	n. d.	9.45	6.54	6.72	0.83	4.14			0.32		CO_2 0.45	101.16	2.63
136 D4. V	37.79	18.35	11.79	n. d.	4.69	9.31	9.94	1.89	1.83			0.34	trace	CO 5.87	101.80	
137 D4. V	50.71	19.04	8.32	n. d.	8.91	6.66	4.03	1.11	3.05		trace	trace			101.83	
138 C4. V	50.66	12.58	n. d.	14.39	6.34	1.90	2.76	3.81	4.60		0.54	trace	1.44		99.32	2.64
139 C3. V	35.94	19.92	2.46	8.30	10.27	14.94	0.76	0.08	6.23	0.10	0.75	trace	1.36		101.11	3.15
140 C2. IV	46.22	22.73	5.34	3.15	5.28	6.06	3.59	0.82	5.38	0.21	0.12	0.03		CO_2 1.31 S 0.08	100.32	
141 B3. IV	52.75	12.12	1.36	7.39	11.25	10.56	3.56	0.29	2.26						101.11	
142 D3. V	45.56	14.67	4.61	10.95	7.31	12.08	2.58	0.56	3.90						102.22	

DIABASE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
123	Kozi Oltar, Bohemia.	J. Friedrich.	K. Hinterlechner, Jb. G. R.-A. Wien, LII, p. 188, 1903.	Mica diabase.	
124	Tenczyner Garden, Cracow, Galicia.	R. Zuber.	R. Zuber, Jb. G. R.-A. Wien, XXXV, p. 752, 1885.	Melaphyre.	In W. T., p. 447.
125	Rettenback-Klemm, Schöckel, Styria.	L. Welisch.	L. Welisch, Mt. Nw. Ver. Steierm., XLVII, p. 75, 1911.	Diabase.	
126	Rettenback-Klemm, Schöckel, Styria.	L. Welisch.	L. Welisch, Mt. Nw. Ver. Steierm., XLVII, p. 76, 1911.	Diabase.	
127	Hochlautsch, Styria.	L. Welisch.	L. Welisch, Mt. Nw Ver. Steierm., XLVII, p. 66, 1911.	Diabase.	
128	Hochlautsch, Styria.	L. Welisch.	L. Welisch, Mt. Nw. Ver. Steierm., XLVII, p. 65, 1911.	Diabase.	
129	Boscampo, Predazzo, Tyrol.	J. A. Ippen.	J. A. Ippen, N. J. Cb., p. 640, 1903.	Melaphyre.	
130	Palle Rabiose, Monzoni, Tyrol.	C. Doelter.	C. Doelter, Anz. Ak. W. Wien, XXXIX, p. 231, 1902.	Melaphyre.	
131	Bischofsjoch, Kitzbüchler Alpen, Tyrol.	L. Obermaier.	A. Spitz, T. M. P. M.,/XXVIII, p. 504, 1909.	Hornblende diabase.	
132	Galleno, Adamello, Tyrol.	C. Riva.	C. Riva, Ref. N. J., II, p. 65, 1887.	Diabase.	In W. T., p. 443.
133	Cadin Brut, Fassa Thal, Tyrol.	H. Proboscht.	H. Proboscht, N. J. Cb., p. 47, 1905.	Melaphyre.	
134	Pizmeda, Tyrol.	H. Proboscht.	H. Proboscht, N. J. Cb., p. 80, 1904.	Analcite melaphyre.	
135	Nozza, Val Sabbia, Piedmont.	C. Riva.	C. Riva, Rend. Inst. Lomb., XXVI, p. 433, 1893.	Olivine diabase.	Not fresh. In W. T., p. 443.
136	Colmo di Provoglio, Val Sabbia, Piedmont.	C. Riva.	C. Riva, Rend. Inst. Lomb., XXVI, p. 435, 1893.	Olivine melaphyre.	Not fresh. In W. T., p. 447.
137	Romito, near Livorno, Tuscany.	E. Manasse.	E. Manasse, Pr. Soc. Tosc., XII, p. 165, 1901.	Diabase.	
138	Groppo del Vescovo, near Parma, Italy.	M. Ferrari.	M. Ferrari, Mem. Ac. Linc. (5), VIII, No. 21, p. 733, 1911.	Diabase.	
139	Gorgona Island, Tuscan Archipelago.	E. Manasse.	E. Manasse, Mem. Soc. Tosc., XX, p. 50, 1904.	Diabase.	Altered.
140	Paraspora, Monte Scalpello, Madonie, Sicily.	G. Ponte.	G. Ponte, Mem. Ac. Linc. (5), VII, No. 10, p. 622, 1909.	Diabase.	Not fresh. 3 decimals.
141	Malinka-Sosnowka, Koswinsky, Ural Mountains.	L. Duparc.	Duparc and Pearce, Oural Nord, I, p. 189, 1902.	Diabase.	
142	Kroutoi-Ouwal, Koswinsky, Ural Mountains.	L. Duparc.	Duparc and Pearce, Oural Nord, I, p. 189, 1902.	Diabase.	Tilaite in Oural Nord, II, p. 440, 1905.

DIABASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
143 B3. IV	51.02	13.62	2.67	9.86	6.01	11.42	2.16	0.53	2.48		1.38		trace		101.15	
144 D3. V	55.08	15.18	4.68	6.86	3.96	5.45	1.93	0.43	2.02		0.23		3.54		99.36	
145 D3. V	41.98	22.68	4.87	7.28	1.98	5.93	4.57	0.27	4.09		trace		4.91		98.56	
146 D4. V	49.92	14.84	11.93	n. d.	3.84	10.50	5.72		3.25						100.00	
147 C4. V	57.67	24.37			3.05	8.02	2.93	1.12	3.48						100.64	
148 C4. V	52.61	18.94	9.60	n. d.	3.56	9.14	2.62	0.86	3.27						99.70	
149 C4. V	51.96	20.47	9.55	n.d.	2.27	4.14	3.90	2.15	5.65						100.08	
150 C4.V	49.99	15.11	14.25	n. d.	4.11	6.04	3.52	1.42	4.78						99.77	
151 C4.V	49.02	20.25	9.30	n. d.	3.32	8.26	4.09	1.52	4.30						100.07	2.80
152 D4.V	49.71	17.45	6.56	n. d.	7.01	10.76	3.74	3.24	1.82						101.29	
153 B3.IV	49.19	16.83	1.96	8.15	7.50	12.38	3.24	1.41							100.66	
154 B3.IV	47.15	16.09	4.59	9.49	4.43	8.86	4.46	0.39	2.39	0.29	1.32				99.46 (100.61)	
155 C4.V	45.78	21.23	9.57	n. d.	5.81	8.06	3.57	2.71	3.45						100.18	
156 C4.V	53.27	19.33	8.71	trace	2.33	5.19	3.84	1.80	3.84	1.67					100.00	
157 D4.V	52.89	20.88	7.10	n. d.	3.13	12.82	(2.55)		0.63						100.00	
158 B4.V	52.44	12.16	13.79	n. d.	7.40	10.46	1.90	0.49	1.89						100.53	
159 C3.V	53.00	19.70	10.93	2.88	4.00	7.20	0.82	0.79	n. d.			trace	trace	CO_2 trace FeS_2 0.25	99.57	2.864
160 C3.V	52.20	16.50	14.50	1.20	3.50	11.50	0.28	0.25	n. d.			trace		S trace	99.93	
161 C3. V	51.20	16.75	16.87	2.88	2.60	8.74	0.50	0.39				trace	trace	CO_2 trace FeS_2 0.02	99.95	2.834
162 B3. IV	51.75	14.67	6.27	4.73	5.19	11.94	2.70	0.58	1.86						99.69	
163 C4. V	49.50	18.40	13.10	n. d.	5.25	2.24	4.65	1.48	5.23						99.95	

DIABASE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
143	Pelia Ravine, Wichera, Ural Mountains.	Not stated.	Duparc, Pearce, and Tikanovitch, Oural Nord, III, p. 66, 1909.	Diabase.	
144	Drugoretzkaja Schtschalga, Olonez, Russia.	S. A. Jakowseff.	Cited by W. Wahl, Fennia, XXIV, No. 3, p. 50, 1908.	Diabase.	
145	Drugoretzkaja Schtschalga, Olonez, Russia.	S. A. Jakowseff.	Cited by W. Wahl, Fennia, XXIV, No. 3, p. 50, 1908.	Microvariolite.	
146	Jalguba, Olonez, Russia.	Loewinson-Lessing.	Loewinson-Lessing, T. M. P. M., VI, p. 294, 1885.	Diabase aphanite.	Alkalies by difference. In W. T., p. 443.
147	Koktebel, Crimea.	A. Lagorio.	A. Lagorio, Cong. G. Int. VII, Guide XXXIII, p. 27, 1897.	Melaphyre.	In W. T., p. 447.
148	Kobosa, Crimea.	A. Lagorio.	A. Lagorio, Cong. G. Int. VII, Guide XXXIII, p. 27, 1897.	Melaphyre.	In W. T., p. 447.
149	Karagatch, Crimea.	A. Lagorio.	A. Lagorio, Cong. G. Int. VII, Guide XXXIII, p. 27, 1897.	Melaphyre.	In W. T., p. 447.
150	Bodrak River, Crimea.	A. Lagorio.	A. Lagorio, Cong. G. Int. VII, Guide XXXIII, p. 27, 1897.	Melaphyre.	In W. T., p. 447.
151	Mount Kastel, Crimea.	R. Prendel.	R. Prendel, Ref. N. J., 1887, II, p. 98.	Melaphyre.	In W. T., p. 447.
152	Sejovica, near Sofia, Bulgaria.	L. Dimitrow.	L. Dimitrow, Ds. Ak. W. Wien, LX, p. 514, 1893.	Epidiabase.	In W. T., p. 443.
153	Assa, Caucasus.	Loewinson-Lessing and Krikmeyer.	Loewinson-Lessing, Ref. N. J., 1899, II, p. 234.	Diabase.	In W. T., p. 443.
154	Krasnaja Poljana, Caucasus.	D. Beljankin.	D. Beljankin, An. Inst. Pol. Pet. G. T., XV, p. 371, 1911.	Albite diabase.	
155	Kolotanis, Caucasus.	Makerow.	Loewinson-Lessing, Ref. N. J., 1899, II, p. 234.	Diabase.	In W. T., p. 443.
156	Aspinsi, Armenia.	C. Schmidt.	H. Abich, G. Armen., II, p. 156, 1888.	Melaphyre.	SiO_2 includes loss. 3 decimals. Not in W. T.
157	Mujongo, Uganda.	A. Roccati.	A. Roccati in Duca Abruzzi, Ruwenzori, p. 179, 1909.	Diabase.	Other analyses in same work.
158	Pietermaritzburg, Natal.	G. Bauzel.	E. Cohen, N. J. B. B., V, p. 233, 1887.	Olivine diabase.	In W. T., p. 445.
159	Kliprivérsberg, Transvaal.	H. Eckstein & Co.	C. B. Horwood, Tr. G. Soc. S. Afr., XIII, p. 39, 1911.	Diabase.	
160	East Rand, Transvaal.	H. Eckstein & Co.	C. B. Horwood, Tr. G. Soc. S. Afr., XIII, p. 39, 1911.	Diabase.	
161	Grootvlei, East Rand, Transvaal.	H. Eckstein & Co.	C. B. Horwood, Tr. G. Soc. S. Afr., XIII, p. 39, 1911.	Diabase.	
162	Near Kimberley, Griqualand.	Dodge (student).	E. Cohen, N. J. B. B., V, p. 233, 1887.	Olivine diabase.	In W. T., p. 337.
163	Kimberley, Griqualand.	Not stated.	L. de Launay, C. R., CXXV, p. 336, 1897.	Olivine diabase.	In W. T., p. 445.

DIABASE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
164 C4. V	46.60	16.90	11.60	n. d.	9.35	2.76	4.67	0.63	7.12						99.74	
165 B3. IV	51.82	13.55	10.07	2.85	7.35	10.86	2.52	0.23	1.40						100.65	
166 B3. IV	49.50	14.89	5.93	6.42	6.73	12.45	1.68	0.56	2.84						101.00	
167 D3. V	56.63	11.24	12.66	5.20	3.15	6.38	3.97	1.24	2.08						102.55	
168 D3. V	53.04	12.45	9.60	3.35	6.07	10.23	5.36	0.25	2.27						102.62	
169 C3. V	50.17	15.83	9.32	4.87	7.21	9.34	3.00	0.71	0.74						101.19	
170 B4. V	50.44	18.25	n. d.	8.93	7.86	7.14	3.25	0.64	3.01						99.52	
171 B4. V	48.31	18.51	14.53	n. d.	4.45	5.40	3.42	1.82	3.88						100.32	
172 C4. V	47.51	16.00	16.26	n. d.	7.38	7.63	2.29	1.01	3.25						101.33	
173 D3. V	54.00	18.15	4.07	8.05	3.37	5.01	2.82	1.31	1.77					CO_2 0.20	98.75	
174 D3. V	46.05	21.20	5.08	7.99	2.73	10.40	1.43	0.17	2.03		1.19				98.27	
175 C3. V	35.18	14.55	4.01	7.88	8.10	9.60	4.25	2.21	2.57					CO_2 12.61	100.96	
176 C2. IV	50.41	19.11	1.97	9.58	6.23	7.42	1.37	0.74	0.94	0.09	2.14	0.10	0.11	NiO 0.01 BaO 0.07	100.29	
177 C3. V	49.66	21.29	5.94	2.19	6.47	9.16	2.28	0.32	2.78						100.09	2.84
178 B4. V	48.12	17.80	8.34	n. d.	8.40	7.78	2.05	0.25	6.36				0.95		100.05	
179 B4. V	48.55	14.38	n. d.	10.73	11.69	12.65	1.42	0.29	0.46				0.11		100.28	
180 C3. V	61.08	14.15	6.77	1.08	3.87	8.14	1.17	0.21	3.71		trace	0.10	0.96		101.24	2.86
181 C4. V	50.22	19.41	8.15	n. d.	7.14	10.20	3.84	1.20	1.10						101.26	
182 C3. V	40.62	22.12	5.36	9.57	4.05	2.20	1.32	1.32	2.92	4.65				CO_2 6.74	100.87	
183 C3. V	50.98	17.09	0.87	8.35	4.70	9.70	4.09	0.10	1.08	0.05	0.79		1.25	CO_2 none FeS_2 0.19	99.24	2.95

DIABASE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
164	Kimberley, Griqualand.	Not stated.	L. de Launay, C. R., CXXV, p. 336, 1897.	Olivine diabase.	In W. T., p. 445.
165	Between Oranje and Rietfluss, Orange River Colony.	Ehrhardt and Schwedes (students).	E. Cohen, N. J. B. B., V, p. 233, 1887.	Olivine diabase.	In W. T., p. 311.
166	Philipolis, Orange River Colony.	Liepmann (student).	E. Cohen, N. J. B. B., V, p. 244, 1887.	Diabase porphyrite.	In W. T., p. 337.
167	Colesburg, Cape Colony.	Trechmann and Ambühl (students).	E. Cohen, N. J. B. B., V, p. 237, 1887.	Quartz diabase.	In W. T., p. 445.
168	Richmond, Cape Colony.	Raincke and Reuling (students).	E. Cohen, N. J. B. B., V, p. 247, 1887.	Diabase porphyrite.	In W. T., p. 445.
169	Pfandstall, near Colesberg, Cape Colony.	Wetzig (student).	E. Cohen, N. J. B. B., V, p. 245, 1887.	Diabase porphyrite.	In W. T., p. 337.
170	Purikan, Persia.	C. v. John.	C. v. John, Jb. G. R.-A. Wien, XXXIV, p. 133, 1884.	Olivine melaphyre.	In W. T., p. 447.
171	Maschur Spring, Firuskuh, Persia.	C. v. John.	C. v. John, Jb. G. R.-A. Wien, XXXIV, p. 121, 1884.	Diabase.	In W. T., p. 443.
172	Buhemin, Elburz Mountains, Persia.	E. Drasche.	E. Drasche, Vh. G. R.-A. Wien, 1884, p. 196.	Olivine diabase.	In W. T., p. 445.
173	Angara River, Jenissei District, Siberia.	Not stated.	A. Meister, Reg. Aurif. Sib., IX, p. 363, 1910.	Mica diabase.	
174	Rybnaya River, Jenissei District, Siberia.	Not stated.	A. Meister, Reg. Aurif. Sib., IX, p. 332, 1910.	Gabbro-diabase.	
175	Murozhuaya River, Jenissei District, Siberia.	Not stated.	A. Meister, Reg. Aurif. Sib., IX, p. 376, 1910.	Mica diabase.	Not fresh.
176	Kusjkin Island, Siberia.	H. Backlund.	H. Backlund, Mem. Ac. Sc. St. P., XXI, No. 6, p. 15, 1910.	Diabase.	
177	Tukchi River, Okhotsk, Siberia.	Not stated.	K. E. Bogdanovitch, Fund. Marek., p. 56.	Diabase.	
178	Nemerikan River, Okhotsk, Siberia.	Not stated.	K. E. Bogdanovitch, Fund. Marek., p. 56.	Gabbro-diabase.	
179	Dicksons Harbor, Siberia.	Lindström.	Lindström, Ref., N. J., 1885, I, p. 430.	Olivine diabase.	In W. T., p. 445.
180	Ta-thung-ho River, Nan Shan, China.	C. Pfeil.	K. Futterer, Durch. Asien, II (2), p. 45, 1909.	Diabase porphyrite.	
181	Hinazuru Pass, Kai, Japan.	B. Koto.	B. Koto, Q. J. G. S., XL, p. 456, 1884.	Diabase.	In W. T., p. 445.
182	Pitfield Plains, Victoria.	Mining department.	S. B. Hunter, Vict. Dep. Min., Spec. Rep., 1901, p. 13.	Dike rock (diabase?).	Not fresh.
183	Leonora, Western Australia.	C. C. Williams.	C. F. V. Jackson, W. Aust. G. S. B. 13, p. 19, 1904.	"Greenstone."	

BASALT.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 B3. IV	45.20	19.08	3.64	14.64	4.98	7.89	3.32	1.08	n. d.						99.83	
2 D3. V	40.25	13.62	5.46	10.36	8.86	10.31	1.96	0.59	0.74		6.53				98.68	
3 B3. IV	41.28	18.48	9.44	8.20	7.49	7.04	3.52	2.21	2.74						100.40	
4 D4. V	44.93	18.32	8.70	21.09	0.47	1.41	2.12	0.58	trace		2.92			CO_2 trace	100.54	
5 D4. V	39.22	4.93	18.12	5.90	3.61	19.29	2.51	0.68	0.21		3.49			CO_2 1.24	99.20	
6 C3. V	44.85	20.63	6.91	5.10	6.27	8.69	3.28	2.65	1.15	0.69			0.41		100.63	
7 C4. V	47.35		34.38		4.43	8.27	2.55	1.33	0.95						99.26	
8 A4. IV	55.68	18.93	n. d.	8.73	4.86	7.99	2.12	0.48	0.60						99.39	
9 A4. IV	51.92	19.76	11.21	n. d.	3.38	9.30	2.16	0.60	1.54						99.87	
10 A4. IV	51.66	11.22	7.62	n. d.	13.61	7.72	5.98	0.89	1.06		trace		0.12		100.13	
11 C3. V	49.45	17.58	3.41	3.41	4.05	7.20	5.83	1.57	4.34		2.23		trace		99.07	2.738
12 B3. IV	48.03	21.81	2.25	6.04	6.11	9.15	4.58	0.44	2.16		trace	0.33			100.90	2.82
13 C3. V	52.18	15.44	4.26	5.10	8.89	8.57	2.11	0.55	2.16		trace	trace			99.26	2.848
14 C2. V	49.52	21.20	4.21	6.48	3.62	8.46	2.08	0.88	1.38		1.55	0.25			99.63	
15 B3. IV	52.02	17.14	7.96	3.52	3.13	11.57	2.38	0.60	0.28			trace	0.85	SO_3 trace Cl trace	99.45	2.76
16 D4. V	47.95	23.75	12.72	n. d.	1.90	7.86	1.82	0.35	1.91						98.26	
17 C4. V	45.51	15.82	15.31	n. d.	3.98	9.26	4.98	2.99	0.48						100.00	2.836
18 C4. V	53.03	20.09	9.43	n. d.	2.63	6.05	4.52	1.27	2.64						99.66	
19 C4. V	48.30	20.06	1.29	10.15	5.21	10.10	2.80		2.00						99.91	
20 C4. V	46.68	18.89	8.74	7.95	5.36	10.00	1.96		0.40						99.98	2.90

BASALT.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Cross Lake, Cobalt, Ontario.	Not stated.	W. G. Miller, Rep. Bur. Min. Ont., XIV (II), p. 50, 1906.	Basalt.	
2	Littleton, New Hampshire.	G. W. Hawes.	G. W. Hawes, A. J. S., XII, p. 136, 1876.	Metadolerite.	Not in W. T.
3	Russell mine, South Mountain, Pennsylvania.	C. H. Henderson.	C. H. Henderson, Tr. Am. Inst. M. E., XII, p. 82, 1884.	Basalt.	In W. T., p. 301.
4	Alum Hill, Boulder County, Colorado.	C. I. Andrews.	C. I. Andrew, Pr. Col. Sc. Soc., V, p. 151, 1895.	Basalt	In W. T., p. 447.
5	Alum Hill, Boulder County, Colorado.	C. I. Andrews.	C. I. Andrews, Pr. Col. Sc. Soc., V, p. 150, 1895.	Basalt.	In W. T., p. 447.
6	Mount Franklin, Talbot County, Victoria, British Columbia.	F. G. Wait.	G. C. Hoffman, Can. G. S. A.-R., VI, p. 31 R, 1895.	"Lava" (basalt?).	In W. T., p. 301.
7	Walla Walla, Washington.	G. P. Merrili.	G. P. Merrill, U. S. G. S. W. S. P. 53, p. 44, 1903.	Basalt.	Also in W. Lindgren, U. S. G. S. P. P. 27, p. 95, 1904.
8	Mount Thielson, Oregon.	F. W. Clarke.	J. S. Diller, A. J. S., XXVIII, p. 257, 1884.	Hypersthene basalt.	For fulgurite see ref. In W. T., p. 447.
9	Pit River, Lassen Peak, California.	F. W. Clarke.	J. S. Diller, U. S. G. S. B. 148, p. 200, 1897.	Basalt.	In W. T., p. 447.
10	Knoxville, California.	W. H. Melville.	G. F. Becker, U. S. G. S. Mon. 13, p. 159, 1888.	Basalt.	In W. T., p. 447.
11	Point Bonita, Marin County, California.	F. L. Ransome.	F. L. Ransome, B. Dep. G. Un. Cal., I, p. 106, 1893.	Basalt.	In W. T., p. 447.
12	Grizzly Peak, Berkeley Hills, California.	C. Palache.	Lawson and Palache, B. Dep. G. Un. Cal., II, p. 434, 1901.	Basalt.	
13	Cerro San Miguel, Atlixco, Puebla, Mexico.	A. Röhrig.	A. Hoppe in Felix and Lenk, Btr. G. Mex., II, p. 213, 1899.	Basalt.	In W. T., p. 333.
14	Near Le Marin, Martinique, West Indies.	Pisani.	A. Lacroix, Mount Pelée, p. 573, 1904.	Basalt.	
15	Portanuela, Yate Volcano, Patagonia.	H. Ziegenspeck.	H. Ziegenspeck. In. Diss. Jena, p. 29, 1883.	Basalt.	In W. T., p. 249.
16	Laugervatus, Iceland.	R. Bréon.	R. Bréon, G. Islande, p. 37, 1884.	Basalt glass.	In W. T., p. 449.
17	Mary Muss Bay, Jan Mayen.	R. Scharitzer.	R. Scharitzer, Jb. G. R.-A. Wien, XXXIV, p. 718, 1884.	Basalt.	In W. T., p. 447.
18	Ardtun, Mull, Scotland.	G. A. J. Cole.	G. A. J. Cole, Q. J. G. S., XLIV, p. 303, 1888.	Tachylyte.	In W. T., p. 449.
19	Ob Alt an Daraich, Kyleakin, Skye, Scotland.	T. Baker.	A. Harker, Rocks of Skye, p. 322, 1904.	Dolerite.	
20	Allt na Nighinn, Kyleakin, Skye, Scotland.	T. Baker.	A. Harker, Rocks of Skye, p. 322, 1904.	Dolerite.	

BASALT—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
21 C3. V	51.10	22.05	1.21	5.89	2.35	11.42	2.22	1.02	0.71			0.58		CO_2 1.82	99.97	
22 C4. V	59.15	14.54	12.31	n. d.	1.97	trace	4.01	6.56	1.51			trace			100.05	2.68
23 D4. V	45.95	7.23	n. d.	25.02	1.71	5.17	5.91	1.51	6.14	0.39	1.08	0.38			100.49	
24 D4. V	42.21	9.47	n. d.	23.40	2.16	6.20	5.30	1.76	7.18	0.35	1.57	0.51			100.11	
25 C3. V	43.23	21.37	1.69	9.53	3.57	6.66	5.63	trace	4.49			0.97	trace	CO_2 2.61 FeS_2 0.33	100.08	2.82
26 B4. V	52.29	17.33	11.14	n. d.	2.62	6.47	4.24	2.40	3.27				0.66		100.72	
27 D4. V	35.42	25.68	10.56	n. d.	n. d.	1.96	n. d.	n. d.	9.59	11.23	4.80				99.24	
28 C3. V	53.08	21.41	3.60	5.84	3.11	6.90	3.68	1.55	(0.71)		1.24				100.41	2.821
29 C3. V	50.67	19.43	2.30	7.26	6.01	9.42	3.67	0.93	(0.66)		0.88				100.62	3.024
30 D3. V	49.94	19.62	5.95	4.89	5.05	7.92	3.38	2.26	(0.88)		2.54				101.55	2.98
31 C3. V	46.71	22.01	4.03	7.00	3.78	10.93	2.74	0.67	(0.21)		2.49				100.36	3.068
32 C4. V	49.00	21.70	13.30	n. d.	5.22	8.95	0.63	1.95	n. d.						100.75	
33 C4. V	47.23	24.25	11.33	n. d.	4.85	8.47	1.81	1.64	n. d.						99.58	
34 D4. V	44.50	21.50	14.90	n. d.	7.60	8.96	1.36	2.47	n. d.						101.26	
35 D4. V	44.27		29.82		5.83	11.69	3.29	1.94	2.51						99.35	2.864
36 B3. IV	46.82	14.31	11.14	1.92	7.50	9.03	4.43	2.22	0.16			1.85			99.38 (99.365)	
37 B3. IV	46.46	18.70	6.72	3.35	5.85	9.72	2.55	1.36	4.13			0.65			99.49 (99.470)	
38 B3. IV	44.29	14.14	3.84	8.60	9.20	9.10	6.72	3.15	0.58			0.48			100.20 (100.103)	
39 D3. V	47.54	17.70	5.19	6.20	5.94	9.12	4.01	1.43	0.72		trace	0.62		CO_2 0.10 SO_3 trace Cl 0.07	98.64	2.79
40 D4. V	48.0	23.0	16.5	n. d.	0.8	5.0	1.0	n. d.	3.2		1.5				99.0	

BASALT—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
21	Eycott Hill, Lake District, England.	J. Hughes.	Cited in J. J. H. Teall, Brit. Petrog., p. 228, 1888.	Lava (basalt?).	In W. T., p. 449.
22	Garn Fawr, near Fishguard, Pembrokeshire, Wales.	F. E. Tadman.	F. R. C. Reed, Q. J. G. S., LI, p. 192, 1895.	Tachylyte.	In W. T., p. 423.
23	Dinas Head, Cornwall.	J. J. Beringer.	H. Fox, Tr. R. Soc. Corn., XII, p. 71, 1896.	Dolerite.	In W. T., p. 449.
24	Round Hole Point, Cornwall.	J. J. Beringer.	H. Fox, Tr. R. Soc. Corn, XII, p. 71, 1896.	Dolerite.	In W. T., p. 449.
25	Pentire Point, Cornwall.	Phillips.	J. J. H. Teall, Brit. Petrog., p. 231, 1888.	Lava (basalt?).	Not fresh. In W. T., p. 449.
26	The Beal, Portree, Ireland.	Hodgkinson.	Judd and Cole, Q. J. G. S., XXXIX, p. 455, 1883.	Basalt glass.	In W. T., p. 449.
27	Giants Causeway, Ireland.	D. Jardin.	G. A. J. Cole, G. S. Irel. Mem., p. 113, 1912.	Basalt.	Altered.
28	La Morangie, Puy-de-Dome, Auvergne.	F. Fouqué.	F. Fouqué. B. Soc. M. Fr., XXV, p. 342, 1902.	Basalt.	
29	Seriers, Cantal, Auvergne.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 344, 1902.	Basalt.	
30	Puy de la Croix, Cantal, Auvergne.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 347, 1902.	Basalt.	
31	Bouzenties, Cantal, Auvergne.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 346, 1902.	Basalt.	
32	Banne d'Ordenche, Mont Dore, Auvergne.	E. Bonjean.	E. Bonjean, C. R., CXXVIII, p. 1097, 1899.	Basalt.	In W. T., p. 449.
33	Puy Louh, Mont Dore, Auvergne.	E. Bonjean.	E. Bonjean, C. R., CXXVIII, p. 1097, 1899.	Basalt.	In W. T., p. 449.
34	Banne d'Ordenche, Mont Dore, Auvergne.	E. Bonjean.	E. Bonjean, C. R., CXXVIII, p. 1097, 1899.	Basalt.	In W. T., p. 449.
35	La Croix-Morand, Mont Dore, Auvergne.	A. Lagorio.	A. Lagorio, T. M. P. M., VIII, p. 479, 1887.	Dolerite.	In W. T., p. 449.
36	San Feliu de Pallarols, Catalonia, Spain.	Fages.	L. Fernandez-Navarro, Mem. Soc. Esp. H. N., IV (5), p. 410, 1907.	Basalt.	3 decimals.
37	Mallorquinas, near Olot, Catalonia, Spain.	Fages.	L. Fernandez-Navarro, Mem. Soc. Esp. H. N., IV (5), p. 410, 1907.	Basalt.	Altered. 3 decimals.
38	Montolivet, near Olot, Catalonia, Spain.	Fages.	L. Fernandez-Navarro, Mem. Soc. Esp. H. N., IV (5), p. 410, 1907.	Basalt.	3 decimals.
39	Senoreta, Columbretes Islands, Spain.	R. Pfohl.	F. Becke, T. M. P. M., XVI, p. 310, 1896.	Basalt.	In W. T., p. 449.
40	Alboran Island, Spain.	S. Traverso.	S. Traverso, Gior. Min., V, p. 203, 1894.	Labradorite (basalt).	In W. T., p. 449.

BASALT—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
41 C2.IV	51.65	13.41	8.45	2.79	3.60	8.17	3.90	1.58	0.14		3.37	1.07		CO_2 trace SO_3 1.28	99.41	
42 C3.V	51.82	18.11	4.92	3.80	3.68	7.55	3.79	6.11	0.71						100.49	
43 D4.V	50.91	18.45	11.87	n. d.	4.46	7.64	4.45	2.72	1.49						101.99	
44 D4.V	50.36	16.83	13.27	n. d.	4.78	8.34	4.79	2.20	1.56						102.13	
45 C3.V	48.93	22.63	8.84	1.97	3.54	7.27	4.32	2.04	0.36		trace	trace	0.50		100.40	
46 B3.IV	48.56	15.65	5.17	6.42	6.95	8.89	3.73	1.24	0.28			1.31		CO_2 1.07	99.27	
47 D4.V	47.55	14.82	n. d.	11.63	5.90	9.16	3.87	4.39			2.68				100.00	
48 D4.V	47.14	15.67	n. d.	11.17	3.60	11.85	2.90	2.20			4.00				100.00	
49 D4.V	46.57	16.10	n. d.	12.02	4.14	13.67	2.14	0.84			3.80				99.28	
50 D4.V	44.49	13.35	n. d.	13.75	5.59	12.90	1.39	2.00	3.25		2.48	0.45			100.01	
51 C4.V	23.65	6.68	6.34	n. d.	6.74	25.41	1.03	0.87	9.89			0.28		CO_2 19.46	100.35	
52 D4.V	20.70	5.20	8.08	n. d.	2.93	30.49	n. d.	n. d.	7.10		1.20	0.70		CO_2 22.60	98.00	
53 C4.V	52.87	16.36	10.87	n. d.	5.23	7.94	3.64	0.96	1.22						99.09	
54 B3.IV	45.94	21.16	2.21	7.14	7.80	10.49	3.21	1.14	1.02						100.11	2.982
55 D2.V	45.21	7.82	3.41	8.08	8.43	12.31	6.64	2.94	1.82		1.69	0.52		SO_3 0.56	99.43	
56 B3.IV	44.97	17.48	12.80	0.44	4.06	10.80	3.21	1.38	2.12		2.47				99.73	
57 C2.IV	41.71	15.80	5.59	7.64	4.85	10.30	6.08	1.00	2.22		2.77	trace	0.16	CO_2 2.01 X 0.74 SO_3 0.12 Cl 0.46	101.45	2.900
58 C2.IV	51.68	20.12	5.17	1.08	4.10	6.49	3.36	1.56	4.30		1.56	1.11			100.53	
59 C2.IV	44.64	20.63	11.60	2.98	0.47	9.47	3.20	1.75	2.90		2.31	0.81			100.76	

BASALT—Continued.

No.	Locality.	Analyst.	Reference.	Rockname.	Remarks.
41	Staufenberg, Wesergebiet, Rheinland.	P. Jannasch.	F. Rinne, Jb. Pr. G. L.-A., XIII, p. 79, 1893.	Basalt.	In W. T., p. 281.
42	Schurkopf, Siebengebirge.	Hübner (student).	H. Laspeyres, Vh. Nh. Ver. Bonn., LVII, p. 561, 1900.	Hornblende basalt.	Not in W. T.
43	Löwenburg, Siebengebirge.	Fels.	H. Laspeyres, D. Siebengeb., p. 190, 1901.	Hornblende basalt.	
44	Löwenburg, Siebengebirge.	H. Laspeyres.	H. Laspeyres, D. Siebengeb., p. 188, 1901.	Dolerite.	
45	Kirmessplatz, Siebengebirge.	E. Kaiser?	E. Kaiser, Vh. Nh. Ver. Bonn., LIV, p. 186, 1897.	Basalt.	In W. T., p. 449.
46	Lyngsberg, near Mehlem, Rheinland?	W. V. Kohnen.	W. V. Kohnen, Ref. N. J., II, p. 197, 1908.	Basalt.	
47	Schelingen, Kaiserstuhl, Baden.	A. Knop.	A. Knop, D. Kaiserstuhl, p. 277, 1892.	Basalt.	Calculated to 100, 2.19 H_2O and 5.00 $CaCO_3$ deducted. In W. T., p. 451.
48	Sponeck, Kaiserstuhl, Baden.	A. Knop.	A. Knop, D. Kaiserstuhl, p. 277, 1892.	Basalt.	Calculated to 100, 4.25 H_2O deducted. In W. T., p. 451.
49	Sponeck, Kaiserstuhl, Baden.	A. Knop.	A. Knop, D. Kaiserstuhl, p. 278, 1892.	Basalt.	Calculated to 100, 3.27 H_2O deducted. In W. T., p. 451.
50	Schönberg, Kaiserstuhl, Baden.	A. Knop.	A. Knop, D. Kaiserstuhl, p. 308, 1892.	Basalt tuff.	In W. T., p. 451.
51	Schafberg, Schwäbische Alb, Wurttemberg.	E. Gaiser.	E. Gaiser, In. Diss. Bres., p. 37, 1904.	Basalt tuff.	
52	Randecker Maar, Schwäbische Alb, Wurttemberg.	E. Gaiser.	E. Gaiser, In. Diss. Bres., p. 37, 1904.	Basalt tuff.	
53	Schwartzenfels, Rhöngebirge.	A. Lagorio.	A. Lagorio, T. M. P. M., VIII, p. 479, 1887.	Basalt glass.	In W. T., p. 451.
54	Veitenfeld, Kreuzberg, Rhöngebirge.	E. v. Seyfried.	E. v. Seyfried, Jb. Pr. G. L.-A. (1896), XVII, p. 26, 1897.	Basalt.	In W. T., p. 291.
55	Rote Moose, Bischofsheim, Rhöngebirge.	K. Endell.	K. Endell, N. J. B. B., XXXI, p. 18, 1911.	Basalt.	
56	Zernberg, Rhöngebirge.	Dürrfeld.	H. Bücking, Sb. Pr. Ak. W., 1910, p. 494.	Basalt.	
57	Dachberg, Rhöngebirge.	P. Jannasch.	F. Rinne, Jb. Pr. G. L.-A., VII, p. 9, 1887.	Basalt.	In W. T., p. 451.
58	Kottenhain, near Niederhain, Hesse.	C. Trenzen.	C. Trenzen, N. J., 1902, II, p. 14.	Enstatite dolerite.	Same mass as next two. Not fresh.
59	Kottenhain, near Niederhain, Hesse.	C. Trenzen.	C. Trenzen, N. J., 1902, II, p. 14.	Enstatite dolerite.	Same specimen as next number. Not fresh.

BASALT—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
60 D2. V	44.60	20.37	12.41	2.87	4.30	6.90	1.86	1.46	4.12		1.99	0.56			101.24	
61 D2. V	47.77	19.49	8.60	2.87	6.11	9.63	1.87	1.01	1.86		1.24	0.74			101.19	
62 D3. V	46.68	12.75	7.41	4.76	9.74	10.15	2.09	0.94	1.74	0.51	1.98				98.75	
63 D3. V	46.21	14.43	4.24	7.20	9.82	6.16	3.65	1.20	2.05	0.92	1.72				97.60	
64 C2. IV	45.44	20.04	3.36	7.38	6.91	9.20	1.59	1.28	1.83	1.20	1.16	0.52		CO_2 0.01 SO_3 0.03	99.95	
65 D3. V	43.64	11.64	4.01	7.26	12.25	10.00	2.03	0.87	3.60	1.00	2.33				98.63	
66 D3. V	43.16	14.23	2.74	6.82	11.75	10.72	3.46	1.11	1.91	0.41	2.22				98.53	
67 C4. V	41.96	11.63	4.59	7.33	11.87	13.39	$\underbrace{\quad 4.84 \quad}$		1.80		0.60	0.66		CO_2 0.78	99.45	
68 D3. V	41.32	13.60	5.83	9.26	11.02	11.55	3.61	1.89	2.79		0.34	0.28		CO_2 0.34	101.83	
69 D3. V	41.17	12.35	6.29	8.02	9.70	11.09	3.60	1.97	2.77			1.16		CO_2 0.98	99.10	
70 C2. IV	52.21	14.62	10.77	3.20	5.02	8.72	1.77	0.55	0.09		1.36	0.52		CO_2 0.19	99.02	
71 C2. IV	49.06	13.66	7.55	4.00	8.45	8.90	4.03	1.00	1.30		2.93	0.31			101.19	
72 D3. V	47.39	11.54	12.47	7.13	6.24	8.83	3.80	0.73	2.79			0.97		CO_2 0.18	102.07	
73 D2. V	44.64	16.14	19.35	2.52	0.96	10.78	1.65	2.24	0.27		0.78		0.61	CO_2 0.13 SO_3 0.16 Cl trace	100.23	2.794
74 D4. V	43.65	$\underbrace{\qquad 33.23 \qquad}$			2.03	8.70	5.43	6.48	0.61						100.13	
75 C2. IV	40.52	18.97	10.77	2.99	6.72	11.34	3.40	0.42	2.40	0.81	0.26	0.74		SO_3 0.62 Cl 0.15	100.11	2.958
76 C2. IV	40.02	19.88	11.68	1.61	4.03	12.52	2.93	0.57	3.49	1.31	0.24	0.82		SO_3 0.61 Cl 0.09	99.80	2.884
77 C2. IV	53.83	15.85	6.87	4.09	5.56	7.68	3.02	0.72	0.84		1.73	0.26	0.21	CO_2 0.32 X 0.61 SO_3 trace Cl 0.05	101.64	2.911
78 D2. V	49.05	14.36	4.25	6.35	8.38	8.38	3.42	2.26	1.57		2.18	0.09	0.24	CO_2 0.40 X 0.79 SO_3 0.07 Cl 0.08	101.87	2.945

BASALT—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
60	Kottenhain, near Niederhain, Hesse.	C. Trenzen.	C. Trenzen, N. J., 1902, II, p. 14,	Enstatite dolerite.	Same specimen as preceding number. Not fresh.
61	Buschhorn, Hesse.	C. Trenzen.	C. Trenzen, N. J., 1902, II, p. 6.	Basalt.	
62	Near Giessen, Hesse.	Hess.	W. Schottler, Abh. G. L.-A. Darm., IV (3), p. 462, 1908.	Basalt.	
63	Steinbach, near Giessen, Hesse.	A. Streng.	W. Schottler, Abh. G. L.-A. Darm., IV (3), p. 458, 1908.	Basalt.	
64	Near Giessen, Hesse.	G. Butzbach.	W. Schottler, Abh. G. L.-A. Darm., IV (3), p. 462, 1908.	Basalt.	
65	Burckardsfelsen, near Giessen, Hesse.	A. Streng.	W. Schottler, Abh. G. L.-A. Darm., IV (3), p. 454, 1908.	Basalt.	
66	Schliffenberg, near Giessen, Hesse.	Hess.	W. Schottler, Abh. G. L.-A. Darm., IV (3), p. 458, 1908.	Basalt.	
67	Altenbuseck-Treis, near Giessen, Hesse.	W. Schottler.	W. Schottler, Nb. Ver. Erdk., IV, p. 26, 1899.	Basalt.	Not in W. T.
68	Hundsköppel, near Giessen, Hesse.	H. Heyl.	W. Schottler, Abh. G. L.-A. Darm., IV (3), p. 454, 1908.	Basalt.	
69	Lollarerkopf, near Giessen, Hesse.	W. Schottl	W. Schottler, Abh. G. L.-A. Darm., IV (3), p. 454, 1908.	Basalt.	
70	Frauenberg, Breitfirst, Hesse.	R. Wedel.	R. Wedel, Jb. Pr. G. L.-A., XI, p. 21, 1892.	Basalt.	In W. T., p. 451.
71	Londorf, Vogelsberg, Hesse.	A. Streng.	A. Streng, N. J., 1888, II, p. 211.	Dolerite.	In W. T., p. 451.
72	Michelnau, Vogelsberg, Hesse.	J. M. Ledroit.	J. M. Ledroit, Ber. Oberh. Ges., XXIV, p. 151, 1886.	Basalt.	In W. T., p. 451.
73	Dolmesberg, Hesse.	F. W. Schmidt.	C. Chelius, Erl. G. Kt. Hes., Bl. Messel, p. 33, 1886.	Basalt.	In W. T., p. 451.
74	Bobenhausen, Vogelsberg, Hesse.	A. Lagorio.	A. Lagorio, T. M. P. M., VIII, p. 493, 1887.	Tachylyte.	In W. T., p. 451.
75	Kleinostheim, Hesse.	Not stated.	G. Klemm, Erl. G. Kt. Hes., Bl. Schafheim, p. 33, 1894.	Basalt.	In W. T., p. 451.
76	Otzberg, Hesse.	Not stated.	G. Klemm, Erl. G. Kt. Hes., Bl. Schafheim, p. 33, 1894.	Basalt.	In W. T., p. 451.
77	Bühl, near Cassel, Hesse-Nassau.	O. Fromm.	P. Fromm, Z. D. G. G., XLIII, p. 72, 1891.	Basalt.	In W. T., p. 449.
78	Klein Staufenberg, near Cassel, Hesse-Nassau.	O. Fromm.	O. Fromm, Z. D. G. G., XLIII, p. 72, 1891.	Basalt.	In W. T., p. 449.

BASALT—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
79 D2. V	51.84	11.27	5.47	4.98	6.21	8.57	4.34	2.05	1.71		0.85	0.34		CO_2 0.68	98.31	
80 C3. V	51.60	14.70	11.90	6.30	2.24	4.88	3.60	1.40	3.20	1.52	0.22				101.56	
81 C3. V	42.60	17.60	9.82	4.30	7.14	12.40	2.22	0.24	3.40	1.49	0.12				101.33	
82 C3. V	46.93	24.19	5.89	4.42	2.42	8.54	2.47	4.56	0.88			0.61			100.91	
83 D3. V	44.60	21.29	10.51	0.57	3.51	11.35	4.81	0.74	2.65						100.03	
84 D3. V	42.08	20.88	6.77	3.17	6.85	12.48	3.37	0.44	3.18						99.22	
85 B3. IV	42.75	17.24	8.10	5.88	6.17	11.14	4.21	2.48	1.06		2.13	trace			101.16	3.008
86 C3. V	41.68	17.98	5.40	8.42	7.40	11.84	4.28	2.07	1.09		1.21	trace			101.37	3.015
87 C3. V	46.60	20.92	6.42	3.74	2.75	7.29	5.59	4.46	1.86		0.14		0.48		100.25	2.729
88 B4. V	41.05	11.78	0.89	17.16	12.41	11.62	3.46	1.33	(2.05)			0.57			100.27	
89 C2. IV	38.78	18.43	6.16	5.21	11.05	13.00	4.36	1.29	n. d.		0.32	0.66	0.18		99.44	
90 C3. V	48.62	19.15	11.69	3.20	3.07	7.22	2.01	1.69	3.64				trace		100.29	
91 C4. V	59.52	20.18	n. d.	6.68	1.34	6.81	2.82	1.26	1.77						100.38	
92 C4. V	55.19	20.24	n. d.	8.18	4.97	8.68	1.83	0.27	0.79						100.15	
93 B3. IV	48.99	16.33	4.27	6.19	3.96	8.90	5.21	1.40	3.08		0.98				99.31	
94 D2. V	46.78	14.66	7.25	5.22	6.81	9.61	3.08	0.45	1.78		1.78	0.45			97.87	
95 D2. V	46.18	14.26	6.93	5.72	7.23	8.24	4.75	1.32	2.14		2.27	0.51			98.95	
96 C3. V	43.12	20.12	3.49	14.45	3.17	8.32	5.43	1.02	0.40		0.40	trace	trace		100.01	
97 C3. V	40.53	21.16	5.14	9.33	5.25	9.57	5.65	1.19	2.07		0.48	trace	trace		100.37	
98 B4. V	51.34	14.92	8.84	n. d.	3.56	9.37	3.13	0.64	8.08						99.88	

BASALT—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
79	Near Alzenau, Spessart, Bavaria.	F. Knapp.	H. Bücking, Abh. Pr. G. L.-A., XII, p. 220, 1892.	Basalt.	Not in W. T.
80	Kosel, Böhmer-Leipa, Bohemia.	E. Donath.	B. Förstner, Jb. G. R.-A. Wien, LV, p. 588, 1905.	Schliere in basalt.	Cf. next number.
81	Kosel, Böhmer-Leipa, Bohemia.	E. Donath.	B. Förstner, Jb. G. R.-A. Wien, LV, p. 589, 1905.	Basalt.	
82	Rongstock, Bohemia.	Student of Jannasch.	H. O. Lang, T. M. P. M., XV, p. 191, 1890.	Dolerite.	Cf. No. 22, II.6.2.4. In W. T., p. 451.
83	Burberg, Duppauergebirge, Bohemia.	J. M. Clements.	J. M. Clements, Jb. G. R.-A. Wien, XL, p. 345, 1890.	Basalt.	In W. T., p. 451.
84	Burberg, Duppauergebirge, Bohemia.	J. M. Clements.	J. M. Clements, Jb. G. R.-A. Wien, XL, p. 345, 1890.	Basalt.	In W. T., p. 303.
85	Scharfenstein, Bohemia.	R. Pfohl.	J. E. Hibsch, T. M. P. M., XVII, p. 48, 1897.	Basalt.	In W. T., p. 345.
86	Paudlers Berg, near Güntersdorf, Bohemia.	R. Pfohl.	J. E. Hibsch, T. M. P. M., XV, p. 247, 1896.	Basalt.	In W. T., p. 351.
87	Bezdedic, Mittelgebirge, Bohemia.	E. Kohn.	B. Zahalka, Sb. Böhm. Ges. W., p. 57, 1905.	Trachybasalt.	
88	Lobosch, Mittelgebirge, Bohemia.	J. Hanamann.	J. Hanamann, Arch. Landdf. Böhm., VII (3), p. 57, 1890.	Basalt.	3 decimals. Not in W. T.
89	Radobyl, Mittelgebirge, Bohemia.	J. Hanamann.	J. Hanamann, Arch. Landdf. Böhm., VII (3), p. 59, 1890.	Basalt.	Not in W. T.
90	Weitendorf, Styria.	H. Leitmeier.	H. Leitmeier, N. J. B. B., XXVII, p. 229, 1909.	Basalt.	
91	Mount Pilis, Zemplen, Hungary.	Petrik.	J. v. Szadeczky, F. K., XXI, p. 268, 1891.	Labradorite (basalt).	In W. T., p. 433.
92	Mount Pilis, Zemplen, Hungary.	Petrik.	J. v. Szadeczky, F. K., XXI, p. 272, 1891.	Labradorite (basalt).	In W. T., p. 433.
93	Tatika, Balaton Lake, Hungary.	L. Tomasowsky (student).	J. Vitalis, F. K., XXXIV, p. 458, 1904.	Basalt.	
94	Totihegy, Balaton Lake, Hungary.	K. Emszt.	J. Vitalis, Erf. Bal. Sees., I (1), No. 2, p. 72, 1911.	Basalt.	
95	Mencshegy, Balaton Lake, Hungary.	K. Emszt.	K. Emszt, Jb. Ung. G. A. (1904), p. 338, 1908.	Basalt.	3 decimals.
96	Badacsony, Balaton Lake, Hungary.	C. Preiss.	C. Preiss. Mt. Nw. Ver. Steicrm., XLV, p. 31, 1909.	Basalt.	
97	Sümeg, Balaton Lake, Hungary.	C. Preiss.	C. Preiss, Mt. Nw. Ver. Steicrm., XLV, p. 24, 1909.	Basalt.	
98	Mount Holapi, Hungary.	K. Emszt.	K. Emszt, Jb. Ung. G. A., 1910, p. 345.	Basalt tuff.	

BASALT—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
99 C3. V	49.70	9.40	13.70	2.80	9.47	10.25	2.85	0.18				1.65	0.34		100.34	
100 C3. V	49.65	9.38	15.72	0.85	9.40	10.25	2.78	0.18				1.50	0.32		100.03	
101 C3. V	49.42	13.01	13.34	0.96	6.30	10.84	3.48	1.05			0.04	1.25	0.21		99.90	2.34
102 C4. V	48.52	12.90	14.19	2.82	8.23	7.54	3.19	none				1.71	0.21		99.31	2.30
103 D4. V	48.52	12.80	15.39	1.52	8.33	7.84	3.29	none				1.29	0.21		99.19	2.12
104 C3. V	47.98	12.52	8.07	7.09	7.41	10.56	3.58	0.58			trace	1.95	0.33		100.07	2.75
105 C3. V	47.53	12.35	8.32	7.15	7.18	11.54	3.60	none			0.04	1.98	0.28		99.97	3.11
106 C3. V	47.51	12.53	8.08	7.05	8.40	10.05	3.85	none			0.03	2.05	0.28		99.83	3.02
107 C3. V	46.18	13.45	8.18	7.01	7.35	12.26	3.05	0.57			trace	1.56	0.31		99.92	3.01
108 C3. V	45.76	13.50	8.43	6.96	7.38	12.19	3.09	0.55				1.72	0.35		99.93	3.05
109 D4. V	43.70	23.46	3.14	5.27	3.54	13.05	4.86	n. d.	2.40					CO_2 2.92	102.32	
110 C4. V	49.10	13.64	17.21	n. d.	5.30	8.20	4.10	1.32	0.70		trace	1.60			101.17	2.96
111 B4. V	46.60	12.50	16.92	n. d.	6.29	9.74	3.39	1.15	1.65			1.05			99.29	
112 D4. V	44.2	20.9	12.2	n. d.	2.5	6.6	6.1	4.6	n. d.						97.1	
113 B3. IV	53.86	16.44	8.02	1.96	5.44	8.53	4.52	0.07	1.27			0.15		Cl 0.04	100.30	2.894
114 B4. V	50.34	16.72	15.12	n. d.	3.96	8.00	3.78	1.83	0.72						100.47	
115 C4. V	48.10	19.05	n. d.	11.53	7.12	9.56	2.29	1.80	0.09			0.04			99.58	2.83

BASALT—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
99	Brentonico, Rovereto, Tyrol.	P. Giacomelli.	P. Giacomelli, Riv. Soc. Alp. Trid., XIX, p. 406, 1895.	Basalt.	H_2O=7.56. Ignited before analysis. In W. T., p. 451.
100	Botte, Rovereto, Tyrol.	P. Giacomelli.	P. Giacomelli, Riv. Soc. Alp. Trid., XIX, p. 406, 1895.	Basalt tuff.	H_2O=6.17. Ignited before analysis. In W. T., p. 451.
101	Sano, Rovereto, Tyrol.	P. Giacomelli.	P. Giacomelli, Riv. Soc. Alp. Trid., XIX, p. 408, 1895.	Basalt.	H_2O=6.24. Ignited before analysis. In W. T., p. 453.
102	Foianeghe, Rovereto, Tyrol.	P. Giacomelli.	P. Giacomelli, Riv. Soc. Alp. Trid., XIX, p. 408, 1895.	Basalt tuff.	H_2O=6.75. Ignited before analysis. In W. T., p. 453.
103	Nomesino, Rovereto, Tyrol.	P. Giacomelli.	P. Giacomelli, Riv. Soc. Alp. Trid., XIX, p. 410, 1895.	Basalt.	H_2O=7.74. Ignited before analysis. In W. T., p. 453.
104	Pianeti, Rovereto, Tyrol.	P. Giacomelli.	P. Giacomelli, Riv. Soc. Alp. Trid., XIX, p. 407, 1895.	Basalt.	H_2O=1.56. Dried before analysis. In W. T., p. 327.
105	Pradaglia, Rovereto, Tyrol.	P. Giacomelli.	P. Giacomelli, Riv. Soc. Alp. Trid., XIX, p. 409, 1895.	Basalt.	H_2O=0.95. Dried before analysis. In W. T., p. 327.
106	Manzano, Mori, Rovereto, Tyrol.	P. Giacomelli.	P. Giacomelli, Riv. Soc. Alp. Trid., XIX, p. 410, 1895.	Basalt.	H_2O=2.35. Dried before analysis. In W. T., p. 327.
107	Val del Parol, Mori, Rovereto, Tyrol.	P. Giacomelli.	P. Giacomelli, Riv. Soc. Alp. Trid., XIX, p. 407, 1895.	Basalt.	H_2O=1.27. Dried before analysis. In W. T., p. 329.
108	Tierno, Mori, Rovereto, Tyrol.	P. Giacomelli.	P. Giacomelli, Riv. Soc. Alp. Trid., XIX, p. 405, 1895.	Basalt.	H_2O=1.34. Dried before analysis. In W. T., p. 329.
109	Fee Gletscher Alp, Pennine Alps, Switzerland.	A. A. Longsden.	T. G. Bonney, Q. J. G. S., XLIX, p. 97, 1893.	Basalt.	Altered. Calculated from sol. and insol. In W. T., p. 453.
110	Musc' al Bo, Euganean Hills, Italy.	Not stated.	G. dal Piaz, Riv. Min. Crist., XVI, p. 65, 1896.	Basalt.	In W. T., p. 453.
111	Castelnuovo, Euganean Hills, Italy.	Not stated.	G. dal Piaz, Riv. Min. Crist., XVI, p. 69, 1896.	Basalt.	In W. T., p. 453.
112	Scajara, near Battaglia, Euganean Hills, Italy.	S. Bertolio.	S. Bertolio, B. Soc. G. Fr. (3), XXI, p. 433, 1894.	Basalt.	In W. T., p. 453.
113	Punta del Zenobito, Capraia, Tuscan Archipelago.	A. Röhrig.	H. Emmons, Q. J. G. S., XLIX, p. 143, 1893.	Anamesite.	In W. T., p. 285.
114	Cala Rossa, Capraia, Tuscan Archipelago.	A. Röhrig.	H. Emmons, Q. J. G. S., XLIX, p. 143, 1893.	Basalt.	In W. T., p. 453.
115	San Marco, near Ceccano, Ernici, Italy.	G. Aichino.	C. Viola, B. C. G. It., XXXIII, p. 120, 1902.	Basalt.	

BASALT—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
116 B4. V	50.55	16.58	8.18	n. d.	6.10	11.45	3.15	3.16	0.06			0.67			99.90	
117 B3. IV	50.15	12.08	9.07	6.53	3.88	10.52	3.08	2.77	0.24			0.67	0.82	SO_3 0.64 Cl 0.06	100.51	
118 B3. IV	50.00	13.99	5.13	9.10	4.06	10.81	2.87	3.02	0.24			0.71	0.42	SO_3 trace Cl trace	100.35	
119 C4. V	55.82		31.29		0.44	3.91	4.60	4.26	0.58						100.90	
120 B3. IV	53.04	13.06	8.19	2.40	5.17	10.61	3.27	2.06	2.21			0.56	0.16		100.73	
121 B4. V	51.00	15.80	10.96	n. d.	4.70	11.17	2.54	1.15	0.30	0.13		0.56		CO_2 0.93	99.24	
122 B3. IV	51.31	12.54	4.87	7.42	2.90	10.01	3.23	1.36	5.63		0.32	0.52	trace		100.17	2.656
123 C3. V	52.6	17.2	2.4	8.6	7.2	9.1	2.0	1.0	n. d.			trace			100.1	
124 C2. IV	47.18	15.21	4.07	7.26	6.64	8.86	7.61	1.41	0.72		1.09	0.08	0.02		100.15	2.868
125 C2. IV	47.16	15.05	0.87	11.00	6.34	9.11	7.73	1.32	0.42		1.01	0.06	0.02		100.09	2.912
126 D3. V	47.14	14.40	5.58	6.22	6.31	9.55	7.46	1.52	0.51		1.21	0.05	0.04		99.99	2.846
127 D3. V	52.93	19.03	1.67	3.94	3.20	7.00	5.01	2.07	1.25	0.64	0.67	1.13	0.28	CO_2 0.75	99.57	
128 D3. V	52.33	19.25	2.72	4.39	3.94	7.64	2.23	1.89	1.64	0.68	0.93	0.61	1.12		99.37	
129 D3. V	52.13	20.55	5.13	2.07	9.22	3.35	2.90	1.22	0.40		0.40	0.27	0.71		100.21	
130 D3. V	50.29	18.81	1.79	4.91	3.42	8.49	2.86	1.45	2.65	1.09	0.89	0.51	0.58	CO_2 3.12 Cl 0.03 S 0.19	101.08	
131 D3. V	48.72	22.56	1.08	3.74	2.68	10.00	4.65	2.05	1.88	0.84	0.50	0.50	0.77		99.87	
132 D3. V	53.36	23.17	1.92	3.34	0.89	7.34	4.62	3.08	0.83	0.55	0.59	0.60	0.48		100.77	
133 D3. V	53.15	24.47	1.40	3.60	1.22	6.83	4.97	2.59	0.57	0.20	0.60	0.56	0.32		100.48	
134 D3. V	52.14	21.89	1.74	3.50	2.81	9.16	4.15	2.34	0.93	0.32	0.51	0.77	0.40		100.66	
135 D3. V	50.96	20.31	2.49	5.59	4.23	7.32	4.60	1.98	0.20	0.13	0.61	0.53	0.94		99.89	

BASALT—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
116	La Sciarra, Stromboli, Æolian Islands.	F. Glaser.	A. Bergeat, N. J., 1897, II, p. 113.	Basalt.	In W. T., p. 453.
117	Eruption, August, 1891, Stromboli, Æolian Islands.	L. Ricciardi.	Ricco and Mercalli, Gior. Min., IV, p. 28, 1893.	Basalt ashes.	In W. T., p. 453.
118	Eruption of 1891, Stromboli, Æolian Islands.	L. Ricciardi.	Ricco and Mercalli, An. Uff. Met. It., XI (III), p. 202, 1892.	Basalt.	Not in W. T.
119	Eruption, 1888–89, Vulcano, Æolian Islands.	O. Silvestri.	G. Mercalli, Gior. Min., III, p. 108, 1892.	Dolerite.	In W. T., p. 453.
120	Punta Luccia, Vulcano, Æolian Islands.	L. Ricciardi.	G. Mercalli, Gior. Min., III, p. 102, 1892.	Basalt.	In W. T., p. 325.
121	Notaro, Filicudi, Æolian Islands.	F. Glaser.	A. Bergeat, Abh. Bay. Ak. W., XX, p. 207, 1899.	Basalt.	In W. T., p. 453.
122	Eruption of November, 1884, Mount Etna, Sicily.	L. Ricciardi.	L. Ricciardi, At. Ac. Gioen., XVIII, p. 4, 1884.	Basalt ash.	In W. T., p. 453.
123	Monte Altore, near Vizzini, Val di Noto, Sicily.	A. Rosati.	A. Rosati, Rend. Ac. Linc. (5), X, p. 23, 1901.	Basalt.	
124	Serravalle, near Palagonia, Val di Noto, Sicily.	G. Ponte.	G. Ponte, At. Ac. Gioen. (5), III, No. 10, p. 5, 1910.	Basalt.	Alkalies? Norm and mode.
125	Serravalle, near Palagonia, Val di Noto, Sicily.	G. Ponte.	G. Ponte. At. Ac. Gioen. (5), III, No. 10, p. 5, 1910.	Basalt glass.	Crust of preceding. Alkalies?
126	Monte Lauro, Val di Noto, Sicily.	S. Mariscalco.	S. Mariscalco, At. Ac. Gioen. (5), VII, No. 9, p. 6, 1914.	Basalt.	Alkalies? Norm and mode.
127	Ferru Ezzu, near Sassari, Sardinia.	A. Serra.	A. Serra, Rend. Ac. Linc., XVII (1), p. 135, 1908.	Basalt.	
128	Monte San Matteo, Ploaghe, Sardinia.	A. Serra.	A. Serra, Rend. Ac. Linc., XVII (1), p. 130, 1908.	Basalt.	Cf. No. 93, II. 5.2.4.
129	Adde de S'Ulmu, near Ploaghe, Sardinia.	A. Serra.	A. Serra, Rend. Ac. Linc., XVII, (2), p. 600, 1908.	Basalt.	
130	Coloru, near Ploaghe, Sardinia.	A. Serra.	A. Serra, Rend. Ac. Linc. (5), XVI (2), p. 354, 1907.	Basalt.	
131	Fenosu, near Ploaghe, Sardinia.	A. Serra.	A. Serra, Rend. Ac. Linc. (5), XVII (2), p. 598, 1908.	Basalt.	
132	Monte Pelao, near Tiesi, Sardinia.	A. Serra,	A. Serra, Rend. Ac. Linc. (5), XVIII (1), p. 401, 1909.	Basalt.	
133	Monte Santo, near Tiesi, Sardinia.	A. Serra.	A. Serra, Rend. Ac. Linc. (5), XVIII (1), p. 400, 1909.	Basalt.	
134	Monte di Giave, near Tiesi, Sardinia.	A. Serra.	A. Serra, Rend. Ac. Linc. (5), XVIII (I), p. 403, 1909.	Basalt.	
135	Monte Massa, near Osilo, Sardinia.	A. Serra.	A. Serra, Rend. Ac. Linc. (5), XVII (I), p. 133, 1908.	Basalt.	

BASALT—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
136 D3. V	51.61	22.87	4.14	1.17	3.02	7.98	3.79	2.74	0.29	0.12	0.64	0.92	0.80		100.09	
137 D3. V	51.80	20.09	1.83	3.42	3.31	8.32	4.24	2.15	1.83	0.71	0.61	0.92	0.52		99.75	
138 D3. V	50.07	23.98	2.18	5.27	2.70	6.70	4.81	1.86	0.27	0.13	0.71	0.90	0.74		100.32	
139 C3. V	49.87	14.80	8.25	6.88	6.77	9.36	2.81	0.68	0.45						99.87	
140 C3. V	49.35	15.71	7.44	6.96	5.71	9.80	2.96	1.31	0.49						99.73	
141 D4. V	46.40	21.84	9.53	2.04	5.37	10.33	3.27	1.69	n. d.				trace		100.47	
142 C3. V	44.64	12.74	4.21	11.17	5.82	10.12	4.31	1.41	0.51		5.86		0.20		100.99	
143 D3. V	49.24	19.06	1.77	10.33	5.00	8.75	3.89	1.19	0.63						99.86	
144 B4. V	53.42	15.08	17.13	n. d.	2.24	8.72	3.25	trace	2.34		0.85	trace			100.69	
145 C2. V	49.05	19.84	3.46	8.62	2.51	8.95	2.92	0.53	2.34		1.96	0.21		Fe 0.04	100.44	
146 D3. V	47.06	29.38	5.97	0.19	3.22	8.65	3.74	0.81	0.25	0.32	0.20	0.04			100.00	
147 D3. V	48.24	20.64	4.63	5.55	5.02	7.94	5.08	1.88	0.02			0.97			99.97	2.733
148 D3. V	47.97	20.04	4.45	5.50	5.54	7.64	5.14	1.99	0.48						98.75	2.711
149 D3. V	47.79	18.52	4.65	5.47	5.31	8.34	7.66	0.69	0.12						98.53	2.695
150 D3. V	47.74	20.95	3.29	6.32	5.16	7.56	7.12	1.21	0.04			0.13			99.52	2.736
151 D3. V	47.58	20.36	3.78	5.75	5.28	8.31	6.49	1.33	0.30						98.88	2.604
152 D3. V	47.50	19.32	4.75	5.20	4.36	8.37	7.63	2.31	0.46			0.21			100.11	2.704
153 C4. V	60.50	22.10	4.58	n. d.	1.67	3.90	2.74	3.33	1.70						100.52	
154 C4. V	53.70	22.40	6.50	n. d.	3.05	7.52	2.41	2.96	2.10						100.64	
155 C4. V	51.20	22.80	5.12	n. d.	2.32	8.75	2.38	2.39	5.70						100.66	

BASALT—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
136	Monte Pubulema, Sardinia.	A. Serra.	A. Serra, Rend. Ac. Linc. (5), XVII (2), p. 729, 1908.	Basalt.	
137	Keremule, Sardinia.	A. Serra.	A. Serra, Rend. Ac. Linc. (5), XVII (2), p. 733, 1908.	Basalt	
138	Monte Cuccuruddu, Keremule, Sardinia.	A. Serra.	A. Serra, Rend. Ac. Linc. (5), XVII (2), p. 731, 1908.	Basalt.	Cf. No. 20, III.6.2.4.
139	San Marco, Pantelleria.	H. Foerstner.	H. Foerstner, T. M. P. M., V, p. 393, 1883.	Basalt.	Cf. No. 105, III.5.3.4. Not in W. T.
140	Cuddie Monti, Pantelleria.	H. Foerstner.	H. Foerstner, T. M. P. M., V, p. 393, 1883.	Basalt.	Not in W. T.
141	Foerstner Volcano (1891), near Pantelleria.	G. H. Perry.	G. H. Perry, Nature, XLV, p. 252, 1891.	Basalt.	Cf. No. 107, III.5.3.4.
142	Foerstner Volcano (1891), near Pantelleria.	H. Foerstner.	H. Foerstner, T. M. P. M., XII, p. 512, 1891.	Basalt.	Cf. No. 107, III.5.3.4. In W. T., p. 343.
143	Ferdinandea (Graham) Island, 1831, near Pantelleria.	H. Foerstner.	H. Foerstner, T. M. P. M., V, p. 391, 1883.	Basalt.	Cf. No. 207, II.5.3.4. In W. T., p. 283.
144	Rovno, Volhynia, Russia.	Blümel.	S. Pfaffius, Ref., N. J., II, p. 78, 1888.	Basalt.	Contains metallic iron. In W. T., p. 453.
145	Rovno, Volhynia, Russia.	S. Pfaffius.	A. Lagorio, T. M. P. M., VIII, p. 480, 1887.	Basalt.	Contains metallic iron. In W. T., p. 293.
146	Bjelvi Kljutsch, Armenia.	C. Schmidt.	H. Abich, G. Armen., II, p. 154, 1888.	Dolerite.	SiO_2 includes loss. 3 decimals. Not in W. T.
147	Kula, Asia Minor.	A. Röhrig.	H. S. Washington, A. J. S., XLVII, p. 122, 1894.	Kulaite.	Cf. No. 29, II.6.2.4. In W. T., p. 455.
148	Kula Devit, Asia Minor.	A. Röhrig.	H. S. Washington, In. Diss. Leip., p. 57, 1894.	Kulaite.	Not in W. T.
149	Kula Devit, Asia Minor.	A. Röhrig.	H. S. Washington, In. Diss. Leip., p. 57, 1894.	Kulaite.	Not in W. T.
150	Gediz Chai, near Kula, Asia Minor.	A. Röhrig.	H. S. Washington, A. J. S., XLVII, p. 122, 1894.	Leucite kulaite.	Cf. No. 28, II.6.2.4. In W. T., p. 455.
151	Kara Tepé, near Kula, Asia Minor.	A. Röhrig.	H. S. Washington, In. Diss. Leip., p. 57, 1894.	Kulaite.	Not in W. T.
152	Kula Devit, Kula, Asia Minor.	A. Röhrig.	H. S. Washington, A. J. S., XLVII, p. 122, 1894.	Kulaite.	In W. T., p. 455.
153	Hagia Paraskevi, Mytilene, Aegean Sea.	L. de Launay.	L. de Launay, Ann. Mines (9), XIII, p. 187, 1898.	Andesilabradorite.	Not in W. T.
154	Molyvo, Mytilene, Aegean Sea.	L. de Launay.	L. de Launay, Ann. Mines (9), XIII, p. 187, 1898.	Basalt.	Not in W. T.
155	Stehsis, Mytilene, Aegean Sea.	L. de Launay.	L. de Launay, Ann. Mines (9), XIII, p. 187, 1898.	Andesilabradorite.	Not in W. T.

BASALT—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
156 D2. V	46.20	13.40	4.00	8.56	18.92	12.24	2.82	0.48	0.18		2.18	0.53	0.28		101.79	
157 C2. IV	45.40	17.00	9.97	3.27	5.07	10.72	3.28	1.09	0.16		2.90	1.27	0.40		100.53	
158 C4. V	48.25	19.23	10.87	n. d.	5.17	7.91	3.86	1.67	3.16						100.12	
159 C2. IV	52.40	14.12	6.52	4.47	6.77	9.43	3.50	0.31	0.22	0.21	2.71	0.14	0.41	CO_2 trace	101.21	
160 D4. V	50.60	14.80	6.00	n. d.	4.00	6.60	1.60		16.00						99.60	
161 C2. IV	43.76	10.90	3.49	9.82	12.76	13.80	2.21	0.31	1.00		2.32	0.51	0.32		101.20	
162 D3. V	48.09	19.05	3.44	5.59	3.50	9.42	5.06	2.88	0.67		4.38				102.08	
163 B3. IV	46.67	12.64	6.13	10.07	5.64	11.48	1.64	2.31	2.64			0.74	0.19	Cr_2O_3 0.34	100.49	2.703
164 B3. IV	46.30	13.44	4.11	12.61	4.42	11.88	2.13	1.94	3.02			0.59	0.22	Cr_2O_3 0.26	100.92	2.401
165 B3. IV	45.57	13.07	6.72	12.43	2.80	6.79	2.04	3.36	6.06			0.52	0.21	Cr_2O_3 0.28	99.85	2.331
166 C3. V	50.1	19.6	1.8	9.5	4.9	7.1	3.1	1.2	1.5		1.3				100.1	2.87
167 D3. V	49.8	17.9	2.9	11.5	4.6	7.1	3.2	0.8	0.0		3.8				101.6	2.97
168 D3. V	49.3	16.0	3.3	11.1	5.2	8.6	2.9	0.6	0.5		3.9				101.4	2.92
169 D3. V	48.7	15.7	1.5	12.5	6.0	10.1	3.3	0.5	1.0		1.7				101.0	3.01
170 D3. V	47.3	17.8	4.2	11.5	4.5	7.1	2.8	1.1	1.6		3.4				101.3	2.93
171 D3. V	46.6	18.8	0.4	9.1	12.2	10.6	2.1	0.2	0.1		1.4				101.5	3.00
172 D3. V	46.3	20.1	2.7	10.0	7.8	9.3	2.9	0.7	0.7		1.8				101.6	2.94
173 C3. V	46.2	19.0	1.3	13.2	4.7	7.7	2.7	0.7	1.5		4.0				101.0	3.01
174 D4. V	49.47	18.70	15.05	n. d.	5.34	8.90	2.87	0.79	0.81						101.93	
175 D4. V	50.09	12.60	22.31	n. d.	3.48	9.13	(2.29)		0.20						100.00	

BASALT—Continued.

No.	Locality.	Reference.	Analyst.	Rock name.	Remarks.
156	Punta Delgada, San Miguel, Azores.	C. v. John.	C. v. John, Jb. G. R.-A. Wien, XLVI, p. 289, 1896.	Anamesite.	In W. T., p. 453.
157	Punta Delgada, San Miguel, Azores.	C. v. John.	C. v. John, Jb. G. R.-A. Wien., XLVI, p. 290, 1896.	Basalt.	Cf. No. 129, III.5.4.4–5. In W. T., p. 283.
158	Cap Marsa, Menerville, Algeria.	L. Duparc.	Duparc, Pearce, and Ritter, Mem. Soc. Ph. Gen., XXXIII, No. 2, p. 94, 1900.	Basalt.	In W. T., p. 453.
159	Between Ghadames and Tripoli, Tripolitania.	E. Manasse.	E. Manasse, B. Soc. G. It., XXIV, p. 141, 1905.	Olivine basalt.	
160	Dakar, Cap Verde, Senegal.	L. Rioult.	L. Guilbert, B. Soc. G. Fr. (4), V, p. 773, 1905.	Pozzolana.	
161	Green Mountain, Sao Vicente, Cap Verde Islands.	C. v. John.	C. v. John, Jb. G. R.-A. Wien, XLVI, p. 284, 1896.	Dolerite.	In W. T., p. 359.
162	Inaccessible Island, Tristan d'Acunha.	C. Klement.	A. Renard, Pet. Oc. Islds., p. 88, 1889.	Tachylyte.	In W. T., p. 455.
163	Assab, near Massaua, Eritrea.	L. Ricciardi.	L. Ricciardi, B. Soc. G. It., V, p. 58, 1886.	Basalt.	In W. T., p. 317.
164	Assab, near Massaua, Eritrea.	L. Ricciardi.	L. Ricciardi, B. Soc. G. It., V, p. 58, 1896.	Basalt.	In W. T., p. 325.
165	Assab, near Massaua, Eritrea.	L. Ricciardi.	L. Ricciardi, B. Soc. G. It., V, p. 59, 1896.	Basalt.	In W. T., p. 317.
166	Arto, Djébel Guemel, French Somali.	H. Arsandaux.	H. Arsandaux, C. R., CXXXVII, p. 1310, 1903.	Basalt.	
167	Karakourkoura, French Somali.	H. Arsandaux.	H. Arsandaux, C. R., CXXXVII, p. 1310, 1903.	Labradorite (basalt).	
168	Guildessa, French Somali.	H. Arsandaux.	H. Arsandaux, C. R., CXXXVII, p. 1310, 1903.	Labradorite (basalt).	
169	Chissi, near Djibouti, French Somali.	H. Arsandaux.	H. Arsandaux, C. R., CXXXVII, p. 1310, 1903.	Labradorite (basalt).	
170	Baldji, French Somali.	H. Arsandaux.	H. Arsandaux, C. R., CXXXVII, p. 1310, 1903.	Basalt.	
171	Yabelé, near Djibouti, French Somali.	H. Arsandaux.	H. Arsandaux, C. R., CXXXVII, p. 1310, 1903.	Basalt.	
172	Ouaramalka, French Somali.	H. Arsandaux.	H. Arsandaux, C. R., CXXXVII, p. 1310, 1903.	Basalt.	
173	Ima, French Somali.	H. Arsandaux.	H. Arsandaux, C. R., CXXXVII, p. 1310, 1903.	Labradorite (basalt).	
174	French Somali.	Pisani.	Gennes and Bonard, C. R., CXXXI, p. 197, 1900.	Basalt.	Not in W. T.
175	Kichuchu, Ruwenzori, Uganda.	A. Roccati.	A. Roccati in Duca Abruz., Ruwenzori, p. 229, 1909.	Basalt.	Alkalies by difference.

BASALT—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
176 D2. V	49.02	14.75	3.28	8.61	8.52	9.61	3.06	1.56	0.22		2.25	0.60	0.20		101.68	
177 D2. V	46.67	14.91	6.57	7.81	7.25	9.24	3.07	1.45	1.50		3.19	0.47	0.07		102.20	
178 C2. IV	45.32	14.35	4.51	8.19	9.25	11.31	3.32	2.06	0.51		1.54	0.91	0.05		101.32	
179 B4. V	47.00	16.60	11.00	n. d.	9.80	11.38	3.00	0.46	1.89						101.13	
180 B4. V	50.53	18.36	11.76	n. d.	4.40	9.33	2.07	3.23	1.35						101.03	
181 C3. V	50.4	22.2	9.9	3.6	1.5	8.4	0.9	1.8	0.9		0.9				100.5	
182 C3. V	53.96	24.38	4.65	2.87	2.63	5.16	1.92	1.41	2.63						99.61	
183 C3. V	44.10	25.59	8.28	2.88	4.85	8.96	2.12	2.80	1.16						100.64	
184 C3. V	43.10	25.62	7.19	1.68	4.00	9.98	2.90	5.90	n. d.						100.37	
185 C3. V	55.58	23.22	4.13	2.09	3.05	7.31	2.07	1.12	1.50				trace		100.07	2.82
186 C3. V	48.56	20.09	2.87	4.03	8.33	9.92	3.90	0.83	1.20						99.73	2.94
187 C3. V	47.52	21.45	6.43	2.13	4.84	7.76	5.04	1.58	3.56				0.38		100.69	2.82
188 C3. V	44.26	20.87	7.23	2.09	5.39	12.55	1.90	0.39	5.00				trace		99.68	2.82
189 B3. IV	57.06	20.00	3.03	3.01	3.27	7.18	2.95	3.06	0.77	0.13					100.46	
190 B4. V	53.81	19.69	8.16	n. d.	3.13	7.73	3.64	2.19	2.13	0.24					100.72	
191 C3. V	47.65	19.32	3.93	4.92	3.90	6.15	3.58	4.61	5.15		0.75	1.23			101.19	
192 D3. V	49.81	14.39	7.84	2.56	1.68	14.70	4.52	1.98	1.27						98.75	2.771
193 D3. V	48.30	25.35	1.25	5.43	2.70	11.50	2.44	0.73	1.32		trace		0.23		99.25	2.580
194 D3. V	47.60	32.02	1.55	3.30	2.70	10.00	2.05	1.09	1.13				0.44		101.88	2.819
195 C2. IV	51.86	18.56	0.38	10.69	3.72	5.77	3.30	2.10	0.56	0.24	0.70	1.44	0.18		99.50	

BASALT—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
176	Tritriw, Antsirabé, Madagascar.	Not stated.	Duparc, Wunder, and Sabot, Mem. Soc. Ph. Gen., XXXVI (3), p. 298, 1910.	Basalt.	
177	Vohitra, Antsirabé, Madagascar.	Not stated.	Duparc, Wunder, and Sabot, Mem. Soc. Ph. Gen., XXXVI (3), p. 298, 1910.	Basalt.	
178	Vinonkarena, Antsirabé, Madagascar.	Not stated.	Duparc, Wunder, and Sabot, Mem. Soc. Ph. Gen., XXXVI (3), p. 298, 1910.	Basalt.	
179	Kimberley, Griqualand.	Not stated.	L. de Launay, C. R., CXXV, p. 336, 1897.	Basalt.	In W. T., p. 453.
180	Buhemin, Elburz Mountains, Persia.	E. Drasche.	E. Drasche, Vh. G. R.-A. Wien., XVIII, p. 196, 1884.	Basalt.	In W. T., p. 455.
181	Poonah, Western Ghats, Bombay, India.	F. S. Warth.	H. Warth, G. Mag. (V), II, p. 21, 1905.	Dolerite.	
182	Sasa River, Witim Plateau, Lake Baikal, Siberia.	Not stated.	B. Polanow, Ref., N. J., 1902, I, p. 231.	Basalt.	
183	Dshilinda River, Witim Plateau, Lake Baikal, Siberia.	Not stated.	B. Polanow, Ref., N. J., 1902, I, p. 231.	Olivine basalt.	
184	Tunkinsk, Lake Baikal, Siberia.	Not stated.	B. Polanow, Ref., N. J., 1902, I, p. 231.	Basalt.	
185	Ulja River, Okhotsk, Siberia.	Not stated.	K. E. Bogdanovitch, Fund. Marek., p. 57.	Basalt.	
186	Nikolaievska, Amur River, Siberia.	Not stated.	K. E. Bogdanovitch, Fund. Marek., p. 57.	Olivine basalt.	
187	Sebach, Amur River, Siberia.	Not stated.	K. E. Bogdanovitch, Fund. Marek., p. 57.	Olivine basalt.	
188	Ulja River, Okhotsk, Siberia.	Not stated.	K. E. Bogdanovitch, Fund. Marek., p. 57.	Basalt.	
189	Batuaan Creek, Benguet, Luzon, Philippine Islands.	P. J. Fox.	A. J. Eveland, Phil. J. Sci. (A), II, p. 226, 1907.	Basalt.	
190	Malaqui, Taal Volcano, Philippine Islands.	A. J. Cox.	A. J. Cox, Phil. J. Sci. (A), III, p. 404, 1908.	Dolerite.	
191	Kau, near Maros Peak, Celebes.	Hinden.	C. Schmidt in Sarasin, Ins. Celebes, IV, p. 13, 1901.	Basalt.	
192	Boekit Doea Volcono, Sumatra.	A. Clausnitzer.	R. D. M. Verbeek, Sum. Westk., p. 516, 1883.	Basalt.	Not in W. T.
193	Atar Volcano, Sumatra.	Reuter.	R. D. M. Verbeek, Sum. Westk., p. 516, 1883.	Basalt.	Not in W. T.
194	Koeliet Manies Volcano, Sumatra.	Reuter.	R. D. M. Verbeek, Sum. Westk., p. 516, 1883.	Basalt.	Not in W. T.
195	Ipswich, Purga Parish, Queensland.	G. R. Patten.	A. R. Agric. Chem. Qld., 1912.	Basalt.	H. C. Richards, pers. com.

BASALT—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
196 D3. V	43.50	14.60	5.40	8.28	6.16	8.70	7.34	2.95	2.50		0.10	trace		Cl 0.37 Cr_2O_3 trace	99.90	2.94
197 C3. V	47.21	16.06	11.87	4.43	0.12	7.34	7.51	2.40	2.55						99.49	2.81
198 C2. IV	50.05	21.66	3.23	4.93	3.51	10.14	3.08	1.59	0.75		0.95		0.06		99.95	
199 C3. V	45.80	17.91	6.14	8.69	3.92	8.10	4.71	1.77	2.10		0.35			Cl 0.11	99.60	
200 B3. IV	44.00	14.07	5.16	10.87	11.18	10.28	1.74	1.98	1.40		0.47			Cl 0.11	101.26	
201 D3. V	45.28	19.01	8.52	5.01	5.14	7.55	2.66	2.51	2.99						98.67	
202 B3. IV	44.91	17.59	8.07	9.08	6.41	7.88	3.37	1.58	1.54		(0.87)				101.30 (101.32)	
203 B3. IV	45.02	17.78	6.61	8.72	6.29	8.76	3.82	1.16	1.57		(0.87)				100.60	2.957
204 B3. IV	42.19	18.00	7.73	8.67	7.06	9.27	3.15	1.05	1.35		0.87				99.34	
205 C3. V	46.67	22.36	1.44	7.70	2.90	10.27	1.87	1.50	3.73		1.19		0.32	CO_2 0.05	100.00	
206 C4. V	47.44	16.51	15.33	3.19	8.80	6.02	1.60	0.30				0.61	0.37	CO_2 0.17 SO_3 0.06 CuO 0.08	100.48	
207 C4. V	40.11	12.40	14.64	trace	11.65	12.24	2.72	0.96				0.57	0.25	CO_2 4.15 SO_3 0.17 CuO 0.11	99.97	
208 C4. V	37.82	13.16	14.11	0.14	11.75	13.39	1.66	1.49				0.82	0.24	CO_2 5.56 SO_3 0.15 FeS_2 0.05 CuO 0.07	100.41	
209 D4. V	34.81	33.18	23.03	2.34	0.39	trace	trace	trace			4.89	0.39	0.28	SO_3 0.31 CuO 0.37	99.99	
210 D4. V	4.54	41.35	40.87	2.52	0.37	trace	trace	trace			8.99	0.63	0.08	SO_3 0.55 CuO 0.26	100.16	
211 D4. V	50.00	22.80	14.15	4.05	1.93	3.17	1.99		0.33		0.42	trace	0.97		99.81	2.77
212 D4. V	48.65	16.47	8.90	7.70	3.20	7.60	5.00		0.28		0.36	trace	0.99		99.15	2.85
213 D4. V	48.60	25.45	17.55	1.20	0.98	2.20	1.30		1.87		trace	trace	trace		99.23	2.80

BASALT—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
196	Bondi, New South Wales.	Not stated.	J. M. Curran, Pr. R. Soc. N. S. W., XXVIII, p. 225, 1894.	Basalt.	Cf. No. 54, III.6.3.4. In W. T., p. 353.
197	One Tree Point, Sandy Bay, Tasmania.	O. E. White.	White and Macleod, Pr. R. Soc. Tas., p. 78, 1900.	Fayalite basalt.	Not in W. T.
198	Mangorei Creek, New Plymouth, Taranaki, New Zealand.	J. S. Maclaurin.	E. D. Clarke, N. Z. G. S. B. 14, p. 23, 1912.	Basalt?	
199	Signal Hill, Dunedin, New Zealand.	C. A. Cotton.	C. A. Cotton, Tr. N. Z. Inst., XLI, p. 122, 1909.	Basalt.	"MgO low" in ref.
200	Signal Hill, Dunedin, New Zealand.	C. A. Cotton.	C. A. Cotton, Tr. N. Z. Inst., XLI, p. 123, 1909.	Basalt.	
201	Dunedin, New Zealand.	P. Marshall.	P. Marshall, Q. J. G. S., LXII, p. 412, 1906.	Basalt.	
202	Clarendon, Otago, New Zealand.	A. R. Andrew.	A. R. Andrew, Tr. N. Z. Inst., XXXVIII, p. 461, 1906.	Basalt.	
203	Clarendon, Otago, New Zealand.	A. R. Andrew.	A. R. Andrew, Tr. N. Z. Inst., XXXVIII, p. 461, 1906.	Basalt.	
204	Clarendon, Otago, New Zealand.	A. R. Andrew.	A. R. Andrew, Tr. N. Z. Inst., XXXVIII, p. 461, 1906.	Basalt.	
205	Waiwate North, Whangaroa, New Zealand.	J. S. Maclaurin.	Bell and Clarke, N. Z. G. S. B. 8, p. 71, 1909.	Dolerite.	
206	Salt Lake, Oahu, Hawaiian Islands.	A. B. Lyons.	A. B. Lyons, A. J. S., II, p. 427, 1896	Basalt tuff.	Ignited before analysis. $H_2O+=5.04$. $H_2O-=9.08$. In W. T., p. 455.
207	Diamond Head, Oahu, Hawaiian Islands.	A. B. Lyons.	A. B. Lyons, A. J. S., II, p. 427, 1896.	Basalt tuff.	Ignited before analysis. $H_2O+=6.48$. $H_2O-=5.46$. In W. T., p. 455.
208	Punch Bowl, Oahu, Hawaiian Islands.	A. B. Lyons.	A. B. Lyons, A. J. S., II, p. 427, 1896.	Basalt tuff.	Ignited before analysis. $H_2O+=8.24$. $H_2O-=9.98$. In W. T., p. 455.
209	Honolulu, Oahu, Hawaiian Islands.	A. B. Lyons.	A. B. Lyons, A. J. S., II, p. 427, 1896.	Basalt.	Ignited before analysis. $H_2O+=11.63$. $H_2O-=6.43$. In W. T., p. 455.
210	Kaneohe, Oahu, Hawaiian Islands.	A. B. Lyons.	A. B. Lyons, A. J. S., II, p. 427, 1896.	Altered basalt.	Ignited before analysis. $H_2O+=20.48$. $H_2O-=3.55$. In W. T., p. 457.
211	Kilauea, Hawaii, Hawaiian Islands.	O. Silvestri.	O. Silvestri, B. C. G. It., XIX, p. 171, 1888.	Basaltoid.	In W. T., p. 455.
212	Kilauea, Hawaii, Hawaiian Island.	O. Silvestri.	O. Silvestri, B. C. G. It., XIX, p. 193, 1888.	Basalt.	Not in W. T.
213	Kilauea, Hawaii, Hawaiian Islands.	O. Silvestri.	O. Silvestri, B. C. G. It., XIX, p. 169, 1888.	Basaltoid.	In W. T., p. 455.

BASALT—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
214 B3. IV	48.04	14.62	9.18	11.68	2.17	7.66	4.00	1.28	0.00		trace	0.45	1.91		100.99	2.78
215 B3. IV	47.61	16.09	7.00	10.60	3.10	8.15	2.98	1.15	0.70		0.39	trace	1.72		99.49	2.93
216 C3. V	45.30	14.90	10.87	8.20	3.78	6.58	5.23	1.77	1.20		trace	0.25	0.91		98.99	2.79
217 B3. IV	51.77	15.66	8.46	6.54	4.95	9.56	2.17	0.96	n. d.				0.82		100.89	
218 B3. IV	50.76	14.75	2.89	9.85	6.54	11.05	2.70	0.88	n. d.			0.26	0.41		100.09	
219 C4. V	24.62	23.89	37.85	2.08	0.99	trace	1.41	trace			8.12	0.24	0.25	SO_3 0.40 CuO 0.27	100.12	
220 D4. V	67.0	9.7	8.6	n. d.	6.7	4.3	3.2	0.3	n. d.						99.8	
221 D4. V	55.49	16.00	5.65	6.83	n. d.	7.96	4.40	0.69						SO_3 0.60	97.62	
222 D4. V	49.01	16.13	7.29	10.10	n. d.	10.66	4.20	0.65						SO_3 0.24	98.28	
223 C2. IV	50.56	10.30	4.95	7.59	9.27	9.35	2.81	1.24	1.70		0.80		0.14		98.71	
224 B3. IV	46.84	17.78	1.64	10.79	9.24	11.87	2.02	0.28	n. d.				0.34		100.80	
225 D3. V	46.76	17.71	1.73	10.92	10.37	11.56	1.83	0.17	n. d.				0.44		101.49	
226 C4. V	44.73	16.28	14.57	n. d.	2.23	1.88	4.50	4.02	9.56				2.89		100.64	
227 C3. V	53.31	9.01	17.34	2.00	0.73	9.06	3.42	3.35	0.14				1.44		99.80	2.686
228 C2. IV	46.78	21.22	4.63	6.17	4.30	12.07	1.40	0.64	0.94	0.50	1.20	0.31	trace	CO_2 trace Cl trace S none Cr_2O_3 0.05 BaO none SrO none	100.21	2.90
229 D4. V	54.1	18.2	11.2	n. d.	0.5	3.8	(4.9)		7.2						100.0	2.5
230 C3. V	53.40	15.94	9.14	3.59	3.37	8.57	2.18	1.19	1.51		2.60				101.49 (100.39)	

BASALT—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
214	Kilauea, Hawaii, Hawaiian Islands.	O. Silvestri.	O. Silvestri, B. C. G. It., XIX, p. 175, 1888.	Basalt.	MnO high. In W. T., p. 325.
215	Kilauea, Hawaii, Hawaiian Islands.	O. Silvestri.	O. Silvestri, B. C. G. It., XIX, p. 183, 1888.	Basaltoid.	MnO high. In W. T., p. 325.
216	Kilauea, Hawaii, Hawaiian Islands.	O. Silvestri.	O. Silvestri, B. C. G. It., XIX, p. 180, 1888.	Basaltoid.	In W. T., p. 455.
217	Kilauea, Hawaii, Hawaiian Islands.	A. H. Phillips.	A. H. Phillips, A. J. S., XLVII, p. 473, 1894.	Basalt.	Stalagmite. In W. T., p. 455.
218	Kilauea, Hawaii, Hawaiian Islands.	A. H. Phillips.	A. H. Phillips, A. J. S., XLVII, p. 473, 1894.	Basalt.	Pelé's hair. In W. T., p. 337.
219	Hilo, Hawaii, Hawaiian Islands.	A. B. Lyons.	A. B. Lyons, A. J. S., II, p. 427, 1896.	Altered basalt.	Ignited before analysis. $H_2O+=12.70$. $H_2O-=8.49$. In W. T., p. 457.
220	Kilauea, Hawaii, Hawaiian Islands.	W. Maxwell.	W. Maxwell, Lavas and Soils of Hawaii, p. 19, 1898.	Basalt.	Decomposed. Not in W. T.
221	Kilauea, Hawaii, Hawaiian Islands.	W. Maxwell.	W. Maxwell. Lavas and Soils of Hawaii, p. 13, 1898.	Basalt.	"Acted on by SO_2." Cf. next number. Not in W. T.
222	Kilauea, Hawaii, Hawaiian Islands.	W. Maxwell.	W. Maxwell, Lavas and Soils of Hawaii, p. 13, 1898.	Basalt scoria.	Not in W. T.
223	Lat. 12° 8′ S., Long. 145° 10′ E., South Pacific Ocean.	A. F. Renard.	Murray and Renard, Chall. Rep., Deep Sea Dep., p. 297, 1891.	Basalt pumice.	Not in W. T. Dredged block.
224	Lat. 42° 43′ S., Long. 82° 11′ W., South Pacific Ocean.	A. F. Renard.	Murray and Renard, Chall. Rep., Deep Sea Dep., p. 307, 1891.	Volcanic glass.	Not in W. T. Dredged block.
225	Lat. 13° 28′ S., Long. 149° 30′ W., South Pacific Ocean.	A. F. Renard.	Murray and Renard, Chall. Rep., Deep Sea Dep., p. 307, 1891.	Basalt glass.	In W. T., p. 457. Dredged block.
226	Lat. 13° 28′ S., Long. 149° 30′ W., South Pacific Ocean.	A. F. Renard.	Murray and Renard, Chall. Rep., Deep Sea Dep., p. 307, 1891.	Palagonite.	In W. T., p. 457. Dredged block.
227	Port Resolution, Tanna Island, New Hebrides.	A. Liversidge.	A. Liversidge, J. R. Soc. N. S. W., XX, p. 237, 1887.	Lava (basalt?).	Al_2O_3 and iron oxides? In W. T., p. 271.
228	Mau Island, New Hebrides.	D. Mawson.	D. Mawson, Pr. Linn. Soc. N. S. W., XXX, p. 470, 1905.	Basalt.	Cf. No. 194, III.5.4.4.
229	Campbell Island.	R. Speight.	R. Speight, Tr. N. Z. Inst., XXXVII, p. 554, 1905.	Tachylyte.	
230	Mount Honey, Campbell Island.	P. Marshall.	P. Marshall, Subant. Islds., II, p. 696, 1909.	Basalt.	

BASALT—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
231 C2. IV	47.14	19.35	5.61	10.82	3.98	5.42	2.38	1.60	0.96	0.84	0.68	0.14	0.18	CO_2 0.26	99.36	2.96
232 D3. V	48.3	15.4	1.7	10.3	9.6	9.3	3.7	1.4	n. d.		1.9				101.6	
233 A4. IV	45.13	18.13	2.94	n. d.	7.33	11.23	2.14	0.98	2.18						100.06	

NEPHELITE SYENITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 B4. V	60.92	21.34	n. d.	3.44	0.16	1.34	6.02	6.33	0.60						100.15	
2 C2. IV	55.11	16.76	2.18	5.72	3.20	6.66	3.98	3.25	1.66		0.78	0.49	0.28		100.07	
3 C2. IV	48.60	13.60	2.30	4.97	8.79	10.00	1.42	5.62	0.61		0.79	0.19		CO_2 1.23 SO_3 0.54 Cl trace F none	98.66	
4 D4. V	50.36	19.34	6.94	n. d.	n. d.	3.43	7.64	7.17	3.51				0.41		98.80	
5 C3. V	55.83	16.58	1.69	3.62	1.49	4.34	8.78	7.35	0.42						100.10	
6 C3. V	60.42	19.23	0.63	3.19	0.67	1.73	6.99	6.88	1.74				trace		101.48	
7 C3. V	58.61	21.12	2.62	1.14	0.79	0.62	7.85	5.93	1.01		1.10	trace	trace		100.79	
8 D4. V	60.29	21.39	3.07	n. d.	trace	0.46	12.30	trace	0.67						98.18	
9 C3. V	59.20	20.60	2.31	2.07	0.87	0.93	7.01	6.75	1.50		0.07			Cl none	101.31	
10 C2. IV	42.60	17.20	4.55	7.60	4.28	9.22	3.43	2.91	5.25		3.50	1.31			101.55	
11 D4. V	52.24	26.95	n. d.	2.14	0.29	4.00	6.04	6.73	2.77						101.16	
12 D4. V	37.44	33.97	n. d.	1.17	n. d.	4.53	12.94	4.78	n. d.		0.49		trace	(CO_2 3.17)	98.62	
13 D4. V	55.68	23.81	4.84	n. d.	0.65	1.69	9.23	5.16	0.39					Graphite 0.58	101.98	2.593
14 C4. V	55.41	19.84	9.50	n. d.	n. d.	3.86	5.97	5.29	n. d.						99.87	
15 D3. V	52.03	22.34	1.13	1.63	0.67	2.09	8.44	5.16	1.79		0.99		0.41	CO_2 1.32	98.00	

BASALT—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
231	Adams Island, Auckland Islands.	A. M. Wright.	Speight and Finlayson, Subant. Islds., II, p. 733, 1909.	Basalt.	
232	Wiencke Island, Graham Land, Antarctica.	Pisani.	E. Gourdon, C. R., CXLIII, p. 179, 1906.	Basalt.	
233	Cape Adare, South Victoria Land, Antarctica.	J. A. Schofield.	David, Smeeth, and Schofield, J. R. Soc. N. S. W., XXIX, p. 477, 1895.	Basalt.	In W. T., p. 457.

NEPHELITE SYENITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Port Coldwell, Ontario.	E. S. Moore.	H. L. Kerr, Rep. Bur. Min. Ont., XIX (1), p. 209, 1910.	Nephelite syenite.	
2	Port Coldwell, Ontario.	F. A. Genth.	H. L. Kerr, Rep. Bur. Min. Ont., XIX (1), p. 209, 1910.	Nephelite syenite.	Quartz in norm.
3	Crown Hill, near Ottawa, Ontario.	M. Dittrich.	A. Osann, Can. G. S. A. R., XII, p. 45, 1902.	Shonkinite.	"Good in spite of low sum."
4	Beemerville, Sussex County, New Jersey.	F. W. Love.	J. F. Kemp, Tr. N. Y. Ac. Sc., XI, p. 65, 1892.	Nephelite syenite.	Complete in separate. In W. T., p. 401.
5	Constancia, Jacupiranga, Sao Paulo, Brazil.	St. Dizier and Dafert.	O. A. Derby, pers. com.	Nephelite syenite.	Published?
6	Moita, Foia, Portugal.	M. Dittrich.	Kraatz-Koschlau and Hackman, T. M. P. M., XVI, p. 225, 1896.	Nephelite syenite.	In W. T., p. 207.
7	Heum, Lougendal, Norway.	O. N. Heidenreich.	W. C. Brögger, Eg. Kg., III, p. 176, 1899.	Foyaite.	Na_2O low. Cf. ref., p. 181. In W. T., p. 211.
8	Kaltschik River, Marinpol, Russia.	Nikolajew.	P. Jeremejeff, Ref. N. J., 1900, I, p. 395.	Nephelite syenite.	In W. T., p. 213.
9	Nosy Komba, Madagascar.	A. Pisani.	A. Lacroix, Mat. Min. Mad., I, p. 53, 1902.	Microditroite.	
10	Andevenanaomby, Bezavona, Madagascar.	Pisani.	A. Lacroix, Mat. Min. Mad., II, p. 210, 1903.	Covite.	Spots in syenite. Cf. No. 48, I.5.2.4.
11	Zerafshan, Turkestan.	Not stated.	J. Preobrajensky, An. Inst. Pet. Grt., XV, p. 308, 1911.	Nephelite syenite.	
12	Zerafshan, Turkestan.	Not stated.	J. Preobrajensky, An. Inst. Pet. Grt., XV, p. 328, 1911.	Nephelite syenite.	
13	Sivamalai, Coimbatore, Madras, India.	T. L. Walker.	T. H. Holland, Mem. G. S. Ind., XXX (3), p. 181, 1901.	Nephelite syenite.	
14	Alibert's graphite mine, Botolgolskij-Golez, Siberia.	Alexejew.	L. Jaczewski, Ref., N. J., 1901, II, p. 75.	Nephelite syenite.	Contains graphite. In W. T., p. 401.
15	Lake Ilmen, Siberia.	Bourdakow.	A. Karpinsky, Cong. G. Int. VII, Guide V, p. 22, 1897.	Miascite.	In W. T., p. 401.

NEPHELITE SYENITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
16 D3. V	54. 17	23. 25	0. 69	2. 95	0. 48	2. 02	6. 33	6. 19	0. 17		0. 98		0. 16	CO_2 1. 14	98. 53	
17 C2. IV	48. 05	13. 94	2. 67	5. 98	7. 81	7. 25	2. 72	6. 56	1. 66		1. 10		1. 15		98. 89	

PHONOLITE.

1 C2. IV	51. 31	21. 54	3. 68	3. 37	0. 18	1. 39	9. 25	5. 49	0. 84		1. 20	trace	0. 41	CO_2 0. 15 Cl 0. 17	98. 94	2. 71
2 D4. V	45. 18	23. 31	6. 11	n. d.	1. 45	4. 62	11. 17	5. 95	1. 14						98. 92	
3 B4. V	59. 25	19. 46	n. d.	5. 08	trace	2. 07	7. 39	3. 96	2. 12	0. 70					100. 03	
4 B4. V	58. 98	16. 03	n. d.	8. 27	trace	1. 11	8. 28	4. 90	2. 07	0. 51					100. 15	
5 B4. V	58. 94	18. 11	n. d.	6. 31	trace	0. 57	7. 56	6. 87	1. 36	0. 09					99. 81	
6 C4. V	58. 65	16. 45	4. 08	n. d.	trace	3. 78	8. 92	4. 16	2. 78	0. 29					99. 11	
7 B4. V	58. 58	17. 19	n. d.	7. 69	none	0. 88	9. 26	4. 54	1. 65	0. 09					99. 78	
8 B4. V	58. 56	18. 14	n. d.	7. 32	n. d.	1. 56	8. 49	5. 28	1. 01	0. 12					100. 48	
9 B4. V	53. 38	20. 40	n. d.	4. 42	trace	1. 56	6. 23	6. 26	2. 70	0. 50					100. 45	
10 B4. V	58. 09	21. 29	n. d.	4. 06	trace	0. 81	9. 35	3. 79	2. 26	0. 20					99. 85	
1 B4. V	57. 45	20. 38	n. d.	3. 63	trace	1. 84	7. 41	6. 19	2. 76	0. 36					100. 02	
12 B4. V	56. 34	21. 06	n. d.	4. 21	0. 71	3. 34	9. 27	4. 08	0. 90	0. 07					99. 98	
13 B4. V	55. 60	19. 71	n. d.	5. 49	0. 86	1. 69	8. 60	4. 88	2. 89	0. 34					100. 06	
14 D4. V	55. 94	19. 22	3. 49	n. d.	1. 40	2. 62	4. 32	6. 22	2. 06	1. 90				CO_2 1. 54 S trace	98. 71	2. 567
15 D4. V	61. 3	21. 2	n. d.	3. 9	0. 7	0. 2	10. 2	2. 7	n. d.						100. 2	2. 60
16 C3. V	59. 46	24. 28	1. 06	1. 16	0. 77	3. 10	7. 76	2. 58	(1. 67)		0. 26				100. 43	2. 579
17 C3. V	58. 55	22. 32	2. 13	1. 32	1. 55	6. 70	6. 09	1. 55	(0. 73)		0. 77				100. 98	2. 595

NEPHELITE SYENITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
16	Mount Wichniowaia, Ural Mountains, Siberia.	Bourdakow.	A. Karpinsky, Cong. G. Int. VII, Guide V, p. 22, 1897.	Miascite.	In W. T., p. 401.
17	Maros Peak, Celebes.	Hinden.	C. Schmidt in Sarasin, Ins. Celebes, IV, p. 23, 1901.	Shonkinite.	

PHONOLITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Akuliarusak, Igaliko Fjord, Greenland.	C. Detlefsen.	N. V. Ussing, G. Julhb., p. 275, 1911.	Nephelite porphyry.	
2	Beemerville, Sussex County, New Jersey.	J. F. Kemp.	J. F. Kemp, Tr. N. Y. Ac. Sci., XI, p. 67, 1892.	Nephelite porphyry (sussexite).	In W. T., p. 307.
3	Annie Greek, Black Hills, South Dakota.	Flintermann.	J. D. Irving, An. N. Y. Ac. Sci., XII, p. 272, 1899.	Phonolite.	In W. T., p. 201.
4	Annie Creek, Black Hills, South Dakota.	Flintermann.	J. D. Irving, An. N. Y. Ac. Sci., XII, p. 272, 1899.	Phonolite.	In W. T., p. 403.
5	Annie Creek, Black Hills, South Dakota.	Flintermann.	J. D. Irving, An. N. Y. Ac. Sci., XII, p. 272, 1899.	Phonolite.	In W. T., p. 403.
6	Calamity Gulch, Black Hills, South Dakota.	J. D. Irving.	J. D. Irving, An. N. Y. Ac. Sci., XII, p. 272, 1899.	Phonolite.	In W. T., p. 403.
7	Annie Creek, Black Hills, South Dakota.	Flintermann.	J. D. Irving, An. N. Y. Ac. Sci., XII, p. 272, 1899.	Phonolite.	In W. T., p. 403.
8	Annie Creek, Black Hills, South Dakota.	Flintermann.	J. D. Irving, An. N. Y. Ac. Sci., XII, p. 272, 1899.	Phonolite.	In W. T., p. 403.
9	Annie Creek, Black Hills, South Dakota.	Flintermann.	J. D. Irving, An. N. Y. Ac. Sci., XII, p. 272, 1899.	Phonolite.	In W. T., p. 403.
10	Green Mountain, Black Hills, South Dakota.	Flintermann.	J. D. Irving, An. N. Y. Ac. Sci., XII, p. 272, 1899.	Phonolite.	In W. T., p. 209.
11	Whitetail Gulch, Black Hills, South Dakota.	Flintermann.	J. D. Irving, An. N. Y. Ac. Sci., XII, p. 272, 1899.	Phonolite.	In W. T., p. 403.
12	Squaw Creek, Black Hills, South Dakota.	Flintermann.	J. D. Irving, An. N. Y. Ac. Sci., XII, p. 272, 1899.	Phonolite.	In W. T., p. 403.
13	Annie Creek, Black Hills, South Dakota.	Flintermann.	J. D. Irving, An. N. Y. Ac. Sci., XII, p. 272, 1899.	Phonolite.	In W. T., p. 403.
14	Homestake Mine, Lead, South Dakota.	W. J. Sharwood.	W. J. Sharwood, Ec. G., VI, p. 731, 1911.	Phonolite.	Altered.
15	Megal, Velay.	M. Boule.	M. Boule, B. Sv. Ct. G. Fr., IV, No. 28, p. 152, 1892.	Phonolite.	In W. T., p. 403.
16	Puy Grioux, Cantal, Auvergne.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 338, 1902.	Phonolite.	
17	La Terrisse, Cantal, Auvergne.	F. Fouqué.	F. Fouqué, B. Soc. M. Fr., XXV, p. 340, 1902.	Phonolite.	

PHONOLITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
18 D4. V	58.70	22.36	5.08	n. d.	1.27	3.39	5.13	5.45	n. d.			trace		SO_3 trace	101.38	
19 D4. V	54.97	25.84	6.29	n. d.	1.13	5.21	4.49	3.52	n. d.			trace			101.45	
20 D4. V	55.90	22.70	4.20	n. d.	0.96	1.25	9.20	6.78	0.87		0.37				102.23	
21 C3. V	53.33	21.33	2.66	1.75	0.63	1.44	10.34	6.13	0.88		0.40		1.15		100.04	
22 D4. V	53.09	23.81	3.92	n. d.	1.13	1.29	10.41	6.31	0.67		0.29		0.42		101.34	
23 C2. IV	51.04	20.47	1.89	2.19	0.97	2.62	11.62	3.52	5.85		0.27	0.27		CO_2 0.62	101.35	2.460
24 B3. IV	48.83	18.71	4.16	1.91	1.02	5.19	10.63	3.04	5.52						99.01	
25 B4. V	52.24	21.08	4.41	n. d.	0.60	2.68	4.58	6.43	8.33					SO_3 trace Cl 0.08	100.43	
26 C2. IV	45.17	18.27	1.39	6.64	2.44	2.27	11.35	5.64	1.93		2.70	1.40			99.20	2.63
27 C4. V	58.34	23.05	2.07	n. d.	trace	0.50	1.79	12.22	1.53		0.35		trace	BaO 0.66	100.51	
28 C4. V	56.72	21.04	n. d.	4.63	1.13	4.13	4.33	6.28			1.74				100.00	
29 C4. V	56.47	18.66	n. d.	5.83	trace	4.79	7.81	4.87							100.00	
30 C4. V	52.03	20.00	n. d.	5.90	1.52	4.42	9.30	5.22			1.32		0.22		99.93	
31 C4. V	50.70	20.32	n. d.	4.51	2.09	3.58	5.05	6.23			5.68			FeS_2 1.84	100.00	
32 C4. V	50.69	21.85	n. d.	4.51	0.25	7.77	1.28	2.83			0.82				100.00	
33 C4. V	50.66	21.18	n. d.	5.42	2.65	7.72	5.06	3.77			2.15		0.25	SO_3 1.14	100.00	

PHONOLITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
18	Roc Blanc, Mont Dore, Auvergne.	E. Bonjean.	E. Bonjean, C. R., CXXVIII, p. 1097, 1899.	Phonolite.	In W. T., p. 403.
19	La Malvialle, Mont Dore, Auvergne.	E. Bonjean.	E. Bonjean, C. R., CXXVIII, p. 1097, 1899.	Phonolite.	In W. T., p. 403.
20	Foia, Serra de Monchique, Portugal.	Student of Jannasch.	Kraatz-Koschlau and Hackmann, T. M. P. M., XVI, p. 257, 1896.	Tinguaite porphyry.	SiO_2 and Na_2O doubtful. In W. T., p. 403.
21	Foia, Serra de Monchique, Portugal.	Student of Jannasch.	Kraatz-Koschlau and Hackmann, T. M. P. M., XVI, p. 257, 1896.	Tinguiate porphyry.	In W. T., p. 403.
22	Foia, Serra de Monchique, Portugal.	Student of Jannasch.	Kraatz-Koschlau and Hackmann, T. M. P. M., XVI, p. 257, 1896.	Tinguiate porphyry.	Al_2O_3 doubtful. In W. T., p. 403.
23	Elfdalen, Dalarne, Sweden.	P. Mann.	P. Mann, N. J., 1884, II, p. 193.	Phonolite.	In W. T., p. 303.
24	Elfdalen, Dalarne, Sweden.	G. T. Prior.	G. T. Prior, Min. Mag., XIII, p. 87, 1901.	Cancrinite tinguaite.	"Na_2O low?"
25	Schorenberg, Eifel, Rheinland.	K. Busz.	K. Busz, Vh. Nh. Ver. Bonn, XLVIII, p. 254, 1891.	Phonolite tuff.	In W. T., p. 403.
26	Michelsberg, Katzenbuckel, Odenwald.	G. Latterman.	W. Freudenberg, Mt. Bad. G. L.-A., V (1), p. 304, 1907.	Nephelite porphyry.	
27	Degenmatt, Kaiserstuhl, Baden.	A. Cathrein.	A. Knop, D. Kaiserst., p. 209, 1892.	Phonolite.	Na_2O and K_2O interchanged? In W. T., p. 213.
28	Kirchberg, Kaiserstuhl, Baden.	A. Knop.	A. Knop, D. Kaiserst., p. 221, 1892.	Phonolite.	Calculated to 100. 3.36 H_2O and 4.56 $CaCO_3$ deducted. In W. T., p. 405.
29	Endhalde, Kaiserstuhl, Baden.	A. Knop.	A. Knop, D. Kaiserst., p. 235, 1892.	Analcite phonolite.	Calculated to 100. 6.82 $CaCO_3$ deducted. In W. T., p. 405.
30	Eichwalde, Kaiserstuhl, Baden.	A. Knop.	A. Knop, D. Kaiserst., p. 225, 1892.	Hauyne phonolite.	Ignited before analysis. SO_3 n. d. In W. T., p. 405.
31	Schelingen, Kaiserstuhl, Baden.	A. Knop.	A. Knop, D. Kaiserst., p. 239, 1892.	Phonolite.	Calculated to 100. 4.16 H_2O and 6.27 $CaCO_3$ deducted. In W. T., p. 405.
32	Oberschaffhausen, Kaiserstuhl, Baden.	A. Knop.	A. Knop, D. Kaiserst., p. 232, 1892.	Natrolite phonolite.	Calculated to 100. 6.74 H_2O and 2.00 $CaCO_3$ deducted. In W. T., p. 405.
33	Horberig, Kaiserstuhl, Baden.	A. Knop.	A. Knop, D. Kaiserst., p. 218, 1892.	Hauyne phonolite.	Calculated to 100. 6.35 H_2O and 3.07 $CaCO_3$ deducted. In W. T., p. 405.

PHONOLITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
34 D4. V	49.69	21.05	n. d.	5.05	1.45	8.90	4.22	1.33	5.23					CO_2 1.35 SO_3 0.41 Cl none	98.68	
35 D2. V	57.69	20.44	2.32	1.47	0.70	3.18	7.51	4.74	1.70		0.66		trace	CO_2 0.42 X 0.34 SO_3 0.27 Cl 0.35 Li_2O trace	101.79	2.624
36 C4. V	55.32	20.25	4.05	n. d.	0.98	4.21	6.32	4.10	3.34		0.75				99.32	
37 B3. IV	54.98	18.26	6.88	2.42	1.96	5.82	3.84	2.19	1.99		0.76				99.10	
38 D3. V	54.63	18.02	9.04	0.92	1.87	4.20	3.42	2.27	3.10		0.78				98.25	
39 C3. V	54.65	22.75	3.40	2.18	2.19	2.04	6.61	5.25	0.76		1.09				100.92	2.575
40 C3. V	50.08	21.68	3.88	4.00	2.85	7.78	4.21	3.96	0.55		1.24				100.23	2.607
41 D4. V	58.64	17.61	2.35	n. d.	0.35	1.27	11.48	7.36	2.95						101.01	
42 D3. V	58.02	21.98	3.33	0.85	0.56	3.20	6.46	4.48	(2.25)			0.06	trace		98.94	
43 C3. V	57.59	21.38	1.69	0.84	0.40	3.25	5.04	5.76	4.45			0.70			101.10	
44 B3. IV	56.80	20.41	none	3.62	0.29	1.75	9.42	5.72	1.46		none	0.22		CO_2 0.26	100.41	
45 D4. V	52.85	15.50	11.70	n. d.	4.58	7.56	n. d.	7.54	n. d.						102.73	
46 C3. IV	55.38	18.46	4.72	6.28	1.19	3.93	7.55	2.94	0.36			0.42	0.19	Cl trace	101.42	
47 C4. V	62.72	16.27	6.83	n. d.	n. d.	1.06	8.47	4.99	n. d.						100.34	
48 B3. IV	56.17	19.25	4.77	2.72	0.21	1.26	6.08	4.66	4.09			0.21			99.42	
49 D3. V	56.12	21.32	2.59	3.29	0.56	2.30	5.79	4.81	1.54					Cl 0.34	98.66	
50 D4. V	54.52	15.84	6.42	4.53	0.98	4.20	4.38	4.23	3.64						98.74	
51 D4. V	51.15	$\underbrace{\qquad\qquad\qquad}_{29.38}$			0.34	4.59	13.80	0.95	n. d.						100.21	
52 C3. V	58.23	20.90	3.21	1.75	0.39	3.24	6.16	5.88	1.60				trace		101.36	

PHONOLITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
34	Horberig, Kaiserstuhl, Baden.	A. Knop.	A. Knop, D. Kaiserst., p. 224, 1892.	Hauyne phonolite.	In W. T., p. 405.
35	Linsberg, Rhöngebirge.	E. Möller.	E. Möller, N. J., 1888, I, p. 97.	Phonolite.	In W. T., p. 403.
36	Kalvarienberg, Poppenhausen, Rhöngebirge.	Dürrfeld.	H. Bücking, Sb. Pr. Ak. W., 1910, p. 514.	Phonolite.	
37	Dammerfeld, Rhöngebirge.	O. Dreher.	O. Dreher, In. Diss. Strassb., p. 8, 1911.	Phonolite.	9.84 per cent quartz in norm.
38	Dammerfeld, Rhöngebirge.	O. Dreher.	O. Dreher, In. Diss. Strassb., p. 8, 1911.	Phonolite.	Weathered from preceding.
39	Schackau, Rhöngebirge.	H. Gachot.	H. Gachot, Jb. Pr. G. L.-A., XXXIV (2), p. 15, 1913.	Trachyphonolite.	
40	Schackau, Rhöngebirge.	H. Gachot.	H. Gachot, Jb. Pr. G. L.-A., XXXIV (2), p. 15, 1913.	Trachyphonolite.	
41	Schönfeld, near Kamnitz, Bohemia.	A. Pelikan.	A. Pelikan, T. M. P. M., XXV, p. 117, 1906.	Analcite phonolite.	Alkalies uncertain. Cf. ref.
42	Kahlenberg, Mittelgebirge, Bohemia.	J. Hanamann.	J. Hanamann, Arch. Landdf. Böhm., VII (3), p. 55, 1890.	Phonolite.	Not in W. T.
43	Kibitschken, Mittelgebirge, Bohemia.	C. F. Eichleiter.	G. Irgang, T. M. P. M., XXVIII, p. 62, 1909.	Phonolite.	
44	Flur Ratschin, Bohemia.	F. Hanusch.	J. E. Hibsch, T. M. P. M., XXIX, p. 432, 1910.	Sodalite tinguaite.	No Fe_2O_3? Cl n. d.
45	Le Braidi, Monte Vulture, Apulia, Italy.	Musaio.	Cited by W. Deecke, N. J. B. B., VII, p. 602, 1891.	Phonolite.	In W. T., p. 405.
46	Azeo, Digsa, Eritrea.	E. Manasse.	E. Manasse, Stud. Pet. Erit., p. 101, 1909.	Tinguaite.	
47	Turritable Waterfall, Victoria.	R. J. Lewis.	J. W. Gregory, Pr. R. Soc. Vict., XIV, p. 201, 1902.	Trachyphonolite.	
48	Acheron Point, Dunedin, Otago, New Zealand.	P. Marshall.	P. Marshall, Q. J. G. S., XLII, p. 395, 1906.	Tinguaite.	
49	Mount Zion, Mount Cargill, Dunedin, New Zealand.	J. A. Bartrum.	J. A. Bartrum, Tr. N. Z. Inst., XLIV, p. 173, 1912.	Phonolite.	
50	See House, Dunedin, New Zealand.	P. Marshall.	P. Marshall, Q. J. G. S., LXII, p. 402, 1906.	Phonolite.	
51	Purakanui Cliffs, near Dunedin, New Zealand.	Allen and Fitzgerald (students).	G. H. F. Ulrich, Tr. Aust. A. A. S., III, p. 136, 1891.	Tinguaite.	In W. T., p. 405.
52	Greenland Harbor, Kerguelen Island.	C. Klement.	A. Renard, Pet. Oc. Islds., p. 136, 1889.	Phonolite.	In W. T., p. 405.

LEUCITE PHONOLITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 C4. V	55.22	23.34	2.16	n. d.	0.36	2.25	3.14	5.72	8.76					SO_3 trace Cl 0.14	101.09	
2 C4. V	55.18	23.03	2.85	n. d.	0.25	1.06	5.98	8.43	2.62					SO_3 0.44 Cl 0.32	100.16	
3 C4. V	53.25	24.20	3.37	n. d.	trace	1.03	5.73	5.48	6.64					Cl trace	99.70	
4 C4. V	50.95	21.43	3.50	n. d.	trace	4.87	6.81	6.66	10.20					Cl trace	100.46	
5 D4. V	52.33	21.42	n. d.	8.14	1.97	7.88	4.97	2.57			0.72				100.00	
6 D4. V	59.69	16.22	1.93	8.17	2.72	4.80	1.03	3.09	1.54			trace	0.44	SO_3 0.64 Cl trace	100.27	
7 C3. V	55.26	16.36	5.26	2.90	1.14	3.90	4.08	8.82	1.20		0.36				99.28	

ESSEXITE, ETC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 B3. IV	44.31	17.20	4.64	3.73	6.57	10.40	4.45	3.64	3.30	0.77			0.10		99.11	
2 B3. IV	43.18	15.24	7.61	2.67	5.81	10.63	5.68	4.07	3.57					SO_3 0.94 Cl none	99.40	2.93
3 B3. IV	50.55	20.48	2.66	4.02	4.24	7.30	8.37	2.27	0.44					Cl trace	100.33	
4 C3. V	49.61	19.18	2.12	5.01	4.94	10.05	5.62	1.04	3.55			0.27		SO_3 trace	101.39	2.782
5 C2. IV	47.66	14.33	4.22	8.19	6.74	10.15	2.87	3.06	0.42		3.29	0.43			101.41	
6 C3. V	47.0	22.0	3.6	4.7	4.1	6.1	4.0	2.1	6.4		0.6				100.6	
7 B4. V	49.67	17.99	13.06	n. d.	3.06	6.63	6.21	2.62	0.86						100.10	
8 C3. IV	46.53	14.31	3.61	8.15	6.56	12.13	4.95	1.58	0.20		2.99		0.22		101.23	2.96
9 D2. V	45.66	11.64	3.57	10.61	11.08	9.11	2.60	0.44	n. d.		2.75	0.26			97.72	
10 D4. V	42.08	20.03	7.61	n. d.	3.52	10.62	$\underbrace{\quad\quad}_{(4.50)}$		4.54			1.59		CO_2 5.51	100.00	
11 B3. IV	39.64	16.98	6.61	9.31	6.65	10.58	5.95	3.09	1.32						100.13	

LEUCITE PHONOLITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Bell, Laacher See, Rheinland.	K. Busz.	K. Busz, Vh. Nh. Ver. Bonn, XLVIII, p. 265, 1891.	Leucitophyre.	In W. T., p. 405.
2	Rieden, Laacher See, Rheinland.	K. Busz.	K. Busz, Vh. Nh. Ver. Bonn, XLVIII, p. 246, 1891.	Leucite phonolite.	In W. T., p. 207.
3	Rieden, Laacher See, Rheinland.	K. Busz.	K. Busz, Vh. Nh. Ver. Bonn, XLVIII, p. 246, 1891.	Leucite phonolite.	In W. T., p. 405.
4	Rieden, Laacher See, Rheinland.	K. Busz.	K. Busz, Vh. Nh. Ver. Bonn, XLVIII, p. 244, 1891.	Leucitophyre.	In W. T., p. 405.
5	Oberrothweil, Kaiserstuhl, Baden.	A. Knop.	A. Knop, D. Kaiserst., p. 229, 1892.	Leucite phonolite.	Calculated to 100. 7.00 H_2O and 4.30 $CaCO_3$ deducted. In W. T., p. 405.
6	Proceno, Lake Bolsena, Italy.	L. Ricciardi.	C. Klein, N. J. B. B., VI, p. 26, 1889.	Leucite phonolite.	In W. T., p. 405. Cf. No. 30, I.5.2.3.
7	Madonna di Lauro, Vetralla, near Viterbo, Italy.	A. Röhrig.	H. S. Washington, J. G., IV, p. 849, 1896.	Leucite trachyte.	In W. T., p. 251.

ESSEXITE, ETC.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Gordons Butte, Crazy Mountains, Montana.	E. A. Schneider.	J. E. Wolff, U. S. G. S. B. 150, p. 201, 1898.	Theralite.	In W. T., p. 349.
2	Martinsdale, Crazy Mountains, Montana.	J. E. Wolff.	J. E. Wolff, N. Transcont. Surv., Sep., p. 10, 1885.	Theralite.	In W. T., p. 353.
3	Cuyamas, San Luis Obispo County, California.	V. Lenher.	H. W. Fairbanks, B. Dep. G. Un. Cal., I, p. 293, 1895.	Teschenite.	In W. T., p. 305.
4	Point Sal, California.	H. W. Fairbanks.	H. W. Fairbanks, B. Dep. G. Un. Cal., II, p. 30, 1896.	Teschenite.	In W. T., p. 303.
5	Barra do Guarahu, Jacupiranga, Sao Paulo, Brazil.	Florence.	O. A. Derby, pers. com.	Essexite.	Published?
6	Puy St. Sandoux, Limagne, Puy de Dome, Auvergne.	Arsandaux.	P. Glangeaud, B. Sv. Ct. G. Fr., XIX, No. 123, p. 86, 1909.	Tescnenite.	
7	Monchique, Portugal.	Student of Jannasch.	Kraatz-Koschlau and Hackman, T. M. P. M., XVI, p. 239, 1896.	Essexite.	In W. T., p. 411.
8	Kunjok Valley, Kola, Finland.	F. Eichleiter.	F. Eichleiter, Vh. G. R.-A. Wien, XXVII, p. 217, 1893.	Theralite.	In W. T., p. 349.
9	Penikkavaara, Kuusamo, Finland.	A. Zilliacus.	V. Hackman, B. C. G. Fin., XI, p. 29, 1900.	Essexite.	In W. T., p. 411.
10	Söhla, Silesia.	C. E. M. Rohrbach.	C. E. M. Rohrbach, T. M. P. M., VII, p. 49, 1886.	Teschenite.	Alkalies by difference. Not fresh. In W. T., p. 457.
11	Praya, Cape Verde Islands.	F. Kertscher.	F. Eigol, T. M. P. M., XI, p. 98, 1890.	Teschenite.	In W. T., p. 353.

TRACHYDOLERITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 B3. IV	54.12	18.77	8.20	2.14	1.17	3.98	5.63	4.03	2.45						100.49	2.63
2 B3. IV	53.57	19.14	8.51	3.05	1.01	4.13	4.76	3.98	2.88				trace		101.05	2.71
3 B3. IV	42.14	13.13	3.49	7.97	4.74	12.13	4.78	2.89	0.98		2.86		3.41	CO_2 0.62 SO_3 none Cl 0.27	99.92	2.922
4 C3. V	53.27	16.49	5.11	2.30	3.39	8.78	3.66	5.24	1.81	0.83	0.08	0.41	trace	Cl 0.05	101.42	
5 D3. V	54.24	18.08	2.18	3.53	0.88	5.01	7.29	5.01	1.79					Cl 0.63	98.64	
6 C3. V	50.43	18.00	3.78	5.65	2.91	5.76	5.76	4.79	1.37					Cl 0.38	98.83	
7 D3. V	49.02	19.50	4.37	6.60	2.14	6.78	7.35	1.70	1.18						98.64	
8 C4. V	55.78	18.12	8.60	n. d.	1.91	5.78	5.50	2.62	1.28						99.59	
9 C4. V	53.30	21.10	8.90	n. d.	2.44	5.45	4.81	1.97	2.25						100.22	
10 C4. V	53.15	20.76	9.55	n. d.	2.42	5.60	4.50	2.21	1.71						99.90	

MONCHIQUITE, ETC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 C3. V	45.58	15.87	4.65	6.37	8.32	9.91	3.42	1.61	3.14				trace		98.87	
2 D4. V	45.13	18.06	11.88	0.32	1.12	10.17	3.57	6.06	3.04			0.39			99.74	
3 D4. V	40.37	17.86	14.45	0.38	1.63	17.61	1.29	0.83	4.47						99.39	
4 C4. V	41.37	16.25	16.93	n. d.	4.57	12.35	4.18	3.98	0.45						100.08	
5 D4. V	40.47	11.96	17.44	n. d.	3.10	16.80	1.90	4.21	3.60						99.38	3.102
6 D4. V	31.80	18.78	15.20	n. d.	3.32	14.60	1.10	5.07	8.10			0.95			98.92	
7 D4. V	38.07	17.92	14.08	n. d.	8.87	11.70	0.96	2.23	5.50						99.33	
8 C4. V	46.98	17.07	1.85	7.02	8.29	12.15	2.54	0.53	4.86			0.09			101.38	3.20
9 C2. IV	43.48	15.13	6.40	4.14	5.14	10.31	4.23	2.83	3.17	0.50	2.52	0.29		CO_2 0.27 SO_3 1.51	99.92	

TRACHYDOLERITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Löwenburg, Siebengebirge, Rheinland.	H. Müller.	H. Müller, N. J. B. B., XXIII, p. 432, 1907.	Trachydolerite.	
2	Löwenburg, Siebengebirge, Rheinland.	H. Müller.	H. Müller, N. J. B. B., XXIII, p. 432, 1907.	Trachydolerite.	
3	Biliner Skale, near Lukow, Bohemia.	F. Hanusch.	J. E. Hibsch, T. M. P. M., XXIV, p. 281, 1905.	Trachydolerite.	MnO high.
4	Santa Teresa Volcano, Phlegrean Fields, Italy.	F. S. Starrabba.	F. S. Starrabba, At. Ac. Sc. Nap. (2), XIV, No. 7, p. 12, 1910.	Trachydolerite.	
5	Butlers Peaks, Mount Cargill, Dunedin, New Zealand.	J. A. Bartrum.	J. A. Bartrum, Tr. N. Z. Inst., XLIV, p. 169, 1912.	Trachydolerite.	
6	Mount Cargill, Dunedin, New Zealand.	J. A. Bartrum.	J. A. Bartrum, Tr. N. Z. Inst., XLIV, p. 167, 1912.	Trachydolerite.	
7	Pine Hill, Mount Cargill, Dunedin, New Zealand.	J. A. Bartrum.	J. A. Bartrum, Tr. N. Z. Inst., XLIV, p. 167, 1912.	Trachydolerite.	
8	Amaua, Tutuila, Samoa.	Hobein.	M. Weber, Abh. Bay. Ak. W., XXIV, p. 297, 1909.	Trachydolerite.	
9	Aunuu Island, Samoa.	Hobein.	M. Weber, Abh. Bay. Ak. W., XXIV, p. 302, 1909.	Trachydolerite.	
10	Afono, Tutuila, Samoa.	Hobein.	M. Weber, Abh. Bay. Ak. W., XXIV, p. 300, 1909.	Trachydolerite.	

MONCHIQUITE, ETC.

1	Shelburne Point, Burlington, Vermont.	H. T. Vulté.	J. F. Kemp in Weed and Pirsson, U. S. G. S. B. 139, p. 116, 1896.	Monchiquite.	New analysis of next number. In W. T., p. 459.
2	Shelburne Point, Burlington, Vermont.	W. H. Morrison.	Kemp and Marsters, U. S. G. S. B. 107, p. 34, 1893.	Monchiquite.	In W. T., p. 459.
3	Burlington, Vermont.	W. H. Morrison.	Kemp and Marsters, U. S. G. S. B. 107, p. 34, 1893.	Monchiquite.	In W. T., p. 459.
4	Beemerville, Sussex County, New Jersey.	F. W. Love.	J. F. Kemp, Tr. N. Y. Ac. Sc., XI, p. 69, 1892.	Ouachitite.	In W. T., p. 459.
5	Rutans Hill, near Beemerville, Sussex County, New Jersey.	J. F. Kemp.	J. F. Kemp, A. J. S., XXXVIII, p. 133, 1889.	Ouachitite.	In W. T., p. 459.
6	Beemerville, Sussex County, New Jersey.	J. F. Kemp.	J. F. Kemp, A. J. S., XXXVIII, p. 133, 1889.	Ouachitite.	In W. T., p. 459.
7	Tatumville, Saline County, Arkansas.	J. F. Kemp.	J. F. Kemp in J. F. Williams, Ig. R. Ark., p. 399, 1891.	Ouachitite.	In W. T., p. 459.
8	Angel Island, California.	F. L. Ransome.	F. L. Ransome, B. Dep. G. Un. Cal., I, p. 231, 1884.	Fourchite.	In W. T., p. 459.
9	Offenthal, Odenwald.	F. Herberger.	G. Klemm, Nb. Ver. Erdk. (4), XXVIII, p. 37, 1907.	Monchiquite.	Cf. No. 25, III.6.3.4.

MONCHIQUITE, ETC.—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
10 C2. IV	41.00	10.05	4.60	7.20	9.23	15.85	2.32	3.20	4.01		3.37	0.39			101.22	
11 D3. V	47.19	17.25	3.00	11.40	0.63	10.84	2.81	3.21	1.10		0.49	0.12	trace	$(Ce, Di)_2O_3$ 1.79 NiO 1.35	101.18	

NEPHELITE TEPHRITE, ETC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 C3. IV	44.43	17.89	4.00	4.94	2.40	12.60	2.55	3.02	6.25		1.40		trace		99.48	
2 D4. V	38.35	9.18	20.32	n. d.	13.78	11.76	2.77	2.02	1.20						99.38	3.22
3 C3. V	47.3	20.5	3.2	5.1	4.6	6.5	3.9	1.8	7.0		0.5				100.4	
4 C3. V	44.0	16.9	8.6	8.7	5.9	9.9	4.0	1.0	1.9						100.9	
5 C3. V	42.9	21.1	3.7	8.3	5.2	11.6	4.2	0.7	3.1						100.8	
6 D3. V	48.05	18.65	2.90	4.70	2.28	7.50	6.19	5.16	n. d.		2.60		0.28		98.31	2.665
7 C4. V	42.20	10.32	n. d.	11.85	14.82	12.96	3.44	0.64			2.92				100.00	
8 C3. V	47.57	17.52	0.80	10.77	9.53	1.69	1.10	2.66							99.86	2.88
9 D3. V	44.20	17.03	5.30	5.70	7.20	9.10	5.90	2.95	3.83						101.21	
10 C3. V	43.18	12.66	3.66	8.69	13.74	12.51	3.19	1.22	1.42			0.88			101.15	2.99
11 D3. V	42.68	17.90	2.45	7.22	8.48	9.78	5.91	3.63	3.02						101.07	2.81
12 D4. V	42.93	20.13	7.30	n. d.	2.30	10.95	8.99	2.50	0.79			1.50	0.60		97.99	
13 C2. IV	42.02	13.86	5.81	5.84	10.39	11.43	3.61	0.86	2.41		1.88	0.11	0.31	CO_2 0.56 X 1.99 Cl 0.20	101.28	3.028
14 C3. V	52.18	19.88	4.77	1.99	1.91	6.66	3.65	3.45	2.75		1.76				99.00	
15 C3. V	51.65	18.42	7.95	1.97	1.80	7.92	3.59	2.58	2.44		1.52				99.84	
16 C3. V	51.25	22.10	4.51	1.39	1.74	7.07	4.32	2.79	2.45		1.55				99.17	

MONCHIQUITE, ETC.—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
10	Leeuwfontein, Pretoria, Transvaal.	Pisani.	H. A. Brouwer, Transv. Nephsy., p. 94, 1910.	Amphibole monchiquite.	"H_2O, possibly all CO_2."
11	Girnan, Madras, India.	Not stated.	J. W. Evans, pers. com.	Monchiquite.	Published?

NEPHELITE TEPHRITE, ETC.

1	Cape Fletcher, Canning Peninsula, East Greenland.	N. Sahlbom.	O. Nordenskjöld, Med. Grönl., XXVII, p. 207, 1908.	Nephelite tephrite.	"CaO and MgO uncertain, interchanged?"
2	Pilot Knob, near Austin, Texas.	J. F. Kemp.	J. F. Kemp, Am. G., VI, p. 293, 1890.	Nephelite basalt.	In W. T., p. 457.
3	Puy St. Sandoux, Limagne, Puy de Dome, Auvergne.	H. Arsandaux.	P. Glangeaud, B. Sv. Ct. G. Fr., XIX, No. 123, p. 86, 1909.	Tephrite.	
4	Puy St. Sandoux, Limagne, Puy de Dome, Auvergne.	H. Arsandaux.	P. Glangeaud, B. Sv. Ct. G. Fr., XIX, No. 123, p. 86, 1909.	Olivine tephrite.	
5	Puy St. Sandoux, Limagne, Puy de Dome, Auvergne.	H. Arsandaux.	P. Glangeaud, B. Sv. Ct. G. Fr., XIX, No. 123, p. 86, 1909.	Olivine nephelinite.	
6	Picota, Serra Monchique, Portugal.	G. Pajkull.	Kraatz-Koschlau and Hackman, T. M. P. M., XVI, p. 275, 1896.	Nephelite tephrite.	In W. T., p. 457.
7	Lützelberg, Kaiserstuhl, Baden.	A. Knop.	A. Knop, D. Kaiserst., p. 274, 1892.	Basanite.	Calculated to 100. 3.00 H_2O deducted. In W. T., p. 457.
8	Reiffenberg, near Schorbach, Hesse.	H. Wolff.	H. Wolff, Sb. Ph. Ges. Erl., XXII, p. 134, 1890.	Nephelite basanite.	In W. T., p. 335.
9	Steinerberg, near Schorbach, Hesse.	Keim.	H. Wolff, Sb. Ph. Ges. Erl., XXII, p. 134, 1890.	Nephelite basanite.	In W. T., p. 459.
10	Ibra Kuppe, Oberaula, Hesse.	H. Wolff.	H. Wolff, Sb. Ph. Ges. Erl., XXII, p. 138, 1890.	Nephelite basalt.	3 decimals. In W. T., p. 351.
11	Kronberg, near Schorbach, Hesse.	H. Wolff.	H. Wolff, Sb. Ph. Ges. Erl., XXII, p. 136, 1890.	Nephelite basanite.	3 decimals. In W. T., p. 353.
12	Rossberg, near Darmstadt, Hesse.	E. Becker.	E. Becker, Ref., N. J., I, p. 370, 1906.	Nephelinite.	
13	Hunrodsberg, near Cassel, Hesse-Nassau.	O. Fromm.	O. Fromm, Z. D. G. G., XLIII, p. 75, 1891.	Nephelite basalt.	In W. T., p. 345.
14	Hozzelberg, Rhöngebirge.	Dürrfeld.	H. Bücking, Sb. Pr. Ak. W., p. 501, 1910.	Nephelite tephrite.	
15	Steinhauk, near Obermünst, Rhöngebirge.	Dürrfeld.	H. Bücking, Sb. Pr. Ak. W., p. 501, 1910.	Nephelite tephrite.	
16	Steinhauk, near Obermünst, Rhöngebirge.	Dürrfeld.	H. Bücking, Sb. Pr. Ak. W., p. 501, 1910.	Nephelite tephrite.	

NEPHELITE TEPHTITE, ETC.—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
17 C4. V	50.33	22.57	4.63	n. d.	3.25	9.74	3.90	1.73	1.97		2.08				100.40	
18 C4. V	50.24	20.25	8.11	0.74	2.74	7.94	4.84	1.70	2.32		1.63				100.51	
19 C3. V	48.78	19.39	6.29	3.41	4.05	8.72	4.09	1.53	1.75		1.99				100.00	
20 C3. V	45.67	17.84	9.54	4.04	3.85	9.78	3.88	1.44	1.97		1.57				99.58	
21 D3. V	45.46	22.20	6.95	4.19	3.07	9.57	3.38	1.49	0.76		1.50				98.57	
22 C3. V	45.25	17.69	7.76	4.62	3.68	9.88	2.87	2.27	2.36		2.78				99.16	
23 C3. V	44.37	17.49	7.48	3.39	5.21	10.98	2.56	0.62	3.28		3.75				99.13	
24 D2. V	44.10	12.80	5.43	5.73	10.66	10.57	2.84	1.24	3.90		2.46	0.55	0.18	CO_2 0.36 X 0.71 SO_3 0.09 Cl 0.17	101.79	2.956
25 D3. V	42.68	15.02	7.95	6.09	4.99	9.77	4.97	1.42	3.61		2.48		0.21	CO_2 0.46 X 2.20 Cl trace	101.95	2.925
26 B3. IV	41.18	17.94	9.81	1.16	11.18	12.38	3.15	0.93	2.03		0.50				100.26	3.064
27 C3. V	40.73	20.70	4.26	8.38	5.32	10.78	7.28	0.60	2.00		0.46	0.49	trace	CO_2 trace Cl trace NiO trace	101.00	3.141
28 C2. IV	39.08	22.13	3.40	5.72	5.44	12.56	6.85	1.77	1.28		0.85	0.50	trace	Cl trace S trace Cr_2O_3 trace	99.58	2.910
29 C3. V	39.03	21.57	8.98	6.82	4.52	12.58	3.82	2.63	0.55						100.50	3.145
30 C4. V	42.71	17.05	0.92	7.66	5.49	12.31	10.48	2.81	0.60		0.60	0.96			101.59	3.095
31 D4. V	52.65	28.80	1.45	n. d.	0.16	12.60	3.80	0.38	0.80						100.62	
32 B4. V	52.55	14.63	10.70	n. d.	1.71	6.37	3.83	3.48	6.72			0.63		SO_3 trace Cl trace	100.62	
33 C2. IV	45.56	14.43	7.71	6.07	0.87	9.23	5.57	2.45	2.79	0.49	1.73	1.02	1.47	CO_2 0.25 SO_3 trace	99.64	2.759
34 D2. V	45.28	12.95	9.83	4.73	3.82	10.91	3.34	2.03	1.88	0.69	1.60	0.70	0.91	CO_2 0.16 SO_3 trace	98.83	2.785
35 C2. IV	40.58	13.01	4.72	6.09	5.25	13.57	2.95	2.17	4.87	1.66	3.07	1.58	0.62	CO_2 0.10 SO_3 none Cl 0.09	100.33	2.856
36 C3. V	38.39	17.38	6.49	6.83	7.12	13.14	4.79	2.33	1.01		0.19	1.74	1.41	CO_2 0.21 SO_3 none	101.03	3.05
37 C3. V	54.71	20.29	5.44	4.60	2.03	2.10	6.42	1.58	2.00		trace				99.87	

NEPHELITE TEPHRITE, ETC.—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
17	Dedgesstein, Rhöngebirge.	Dürrfeld.	H. Bücking, Sb. Pr. Ak. W., p. 501, 1910.	Nephelite tephrite.	
18	Kirschberg, near Rasdorf, Rhöngebirge.	Dürrfeld.	H. Bücking, Sb. Pr. Ak. W., p. 501, 1910.	Nephelite tephrite.	
19	Bildstein, near Poppenhausen, Rhöngebirge.	Dürrfeld.	H. Bücking, Sb. Pr. Ak. W., p. 500, 1910.	Nephelite tephrite.	
20	Suchenberg, Rhöngebirge.	Dürrfeld.	H. Bücking, Sb. Pr. Ak. W., p. 500, 1910.	Nephelite tephrite.	
21	Rückersberg, near Eiterfeld, Rhöngebirge.	Dürrfeld.	H. Bücking, Sb. Pr. Ak. W., p. 500, 1910.	Nephelite tephrite.	
22	Hoherod, near Hofbieber, Rhöngebirge.	Dürrfeld.	H. Bücking, Sb. Pr. Ak. W., p. 500, 1910.	Nephelite tephrite.	
23	Tannenfels, Rhöngebirge.	Dürrfeld.	H. Bücking, Sb. Pr. Ak. W., p. 500, 1910.	Nephelite tephrite.	
24	Linsberg, Rhöngebirge.	E. Möller.	E. Möller, N. J., I, p. 105, 1888.	Nephelite basanite.	In W. T., p. 459.
25	Linsberg, Rhöngebirge.	E. Möller.	E. Möller, N. J., I, p. 102, 1888.	Nephelite basanite.	In W. T., p. 459.
26	Kreuzberg, Rhöngebirge.	E. v. Seyfried.	E. v. Seyfried, Jb. Pr. G. L.-A., XVII, p. 20, 1897.	Basanite.	In W. T., p. 347.
27	Volkersberg, near Bruckenau, Rhöngebirge.	H. Lenk.	H. Lenk, Vh. Ph. Ges. Wurz., XXI, p. (76), 1887.	Nephelite basalt.	In W. T., p. 351.
28	Leubach, Rhöngebirge.	H. Lenk.	H. Lenk, Vh. Ph. Ges. Wurz., XXI, p. 54, 1887.	Nephelinite.	In W. T., p. 305.
29	Kreuzberg, Rhöngebirge.	E. v. Seyfried.	E. v. Seyfried, Jb. Pr. G. L.-A., XVII, p. 17, 1897.	Nephelite basalt.	In W. T., p. 305.
30	Babenik, Grossdehsa, Saxony.	O. Beyer.	O. Beyer, T. M. P. M., X, p. 14, 1889.	Nephelite basalt.	Na_2O high. Cf. ref. In W. T., p. 459.
31	Kreutzberg, near Schluckenau, Bohemia.	C. v. John.	C. v. John, Jb. G. R.-A. Wien, LII, p. 146, 1903.	Nephelite basanite.	
32	Liebwerda, Bohemia.	F. Ullik.	J. E. Hibsch, T. M. P. M., XV, p. 237, 1896.	Tephrite tuff.	H_2O includes CO_2. In W. T., p. 459.
33	Schichenberg, near Tetschen, Bohemia.	F. Hanusch.	J. E. Hibsch, T. M. P. M., XIV, p. 104, 1894.	Nephelite tephrite.	Lower flow. In W. T., p. 343.
34	Schichenberg, near Tetschen, Bohemia.	F. Hanusch.	J. E. Hibsch, T. M. P. M., XIV, p. 105, 1894.	Nephelite-leucite tephrite.	In W. T., p. 459.
35	Schanzberg, Bohemia.	F. Hanusch.	J. E. Hibsch, T. M. P. M., XXIII, p. 342, 1904.	Nephelinite.	Not fresh.
36	St. Georgsberg, Randnitz, Bohemia.	J. Hoffmann.	J. Hoffmann, Ref. N. J., II, p. 59, 1898.	Nephelite basalt.	In W. T., p. 459.
37	Lumbwa, Uganda.	M. Goldschlag.	M. Goldschlag, N. J. Cb., p. 592, 1912.	Nephelite tephrite.	

LEUCITE TEPHRITE, ETC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 D3. V	52.06	23.13	8.52	1.75	2.24	3.30	5.37	3.10	1.17		0.16	0.20	trace		101.00	
2 D4. V	43.49	15.43	8.52	n. d.	3.63	8.36	$\underbrace{\quad(12.77)\quad}$		4.49					CO_2 3.31	100.00	
3 D4. V	50.43	25.04	3.48	n. d.	4.51	7.49	5.17	1.08	2.61						99.71	
4 B4. V	51.83	18.62	8.02	n. d.	n. d.	6.78	3.62	4.71	5.86			0.12			99.56	
5 D2. V	50.98	18.94	5.82	1.83	0.32	6.88	3.22	4.67	4.01		1.23	0.21		Cl trace S trace	98.11	2.548
6 C3. V	44.73	14.75	6.59	4.59	7.97	9.41	3.26	0.84	5.90		2.88				100.92	
7 D3. V	42.30	14.77	8.89	3.64	7.52	9.97	3.20	1.13	2.85	1.50	3.07				98.84	
8 B3. IV	41.13	18.18	4.71	7.64	10.59	13.20	2.00	1.59	1.74						100.78	
9 B3. IV	52.34	19.90	6.57	0.55	2.26	6.35	5.66	2.68	3.65	0.41	0.14	0.09		SO_3 0.02	100.62	2.623
10 C2. IV	46.84	13.98	8.99	5.46	0.80	10.41	3.59	2.59	2.69	0.47	1.88	0.59	1.79	CO_2 0.30 SO_3 trace	100.38	2.794
11 D3. V	56.32	17.07	3.11	6.03	2.05	6.53	2.24	4.03	2.04			0.93	0.13		100.48	2.492
12 D3. V	56.07	16.31	1.64	8.39	3.04	5.94	1.22	5.27	1.17			0.92	0.14		100.09	2.552
13 D3. V	55.08	17.52	2.11	6.17	2.41	6.19	1.37	4.32	4.03			1.02	0.10		100.32	2.492
14 D3. V	55.11	16.07	3.04	8.46	3.10	6.46	1.58	5.07	0.89			0.75			100.53	2.546
15 D3. V	52.71	14.41	2.22	8.03	5.11	11.06	1.34	2.55	1.01			1.47	0.12		100.03	2.816
16 D4. V	52.35	15.08	trace	8.38	5.41	11.12	1.28	4.12	1.84			0.85	trace		100.43	2.735
17 D3. V	52.16	15.03	8.17	8.42	4.69	10.07	2.38	2.47	0.72			1.15	0.24		100.50	2.749

LEUCITE TEPHRITE, ETC.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Cerro de las Virgenes, Lower California, Mexico.	Jäger.	K. v. Chrustchoff, T. M. P. M., VI, p. 168, 1885.	Leucitophyre.	In W. T., p. 461.
2	Santa Cruz, Rio de Janeiro, Brazil.	Not stated.	E. Hussak, N. J., II, p. 152, 1892.	Leucite tephrite.	Alkalies by difference. In W. T., p. 461.
3	Clermain, near Cluny, Maconnais, France.	Not stated.	Michel-Levy and Lacroix, B. Sv. Ct. G. Fr., VII, No. 45, p. 9, 1895.	Leucotephrite.	In W. T., p. 461.
4	Mondhalde, Kaiserstuhl, Baden.	K. Gruss.	K. Gruss, Mt. Bad. G. L.-A., IV (2), p. 97, 1901.	Mondhaldeite.	Not in W. T.
5	Föhrenberg, Kaiserstuhl, Baden.	K. Gruss.	K. Gruss, Mt. Bad. G. L.-A., IV (2), p. 97, 1901.	Mondhaldeite.	In W. T., p. 271.
6	Steinberg, near Giessen, Hesse.	A. Streng.	W. Schottler, Abh. G. L.-A. Darm., IV (3), p. 456, 1908.	Leucite basanite.	
7	Arnsburg, near Giessen, Hesse.	A. Streng.	W. Schottler, Abh. G. L.-A. Darm., IV (3), p. 456, 1908.	Leucite basanite.	
8	Eckmannsbain, Vogelsberg, Hesse.	H. Sommerlad.	H. Sommerlad, N. J., II, p. 223, 1884.	Leucite basalt.	In W. T., p. 347.
9	Birkigt, near Tetschen, Bohemia.	R. Pfohl.	J. E. Hibsch, T. M. P. M., XIV, p. 108, 1894.	Nosean-leucite tephrite.	In W. T., p. 283.
10	Falkenberg, near Tetschen, Bohemia.	F. Hanusch.	J. E. Hibsch, T. M. P. M., XIV, p. 107, 1894.	Nephelite-leucite tephrite.	In W. T., p. 315.
11	Montalto, Lake Bolsena, Italy.	L. Ricciardi.	C. Klein, Sb. Pr. Ak. W., p. 115, 1888.	Leucite basanite.	Also in N. J. B. B., VI, p. 28, 1889. In W. T., p. 461.
12	Montalto, Lake Bolsena, Italy.	L. Ricciardi.	C. Klein, Sb. Pr. Ak. W., p. 115, 1888.	Leucite basanite.	Also in N. J. B. B., VI, p. 28, 1889. In W. T., p. 461.
13	Montalto, Lake Bolsena, Italy.	L. Ricciardi.	C. Klein, Sb. Pr. Ak. W., p. 115, 1888.	Leucite basanite.	Also in N. J. B. B., VI, p. 28, 1889. In W. T., p. 461.
14	Montalto, Lake Bolsena, Italy.	L. Ricciardi.	C. Klein, Sb. Pr. Ak. W., 1888, p. 115.	Leucite basanite.	Also in N. J. B. B., VI, p. 28, 1889. In W. T., p. 461.
15	Canonica, near Orvieto, Italy.	L. Ricciardi.	C. Klein, Sb. Pr. Ak. W., 1888, p. 108.	Leucitite.	Also in N. J. B. B., VI, p. 20, 1889. In W. T., p. 461.
16	Mezzano, Lake Bolsena, Italy.	L. Ricciardi.	C. Klein, Sb. Pr. Ak. W., 1888, p. 106.	Leucite tephrite.	Also in N. J. B. B., VI, p. 19, 1889. In W. T., p. 315.
17	Monte Bisenzio, Lake Bolsena, Italy.	L. Ricciardi.	C. Klein, Sb. Pr. Ak. W., 1888, p. 106.	Leucite tephrite.	Also in N. J. B. B., VI, p. 19, 1889. In W. T., p. 461.

LEUCITE TEPHRITE, ETC.—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
18 D3. V	51.94	14.78	2.94	9.13	2.63	8.51	2.08	5.33	2.12			0.62	0.17		100.25	
19 D3. V	51.24	15.26	3.70	8.48	4.04	7.63	1.08	2.85	5.29			0.58	0.12		100.27	
20 D3. V	50.19	16.86	2.12	7.32	3.66	11.40	2.11	3.78	1.17			1.39	0.21		100.21	2.708
21 D3. V	49.63	11.90	2.64	9.16	8.02	12.78	1.08	3.58	1.27			trace	trace	Li_2O trace	100.06	2.876
22 D3. V	48.30	15.07	1.53	9.18	7.48	13.95	0.94	1.73	1.78			0.47	0.29		100.72	
23 D3. V	49.34	18.99	3.11	6.07	3.51	7.89	1.89	6.03	1.98			1.31	0.26		100.38	2.562
24 D3. V	49.23	15.04	1.39	9.03	8.02	13.58	1.07	1.54	0.93			0.17	0.37		100.37	
25 D3. V	49.18	16.07	1.17	8.94	5.43	13.26	1.25	2.07	1.62			0.41	0.42	SO_3 0.48	100.30	
26 D3. V	48.84	15.45	2.78	9.62	5.37	13.29	1.24	1.83	0.72			0.22	0.34	SO_3 0.56	100.26	
27 D3. V	47.61	17.38	2.03	7.24	6.21	15.61	0.86	1.81	0.64			0.61	0.21		100.21	2.731
28 D3. V	49.03	16.07	1.76	10.05	3.94	12.04	1.73	3.06	1.38			0.27	0.44	SO_3 0.57	100.34	
29 D3. V	48.75	16.03	1.83	10.12	4.02	11.72	1.89	2.94	1.39			0.31	0.42	SO_3 0.62	100.04	
30 D3. V	49.03	15.18	2.07	6.32	6.05	12.58	1.49	4.07	2.09			0.86	0.19		99.93	2.743
31 D3. V	48.51	14.56	3.21	8.19	4.12	10.69	2.15	4.24	2.80			0.95	0.16		99.58	2.726
32 D3. V	48.28	16.51	3.07	7.62	4.03	12.50	0.86	1.84	3.51			1.71	0.16		100.09	2.769
33 D3. V	48.09	13.60	2.52	9.36	6.75	13.05	1.41	3.07	1.62			0.41	0.10		99.98	2.762

LEUCITE TEPHRITE, ETC.—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
18	Fosso Pantacciano, Lake Bolsena, Italy.	L. Ricciardi.	C. Klein, Sb. Pr. Ak. W., 1888, p. 111.	Leucite basanite.	Also in N. J. B. B., VI, p. 23, 1889. In W. T., p. 461.
19	Toscanella, near Lake Bolsena, Italy.	L. Ricciardi.	C. Klein, Sb. Pr. Ak. W., 1888, p. 106.	Leucite tephrite.	Also in N. J. B. B., VI, p. 19, 1889. In W. T., p. 461.
20	San Magno, Lake Bolsena, Italy.	L. Ricciardi.	C. Klein, Sb. Pr. Ak. W., 1888, p. 108.	Leucite tephrite.	Also in N. J. B. B., VI, p. 20, 1889. In W. T., p. 461.
21	Monte Jugo, near Lake Bolsena, Italy.	L. Ricciardi.	L. Ricciardi, At. Soc. It. Mil., XXVIII, p. 130, 1885.	"Basalt" (leucitite).	Cf. No. 2, III.7.2.2. In W. T., p. 315.
22	Monte Jugo, near Lake Bolsena, Italy.	L. Ricciardi.	C. Klein, Sb. Pr. Ak. W., 1888, p. 108.	Leucitite.	Also in N. J. B. B., VI, p. 20, 1889. Cf. No. 2, III.7.2.2. In W. T., p. 463.
23	Gradoli, Lake Bolsena, Italy.	L. Ricciardi.	C. Klein, Sb. Pr. Ak. W., 1888, p. 119.	Leucite tephrite tuff.	Also in N. J. B. B., VI, p. 32, 1889. In W. T., p. 461.
24	Montefiascone, Lake Bolsena, Italy.	L. Ricciardi.	C. Klein, Sb. Pr. Ak. W., 1888, p. 111.	Leucite basanite.	Also in N. J. B. B., VI, p. 23, 1889. In W. T., p. 461.
25	Montefiascone, Lake Bolsena, Italy.	L. Ricciardi.	C. Klein, Sb. Pr. Ak. W., 1888, p. 108.	Leucitite.	Also in N. J. B. B., VI, p. 20, 1889. In W. T., p. 463.
26	Montefiascone, Lake Bolsena, Italy.	L. Ricciardi.	C. Klein, Sb. Pr. Ak. W., 1888, p. 108.	Leucitite.	Also in N. J. B. B., VI, p. 20, 1889. In W. T., p. 463.
27	Montefiascone, Lake Bolsena, Italy.	L. Ricciardi.	C. Klein, Sb. Pr. Ak. W., 1888, p. 111.	Leucite basanite.	Also in N. J. B. B., VI, p. 23, 1889. In W. T., p. 463.
28	Sassi Lanciati, Lake Bolsena, Italy.	L. Ricciardi.	C. Klein, Sb. Pr. Ak. W., 1888, p. 108.	Leucitite.	Also in N. J. B. B., VI, p. 20, 1889. In W. T., p. 463.
29	Sassi Lanciati, Lake Bolsena, Italy.	L. Ricciardi.	C. Klein, Sb. Pr. Ak. W., 1888, p. 108.	Leucitite.	Also in N. J. B. B., VI, p. 20, 1889. In W. T., p. 463.
30	Madonna dell' Olivo, Toscanella, near Lake Bolsena, Italy.	L. Ricciardi.	C. Klein, Sb. Pr. Ak. W., 1888, p. 111.	Leucite basanite.	Also in N. J. B. B., VI, p. 23, 1889. In W. T., p. 315.
31	Fosso Pantacciano, Lake Bolsena, Italy.	L. Ricciardi.	C. Klein, Sb. Pr. Ak. W., 1888, p. 108.	Leucitite.	Also in N. J. B. B., VI, p. 20, 1889. In W. T., p. 461.
32	Santa Trinita, Orvieto, Italy.	L. Ricciardi.	C. Klein, Sb. Pr. Ak. W., 1888, p. 106.	Leucite tephrite.	Also in N. J. B. B., VI, p. 19, 1889. In W. T., p. 463.
33	Valentano, Lake Bolsena, Italy.	L. Ricciardi.	C. Klein, Sb. Pr. Ak. W., 1888, p. 111.	Leucite basanite.	Also in N. J. B. B., VI, p. 23, 1889. In W. T., p. 463.

LEUCITE TEPHRITE, ETC.—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
34 B3. IV	50.24	20.09	2.54	5.65	3.65	7.83	2.97	7.45	0.36				trace		100.78	
35 C3. V	57.63	20.88	0.18	5.15	0.96	3.82	3.14	6.39	1.66						99.81	2.57
36 B3. IV	56.96	16.60	5.92	3.11	1.45	4.00	3.76	7.81	0.35				0.36		100.32	2.63
37 C3. V	56.20	20.44	3.91	2.70	1.32	4.41	6.25	4.46	0.52						100.21	
38 C3. V	55.44	19.23	5.07	3.05	2.50	5.96	3.29	5.68	0.75			0.18	trace		100.15	
39 D3. V	54.97	16.88	4.39	3.39	1.23	4.59	7.91	5.30	0.21						99.87	2.60
40 C3. V	54.07	19.21	2.74	1.29	0.73	2.35	4.18	3.59	11.91			0.42			100.49	
41 C3. V	52.59	22.21	5.35	1.77	1.87	5.51	3.55	5.66	1.68						100.19	
42 B3. IV	53.80	15.61	4.71	4.77	2.22	6.45	4.91	6.71	1.46						100.64	2.64
43 C3. V	53.77	20.93	1.05	4.58	2.88	8.14	2.57	6.32	0.07						100.31	2.74
44 C3. V	52.07	12.73	10.28	4.88	2.62	5.78	4.85	6.18	0.41				0.45		100.25	2.68
45 D3. V	52.00	17.96	2.38	1.15	1.19	4.34	2.30	5.82	11.49				1.42		100.05	
46 D3. V	49.70	21.23	1.52	1.95	1.70	4.61	3.59	5.59	10.15			0.17			100.21	
47 D3. V	49.56	17.63	4.87	0.85	1.35	5.71	1.98	3.08	15.41			trace			100.44	
48 A4. IV	49.73	19.20	5.50	2.41	(2.63)	7.96	1.99	9.39	n. d.						100.00	
49 D4. V	51.42	18.57	n. d.	8.47	0.48	2.74	10.38	6.42	0.88			0.14	trace	SO_3 0.73	100.23	2.49
50 D4. V	48.38	19.03	n. d.	10.57	1.13	5.69	4.40	8.65	0.64		0.15	0.33	trace	SO_3 1.64	100.61	2.67
51 D4. V	47.50	28.38	3.68	n. d.	1.36	5.03	trace	4.60	6.00	3.40			trace	Cr_2O_3 trace	99.95	2.35

LEUCITE TEPHRITE, ETC.—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
34	Monte Cavallo, Orvieto, Italy.	H. S. Washington.	H. S. Washington, J. G., V, p. 370, 1897.	Leucite tephrite.	In W. T., p. 297.
35	Fontana di Fiescoli, Vico Volcano, Viterbo, Italy.	G. Aichino.	V. Sabatini, Vulc. Cim., p. 506, 1912.	Leucite tephrite.	
36	Carbognano, Vico Volcano, Viterbo, Italy.	G. Aichino.	V. Sabatini, Vulc. Cim., p. 506, 1912.	Leucite tephrite.	
37	Vetralla, Vico Volcano, Viterbo, Italy.	G. Aichino.	V. Sabatini, Vulc. Cim., p. 506, 1912.	Leucite tephrite.	
38	Vetralla, Vico Volcano, Viterbo, Italy.	G. Aichino.	V. Sabatini, Vulc. Cim., p. 507, 1912.	Leucite tephrite tuff.	
39	Monte Fogliano, Vico Volcano, Viterbo, Italy.	G. Aichino.	V. Sabatini, Vulc. Cim., p. 506, 1912.	Leucite tephrite.	
40	Near Canepina, Vico Volcano, Viterbo, Italy.	G. Aichino.	V. Sabatini, Vulc. Cim., p. 507, 1912.	Leucite tephrite tuff.	
41	Fornace Falcioni, Vico Volcano, Viterbo, Italy.	G. Aichino.	V. Sabatini, Vulc. Cim., p. 507, 1912.	Leucite tephrite tuff.	
42	Vetralla, Vico Volcano, Viterbo, Italy.	G. Aichino.	V. Sabatini, Vulc. Cim., p. 506, 1912.	Leucite tephrite.	
43	Casale Lomellini, Vico Volcano, Viterbo, Italy.	G. Aichino.	V. Sabatini, Vulc. Cim., p. 506, 1912.	Leucite tephrite.	
44	San Martino, Vico Volcano, Viterbo, Italy.	G. Aichino.	V. Sabatini, Vulc. Cim., p. 506, 1912.	Leucite tephrite.	
45	Vetralla, Vico Volcano, Viterbo, Italy.	G. Aichino.	V. Sabatini, Vulc. Cim., p. 507, 1912.	Leucite tephrite tuff.	
46	Ronciglione, Vico Volcano, Viterbo, Italy.	G. Aichino.	V. Sabatini, Volc. Cim., p. 507, 1912.	Leucite tephrite tuff.	
47	Civita Castellana, Vico Volcano, Viterbo, Italy.	G. Aichino.	V. Sabatini, Vulc. Cim., p. 507, 1912.	Leucite tephrite tuff.	
48	Madonna del Riposo, Bracciano, Italy.	H. S. Washington.	H. S. Washington, J. G., V, p. 49, 1897.	Leucite tephrite.	MgO by difference. Cf. No. 4, II.6.2.2. In W. T., p. 305.
49	Tavolato, Alban Hills, near Rome, Italy.	G. Aichino.	V. Sabatini, Mem. C. G. It., X, p. 164, 1900.	Hauyne-leucite tephrite.	Cf. No. 2, I.7.1.3. In W. T., p. 463.
50	Lago di Nemi, Alban Hills, Italy.	G. Aichino.	V. Sabatini, Mem. C. G. It., X, p. 164, 1900.	Hauyne-leucite tephrite.	In W. T., p. 463.
51	Via Ardeatina, Alban Hills, Italy.	Trottarelli.	A. Verri, B. Soc. G. It., XII, p. 72, 1893.	Leucitite tuff.	In W. T., p. 463.

LEUCITE TEPHRITE, ETC.—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
52 D4. V	46.85	21.49	5.21	n. d.	0.96	8.54	trace	4.68	8.10	3.80			trace	Cr_2O_3 trace	99.63	2.16
53 D4. V	46.59	27.12	5.83	n. d.	0.53	4.76	trace	2.04	8.90	3.90			trace	Cr_2O_3 trace	100.67	2.02
54 C4. V	46.57	19.86	n. d.	8.97	1.82	10.38	3.13	7.48	1.29			0.44	0.93		100.87	2.67
55 C4. V	45.93	18.27	n. d.	9.39	4.41	10.98	3.99	6.28	0.83		0.09	0.39	0.06	SO_3 trace	100.62	2.62
56 C4. V	45.71	17.90	n. d.	9.69	3.87	10.56	4.85	5.21	1.82		trace	0.34	0.54	SO_3 0.12	100.61	2.78
57 C4. V	45.02	22.57	n. d.	8.94	2.35	10.09	3.28	7.13	0.91			0.40	trace		100.69	2.83
58 D4. V	46.15	23.19	6.42	n. d.	2.25	8.52	trace	3.01	5.50	4.90			trace	Cr_2O_3 trace	99.94	2.33
59 D4. V	47.68	31.64	11.48	n. d.	3.27	3.87	1.72	0.21	—		0.63	0.35			100.85	
60 D4. V	44.69	22.47	9.81	n. d.	5.32	10.54	(6.59)		0.58						100.00	
61 C3. V	49.23	17.69	6.87	2.03	4.20	12.73	2.05	5.18	0.80			0.30			101.08	2.885
62 C4. V	47.34	16.35	n. d.	10.23	4.26	11.02	3.09	5.96	0.63			0.46			99.34	2.81
63 C4. V	49.57	18.05	n. d.	9.44	2.52	9.38	3.26	6.55	0.43			0.23			99.43	2.81
64 D4. V	48.24	14.65	n. d.	10.33	5.57	14.32	3.04	2.46	0.13			0.04			98.78	2.91
65 C4. V	47.58	14.36	n. d.	10.63	2.14	12.94	3.31	7.00	0.25			0.32	0.85		99.44	2.88
66 D4. V	46.87	17.10	n. d.	9.41	4.78	11.35	3.79	5.54	0.18			0.43			99.45	2.57
67 D4. V	46.39	18.88	n. d.	8.51	7.58	12.45	2.46	2.70	0.13			0.30			99.40	2.92
68 C4. V	46.36	14.87	n. d.	11.03	5.01	10.76	2.62	7.56	0.50			0.67			99.42	2.78
69 D4. V	46.25	14.93	n. d.	10.69	6.56	11.77	3.33	5.35	0.02			0.57			99.47	2.86

LEUCITE TEPHRITE, ETC.—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
52	Casale Caffarella, Alban Hills, Italy.	Trottarelli.	A. Verri, B. Soc. G. It., XII, p. 54, 1893.	Leucitite tuff.	In W. T., p. 463.
53	Alban Hills, Italy.	Trottarelli.	A. Verri, B. Soc. G. It., XII, p. 60, 1893.	Leucitite tuff.	In W. T., p. 463.
54	Rocca di Papa, Alban Hills, Italy.	G. Aichino.	V. Sabatini, Mem. C. G. It., X, p. 163, 1900.	Leucitite.	In W. T., p. 463.
55	Rocca di Papa, Alban Hills, Italy.	G. Aichino.	V. Sabatini, Mem. C. G. It., X, p. 163, 1900.	"Sperone" (altered leucitite).	In W. T., p. 463.
56	Rocca di Papa, Alban Hills, Italy.	G. Aichino.	V. Sabatini, Mem. C. G. It., X, p. 163, 1900.	"Sperone" (altered leucitite).	In W. T., p. 463.
57	Rocca di Papa, Alban Hills, Italy.	G. Aichino.	V. Sabatini, Mem. C. G. It., X, p. 163, 1900.	Leucitite.	In W. T., p. 463.
58	Cava di San Paolo, Alban Hills, Italy.	Trottarelli.	A. Verri, B. Soc. G. It., XII, p. 53, 1893.	Leucitite tuff.	In W. T., p. 463.
59	Catacomb of St. Sebastian, Rome, Italy.	G. H. Miller.	N. Knight, School of Sci. and Math., XIII, p. 666, 1913.	Tuff.	
60	Lunghezza, near Rome, Italy.	A. Rosati.	A. Rosati, B. Soc. G. It., XXX, p. 28, 1911.	Leucitite.	Alkalies by difference. Other analyses in same paper.
61	Morolo, Hernican District, South of Rome, Italy.	C. Viola.	C. Viola, N. J., I, p. 97, 1899.	Leucite basalt.	In W. T., p. 301.
62	Morolo, Hernican District, South of Rome, Italy.	G. Aichino.	C. Viola, B. C. G. It., XXXIII, p. 120, 1902.	Leucite basalt.	
63	Ticchiena, Hernican District, South of Rome, Italy.	G. Aichino.	C. Viola, B. C. G. It., XXXIII, p. 120, 1902.	Leucite tephrite.	Cf. No. 3, III.8.2.2.
64	Sant' Arcangelo, near Ceccano, Hernican District, Italy.	G. Aichino.	C. Viola, B. C. G. It., XXXIII, p. 120, 1902.	Leucite basalt.	
65	Anticoli di Campagna, Hernican District, Italy.	G. Aichino.	C. Viola, B. C. G. It., XXXIII, p. 120, 1902.	Leucitite.	
66	Pofi, Hernican District, South of Rome, Italy.	G. Aichino.	C. Viola, B. C. G. It., XXXIII, p. 120, 1902.	Leucite tephrite.	Cf. No. 4, III.8.2.2.
67	San Francesco, near Ceccano, Hernican District, Italy.	G. Aichino.	C. Viola, B. C. G. It., XXXIII, p. 120, 1902.	Leucite basanite.	
68	Callame, near Ceccano, Hernican District, Italy.	G. Aichino.	C. Viola, B. C. G. It., XXXIII, p. 120, 1902.	Leucitite.	
69	Villa San Stefano, Hernican District, Italy.	G. Aichino.	C. Viola, B. C. G. It., XXXIII, p. 120, 1902.	Leucite basalt.	

LEUCITE TEPHRITE, ETC.—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
70 D4. V	46.14	12.60	n. d.	9.80	3.82	11.71	7.87	6.62	0.28			0.37			99.10	2.79
71 D4. V	45.55	17.04	n. d.	12.02	6.62	7.53	2.06	6.56	0.52			0.74			98.64	2.86
72 D3. V	47.40	19.84	2.72	4.40	4.23	9.88	2.93	5.91	1.66		0.30				99.27	
73 C4. V	59.92	18.09	4.52	n. d.	0.44	2.19	6.23	7.24	1.17						99.80	
74 D4. V	48.83	20.07	7.97	n. d.	1.14	11.85	3.32	7.04	n. d.			1.21	0.50		101.93	
75 B3. IV	48.15	18.44	7.57	2.75	4.43	8.24	2.87	5.83	—			0.74	0.39	BaO 0.10 SrO 0.03	99.55	
76 B3. IV	48.12	19.08	7.71	2.77	3.73	7.95	2.53	6.40	—			0.85	0.42	BaO 0.09 SrO 0.03	99.68	
77 D3. V	47.85	16.82	12.00	n. d.	2.65	7.23	2.53	7.19	—		0.20	0.66	0.48	SO_3 1.13 Cl 0.19 NH_3 0.01	98.94 (98.48)	
78 D4. V	47.79	20.47	8.60	n. d.	4.67	10.90	1.82	5.20				0.38	0.49		100.47	
79 D4. V	47.16	20.38	9.92	n. d.	2.83	10.25	2.30	6.91	0.20			0.34	0.33		100.62	
80 C4. V	47.25	18.17	9.23	n. d.	3.74	8.65	3.93	7.15	0.94		trace				99.06	2.723
81 D2. V	43.69	16.75	12.29	2.72	2.30	11.97	4.63	4.66	n. d.		0.17		0.30	SO_3 0.93 Cl 0.60 SO_2 0.02 NH_3 0.03 NO_3 trace CuO 0.08	101.14	
82 D4. V	41.74	17.71	25.34	n. d.	0.21	5.31	1.92	0.10	3.72			1.43		SO_3 1.52 Cl 0.24 NH_3 trace	99.24	
83 D4. V	51.38		26.35		6.03	9.09	4.76	3.33							100.93	
84 B4. V	47.13	14.47	13.56	n. d.	4.16	9.60	0.81	8.00	2.94						100.07	
85 D4. V	47.31	18.51	14.56	n. d.	2.28	7.57	0.98	6.14	2.31			0.55			100.21	2.910
86 D4. V	46.43	15.99	15.04	n. d.	1.74	9.27	0.51	6.93	3.20			0.73			99.84	2.890

HAUYNOPHYRE, ETC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 D4. V	54.00	24.10	8.95	n. d.	2.35	4.65	5.60	1.58	n. d.					SO_3 n. d.	101.23	
2 D4. V	53.60	22.57	6.78	n. d.	3.92	5.80	5.11	4.01	n. d.					SO_3 trace	101.79	

LEUCITE TEPHRITE, ETC.—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
70	Patrica, Hernican District, South of Rome, Italy.	G. Aichino.	C. Viola, B. C. G. It., XXXIII, p. 120, 1902.	Leucitite.	
71	Giuliano di Roma, Hernican District, Italy.	G. Aichino.	C. Viola, B. C. G. It., XXXIII, p. 120, 1902.	Leucite basalt.	
72	Orchi, Rocca Monfina Volcano, Italy.	A. Röhrig.	H. S. Washington, J. G., V, p. 247, 1897.	Leucite tephrite.	Cf. No. 4, II.5.3.2. In W. T., p. 305.
73	Lava of 1822, Mount Vesuvius.	A. Lagorio.	A. Lagorio, T. M. P. M., VIII, p. 475, 1887.	Obsidian.	In W. T., p. 465.
74	Lava of 1906, Mount Vesuvius.	S. Stoklassa.	L. v. Szatmary, F. K., XXXVII, p. 182, 1907.	Leucite tephrite.	
75	Ashes of 1906, Mount Vesuvius.	Casoria.	H. J. Johnston-Lavis, Tr. R. Dub. Soc., IX, p. 166, 1909.	(Leucite tephrite).	3 decimals.
76	Ashes of 1906, Mount Vesuvius.	Casoria.	H. J. Johnston-Lavis, Tr. R. Dub. Soc., IX, p. 166, 1909.	(Leucite tephrite).	3 decimals.
77	Ashes of 1906, Mount Vesuvius.	G. Kernot.	G. Kernot, Rend. Ac. Sci. Nap. (3), XII, p. 461, 1906.	(Leucite tephrite).	4 decimals. Other analyses in same paper.
78	Lava of 1906, Mount Vesuvius.	F. Heurich.	F. Heurich, Sb. Ph. Ges. Erl., XLIII, p. 205, 1912.	Leucite tephrite.	Interior of flow.
79	Lava of 1906, Mount Vesuvius.	F. Heurich.	F. Heurich, Sb. Ph. Ges. Erl., XLIII, p. 205, 1912.	Leucite tephrite.	Surface of flow.
80	Mount Vesuvius.	A. Lagorio.	A. Lagorio, T. M. P. M., VIII, p. 486, 1887.	Leucite tephrite.	In W. T., p. 465.
81	Ashes of 1906, Mount Vesuvius.	Comanducci and Pescitelli.	Comanducci and Pescitelli, Rend. Ac. Sc. Nap. (3), XII, p. 278, 1906.	(Leucite tephrite).	3 decimals.
82	Ashes of 1904, Mount Vesuvius.	Comanducci and Pescitelli.	Comanducci and Pescitelli, Rend. Ac. Sc. Nap. (3), XI, p. 253, 1905.	(Leucite tephrite).	3 decimals. Cf. No. 15, II.6.2.3.
83	Volcanello, Vulcano, Æolian Islands.	H. Bäckström.	H. Bäckström, G. F. F., XVIII, p. 159, 1896.	Leucite basanite.	In W. T., p. 465.
84	Pangkadjene, Celebes.	W. Bruhns.	H. Bücking, Ber. Nf. Ges. Freib., XI, p. 83, 1900.	Leucite basalt.	In W. T., p. 465.
85	El Capitan, Canbeligo County, New South Wales.	J. C. H. Mingaye.	David and Anderson, Rec. G. S. N. S. W., I, p. 156, 1890.	Leucite basalt.	Cf. No. 11, IV.2.2.2.2. In W. T., p. 465.
86	By rock, New South Wales.	J. C. H. Mingaye.	David and Anderson, Rec. G. S. N. S. W., I, p. 156, 1890.	Leucite basalt.	In W. T., p. 465. Cf. No. 2, III.8.1.2.

HAUYNOPHYRE, ETC.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Aiguille de Guery, Mont Dore, Auvergne.	E. Bonjean.	E. Bonjean, C. R., CXXVIII, p. 1097, 1899.	Hauyne tephrite.	In W. T., p. 465.
2	La Quenille, Mont Dore, Auvergne,	E. Bonjean.	E. Bonjean, C. R. CXVIII, p. 1097, 1899.	Hauyne tephrite.	In W. T., p. 465.

HAUYNOPHYRE, ETC.—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
3 D4. V	53.20	24.16	7.07	n. d.	2.20	6.38	4.44	3.21	n. d.					SO_3 0.50	100.16	
4 D4. V	53.00	22.63	7.50	n. d.	2.47	7.14	1.72	5.89	n. d.					SO_3 0.25	100.60	
5 D4. V	52.80	21.95	10.96	n. d.	3.06	7.05	4.37	2.39	n. d.					SO_3 n. d.	102.58	
6 D3. V	54.48	21.67	1.21	2.77	1.44	5.05	7.43	4.65	2.66		0.33	trace		SO_3 0.21 Cl 0.07	102.02	
7 B3. IV	49.06	16.07	7.92	2.41	2.65	8.21	5.17	3.18	2.27		0.81	0.61	0.98	CO_2 1.21 SO_3 trace Cl trace	100.55	2.631
8 C4. V	55.02	21.81	2.40	0.75	0.73	3.08	2.79	5.61	7.63			0.19		Cl n. d.	100.01	
9 C3. V	51.84	18.96	6.25	3.55	1.34	5.07	3.00	3.21	4.85		0.43		0.43	SO_3 n. d.	98.93	2.637
10 C4. V	50.35	21.50	5.97	trace	0.15	4.51	7.79	5.68	3.64				0.42	CO_2 0.52 SO_3 n. d.	100.53	2.567
11 D3. V	50.80	20.41	3.13	5.36	2.48	6.40	3.44	2.95	2.67		0.15	trace	0.70	Cl 0.08	98.57	
12 D3. V	47.71	9.37	5.31	9.53	7.06	15.13	2.21	1.01	0.41			trace	0.81	SO_3 2.12	100.67	2.992
13 D3. V	46.72	19.50	3.03	5.02	4.41	16.28	2.09	1.24	1.13			0.73	0.37	SO_3 n. d.	100.52	3.012
14 D3. V	45.37	14.11	5.06	7.08	7.56	17.11	1.34	0.62	0.65			0.28	0.26	SO_3 1.30	100.74	2.574
15 D3. V	42.78	11.07	17.07	5.51	4.23	12.57	1.11	0.72	4.02			0.31	0.42	SO_3 0.52	100.33	
16 D3. V	42.63	18.91	5.06	9.16	3.60	12.11	2.66	1.35	2.12			0.34	0.36	SO_3 2.07	100.37	2.538
17 D3. V	42.16	16.25	3.02	9.03	3.11	10.05	2.13	7.06	2.13			0.26	0.72	SO_3 4.11	100.03	2.615
18 D3. V	39.74	10.27	6.07	13.11	4.18	19.11	3.12	0.63	0.50			0.41	0.63	SO_3 3.26	101.03	2.630
19 D3. V	41.77	14.05	4.21	11.03	3.40	12.52	6.23	1.38	1.80			trace	1.23	SO_3 2.65	100.27	
20 D3. V	36.35	12.37	5.26	11.71	7.46	16.82	2.07	1.38	4.11			0.63	0.42	SO_3 2.12	100.80	2.840
21 D3. V	47.29	15.46	12.00	2.35	1.32	1.61	14.74	1.23	1.85				trace	SO_3 n. d. Cl n. d. S trace	97.87	
22 D3. V	58.9	18.8	2.2	1.8	3.2	2.7	6.6	3.5	2.7		1.0			SO_3 0.22 Cl 0.15	101.77	2.44

HAUYNOPHYRE, ETC.—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
3	Roc Blanc, Mont Dore, Auvergne.	E. Bonjean.	E. Bonjean, C. R., CXXVIII, p. 1097, 1889.	Hauyne tephrite.	In W. T., p. 465.
4	Roc Blanc? Mont Dore, Auvergne.	E. Bonjean.	E. Bonjean, C. R., CXXVIII, p. 1097, 1899.	Hauyne tephrite.	In W. T., p. 465.
5	Roc Blanc? Mont Dore, Auvergne.	E. Bonjean.	E. Bonjean, C. R., CXXVIII, p. 1097, 1899.	Hauyne tephrite.	In W. T., p. 465.
6	Hohenstein, Bohemia.	R. Pfohl.	J. E. Hibsch, T. M. P. M., XIX, p. 82, 1900.	Sodalite tephrite.	In W. T., p. 465.
7	Grosspriesen, Bohemia.	F. Hanusch.	J. E. Hibsch, T. M. P. M., XXI, p. 160, 1902.	Sodalite syenite.	Not fresh. MnO high.
8	Boschnei, Mittelgebirge, Bohemia.	C. F. Eichleiter.	G. Irgang, T. M. P. M., XXVIII, p. 67, 1909.	Sodalite gauteite.	Not fresh.
9	Spitzberg, Melnik, Mittelgebirge, Bohemia.	J. Hanusch.	B. Zahalka, Sb. Böhm. Ges. W., Art. III, p. 57, 1905.	Hauyne trachyte.	
10	Vratenské, Mittelgebirge, Bohemia.	E. Kohn.	B. Zahalka, Sb. Böhm. Ges. W., Art. III, p. 57, 1905.	Hauyne trachyte.	
11	Pihlberg, Polzen District, Bohemia.	Donath.	K. H. Scheumann, Abh. Sächs. Ges. W., XXXII, p. 757, 1913.	Sodalite trachyte.	
12	Monte Vulture, Apulia, Italy.	L. Ricciardi.	L. Ricciardi, Gaz. Chim. It., XVII, p. (5), 1887.	Lava (hauynophyre?).	In W. T., p. 465.
13	Monte Vulture, Apulia, Italy.	L. Ricciardi.	L. Ricciardi, Gaz. Chim. It., XVII, p. (5), 1887.	Lava (hauynophyre?).	In W. T., p. 465.
14	Monte Vulture, Apulia, Italy.	L. Ricciardi.	L. Ricciardi, Gaz. Chim. It., XVII, p. (6), 1887.	Lava (hauynophyre).	In W. T., p. 465.
15	Monte Vulture, Apulia, Italy.	L. Ricciardi.	L. Riciardi, Gaz. Chim. It., XVII, p. (7), 1887.	"Oolitic rock" (hauynophyre?).	In W. T., p. 465.
16	Melfi, Monte Vulture, Apulia, Italy.	L. Ricciardi.	L. Ricciardi, Gaz. Chim. It., XVII, p. (10), 1887.	Hauynophyre.	Cf. No. 2, II.8.2.4. In W. T., p. 465.
17	Melfi, Monte Vulture, Apulia, Italy.	L. Ricciardi.	L. Ricciardi, Gaz. Chim. It., XVII, p. (9), 1887.	Hauynophyre.	Cf. No. 2, II.8.2.4. In W. T., p. 465.
18	Melfi, Monte Vulture, Apulia, Italy.	L. Ricciardi.	L. Ricarriardi, Gaz. Chim. It., XVII, p. (9), 1887.	Hauynophyre.	Cf. No. 2, II.8.2.4. In W. T., p. 467.
19	Monte Vulture, Apulia, Italy.	L. Ricciardi.	L. Ricciardi, Gaz. Chim. It., XVII, p. (8), 1887.	Hauynophyre tuff.	In W. T., p. 467.
20	Monte Vulture, Apulia, Italy.	L. Ricciardi.	L. Ricciardi, Gaz. Chim. It., XVII, p. (6), 1887.	Lava (hauynophyre?).	In W. T., p. 467.
21	Tavajokthal, Lujavrurt, Kola, Finland.	H. Blankett.	W. Ramsay, Fennia, XV, No. 2, p. 25, 1899.	Tavite.	Not in W. T.
22	Senoudebou, French Sudan.	H. Arsandaux.	H. Arsandaux, C. R., CXXXVIII, p. 164, 1904.	Nosean trachyte.	

IJOLITE, ETC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 D4. V	45.18	23.31	6.11	n. d.	1.45	4.62	11.17	5.95	1.14						98.93	
2 D3. V	46.63	15.03	5.91	5.09	3.47	11.23	8.16	1.96	0.35		1.12		trace		98.95	
3 D3. V	42.79	19.89	4.39	2.33	1.87	11.76	9.31	1.67	0.99		1.70	1.70	0.41		98.81	

LIMBURGITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 B3. IV	42.55	14.10	4.10	7.10	10.80	11.20	3.05	1.86	2.00		4.47				101.23	
2 C4. V	42.30	12.74	10.60	n. d.	12.74	13.01	2.65	0.94	2.54		1.51				99.03	
3 D4. V	44.47	10.97	n. d.	13.08	6.24	12.66	4.58	1.68	(2.27)		3.56		trace	CO_2 none	99.43	
4 C4. V	43.33	11.06	n. d.	15.25	6.24	12.66	4.58	1.68	1.43		4.63		trace	CO_2 none	100.86	
5 C4. V	42.61	11.55	n. d.	12.27	12.10	13.43	1.06	2.80	n. d.		4.33				100.15	
6 C4. V	40.48	8.93	20.05	n. d.	11.12	13.03	2.05	1.26	3.37						100.29	2.931
7 C2. IV	43.18	13.43	5.06	6.41	11.79	10.39	3.05	1.41	2.36		2.16	0.38		CO_2 0.43 X 0.80 Cl 0.23	101.08	3.021
8 D3. V	43.47	22.00	3.47	7.79	3.40	14.08	2.98	0.91	0.94		1.79	0.91			101.74	
9 D2. IV	42.21	17.45	5.90	6.60	11.00	12.60	1.12	0.87	0.98		1.90	0.93			101.56	
10 D4. V	43.21	13.22	5.74	7.34	13.03	9.82	1.61	n. d.	2.47	0.76	2.15				102.23	
11 D2. IV	42.32	12.11	4.97	6.13	15.21	9.78	2.66	1.92	2.17		2.17	0.26	0.14	CO_2 0.62 X 0.94 SO_3 trace Cl 0.16	101.56	3.069
12 C4. V	39.07	13.70	20.92	n. d.	6.90	10.04	2.68		3.53		0.21	0.52	0.55	CO_2 2.46 SO_3 0.18 Cl 0.13	100.89	
13 B3. IV	44.71	21.05	6.54	5.74	4.69	10.50	2.24	1.19	2.25		0.92				99.83	
14 B4. V	41.00	10.41	11.42	7.44	In FeO	8.07	11.66	2.86	0.41	0.20	2.57	3.76			99.80	

IJOLITE, ETC.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Beemerville, Sussex County, New Jersey.	F. W. Love?	J. F. Kemp, Tr. N. Y. Ac. Sc., XI, p. 67, 1892.	Sussexite.	In W. T., p. 467.
2	Kaljokthal, Kola, Finland.	H. Berghell.	V. Hackman, Fennia, XI, No. 2, p. 185, 1894.	Ijolite.	In W. T., p. 467.
3	Iiwaara, Kola, Finland.	H. Berghell.	Ramsay and Berghell, G. F. F., XIII, p. 302, 1891.	Ijolite.	In W. T., p. 467.

LIMBURGITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Chateau du Perroux, Ardoisiere, France.	Pisani.	A. Michel-Levy, C. R., CXLVIII, p. 1530, 1909.	Limburgite.	
2	Reichenweiler, Vogesen, Elsass.	G. Linck.	G. Linck, Mt. C. G. L.-U. Els., I, p. 60, 1887.	Limburgite.	In W. T., p. 469.
3	Wesenweiler, Kaiserstuhl, Baden.	A. Knop.	A. Knop, D. Kaiserst., p. 283, 1892.	Limburgite.	Figs. for MgO, CaO, Na_2O, K_2O sic. Cf. next below. In W. T., p. 469.
4	Eichelspitze, Kaiserstuhl, Baden.	A. Knop.	A. Knop, D. Kaiserst., p. 281, 1892.	Limburgite.	Figs. for MgO, CaO, Na_2O, K_2O sic. Cf. next above. In W. T., p. 469.
5	Limburg, Kaiserstuhl, Baden.	A. Knop.	A. Knop. D. Kaiserst., p. 296, 1892.	Limburgite.	Ignited before analysis. $H_2O=2.11$. In W. T., p. 469.
6	Kaiserstuhl, Baden.	A. Lagorio.	A. Lagorio, T. M. P. M., VIII, p. 479, 1887.	Limburgite.	In W. T., p. 469.
7	Ulmenstein, Rhöngebirge.	E. Möller.	E. Möller, N. J., I, p. 112, 1888.	Limburgite.	In W. T., p. 345.
8	Heiligenberg, Hesse.	C. Trenzen.	C. Trenzen, N. J., II, p. 32, 1902.	Limburgite.	
9	Stellberg, Homberg, Hesse.	C. Trenzen.	C. Trenzen, N. J., II, p. 25, 1902.	Limburgite.	
10	Neuhof, near Giessen, Hesse.	A. Streng.	W. Schottler, Abh. G. L.-A. Darm., IV (3), p. 452, 1908.	Limburgite.	
11	Schaumburg, near Cassel, Hesse-Nassau.	O. Fromm.	O. Fromm, Z. D. G. G., XLIII, p. 68, 1891.	Limburgite.	In W. T., p. 345.
12	Vinice, Bohemia.	F. Kovar.	K. Hinterlechner, Jb. G. R.-A. Wien, L, p. 512, 1901.	Limburgite.	Not fresh. In W. T., p. 469.
13	Dioshegy, Balaton Lake, Hungary.	L. Tomasowsky.	J. Vitalis, Balat. Sees, I (1), No. 2, p. 89, 1911.	Limburgite.	
14	Ambohimahala, Itasy, Madagascar.	Not stated.	A. Lacroix, C. R., CLVI, p. 179, 1913.	Limburgitic basalt.	Cf. No. 5, IIJ.7.1.4.

LIMBURGITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
15 C2. IV	42.72	16.46	5.74	5.53	6.27	11.20	2.94	0.66	3.23		3.10	0.91	0.26		99.02 (101.02)	
16 D4. V	53.92	17.98	n. d.	4.88	4.57	7.59	3.92	1.14	4.64						98.64	
17 C3. V	39.32	17.53	3.07	9.12	8.00	10.38	2.44	2.04	5.10	2.20					99.20	

MELILITE ROCKS.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 C4. V	33.89	9.93	15.63	n. d.	16.14	15.19	2.86	n. d.	2.90		0.64	1.41	trace	CO_2 1.41 S trace Cr_2O_3 trace	100.00	
2 C3. V	39.63	6.59	13.79	3.53	10.46	14.25	6.62	trace	—		4.21	0.92			100.00	
3 C3. V	37.51	6.84	12.74	5.64	12.49	11.39	5.69	trace	—		7.70				100.00	
4 C4. V	43.36	9.37	8.88	n. d.	10.42	15.38	1.49	3.21	6.66			trace			98.77	

PYROXENITE, ETC.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 C3. V	48.05	16.17	3.44	7.47	8.15	10.85	1.51	0.92	1.21	0.07	1.67	none		CO_2 none ZrO_2 none	99.51 (100.06)	
2 D4. V	43.35	29.75	5.61	n. d.	2.03	12.46	trace	5.93	0.73						99.86	
3 D3. V	50.71	18.75	7.85	n. d.	3.78	9.78	4.86	2.42	1.13	0.06			0.25		99.59	
4 B4. V	51.64	0.12	n. d.	9.28	31.93	0.45	n. d.	n. d.	5.45				0.56		99.43	
5 C3. V	43.65	6.81	15.94	5.14	12.91	4.86	0.43	0.52	7.46					CO_2 1.12	98.84	
6 B4. V	54.12	7.91	n. d.	12.87	16.64	6.21	0.44	1.19	n. d.						99.38	3.30
7 C4. V	46.35	16.41	n. d.	9.91	18.72	6.14	n. d.	n. d.	3.01						100.54	3.21
8 D4. V	44.20	27.37	2.71	6.58	2.78	11.83	2.88		1.08				trace		99.43	
9 C2. IV	38.80	12.50	6.57	8.20	13.10	11.42	1.60	0.81	2.85		1.60	1.26	0.23		98.94	3.16

LIMBURGITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
15	Mindello, Sao Vincente, Cape Verde Islands.	C. v. John.	C. v. John, Jb. G. R.-A. Wien, XLVI, p. 286, 1896.	Limburgite.	Cf. No. 136, III.5.4.4–5. In W. T., p. 337.
16	Chichishima, Bonin Islands, Japan.	J. Petersen.	J. Petersen, Jb. Hamb. W. Anst., VIII, p. 30, 1891.	Boninite (bronzite limburgite).	In W. T., p. 469.
17	Bendigo, Victoria.	F. Stone.	A. W. Howitt, Vict. Dep. Min., Spec. Rep., p. 4, 1893.	Limburgite.	In W. T., p. 469.

MELILITE ROCKS.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Hochbowl, near Owen, Wurttemberg.	J. Meyer.	A. Stelzner, N. J. B. B., II, p. 398, 1883.	Melilite basalt.	Calculated from sol. and insol. In W. T., p. 467.
2	Kimmelsbach, Hassgau, Thuringia.	A. Ostermayer.	A. Ostermayer, In. Diss. Erl., p. 40, 1903.	Melilite basalt.	Calculated to 100, water free. 3 decimals.
3	Schwanhausen, Hassgau, Thuringia.	A. Ostermayer.	A. Ostermayer, In. Diss. Erl., p. 40, 1903.	Melilite basalt.	Calculated to 100, water free. 3 decimals.
4	Coppaeli, Monte Terminillo, near Rieti, Umbria.	L. Brugnatelli.	L. Brugnatelli, B. C. G. It., XIV, p. 318, 1883.	Melilite pyroxene rock.	Coppaelite in V. Sabatini, B. C. G. It., XXXIV, p. 378, 1903. In W. T., p. 467.

PYROXENITE, ETC.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Preston, Connecticut.	G. F. Loughlin.	G. F. Loughlin, U. S. G. S. B. 492, p. 114, 1912.	Amphibolite.	Intruded.
2	Rosetown, near Stony Point, New York.	J. F. Kemp?	J. F. Kemp, A. J. S., XXXVI, p. 250, 1888.	Hornblende-augite rock.	In W. T., p. 469.
3	Follensby Pond, Adirondack Mountains, New York.	Students.	H. P. Cushing, N. Y. St. Mus. A. R., LX (2), p. 527, 1907.	Pyroxenic amphibolite.	Igneous?
4	Corundum Hill, Macon County, North Carolina.	C. Baskerville.	Pratt and Lewis, Rep. N. C. G. S., I p. 90, 1905.	Enstatolite.	
5	Morton, Minnesota River, Minnesota.	A. D. Meeds.	C. W. Hall, U. S. G. S. B. 157, p. 113, 1899.	Saxonite.	In W. T., p. 471.
6	Jackass Creek, Montana.	G. P. Merrill.	G. P. Merrill, Pr. U. S. Nat. Mus., XVII, p. 662, 1895.	Websterite.	In W. T., p. 469.
7	Meadow Creeks, Montana.	G. P. Merrill.	G. P. Merrill, Pr. U. S. Nat. Mus., XVII, p. 656, 1895.	Saxonite.	In W. T., p. 471.
8	Bute Inlet, Queen Charlotte Sound, British Columbia.	R. P. D. Graham.	J. A. Bancroft, Can. G. S. Mem. 23, p. 87, 1913.	Hornblendite.	
9	Prospect Lake, Vancouver, British Columbia.	M. F. Connor.	C. H. Clapp, Can. G. S. Mem. 36, p. 69, 1913.	Hornblendite.	

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PYROXENITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
10 B4. V	49.68	12.07	10.57	n. d.	9.02	13.85	3.31	1.15	0.56				trace		100.21	
11 B3. IV	46.0	10.9	1.7	9.3	15.2	13.1	1.5	0.3	2.0						100.0	
12 D3. V	44.90	17.25	1.71	4.30	20.41	10.89	1.22	0.56	0.33						101.57	
13 C3. V	52.01	1.65	1.23	22.70	1.65	19.15	1.25	1.08	n. d.			0.41		S 0.08	101.21	
14 B3. IV	49.13	11.23	1.41	6.54	14.15	10.99	2.07	0.27	2.35	0.29			0.77		99.20	3.10
15 C3. V	37.17	21.79	9.04	2.84	4.42	14.79	2.85	3.25	3.67		0.72		0.46		101.00	2.974
16 D4. V	40.70	20.80	13.40	n. d.	6.00	8.15	5.25		6.40			0.65			101.35	2.94
17 C3. V	41.97	16.60	3.28	11.22	7.02	12.65	2.55	1.18	2.60		1.06				101.13	
18 D2. V	49.34	3.53	0.91	6.91	18.83	20.15	0.17	0.09	0.58		1.04		0.03		101.58	
19 B4. V	49.15	1.65	1.58	4.19	20.60	20.36	n. d.	n. d.	0.85					Cr_2O_3 0.70	99.08	
20 B3. IV	44.17	11.24	9.97	6.22	6.55	11.77	3.04	1.97	2.31		2.83				99.07	
21 D4. V	46.86	9.80	16.35	n. d.	18.08	9.57	trace	trace	0.67						101.33	3.333
22 C2. IV	45.98	20.60	2.42	7.50	10.43	7.44	2.07	1.68	1.02	0.14	0.50	0.20	0.33		100.23	
23 B3. IV	41.46	20.36	3.37	16.71	5.50	8.79	2.43	0.82	n. d.	0.13				S 0.13 Cu 0.44	100.70	3.05

PERIDOTITE.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
1 C3. V	42.63	6.88	3.33	7.27	29.36	5.90	1.26	0.14	n. d.				0.36	Cr_2O_3 0.05 NiO 0.27	97.45	
2 D4. V	20.85	5.55	45.62		16.45	0.73	n. d.	n. d.	n. d.		9.93	trace		S trace	99.69	
3 C3. V	47.41	6.39	7.06	4.80	15.34	14.32	(0.69)	1.40	2.10					S 0.49	100.00	3.30
4 D4. V	37.44	28.60	11.92	n. d.	1.97	5.45	0.97	1.02	12.67					Cr_2O_3 none	100.04	
5 D4. V	33.80	6.84	12.26	n. d.	21.38	9.50	n. d.	n. d.	15.20						98.98	2.732

PYROXENITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
10	Mount Waterman, San Gabriel Mountains, California.	A. M. Strong.	Arnold and Strong, B. G. S. A., XVI, p. 197, 1905.	Hornblendite.	
11	Col d'Eret, Pyrenees.	H. Arsandaux.	A. Lacroix, Cong. G. Int., VIII, C. R., p. 833, 1901.	Hornblendite.	Not in W. T.
12	Tuc d'Ess, Pyrenees.	Pisani.	A. Lacroix, Cong. G. Int., VIII, C. R., p. 833, 1901.	Ariegite.	In W. T., p. 335.
13	Ransko, Eisengebirge, Bohemia.	C. v. John.	Hinterlechner and v. John, Jb. G. R.-A. Wien., LIX (1), p. 216, 1909.	Pyroxenite.	
14	Halire Forest, Eule, Bohemia.	H. L. Barvir?	H. L. Barvir, Ref. N. J., I, p. 49, 1904.	Porphyritic hornblende rock.	
15	Zitué, Mittelgebirge, Bohemia.	J. Hanasch.	B. Zahalka, Sb. Böhm. Ges. W., Art. III, p. 57, 1905.	Camptonitic augitite.	
16	Giumarra, near Rammacca, Sicily.	C. Viola.	C. Viola, B. C. G. It., XXXII, p. 305, 1901.	Giumarrite (augitite).	
17	Tswetli-bor, Iss River, Ural Mountains.	Not stated.	Duparc and Pamfil, B. Soc. M. Fr., XXXIII, p. 366, 1910.	Issite (feldspathic hornblendite).	Also in C. R., CLI, p. 1137, 1910.
18	Sokolky, Kamenouchky, Ural Mountains.	Not stated.	Duparc and Pamfil, B. Soc. M. Fr., XXXIII, p. 354, 1910.	Pyroxenite.	
19	Tilai Mountains, Iow District, Ural Mountains.	Not stated.	Duparc and Pearce, Ourals Nord., II, p. 417, 1905.	Pyroxenite.	
20	Mokvaja Wolnowacha, Mariupol, Russia.	J. Morozewicz.	J. Morozewicz, Ref., N. J., I, p. 394, 1900.	Augitite.	Schlieren in basalt. In W. T., p. 315.
21	Pallavaram, Madras, India.	T. L. Walker.	T. H. Holland, Mem. G. S. Ind., XXVIII, p. 166, 1900.	Hypersthenite.	In W. T., p. 469.
22	Anabar River, Siberia.	H. Backlund.	H. Backlund, Trav. Mus. G. St. P., I, p. 158, 1907.	Pyroxenite.	
23	Consols mine, Broken Hill, New South Wales.	H. P. White.	J. B. Jaquet, Mem. G. S. N. S. W. No. 5, p. 56, 1894.	Bronzite amphibolite.	Not in W. T.

PERIDOTITE.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Kaersut, Nugsuaks Peninsula, Greenland.	W. C. Phalen.	W. C. Phalen, Smiths. Misc. Coll., XLV, p. 211, 1904.	Peridotite.	"Incomplete analysis."
2	Iron Mine Hill, Cumberland, Rhode Island.	T. Drown.	M. E. Wadsworth, Lithol. Stud., p. XVI, 1884.	Cumberlandite.	In W. T., p. 469. Cf. No. 1, V.3.5.1.3.
3	Montrose Point, near Peekskill, New York.	W. H. Emerson.	G. H. Williams, A. J. S., XXXI, p. 40, 1886.	Augite peridotite.	Na_2O by difference. In W. T., p. 359.
4	Ithaca, New York.	W. H. Morrison.	J. F. Kemp, A. J. S., XLII, p. 412, 1891.	Peridotite.	Not fresh. In W. T., p. 469.
5	Manheim, Herkimer County, New York.	C. W. Smith.	C. H. Smyth, A. J. S., XLIII, p. 325, 1892.	Peridotite.	Not fresh. In W. T., p. 469.

PERIDOTITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
6 D3. V	41.00	7.58	5.99	4.63	23.59	10.08	0.52	n. d.	4.73				trace	CO_2 3.62	101.74	2.989
7 C4. V	44.61	14.28	n. d.	14.59	15.68	2.56	0.97	0.27	7.17		trace		trace		100.13	
8 C4. V	38.72	16.06	n. d.	11.24	19.01	5.37	5.25	0.34	3.16		trace		0.24		99.39	
9 C4. V	38.52	1.60	n. d.	11.24	37.55	1.23	3.61	2.37	3.30		none		0.28		99.70	
10 A4. IV	42.71	0.70	n. d.	6.83	n. d.	n. d.	n. d.	8.38					0.09	Cr_2O_3 trace NiO 0.32	100.21	3.10
11 C4. V	47.41	16.03	2.66	7.05	5.81	12.33	4.47		2.19		1.29		trace		99.24	2.96
12 B4. V	41.49	2.22	1.07	7.11	39.63	1.89	n. d.	n. d.	5.56						98.97	
13 C3. V	46.0	6.8	3.0	7.5	23.9	8.1	0.8	0.9	2.4					Cr_2O_3 0.2	99.6	3.15
14 C3. V	38.6	3.7	7.6	7.8	27.7	7.7	none	0.2	6.4					Cr_2O_3 0.1	99.8	3.00
15 A4. V	44.06	12.16	4.85	5.48	18.21	9.80	0.98		3.80						79.34	
16 D4. V	42.10	3.28	8.27	2.13	30.65	3.77	1.90		7.73				0.70		100.53	2.82
17 D4. V	37.8	9.7	3.4	7.0	22.9	4.1	0.8	trace	14.0						99.7	
18 C3. V	43.39	9.09	9.31	7.25	16.80	9.22	0.04	trace	3.45	0.14	trace		trace	CO_2 0.09 S 0.56 Cr_2O_3 trace NiO trace	99.34	
19 C4. V	49.10	8.48	5.79	n. d.	20.85	12.90	1.67	0.56	0.23				trace	Cr_2O_3 0.57	100.15	
20 B3. IV	44.64	5.85	2.85	4.50	38.76	2.47	n. d.	n. d.	0.30					Cr_2O_3 0.20	99.57	
21 C3. V	43.70	11.20	3.90	6.15	25.60	7.07	0.52	0.31	2.80						101.25	
22 B4. V	43.25	3.25	9.15	n. d.	38.10	2.70	0.45	0.15	2.55						99.60	
23 B3. IV	42.00	3.19	2.81	4.41	40.40	3.30	1.20	0.29	1.66				trace	Spinel 1.90	101.16	
24 C3. V	40.24	5.38	6.61	6.49	31.05	4.10	0.39	0.21	6.80			0.06		S 0.04	101.37	
25 C3. V	37.16	10.06	7.53	6.69	28.04	1.84	0.66	0.42	8.70			0.06	trace	S 0.11	101.27	

PERIDOTITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
6	Pikesville, Baltimore County, Maryland.	L. McCay.	G. H. Williams, U. S. G. S. B. 28, p. 54, 1886.	Peridotite.	Not fresh. In W. T., p. 469.
7	Buck Creek, Clay County, North Carolina.	C. Baskerville.	Pratt and Lewis, N. C. G. S. Rep., I, p. 76, 1905.	Amphibole-peridotite.	
8	Buck Creek, Clay County, North Carolina.	C. Baskerville.	Pratt and Lewis, N. C. G. S. Rep., I, p. 78, 1905.	Troctolite.	
9	Buck Creek, Clay County, North Carolina.	C. Baskerville.	Pratt and Lewis, N. C. G. S. Rep., I, p. 75, 1905.	Dunite.	
10	Laurel Creek, Rabun County, Georgia.	W. H. Emerson.	F. P. Klug, Ga. G. S. B. 2, p. 81, 1894.	Dunite.	In W. T., p. 471.
11	The Potrero, San Francisco, California.	C. Palache.	C. Palache, B. Dep. G. Un. Cal., I, p. 177, 1894.	Lherzolite.	In W. T., p. 471.
12	Spanish Peak, Plumas County, California.	W. C. Blasdale.	A. C. Lawson, B. Dep. G. Un. Cal., III, p. 224, 1903.	Peridotite.	
13	Loch Garabal, Scotland.	J. H. Player.	Dakyns and Teall, Q. J. G. S., XLVIII, p. 115, 1892.	Peridotite.	In W. T., p. 355.
14	Loch Garabal, Scotland.	J. H. Player.	Dakyns and Teall, Q. J. G. S., XLVIII, p. 145, 1892.	Olivine-diallage rock.	In W. T., p. 471.
15	Aodann Clach, Broadford, Skye, Scotland.	T. Baker.	A. Harker, Rocks of Skye, p. 382, 1904.	Dolerite picrite.	
16	Caithness, Scotland.	H. R. Mill.	J. W. Judd, Q. J. G. S., XLI, p. 402, 1885.	Scyelite.	Calculated from 3 poor partial analyses. In W. T., p. 471.
17	Firth of Forth, Scotland.	T. Waller.	J. W. Judd, Q. J. G. S., XLI, p. 400, 1885.	Picrite.	In W. T., p. 471.
18	Glendalough, County Wicklow, Ireland.	H. E. Clarke.	J. A. Thompson, Q. J. G. S., LXIV, p. 479, 1908.	Hornblende peridotite.	Norm and mode.
19	Tuc d'Ess, Pyrenees.	Stroesco.	A. Lacroix, N. Arch. Mus. (3), VI, p. 264, 1894.	Lherzolite.	In W. T., p. 471.
20	Lac Lherz, Pyrenees.	Pisani.	A. Lacroix, Cong. G. Int., VII, C. R., p. 833, 1901.	Lherzolite.	Not in W. T.
21	L'Etand de L'Estagnet, Pyrenees.	Pisani.	A. Lacroix, B. Sv. Ct. G. Fr., XI, No. 71, p. 31, 1900.	Peridotite.	In W. T., p. 355.
22	Freychinede, Pyrenees.	Not stated.	M. Longchambon, B. Sv. Ct. G. Fr., XXI, No. 131, p. 41, 1912.	Lherzolite.	
23	Prades, Pyrenees.	A. Brunet.	A. Lacroix, N. Arch. Mus. (3), VI, p. 264, 1894.	Lherzolite.	In W. T., p. 369.
24	Ransko, Eisengebirge, Bohemia.	C. v. John.	Hinterlachner and v. John, Jb. G. R.-A. Wien, LIX (1), p. 209, 1909.	Peridotite.	
25	Ransko, Eisengebirge, Bohemia.	C. v. John.	Hinterlechner and v. John, Jb. G. R.-A. Wien, LIX (1), p. 209, 1909.	Peridotite.	

PERIDOTITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
26 D3. V	40.81	1.09	1.98	5.02	37.09	1.32	n. d.	n. d.	10.26				0.64	Cr_2O_3 0.32	98.53	
27 C4. V	49.35	2.68	n. d.	7.37	20.00	20.36	n. d.	n. d.	0.60						100.36	
28 C4. V	44.94	4.84	4.64	6.75	23.16	14.70	n. d.	n. d.	1.44					Cr_2O_3 0.76	101.23	
29 D4. V	43.30	4.89	6.20	11.66	16.68	19.70	n. d.	n. d.	0.15						102.58	
30 C4. V	41.44	5.80	10.46	9.93	13.36	19.53	n. d.	n. d.	0.22				0.05	Cr_2O_3 0.57	101.36	
31 C4. V	40.15	4.60	12.24	10.87	15.01	17.26	n. d.	n. d.	0.40					Cr_2O_3 0.58	101.11	
32 D4. V	39.22	0.39	n. d.	16.41	43.81	1.20	n. d.	n. d.	0.32				trace	Cr_2O_3 trace	101.35	
33 B4. V	36.85	1.53	5.60	6.65	42.17	1.09	n. d.	n. d.	6.53					Cr_2O_3 n. d.	100.42	
34 B4. V	31.84	1.37	15.63	14.25	33.10	0.91	n. d.	n. d.	2.49				trace	Cr_2O_3 n. d.	99.59	
35 C4. V	35.41	1.33	4.43	3.66	44.05	n. d.	n. d.	n. d.	12.28						101.06	
36 D3. V	44.20	2.57	7.46	9.00	17.54	18.69	0.21	0.16	1.05		0.63		0.08		101.59	
37 D3. V	42.84	3.60	5.69	8.48	24.60	11.41	0.61	0.42	1.80				trace	Cr_2O_3 3.04	102.49	
38 D4. V	36.92	8.55	17.46	8.02	11.87	18.20	n. d.	n. d.	0.15						101.17	
39 D2. V	40.56	4.54	13.65	8.77	13.07	19.06	0.25	0.09	1.04		0.33		0.02		101.38	
40 D3. V	38.76	11.93	5.57	7.01	26.03	6.91	0.53	0.07	3.86		0.11		0.53		101.31	
41 B4. V	38.72	2.55	4.50	3.76	41.36	n. d.	0.57	n. d.	7.70						99.16	
42 B4. V	38.00	1.33	3.05	4.46	41.92	n. d.	n. d.	n. d.	11.18				0.23	Cr_2O_3 0.21	100.38	
43 D4. V	37.36	16.37	18.03	5.03	1.22	9.62	3.70	3.68	0.51		trace			CO_2 3.24	98.76	
44 D4. V	58.03	15.53	9.64	n. d.	4.55	6.99	n. d.	n. d.	none				4.54		99.28	

PERIDOTITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
26	Kraubath, Styria.	H. Höfer.	K. A. Redlich, Cong. G. Int., IX, Guide IX, p. 3, 1903.	Peridotite.	
27	Koswinsky Kamen, Ural Mountains.	L. Duparc.	Duparc and Pearce, Ourals Nord, I, p. 119, 1902.	Koswite.	
28	Koswinsky Kamen, Ural Mountains.	L. Duparc.	Duparc and Pearce, Ourals Nord, I, p. 173, 1902.	Wehrite.	
29	Koswinsky Kamen, Ural Mountains.	L. Duparc.	Duparc and Pearce, Ourals Nord, I, p. 119, 1902.	Koswite.	Not typical.
30	Koswinsky Kamen, Ural Mountains.	L. Duparc,	Duparc and Pearce, Ourals Nord, I, p. 119, 1902.	Koswite.	Type.
31	Koswinsky Kamen, Ural Mountains.	L. Duparc.	Duparc and Pearce, Ourals Nord, I, p. 119, 1902.	Koswite.	Type.
32	Koswinsky Kamen, Ural Mountains.	Jou Kowsky.	Duparc and Pearce, C. R., CXXXII, p. 894, 1901.	Dunite.	
33	Koswinsky Kamen, Ural Mountains.	L. Duparc.	Duparc and Pearce, Ourals Nord, I, p. 163, 1902.	Dunite.	"Cr_2O_3 in excess of Al_2O_3."
34	Koswinsky Kamen, Ural Mountains.	L. Duparc.	Duparc and Pearce, Ourals Nord, I, p. 128, 1902.	Dunite.	
35	Sosnowsky Ouwal, Ural Mountains.	L. Duparc.	Duparc and Pearce, Ourals Nord, I, p. 163, 1902.	Dunite.	"Cr_2O_3 in excess of Al_2O_3."
36	Tagil, Ural Mountains.	Not stated.	Duparc and Pamfil, B. Soc. M. Fr., XXXIII, p. 351, 1910.	Koswite.	
37	Garewaia River, Tilai Mountains, Iow District, Ural Mountains.	Not stated.	Duparc and Pearce, C. R., CXXXIX, p. 155, 1904.	Garewaite.	Al_2O_3 and Cr_2O_3 interchanged. Cf. Ourals Nord, II, p. 490, 1905.
38	Tilai Mountains, Iow District, Ural Mountains.	Not stated.	Duparc and Pearce, Ourals Nord, II, p. 423, 1905.	Koswite.	
39	Katch Kanar Mountain, Iss District, Ural Mountains.	Not stated.	Duparc and Pamfil, B. Soc. M. Fr., XXXIII, p. 351, 1910.	Koswite.	
40	Tschissopa Mountains, Ural Mountains.	F. Pearce.	Duparc and Pearce, C. R., CXLIV, p. 1290, 1907.	Troctolite.	
41	Solwa-Supreya, Ural Mountains.	Krikmeyer.	Loewinson-Lessing, G. Sk. Jusno. Saosk., p. 166, 1900.	Dunite.	In W. T., p. 473.
42	Antschung River, Ural Mountains.	Not stated.	Duparc and Wunder, C. R., CLIII, p. 884, 1911.	Harzburgite.	
43	Assuan, Egypt.	J. Szadeczky.	J. Szadeczky, F. K., XXIX, p. 210, 1899.	Josefite (olivine-augite rock).	Not in W. T.
44	De Beers mine, Kimberley, Griqualand.	H. E. Roscoe.	Cf. V. Hartog, Ec. G., IV, p. 450, 1909.	Kimberlite.	"Hardibank."

PERIDOTITE—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
45 D4. V	49.50	18.40	13.10	n. d.	5.25	2.24	4.65	1.48	5.23						99.85	
46 D4. V	46.60	16.90	11.60	n. d.	9.35	2.87	4.67	0.63	7.12						99.74	
47 D4. V	46.16	10.00	6.71	n. d.	16.63	3.84	n. d.		9.75	5.68			0.34		99.11	
48 D4. V	40.30	9.45	7.30	n. d.	21.20	3.48	4.93	0.90	13.00						100.56	
49 D4. V	39.73	2.31	9.69	n. d.	24.42	10.16	n. d.	n. d.	7.55					CO_2 6.56	100.42	
50 D4. V	34.80		14.40		30.76	2.70	1.40	n. d.	10.60					CO_2 5.55	100.21	2.67
51 D4. V	33.00		12.00		32.38	9.60	0.67	n. d.	6.00					CO_2 7.05	100.70	2.734
52 D4. V	42.41	9.02	7.94	3.59	17.26	8.35	trace	trace	7.65	1.02		trace		CO_2 3.53; S trace; Cr_2O_3 trace	100.77	
53 C4. V	39.35	6.56	n. d.	9.45	28.51	3.10	0.73	0.15	9.05	0.14	0.60		1.57	CO_2 none; S none	99.21	2.81
54 D4. V	39.99	3.55	n. d.	8.56	41.26	4.19	n. d.	n. d.	2.07				trace	Cr_2O_3 trace	99.62	
55 C4. V	30.00	n. d.	5.76	2.40	45.48	0.48	n. d.	n. d.	13.36					Cr_2O_3 2.30	99.78	

IRON ORES, ETC.

1 D3. V	26.00	0.26	33.71	33.41	1.16	1.14	n. d.	n. d.	n. d.		0.17	none	2.12	S none; Cr_2O_3 0.01; V_2O_3 trace	97.98	
2 B4. V	20.90	1.75	70.29	2.01	2.63	trace	n. d.	n. d.	n. d.		2.23	none			99.81	
3 B4. V	11.89	0.34	87.00		0.80	0.20	n. d.	n. d.	n. d.		none	0.06		S trace	100.25	
4 B4. V	11.39	trace	85.55		3.44	0.22	n. d.	n. d.	n. d.		none	0.02		S trace	100.62	
5 B4. V	11.37	1.32	53.33	14.42	2.73	0.10	n. d.	n. d.	n. d.		16.03	0.01		S trace	99.31	
6 C4. V	18.60	7.00	62.00	n. d.	1.60	1.30	n. d.	n. d.	n. d.		10.00				100.50	
7 C4. V	8.60	4.00	70.50	n. d.	2.30	1.60	n. d.	n. d.	n. d.		14.00				101.00	
8 B4. V	2.32	4.06	73.87		3.66	0.13	n. d.	n. d.	n. d.		15.41	trace		S 1.42	100.87	

PERIDOTITE—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
45	De Beers mine, Kimberley, Griqualand.	L. de Launay.	Cf. V. Hartog, Ec. G., IV, p. 450, 1909.	Kimberlite.	"Hardibank."
46	De Beers mine, Kimberley, Griqualand.	L. de Launay.	Cf. V. Hartog, Ec. G., IV, p. 450, 1909.	Kimberlite.	"Hardibank."
47	De Beers mine, Kimberley, Griqualand.	H. E. Roscoe.	Cf. V. Hartog, Ec. G., IV, p. 450, 1909.	Kimberlite.	"Blue ground."
48	De Beers mine, Kimberley, Griqualand.	L. de Launay.	L. de Launay, C. R., CXXV, p. 336, 1897.	Peridotite (kimberlite).	In W. T., p. 473.
49	De Beers mine, Kimberley, Griqualand.	N. S. Maskelyne.	Cf. V. Hartog, Ec. G., IV, p. 450, 1909.	Kimberlite.	"Blue ground."
50	Kimberley, Griqualand.	H. C. Lewis.	H. C. Lewis, Gen. of the Diam., p. 47, 1897.	Kimberlite.	In W. T., p. 473.
51	Kimberley, Griqualand.	H. C. Lewis.	H. C. Lewis, Gen. of the Diam., p. 47, 1897.	Kimberlite.	In W. T., p. 473.
52	Schuller mine, Pretoria, Transvaal.	Not stated.	H. S. Harger, Tr. G. Soc. S. Afr., VIII, p. 120, 1905.	Kimberlite.	
53	Hannans Lake, Kalgoorlie, Western Australia.	C. C. Williams.	E. S. Simpson, W. Aust. G. S. B. 6, p. 75, 1902.	Peridotite.	
54	Olivine Range, South Island, New Zealand.	T. Bateman.	G. H. F. Ulrich, Q. J. G. S., XLVI, p. 629, 1890.	Peridotite.	In W. T., p. 369.
55	Milford Sound, New Zealand.	P. Marshall.	P. Marshall, Tr. N. Z. Inst., VII, p. 483, 1905.	Harzburgite.	

IRON ORES, ETC.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
1	Tucker Lake, Minnesota.	J. T. Singewald.	J. T. Singewald, U. S. Dep. Min. B. 64, p. 105, 1913.	Magnetite ore.	In gabbro. $MgO=MgCO_3$. $CaO=CaCO_3$.
2	Iron Lake, Minnesota.	J. A. Dodge.	N. H. and H. V. Winchell, Minn. G. S. B. VI, p. 641, 1891.	Iron ore.	$Fe_2O_3=Fe_3O_4$. Not in W. T.
3	Kawishiwi River, Minnesota.	C. F. Sidener.	H. V. Winchell, Minn. G. S. A. R., XVII, p. 80, 1889.	Iron ore.	Not in W. T.
4	Kawishiwi River, Minnesota.	C. F. Sidener.	H. V. Winchell, Minn. G. S. A. R., XVII, p. 97, 1889.	Iron ore.	Not in W. T.
5	Iron Lake, Minnesota.	C. F. Sidener.	H. V. Winchell, Minn. G. S. A. R., XVII, p. 81, 1889.	Iron ore.	$Fe_2O_3=Fe_3O_4$. Not in W. T.
6	Iron Mountain, Fremont County, Colorado.	School of Mines, Paris.	Cited in J. T. Singewald, U. S. Dep. Min. B. 64, p. 132, 1913.	Iron ore.	
7	Iron Mountain, Fremont County, Colorado.	School of Mines, Paris.	Cited in J. T. Singewald, U. S. Dep. Min. B. 64, p. 132, 1913.	Iron ore.	
8	Solnör, Skodje, Sondmöre, Norway.	O. N. Heidenreich.	J. H. L. Vogt, Zs. Pr. G., VIII, p. 236, 1900.	Titanomagnetite spinellite.	Not in W. T.

IRON ORES, ETC.—Continued.

No.	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O+	H_2O-	TiO_2	P_2O_5	MnO	Inclusive.	Sum.	Sp. gr.
9 C4. V	n. d.	n. d.	29.00	27.00	4.07	2.00	n. d.	n. d.	n. d.		34.50	1.27		S 0.29	98.13	
10 C4. V	n. d.	n. d.	20.03	32.31	3.34	n. d.	n. d.	n. d.	n. d.		43.78				100.06	
11 C4. V	n. d.	n. d.	18.71	34.17	3.04	n. d.	n. d.	n. d.	n. d.		44.05				99.97	
12 B3. IV	5.33	0.61	4.83	82.28	0.50	3.84	n. d.	n. d.	n. d.		n. d.	2.52	0.16	S 0.06	99.56	
13 B3. IV	1.92	0.72	0.80	92.80	0.83	0.80	n. d.	n. d.	n. d.		1.34	0.01	0.23	V_2O_3 0.20 S 0.03	99.78	
14 B3. IV	1.88	1.39	4.91	90.19	0.72	0.60	n. d.	n. d.	n. d.		0.26	0.05	0.21	S 0.02 Cu trace	100.23	
15 B3. IV	1.80	0.79	4.58	76.01	0.75	8.92	n. d.	n. d.	n. d.		0.13	6.71	0.93	S 0.05	100.67	
16 D3. IV	1.41	2.09	57.83	20.49	0.58	1.85	n. d.	n. d.	0.20		(Ca10)	0.99	4.50		89.94	
17 B3. IV	29.60	11.12	21.14	18.64	3.96	6.00	n. d.	n. d.	1.40		6.48	0.08	0.26	SO_3 0.25	98.93	
18 B4. V	4.26	13.11	47.94	30.86	3.23	n. d.	n. d.	n. d.	n. d.		none				99.40	
19 C4. V	1.66	8.08	n. d.	18.43	12.47	0.91	n. d.	n. d.		0.20			0.20	Cr_2O_3 59.09	101.04	
20 C2. IV	9.89	5.40	70.83	0.54	2.41	0.92	n. d.	n. d.	5.41			0.02	0.27	S 0.05 Cr_2O_3 4.09 NiO 0.19 BaO none ZnO trace	100.01	
21 C2. IV	9.60	14.59	62.79	0.32	1.03	0.70	n. d.	n. d.	5.55			0.33	0.51	CO_2 0.55 S 0.03 Cr_2O_3 3.40 NiO 0.88 BaO none As 0.01 CuO none ZnO none PbO none	99.98	
22 C3. V	7.44	4.85	73.37	1.97	3.15	trace	n. d.	n. d.	3.68			0.03	0.07	S 0.02 MnO 0.07 NiO 1.69	99.81	
23 C2. IV	7.40	13.75	65.86	0.19	0.77	0.20	n. d.	n. d.	4.80			0.03	0.47	CO_2 0.25 S 0.03 Cr_2O_3 3.58 NiO 0.64 BaO none As 0.01 Zn,Cu,Pb none	99.98	
24 C2. IV	6.65	6.80	74.29	0.39	1.26	0.48	n. d.	n. d.	4.60			0.03	0.51	CO_2 0.05 S 0.04 Cr_2O_3 3.05 NiO 0.90 As 0.02 CuO none ZnO trace PbO trace	99.96	
25 C2. IV	5.25	8.00	70.25	0.39	1.23	1.50	n. d.	n. d.	8.40			0.03	0.05	CO_2 1.50 S 0.03 Cr_2O_7 2.78 NiO 0.50 BaO none PbO trace	99.96	

IRON ORES, ETC.—Continued.

No.	Locality.	Analyst.	Reference.	Rock name.	Remarks.
9	Ankershus, near Ekersund, Norway.	A. Tamm.	C. F. Kolderup, Berg. Mus. Aarb., No. V, p. 178, 1896.	Ilmenitite.	Not in W. T.
10	Kyland, Ekersund, Norway.	Looft.	C. F. Kolderup, Berg. Mus. Aarb., No. V, p. 178, 1896.	Ilmenitite.	Not in W. T.
11	Kyland, Ekersund, Norway.	Looft.	C. F. Kolderup, Berg. Mus. Aarb., No. V, p. 178, 1896.	Ilmenitite.	Not in W. T.
12	Ekströmsberg, Lapland, Sweden.	Not stated.	Lundbohm and Petersson, Iron Ore Res., II, p. 581, 1910.	Iron ore.	$FeO=Fe_3O_4$. Other analyses in paper.
13	Leveäniemi, Lapland, Sweden.	Not stated.	Lundbohm and Petersson, Iron Ore Res., II, p. 580, 1910.	Iron ore.	$FeO=Fe_3O_4$. Other analyses in paper.
14	Luossavara, Lapland, Sweden.	Not stated.	Lundbohm and Petersson, Iron Ore Res., II, p. 561, 1910.	Iron ore.	$FeO=Fe_3O_4$. Other analyses in paper.
15	Kirunavaara, Lapland, Sweden.	Not stated.	Lundbohm and Petersson, Iron Ore Res., II, p. 561, 1910.	Iron ore.	$FeO=Fe_3O_4$. Other analyses in paper.
16	Rödekoruberg, near Lulea, Sweden.	E. Bengtson.	P. Geijer, G. F. F., XXXIV, p. 191, 1912.	Iron ore.	TiO_2 n. d.
17	Joubrechkine, Wichera, Ural Mountains.	Mine analysts.	Duparc et al., Oural Nord., III, p. 187, 1909.	Magnetite rock.	
18	Deneschkin Kamen, Ural Mountains.	Kultacheff.	F. Loewinson-Lessing, Jushno-Saos., p. 166, 1900.	Magnetite rock.	Layers in gabbro. No TiO_2? Not in W. T.
19	Psemjonowka, Kuban District, Caucasus.	N. M. Slawsky.	N. Besborodko, N. J. B. B., XXXIV, p. 791, 1912.	Chromite ore.	
20	Lutzi, Lokris, Greece.	Not stated.	H. K. Scott, J. Iron St. Inst., LXXXVII, p. 465, 1913.	Chrome iron ore.	
21	Thebes, Bocotia, Greece.	Pattinson and Stead.	H. K. Scott, J. Iron St. Inst., LXXXVII, p. 465, 1913.	Chrome iron ore.	3 decimals.
22	Politika, Euboea, Greece.	E. Riley.	H. K. Scott, J. Iron St. Inst., LXXXVII, p. 465, 1913.	Chrome iron ore.	
23	Larmes, Lokris, Greece.	Pattinson and Stead.	H. K. Scott, J. Iron St. Inst., LXXXVII, p. 465, 1913.	Chrome iron ore.	3 decimals.
24	Tsouka, Lokris, Greece.	Pattinson and Stead.	H. K. Scott, J. Iron St. Inst., LXXXVII, p. 465, 1913.	Chrome iron ore.	3 decimals.
25	Karditza, Boeotia, Greece.	Pattinson and Stead.	H. K. Scott, J. Iron St. Inst., LXXXVII, p. 465, 1913.	Chrome iron ore.	3 decimals.

APPENDIXES.

APPENDIX 1.

THE QUANTITATIVE CLASSIFICATION OF IGNEOUS ROCKS.

INTRODUCTION.

As the original publications[1] on the quantitative system of classification and on some modifications of it, as well as some more recent descriptions,[2] may not be readily available to many readers, a concise account of it is given here. More complete details are given in those publications as well as in published discussions of the classification.[3]

GENERAL PRINCIPLES.

The system is a quantitative chemico-mineralogical one. The chemical composition of igneous rocks is regarded as more fundamental than their mineral composition or their texture, so that all igneous rocks, irrespective of the commonness or rarity of their occurrence, are classified primarily according to their chemical composition, with the object of grouping together rocks of like chemical composition, within limits. This phase alone of the classification concerns us here; mineral composition and texture, which are regarded as of subordinate importance, will not here be considered.

The chemical character of a rock is expressed in terms of the *molecules* of certain minerals that are capable of crystallizing on the solidification of a magma of a given chemical composition. The expression of the relations of these molecules is quantitative. For this purpose a selection is made of the molecules of the rock-making minerals which agree so far as is possible (and in fact do so to a very large extent) with the actual rock-making minerals. These mineral molecules are known as *standard,* the minerals that actually make up the rock being called *modal.* For a proper comprehension of the system of classification it is of the utmost importance to bear the distinction in mind, and to grasp the fact, that the standard mineral molecules used are *molecules* and *not minerals.* This point was not sufficiently emphasized in the original publication, and the neglect to state it explicitly has led to some misunderstanding and consequently some unjustifiedly adverse criticisms of the classification.

The modal aluminous pyroxenes, amphiboles, micas, garnets, and melilite (called collectively *alferric* minerals), being very complex and variable in composition, are not included in the standard minerals and are not regarded in this phase of the classification, for reasons of practicality given in the original papers.

The composition of the rock expressed in terms of the standard mineral molecules is called the *norm,* and the actual mineral composition, expressed quantitatively, is called the *mode.* The norm may or may not correspond with the mode, but as nearly all the standard molecules actually express commonly occurring rock minerals (mixtures of isomorphous molecules, as in the feldspars, being taken into account), the norm and the mode correspond very closely with each other in very many, if not the majority, of holocrystalline rocks.

CONSTRUCTION OF THE SYSTEM.

In the construction of the system as outlined above, two considerations, involved in the characters of rocks, are of paramount importance. These are the number of variables that must be dealt with and the unbroken continuity of gradation between all the factors of the same category involved in the problem. The constituents that may enter into the chemical composition or into the norm of a rock are numerous, the number of chemical constituents to be considered in a superior analysis being scarcely ever less than 10 and possibly reaching 20, and the number of standard mineral molecules about 30. The fact is now generally recognized that there are no sharp or "natural" divisions between igneous rocks, as these grade into one another in every respect, whether of chemical composition, mineral composition, or texture, the last including either crystallinity, granularity, or fabric.

It has been found that the best if not the only practicable way of dealing systematically with the

[1] Cross, Whitman, Iddings, J. P., Pirsson, L. V., Washington, H. S., A chemico-mineralogical classification and nomenclature of igneous rocks: Jour. Geology, vol. 10, pp. 555–690, 1902; Quantitative classification of igneous rocks, pp. 95–284, Chicago, 1903; The texture of igneous rocks: Jour. Geology, vol. 14, pp. 692–707, 1906; Modifications of the quantitative system of classification; Jour. Geology, vol. 20, pp. 550–561, 1912. Washington, H. S., The calculation of calcium orthosilicate in the norm: Washington Acad. Sci. Jour., vol. 5, p. 345, 1915.

[2] Iddings, J. P., Igneous rocks, vol. 1, pp. 394–454, 1909. Finlay, G. I., Introduction to the study of igneous rocks, pp. 143–221, New York, 1913. Washington, H. S., I basalti analcitici della Sardegna: Soc. Geol. Ital. Boll., vol. 33, pp. 159–167, 1914.

[3] Michel Lévy, Principales séries volcaniques françaises: Serv. carte géol. France Bull. 92, 1903; Principales séries eruptives françaises: Serv. carte géol. France Bull. 96, 1903. Card, G. W., The classification of the igneous rocks: Mining Journal, 1904, p. (3). Evans, J. W., The quantitative classification of igneous rocks; Sci. Progress, 1906, p. 1. Hatch, F. H., The classification of the plutonic rocks: Sci. Progress, 1908, p. 1. Harker, A., The natural history of igneous rocks, pp. 362–366, 1909. Fletcher, L., Introduction to the study of rocks, pp. 143–149, 1909. Cross, Whitman, The natural classification of igneous rocks: Geol. Soc. Quart. Jour., vol. 66, pp. 493–502, 1910. Certain criticisms of the quantitative classification: 11e Cong. géol. internat., Compt. rend., pp. 971–976, 1912. Fermor, L. L., The systematic position of the kodurite series: Geol. Survey India Rec., vol. 42, pp. 208–230, 1912. Mennell, F. P., Manual of petrology, p. 87, 1913. Daly, R. A., Igneous rocks and their origin, pp. 9–12, 1914. Tyrrell, G. W., A review of igneous rock classification: Sci. Progress, pp. 60–84, 1914. Milch, L., Die systematik der Eruptivgesteine: Fortschritte Mineralogie, vol. 4, pp. 218–222, 1914. Cross, Whitman, Problems of petrographic classification suggested by the kodurite series: Jour. Geology, vol. 22, p. 791, 1914.

numerous variables of the norm is to treat them dichotomously—that is, to divide them into a series of pairs of contrasted variables, each successive pair expressing characters of successively less generality or magnitude and of correspondingly greater particularity and definiteness.

The use of percentages to express the relations of the two variables is preferable to the use of ratios, which were used in the original publication, because the use of ratios involves the consideration of hyperbolic curves, thus tending to conceal the true relations.[1] Statement in percentages is commonly used for the graphs of physical chemistry.

The continuous gradation in the character of rocks and the absence of natural divisions necessitate arbitrary divisions, in making which, furthermore, the fact must be considered that in any pair either one of the variables may be present to the exclusion of the other. In the present system of classification this arbitrary division is accomplished by selecting five center points, which seem to be those that are most obvious and practical in showing the relations of two variables in any pair. These center points are indicated below, the relations being expressed both in percentages and ratios. It should be noted that these and all subsequent percentages here given express only the sum of the amounts of the two variables contrasted. They are not percentages of the norm (except in classes) or of the rock.

Two center points are used where one variable, A or B, is present to the exclusion of the other. A=100, B=0; or A=0, B=100. A:B=1:0 or 0:1.

One center point is used where both variables are present in equal amount. A=50, B=50. A:B=1:1.

Two intermediate center points are used where the amount of one variable is three times that of the other. A=75, B=25; or A=25, B=75. A:B=3:1 or 1:3.

The limits of the divisions of a series marked by these center points are where the percentages are as follows: A=87.5, B=12.5; A=62.5, B=37.5; A=37.5, B=62.5; A=37.5, B=62.5; A=12.5, B=87.5. The corresponding ratios are A:B=7:1, 5:3, 3:5, 1:7.

If one of a pair of variables is present in amount equal to or greater than 12.5 per cent of the two it is said to be *notable*, but if its amount is less than this it is said to be *negligible*.

These general divisions are numbered and defined as follows, the prefix being annexed that indicates the relation in the nomenclature.

1. A is *extreme* over B, B being *negligible*. Prefix *per*, applied to A.
2. A is *dominant* over B, both being *notable*. Prefix *do* (*dom*), applied to A.
3. A is *equal* (or nearly equal) to B, both being *notable*. No prefix is used.
4. B is *dominant* over A, both being *notable*. Prefix *do* (*dom*), applied to B.
5. B is *extreme* over A, A being *negligible*. Prefix *per*, applied to B.

In the first two and in the last two divisions A and B are spoken of, respectively, as *preponderant* (prefix *pre*), the other being *subordinate* (no prefix used). When one variable is subordinate to the other (as B in 2 and A in 4), its further subdivision, when needed, is on a threefold basis, as follows:

1–2. A is *preponderant* over B. Prefix *pre*, applied to A.
3. A is *equal* (nearly equal) to B. No prefix used.
4–5. B is preponderant over A. Prefix *pre*, applied to B.

Subdivision of either variable is only called for when it is in notable amount; when it is negligible (as B in 1 and A in 5) there is no subdivision.

OUTLINE OF THE SYSTEM.

DIVISIONS.

The divisions made in accordance with the principles stated and the terminations that distinguish the divisions are as follows:

Class (-ane).	Subclass (-one).
Order (-are).	Suborder (-ore).
Rang (-ase).	Subrang (-ose).
Grad (-ate).	Subgrad (-ote).

"Sections" of any of these are indicated by the insertion of "i" between the root and the regular termination.

Of these divisions, class, subclass, order, suborder, rang, and subrang are of chief interest here. The classification presented in this collection has not been carried as far as grad and subgrad, so that these will be treated very briefly.

For the purpose of carrying out this classification the standard mineral molecules,[2] in terms of which the norm is calculated—the normative molecules, are first divided into two groups. The first group of molecules called salic, characterized in general by the presence of silica and alumina, includes the molecules of quartz, corundum, zircon, orthoclase, albite, anorthite, leucite, nephelite, and a few others of minor importance. The second, called femic, characterized by being nonaluminous and in general by the presence of magnesia and iron oxides, includes the molecules of acmite, diopside, hypersthene, wollastonite, olivine, calcium orthosilicate, magnetite, ilmenite, hematite, apatite, and a few others of minor importance. In the course of the classification each of these two groups will be further subdivided into parts and these into still smaller divisions.

A diagrammatic scheme of the classification is shown in figure 2. This is necessarily incomplete and expresses in detail only the chief successions of divisions, which, however, include most of the igneous rocks.

[1] Cf. Michel Lévy, Serv. carte géol. France Bull. 92, p. 25, 1903; also Washington, H. S., Jour. Geology, vol. 15, p. 277, 1907.

[2] A list of the standard mineral molecules will be found on p. 1163.

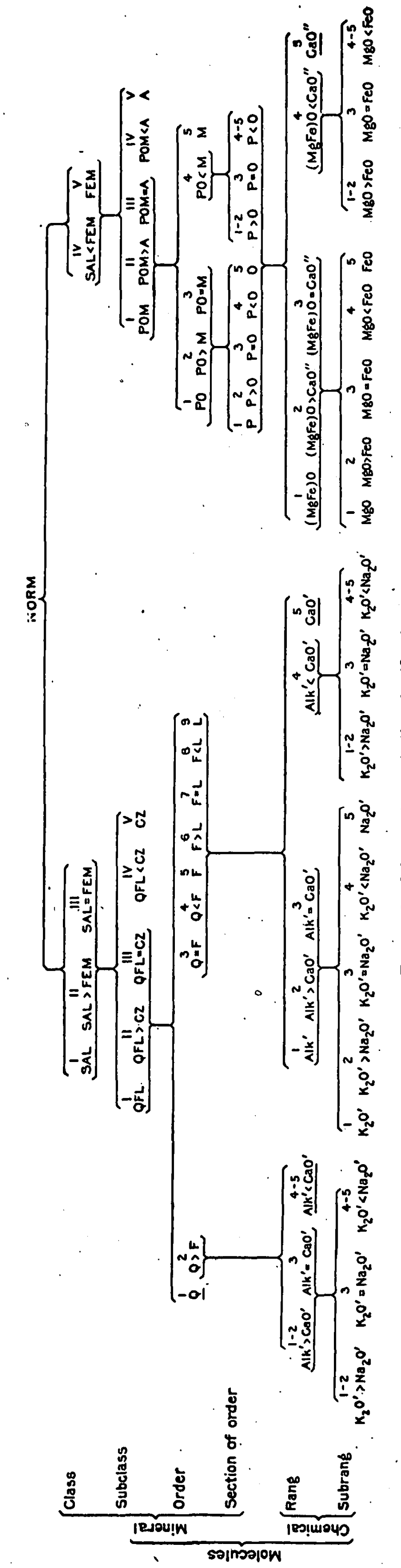

FIGURE 2.—Scheme of quantitative classification.

CLASSES.

The classes are based on the relative amounts of the collective salic and femic molecules in the norm. There are five classes:

Class I (persalic). The salic molecules are extreme over the femic. Center point: sal=100, fem=0; sal:fem=1:0. Limits: sal$\leqq$100>87.5; fem$\leqq$0>12.5; sal; fem=1:0.

Class II (dosalic). The salic molecules are dominant over the femic. Center point: sal=75, fem=25; sal:fem=3:1. Limits: sal$\leqq$87.5>62.5, fem$\geqq$12.5<37.5; sal:fem$\leqq$7:1>5:3.

Class III (salfemic). The salic and femic molecules are equal or nearly equal in amount. Center point: sal=50, fem=50; sal:fem=1:1. Limits: sal$\leqq$62.5$\geqq$37.5; fem $\geqq$37.5$\leqq$62.5; sal:fem $\leqq$5:3$\geqq$3:5.

Class IV (dofemic). The femic molecules are dominant over the salic. Center point: sal=25, fem=75; sal:fem=1:3. Limits: sal <37.5$\geqq$12.5, fem>62.5$\leqq$87.5; sal:fem<3:5$\geqq$1:7.

Class V (perfemic). The femic molecules are extreme over the salic. Center point: sal=0, fem=100; sal:fem=0:1. Limits: sal <12.5$\geqq$0, fem>87.5$\leqq$100.

In subdividing the classes as far down as and including subrang, only the salic molecules are considered in Classes I, II, and III, and only the femic in Classes IV and V. In Class III the amount of the femic molecules may equal or even exceed (up to the limit) that of the salic molecules; but here the femic group is treated as subordinate for reasons given in the original publication and also by Iddings.[1]

SUBCLASSES.

The subclasses are based on the relative amounts of certain parts into which the salic and femic groups are divided, as follows:

Sal { Part 1. Quartz (Q), feldspars (F), feldspathoids (L).
Part 2. Corundum (C), zircon (Z).

Fem { Part 1. Pyroxenes (P); olivines and calcium orthosilicate (O); magnetite, hematite, ilmenite, rutile, titanite, perofskite (M).
Part 2. Apatite, fluorite, pyrite, etc. (A).

In Classes I, II, and III the division is fivefold and is made on the basis of the relations of the two variables (Q+F+L) and (C+Z). In Classes IV and V it is likewise fivefold but is made on the basis of the relations of the two variables (P+O+M) and (A). The center points and limits are identical in position with those of the classes. In Subclasses II, III, IV, and V of Classes I, II, and III the relative amounts of corundum (C) and zircon (Z) may be recognized by sections formed by contrasting these two variables in the same way, the division being threefold in Subclass II and fivefold in the others.

As most igneous rocks belong to Subclass I of any class, the succeeding description of the classification will pertain only to Subclass I of each class.

[1] Iddings, J. P., Igneous rocks, vol. 1, p. 411, 1913.

ORDERS.

The orders are based on the relative amounts of the subparts of mineral molecules that constitute part 1 of the salic and part 1 of the femic group.

In Classes I, II, and III the division is based on the molecules of part 1 of the salic group. To carry this division out rigidly Q should be contrasted first with (F+L), expressing thus the degree of excess of silica. But as was pointed out by Zirkel[1] quartz and the lenads[2] (leucite and nephelite) are incompatible—that is, they never coexist in igneous rocks, so far as known, and as the feldspars may occur with either, these three variables are treated serially—that is, as a combination of two pairs of variables, quartz molecules being contrasted with feldspar molecules, and these in turn, without a break, with lenad (feldspathoid) molecules. The division is doubly fivefold and these orders are defined as follows, the positions of the center points and limits being the same as with classes.

Orders of Classes I, II, and III.

Order 1 (perquaric). Quartz extreme over feldspars.
Order 2 (feldoquaric). Quartz dominant over feldspars.
Order 3 (quarfelic). Quartz and feldspars equal.
Order 4 (quardofelic). Feldspars dominant over quartz.
Order 5 (perfelic). Feldspars extreme over quartz or lenads.
Order 6 (lendofelic). Feldspars dominant over lenads.
Order 7 (lenfelic). Feldspars and lenads equal.
Order 8 (feldolenic). Lenads dominant over feldspars.
Order 9 (perlenic). Lenads extreme over feldspars.

In Classes IV and V the division is based on the molecules of part 1 of the femic group. These are molecules of minerals that are not incompatible in igneous rocks, so that the division is not serial, as before, but fivefold and in two steps. For this purpose the silicate molecules of pyroxenes (P) and olivines (O) are first contrasted with the nonsilicates (M). This procedure is carried out as in the preceding divisions, the positions of the center points and limits being the same.

Orders of Classes IV and V.

Order 1 (perpolic). P+O extreme over M.
Order 2 (dopolic). P+O dominant over M.
Order 3 (polmitic). P+O and M equal.
Order 4 (domitic). M dominant over P+O.
Order 5 (permitic). M extreme over P+O.

The relative amounts of the metasilicates (P) and the orthosilicates (O) are expressed analogously in sections of an order. In orders 1, 2, and 3 the division is fivefold and analogous to the preceding cases.

Section 1 (perpyric). P extreme over O.
Section 2 (dopyric). P dominant over O.
Section 3 (pyrolic). P and O equal.
Section 4 (domolic). O dominant over P.
Section 5 (perolic). O extreme over P.

[1] Zirkel, Ferdinand, Lehrbuch der Petrographie, vol. 1, p. 646, 1893. Zirkel says: "Hiervon ist bis jetzt eine Ausnahme nicht gefunden, so dass dies zur Zeit als ein wirkliches Gesetz gelten muss, allerdings fast das einzige dieser Art."

[2] Lenad is a term used to replace feldspathoid.

In order 4, as the factor P+O is subordinate, though notable, the division is threefold, as follows:

Section 1–2 (prepyric). P preponderant over O.
Section 3 (pyrolic). P and O equal.
Section 4–5 (preolic). O preponderant over P.

In order 5, as the factor P+O is negligible, there is no subdivision.

SUBORDERS.

The classification into suborders involves a consideration of the different acidic radicals that may be present in the molecules so far considered and is based on their relative amounts. In Classes I, II, and III suborders are called for only in orders 7, 8, and 9, where they are based on the relative amounts of the silicate molecules (leucite and nephelite) and the chloride and sulphate molecules (halite and thenardite) in the norm, the relations between the last two being brought out in sections of these suborders. In orders 3, 4, and 5 of Classes IV and V the suborders are based on the relative amounts of the *hemic* molecules containing Fe_2O_3 (magnetite and hematite) and the *tilic* molecules containing TiO_2 (ilmenite, titanite, perofskite, rutile). As illustrating the extended possibility of classification in this system, it may be pointed out that the last four variables may be classified, if called for, by making subsections based on the contrasting of noncalcic ilmenite and rutile with calcic titanite and perofskite; each of these pairs being easily divided dichotomously in the same way.

As the need of the recognition of suborders seldom arises, and as they are formed quite analogously to the other divisions, they need not be further described.

RANGS.

The most general and the *acidic* characters of the preponderant molecules having been used in making the preceding divisions, the relations of the *basic* radicals of the normative mineral molecules are next considered for further divisions. These minor divisions are called rangs and subrangs, and in these divisions oxide molecules and not mineral molecules are dealt with. Rangs are established on the general character of the basic oxide.

In the orders of Classes I, II, and III the rangs are based on the relations of total *salic* alkalies to *salic* lime—that is, the $K_2O'+Na_2O'$ and CaO' of normative feldspar and lenad molecules.

Salic alkalies comprise only those that enter into the molecules of normative orthoclase, albite, leucite, nephelite, kaliophilite, halite, and thenardite, denoted by K_2O' and Na_2O'. The K_2O of K_2SiO_3 and the Na_2O of acmite and Na_2SiO_3 are femic and are denoted by K_2O'' and Na_2O''. *Salic* lime (CaO') is only that which enters into the normative anorthite molecule. The lime (CaO) of normative diopside, wollastonite, calcium orthosilicate, apatite, titanite, and perofskite is femic (CaO″). Stress must be laid on this distinction, as it has been overlooked by some geologists, who have in consequence incorrectly determined the classificatory positions of some rocks.

In orders 3, 4, 5, 6, 7, and 8 (Classes I, II, and III), the division is fivefold and is carried out with the same center points and limits as before. In order 3 the quartz is fixed in composition, so that the division is applied to the chemically variable feldspars and lenads. In order 2, with subordinate feldspar, the division is only threefold, but rocks that fall here are very rare. The divisions are defined as follows:

Rang 1 (peralkalic). Salic alkalies extreme over salic lime.
Rang 2 (domalkalic). Salic alkalies dominant over salic lime.
Rang 3 (alkalicalcic). Salic alkalies and salic lime equal.
Rang 4 (docalcic). Salic lime dominant over salic alkalies.
Rang 5 (percalcic). Salic lime extreme over salic alkalies.

In the orders of Classes IV and V the rangs are based on the relations of total magnesia, *ferrous* oxide (not including Fe_2O_3 calculated as FeO), and *femic* alkalies (practically always Na_2O'') to *femic* lime, a practice in accord with a recently published modification of the classification.[1] The divisions are as follows:

Rang 1 (permiric). $MgO+FeO+Na_2O''$ extreme over CaO″.
Rang 2 (domiric). $MgO+FeO+Na_2O''$ dominant over CaO″.
Rang 3 (calcimiric). $MgO+FeO+Na_2O''$ and CaO″ equal.
Rang 4 (docalcic). CaO″ dominant over $MgO+FeO+Na_2O''$.
Rang 5 (percalcic). CaO″ extreme over $MgO+FeO+Na_2O''$.

SUBRANGS.

The subrangs are based on the relations of the oxides forming the compound to one of the two contrasted variables that are used for rangs. In Classes I, II, and III these are *salic* soda (Na_2O') and *salic* potash (K_2O'). In rangs 1, 2, and 3 the division is fivefold, as follows:

Subrang 1 (perpotassic). K_2O' extreme over Na_2O'.
Subrang 2 (dopotassic). K_2O' dominant over Na_2O'.
Subrang 3 (sodipotassic). K_2O' and Na_2O' equal.
Subrang 4 (dosodic). Na_2O' dominant over K_2O'.
Subrang 5 (persodic). Na_2O' extreme over K_2O'.

In the docalcic rangs of Classes I, II, and III the division is threefold.

Subrang 1–2 (prepotassic). K_2O' preponderant over Na_2O'.
Subrang 3 (sodipotassic). K_2O' and Na_2O' equal.
Subrang 4-5 (presodic). Na_2O' preponderant over K_2O'.

In the percalcic rangs 5 there is no division into subrangs, as the alkalies are negligible.

In Classes IV and V the contrasted factors are MgO and $FeO+Na_2O''$. In rangs 1, 2, and 3 the division is fivefold, as follows:

Subrang 1 (permagnesic). MgO extreme over $FeO+Na_2O''$.
Subrang 2 (domagnesic). MgO dominant over $FeO+Na_2O''$.
Subrang 3 (magnesiferrous). MgO and $FeO+Na_2O''$ equal.
Subrang 4 (doferrous). $FeO+Na_2O''$ dominant over MgO.
Subrang 5 (perferrous). $FeO+Na_2O''$ extreme over MgO.

[1] Jour. Geology, vol. 20, p. 552, 1912.

In the docalcic rangs 4 the division is threefold, as described above; and in the percalcic rangs 5 there is no division into subrangs.

In a very few rocks the amount of femic soda is so great that recognition of the relative amounts of FeO and Na_2O'' is called for and is expressed in sections of subrangs, FeO preceding.

GRADS AND SUBGRADS.

In the divisions called grads and subgrads and in sections of them are expressed the successively more detailed character of the *subordinate* normative molecule group in the various classes; the femic in Classes II and III and the salic in Class IV. These divisions are established precisely as are the divisions from order to subrang inclusive, though not with the same detail, as the variables dealt with are subordinate. In Classes I and V grads and subgrads are not called for, as the subordinate group is present in negligible amount. Grads and subgrads are disregarded in this collection of analyses, except that the symbols of the subordinate femic divisions are given in Class III, Salfemane.

NOMENCLATURE.

The nomenclature of the normative divisions of the classification is treated very briefly here. The names consist of a root and a termination, the termination indicating the relative position of the named division in the system. The terminations for the divisions are:

Class (-ane).	Subclass (-one).
Order (-are).	Suborder (-ore).
Rang (-ase).	Subrang (-ose).
Grad (-ate).	Subgrad (-ote).

Sections of any of these divisions are indicated by inserting an "i" between the root and the termination.

The roots of classes are mnemonic of the contrasted factors on which they are based, and the names of the five classes are as follows:

Class I. Persalane. Sal extreme over fem.
Class II. Dosalane. Sal dominant over fem.
Class III. Salfemane. Sal and fem equal.
Class IV. Dofemane. Fem dominant over sal.
Class V. Perfemane. Fem extreme over sal.

The names for subclasses that were originally proposed (persalone, dosalone, salfemone, dofemone, perfemone) are clearly incorrect and unsystematic, and they must therefore be rejected. They are incorrect and not properly mnemonic in that they are not based on the variables used to form subclasses, namely, (Q+F+L) and (C+Z) in Classes I, II, and III and (P+O+M) and (A) in Classes IV and V; they are not precise in their applications, and they are unsystematic because other subclasses of the same class can not be formed analogously. Mnemonic systematic names, precise in their application, can be devised for subclasses, but they would be awkwardly long.

For example, adopting *quafel* as mnemonic of QFL and *corz* as mnemonic of CZ, the name of Subclass I of persalane would be perquafelpersalone; that of Subclass III of persalane (cf. p. 325) would be quafelcorzpersalone; and that of Subclass II of salfemane (cf. p. 703) would be doquafelsalfemone. Subclass II of Class IV (p. 732) would thus be named dopomdofemone. Similarly formed mnemonic names for divisions below a subclass would become still more complex and unmanageable; thus the order canadare might be systematically and mnemonically called perfelperquafelpersalone.

As the known representatives of subclasses other than Subclass I are still very few, it will be as well, for the present, not to name subclasses.

The names of most of the orders and suborders are based on the names of countries and nations, and occasionally such roots are used for lower orders, but most of the roots of the rangs and subrangs are based on smaller geographic units. Many of the roots of the common rock names are also used.

LIMITS AND SYMBOLS OF THE DIVISIONS.

Figure 3[1] shows the percentages and decimal ratios that determine the limits of the different divisions—central, intermediate, distal, and transitional—and the symbols that indicate them as they have been used in Part I of the collection (pp. 49-747). In Classes I, II, and III the perfelic order 5 is of the same extent as the other orders, but as it intervenes between quardofelic order 4 and lendofelic order 6, this particular division should be twice as long as it is represented on the scale, the scale being continued to include the succeeding orders.[2] Any misapprehension of this point can be obviated by considering that the lenadic half of order 5 in Classes I, II, and III is represented in the figure by order 1, order 6 by order 2, order 7 by order 3, order 8 by order 4, and order 9 by the scalar half of order 5. This applies only to orders in Classes I, II, and III.

It may be well to give illustrations of the meanings of the several terms and symbols that are used to indicate the relative position of a rock in a division of the quantitative system, reference being made to figure 3 and attention being confined to the division, between ratios 1.667 and 0.600. This position is "central" between ratios 1.286 and 0.778, the symbol being a simple 3; "intermediate" stands between

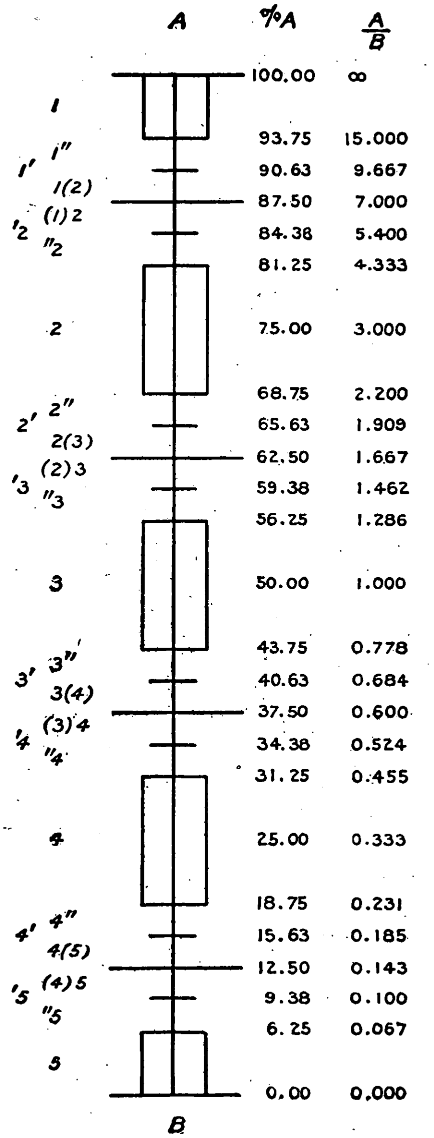

FIGURE 3.—Diagram showing limits of divisions, center points, and symbols of the quantitative classification.

ratios 1.667 and 1.286, or 0.778 and 0.600, the symbol being respectively '3 and 3'; "distal" stands between 1.462 and 1.286, or 0.778 and 0.684, the symbols being respectively ''3 and 3''; and "transitional" stands between 1.667 and 1.462, or 0.684 and 0.600, the symbols being respectively (2)3 and 3(4).

[1] Cross, Whitman, Iddings, J. P., Pirsson, L. V., and Washington, H. S., Jour. Geology, vol. 20, p. 556, figs. 1 and 2, 1912.

[2] Cross, Whitman, Iddings, J. P., Pirsson, L. V., and Washington, H. S., Quantitative classification of igneous rocks, p. 132, Chicago, 1903.

APPENDIX 2.

TABULAR PRESENTATION OF THE DIVISIONS AND NAMES OF THE QUANTITATIVE CLASSIFICATION.

The accompanying tabulation of the quantitative system is similar to that which was published in Professional Paper 14, but it contains also the names that have been proposed since that work was published and that are here accepted (pp. 34-36) as well as a number of names for hitherto-unnamed divisions that have been proposed by me and by several others and that are now published for the first time.

An x in a divisional space indicates that the analyses of rocks that belong here are included in Part I of the collection but that no name is proposed for the division. The absence of a name or of an x implies that no analysis of a rock is yet known or included in Part I that would occupy that position in the system.

The table may be regarded as a concise and definitive statement of all the names of the divisions of the quantitative system accepted by its authors up to the end of 1916, except those for divisions of Subclasses II, III, IV, and V, distinguished by notable amounts of normative corundum, zircon, or apatite. The names of those divisions which have been accepted will be found in Part I of the collection.

To each divisional name is added the number of analyses in Part I of the collection that fall in the division, except those which fall in the subclasses just mentioned, which are omitted from the table.

TABLE I.—CLASS I, PERSALANE. SUBCLASS I (2050).

Order	1. Victorare 3	2. Belgare 24	3. Columbare 399	4. Britannare 1232	5. Canadare 267	6. Russare 111	7. Tasmanare 8	8. Ontarare 2	9. Laurentare 2
Rang 1	1. x 3	1-2. Dargase 15	1. Alaskase 182	1. Liparase 444	1. Nordmarkase 118	1. Miaskase 84	1. Laugenase 8	1. Hochelagase 1	1. Congressase 2
Subrang 1		1-2. Arizonose 9	1. Bisbose 9	1. Lebachose 12	1. Hettose 1	1.	1.	1.	1.
Subrang 2			2. Magdeburgose 31	2. Omeose 33	2 x 1	2.	2.	2.	2.
Subrang 3		3. Cardiffose 3	3. Alaskose 101	3. Liparose 299	3. Phlegrose 48	3. Beemerose 12	3. Appianose 2	3.	3.
Subrang 4		4-5. x 3	4. Tordrillose 27	4. Kallerudose 86	4. Nordmarkose 63	4. Miaskose 72	4. Laugenose 5	4. Hochelagose 1	4. Congressose 1
Subrang 5			5. Westphalose 14	5. Noyangose 14	5. Tuolumnose 5	5. Mariupolose 0	5. x 1	5.	5. x 1
Rang 2		2. 0	2. Alsbachase 162	2. Toscanase 616	2. Pulaskase 117	2. Viezzenase 27	2.	2. Monmouthase 1	
Subrang 1		1.	1. x 2	1. x 1	1.	1.		1.	
Subrang 2		2.	2. Mihalose 8	2. Dellenose 22	2. Vulsinose 9	2.		2.	
Subrang 3		3.	3. Tehamose 96	3. Toscanose 381	3. Pulaskose 47	3. x 5		3.	
Subrang 4		4.	4. Alsbachose 45	4. Lassenose 203	4. Larvikose 58	4. Viezzenose 21		4. Monmouthose 1	
Subrang 5		5.	5. Yukonose 11	5. Mariposose 9	5. x 3	5. Raglanose 1		5.	
Rang 3		3. x 7	3. Riesenase 49	3. Coloradase 170	3. Piedmontase 12	3.	3.		
Subrang 1		1-2. x 5	1.	1.	1.				
Subrang 2			2. x 2	2. x 2	2. Mazarunose 1				
Subrang 3		3. x 1	3. Riesenose 28	3. Amiatose 54	3. x 1				
Subrang 4		4-5. x 1	4. Susquehannose 11	4. Yellowstonose 106	4. Piedmontose 7				
Subrang 5			5. x 8	5. Amadorose 8	5. Kitlimose 3				
Rang 4		4. x 2	4. x 6	4. x 4	4. Labradorase 12	4.			
Subrang 1-2		1-2. x 1	1-2.	1-2.	1-2.				
Subrang 3		3.	3. x 3	3.	3.				
Subrang 4-5		4-5. x 1	4-5. x 3	4-5. x 4	4-5. Labradorose 12				
Rang 5			5.	5.	5. Canadase 8				

TABLE II.—CLASS II, DOSALANE. SUBCLASS I (1880).

Order	1.	2. x 4	3. Hispanare 43	4. Austrare 642	5. Germanare 965	6. Norgare 175	7. Italare 36	8. Campanare 7	9. Lappare 8
Rang 1		1...3	1. Varingase 14	1. Pantellerase 54	1. Umptekase 81	1. Lardalase 75	1. Lujavrase 18	1. Naujaase 3	1. Urtase 8
Subrang 1		1-2 x 2	1.	1.	1. x 1	1.	1.	1.	1.
Subrang 2			2. x 1	2. x 1	2. Highwoodose 5	2. Fergusose 4	2.	2.	2.
Subrang 3		3.	3. Varingose 12	3. Grorudose 36	3. Ilmenose 24	3. Judithose 8	3. Janeirose 3	3.	3. Arkansose 4
Subrang 4		4-5 x 1	4. x 1	4. Pantellerose 15	4. Umptekose 49	4. Lardalose 62	4. Lujavrose 14	4. x 1	4. Urtose 4
Subrang 5			5.	5. x 2	5. Kirunose 2	5. Agpaose 1	5. Antangainose 1	5. Naujaose 2	5.
Rang 2			2. x 9	2. Dacase 127	2. Monzonase 263	2. Essexase 70	2. Vulturase 18	2. Vesuvase 4	
Subrang 1			1.	1.	1.	1.	1.	1.	
Subrang 2			2. x 3	2. x 3	2. Ciminose 12	2. Vicose 5	2. Braccianose 9	2. Vesuvose 2	
Subrang 3			3. x 4	3. Adamellose 58	3. Monzonose 100	3. Borolanose 23	3. Baweanose 4	3.	
Subrang 4			4. x 2	4. Dacose 60	4. Akerose 134	4. Essexose 42	4. Vulturose 5	4. Melfose 2	
Subrang 5			5.	5. x 6	5. Grenadose 17	5.	5.	5.	
Rang 3			3. Almerase 15	3. Tonalase 351	3. Andase 437	3. Salemase 29	3.		
Subrang 1			1.	1.	1.	1.			
Subrang 2			2. x 1	2. x 1	2. Auruncose 6	2. x 2			
Subrang 3			3. Almerose 11	3. Harzose 86	3. Shoshonose 82	3. x 3			
Subrang 4			4. x 3	4. Tonalose 245	4. Andose 329	4. Salemose 22			
Subrang 5			5.	5. Placerose 19	5. Beerbachose 20	5. Narsakose 2			
Rang 4		4. x 1	4. x 4	4. Bandase 109	4. Hessase 171	4. x 1			
Subrang 1-2		1-2.	1-2. x 1	1-2. Sagamose 3	1-2.	1-2.			
Subrang 3		3.	3. x 1	3. x 12	3. x 6	3.			
Subrang 4-5		4-5 x 1	4-5. x 2	4-5. Bandose 94	4-5. Hessose 165	4-5. x 1			
Rang 5			5. x 1	5. x 1	5. Corsase 13	5.			

TABLE III.—SALFEMANE. SUBCLASS I (792).

Order	1...0	2...0	3. Atlantare 2	4. Vaalare 44	5. Gallare 532	6. Portugare 135	7. Kamerunare 38	8. Bohemare 33	9. Finnare 8
Rang 1			1. Rockallase 2	1. Cucullase 4	1. Orendase 13	1. Wyomingase 8	1. Malignase 7	1. Chotase 5	1. Ijolase 8
Subrang 1			1.	1.	1. Orendose 4	1. Wyomingose 1	1.	1.	1. Madupose 1
Subrang 2			2.	2.	2. Fortunose 4	2.	2.	2. Chotose 3	2.
Subrang 3			3.	3. x 1	3. x 1	3. Montanose 2	3. x 1	3.	3. Kivose 1
Subrang 4			4.	4. Cucullose 2	4. Pienarose 3	4. Pilandose 5	4. Malignose 5	4. Otagose 1	4. Iivaarose 5
Subrang 5			5. Rockallose 2	5. x 1	5. Gellivarose 1	5.	5. x 1	5. x 1	5. Ijolose 1
Rang 2			2.	2. x 1	2. Kilauase 38	1. Monchiquase 37	2. Kamerunase 16	2. Albanase 21	
Subrang 1				1.	1.	1.	1.	1.	
Subrang 2				2.	2. Prowersose 5	2. Kajanose 1	2. Jugose 2	2. Albanose 4	
Subrang 3				3.	3. Lamarose 12	3. Shonkinose 6	3. Cascadose 3	3. x 4	
Subrang 4				4. x 1	4. Kilauose 17	4. Monchiquose 28	4. Kamerunose 10	4. Covose 12	
Subrang 5				5.	5. x 4	5. Scanose 2	5. x 1	5. x 1	
Rang 3				3. Vaalase 18	3. Camptonase 251	3. Limburgase 78	3. Etindase 14	3. x 6	
Subrang 1				1.	1.	1.	1.	1.	
Subrang 2				2.	2. Absarokose 4	2. Ottajanose 2	2. Fiasconose 1	2.	
Subrang 3				3. x 3	3. Kentallenose 19	3. Ourose 5	3.	3. x 1	
Subrang 4				4. Vaalose 14	4. Camptonose 186	4. Limburgose 65	4. Etindose 13	4. x 5	
Subrang 5				5. x 1	5. Ornose 42	5. Bekinkinose 6	5.	5.	
Rang 4				4. Koghase 19	4. Auvergnase 210	4. x 12	4. x 1	4. x 1	
Subrang 1-2				1-2.	1-2. x 1	1-2.	1-2. x 1	1-2.	
Subrang 3				3.	3. x 12	3.	3.	3.	
Subrang 4-5				4-5. Koghose 19	4-5. Auvergnose 197	4-5. Papenoose 12	4-5.	4-5. x 1	
Rang 5				5. x 2	5. Kedabekase 20	5.			

TABLE IV.—CLASS IV, DOFEMANE (171).

Order	1. Hungarare (81)				
Section	1. Minnesotiare 20	2. Quebeciare 25	3. Hungariare 22	4. x 9	5. Pyreniare 5
Rang 1	1. Minnesotase 10	1. Hilase 6	1. Wehrlase 5	1. Cortlandtase 9	1. Lherzase 4
Subrang 1	1. x 2	1.	1.	1. Cortlandtose 2	1. Lherzose 1
Subrang 2	2. Cookose 8	2. Hilose 6	2. Wehrlose 5	2. Custerose 7	2. Argeinose 3
Subrang 3	3.	3.	3.	3.	3.
Subrang 4	4.	4.	4.	4.	4.
Subrang 5	5.	5.	5.	5.	5.
Rang 2	2. x 9	2. Brunase 18	2. Rossweinase 17	2.	2.
Subrang 1	1.	1. Belcherose 2	1. Jumillose 3	1.	1.
Subrang 2	2. x 9	2. Palisadose 16	2. Rossweinose 13	2.	2.
Subrang 3	3.	3.	3. x 1	3.	3.
Subrang 4	4.	4.	4.	4.	4.
Subrang 5	5.	5.	5.	5.	5.
Rang 3	3. x 1	3. x 1	3.	3.	3. Venanziase 1
Subrang 1	1.	1.	1.	1.	1.
Subrang 2	2.	2.	2.	2.	2. Venanzose 1
Subrang 3	3.	3. x 1	3.	3.	3.
Subrang 4	4. x 1	4.	4.	4.	4.
Subrang 5	5.	5.	5.	5.	5.
Order	2. Scotare (63).				
Section	1. x 8	2. Pauliare 20	3. Texiare 22	4. x 9	5. x 4
Rang 1	1. x 1	1. Valbonnase 2	1. Marquettase 1	1. x 4	1. Kaltenase 1
Subrang 1	1.	1. Valbonnose 1	1.	1. x 1	1.
Subrang 2	2. x 1	2. x 1	2. Marquettose 1	2. x 3	2. x 4
Subrang 3	3.	3.	3.	3.	3. Kaltenose 1
Subrang 4	4.	4.	4.	4.	4.
Subrang 5	5.	5.	5.	5.	5.
Rang 2	2. Yamaskase 2	2. Montrealase 15	2. Texase 18	2. Casselase 5	2. x 1
Subrang 1	1.	1.	1.	1.	1.
Subrang 2	2. Yamaskose 1	2. Montrealose 12	2. Uvaldose 18	2. Casselose 4	2. x 1
Subrang 3	3. x 1	3. x 3	3.	3. x 1	3.
Subrang 4	4.	4.	4.	4.	4.
Subrang 5	5.	5.	5.	5.	5.
Rang 3	3. Brandbergase 5	3. Paulase 3	3. x 3	3.	3. x 1
Subrang 1	1.	1.	1.	1.	1.
Subrang 2	2. Brandbergose 4	2. Paulose 3	2. Naketose 3	2.	2. x 1
Subrang 3	3. x 1	3.	3.	3.	3.
Subrang 4	4.	4.	4.	4.	4.
Subrang 5	5.	5.	5.	5.	5.
Order	3. Sverigare (11).				
Section	1. Bergeniare 7	2. x 2	3. Uteiare 1	4.	5. Sverigiare 1
Rang 1	1. Bergenase 3	1.	1.	1.	1. x 1
Subrang 1	1.	1.	1.	1.	1.
Subrang 2	2.	2.	2.	2.	2.
Subrang 3	3. Bergenose 1	3.	3.	3.	3.
Subrang 4	4. x 1	4.	4.	4.	4. x 1
Subrang 5	5. x 1	5.	5.	5.	5.
Rang 2	2. Tuxenase 1	2. x 1	2. Eldorase 1	2.	2.
Subrang 1	1.	1.	1.	1.	1.
Subrang 2	2.	2. x 1	2.	2.	2.
Subrang 3	3. Tuxenose 1	3.	3. Eldorose 1	3.	3.
Subrang 4	4.	4.	4.	4.	4.
Subrang 5	5.	5.	5.	5.	5.
Rang 3	3. Ijussase 3	3. Avezacase 1	3.	3.	3.
Subrang 1	1.	1.	1.	1.	1.
Subrang 2	2. x 1	2.	2.	2.	2.
Subrang 3	3. Ijussose 2	3. Avezacose 1	3.	3.	3.
Subrang 4	4.	4.	4.	4.	4.
Subrang 5	5.	5.	5.	5.	5.

TABLE IV.—CLASS IV, DOFEMANE (171)—Continued.

Order	4. Adirondackare (10).		
Suborder	1. x 1	2. Adirondackore 4	3. Champlainore 5
Rang 1	1. Arapahaso 1	1. Adirondackase 4	1. Champlainase 5
Subrang 1	1.	1.	1.
Subrang 2	2.	2.	2.
Subrang 3	3.	3.	3.
Subrang 4	4. Arapahose 1	4. Adirondackose 3	4. Champlainose 3
Subrang 5	5.	5. x 1	5. x 2
Rang 2	2.	2.	2.
Subrang 1			
Subrang 2			
Subrang 3			
Subrang 4			
Subrang 5			
Rang 3			
Subrang 1			
Subrang 2			
Subrang 3			
Subrang 4			
Subrang 5			

Order	5. Cordillerare (6).		
Suborder	1. x 1	2. x 4	3. x 1
Rang 1	1. x 1	1. Pomerase 4	1. x 1
Subrang 1	1.	1.	1.
Subrang 2	2.	2.	2.
Subrang 3	3.	3.	3.
Subrang 4	4.	4. Pomerose 3	4. x 1
Subrang 5	5. x 1	5. x 1	5.

TABLE V.—CLASS V, PERFEMANE (57).

Order	1. Maorare (38).				
Section	1. Caroliniare 10	2. Marylandiare 5	3. Saxoniare 2	4. Helvetiare 14	5. Maoriare 7
Rang 1	1. Maricase 3	1. x 1	1. x 1	1. Gordunase 14	1. Dunase 7
Subrang 1	1. Maricose 2	1. x 1	1. x 1	1. Gordunose 13	1. Dunose 4
Subrang 2	2.	2.	2.	2. Kakoulimose 1	2. Guineose 3
Subrang 3	3.	3.	3.	3.	3.
Subrang 4	4.	4.	4.	4.	4.
Subrang 5	5. x 1	5.	5.	5.	5.
Rang 2	2. Websterase 5	2. Baltimorase 4	2. Koswase 1	2.	2.
Subrang 1	1. Websterose 3	1. x 1	1.	1.	1.
Subrang 2	2. Cecilose 2	2. Baltimorose 3	2. Koswose 1	2.	2.
Subrang 3	3.	3.	3.	3.	3.
Subrang 4	4.	4.	4.	4.	4.
Subrang 5	5.	5.	5.	5.	5.
Rang 3	3. x 2	3.	3.	3.	3.
Subrang 1	1.				
Subrang 2	2. x 2				
Subrang 3	3.				
Subrang 4	4.				
Subrang 5	5.				

Order	2. No name (5).				
Section	1. x 3	2.	3. x 1	4.	5.
Rang 1	1.	1.	1.	1.	1. Permase 1
Subrang 1					1.
Subrang 2					2. Permose 1
Subrang 3					3.
Subrang 4					4.
Subrang 5					5.
Rang 2	2. x 1	2.	2. x 1	2.	2.
Subrang 1	1.		1.		
Subrang 2	2. x 1		2. x 1		
Subrang 3	3.		3.		
Subrang 4	4.		4.		
Subrang 5	5.		5.		
Rang 3	3. Cebollase 2	3.	3.	3.	3.
Subrang 1	1.				
Subrang 2	2. Cebollose 2				
Subrang 3	3.				
Subrang 4	4.				
Subrang 5	5.				

TABLE V.—CLASS V, PERFEMANE (57)—Continued.

Order	3. Rhodare (5).				
Section	1. x 2	2.	3. Bouldiare 1	4. x 1	5. x 1
Rang 1	1. x 2	1.	1.	1. x 1	1. Rhodase 1
Subrang 1	1.			1.	1.
Subrang 2	2.			2. x 1	2.
Subrang 3	3.			3.	3. Rhodose 1
Subrang 4	4.			4.	4.
Subrang 5	5. x 2			5.	5.
Rang 2			2. Cardinalase 1		
Subrang 1			1.		
Subrang 2			2. Cardinalose 1		
Subrang 3			3.		
Subrang 4			4.		
Subrang 5			5.		
Rang 3					
Subrang 1					
Subrang 2					
Subrang 3					
Subrang 4					
Subrang 5					

Order	4. No name (1).				
Section	1.	2. x 1	3.	4.	5.
Rang 1	1.	1. x 1	1.	1.	1.
Subrang 1		1.			
Subrang 2		2.			
Subrang 3		3.			
Subrang 4		4.			
Subrang 5		5. x 1			
Rang 2					
Subrang 1					
Subrang 2					
Subrang 3					
Subrang 4					
Subrang 5					

Order	5. No name (8).				
Section	1. x 1	2. 3	3. 2	4. 2	5.
Rang 1	1. x 1	1. x 3	1. x 2	1. x 2	
Subrang 1	1.	1.	1.	1.	
Subrang 2	2.	2.	2.	2.	
Subrang 3	3.	3.	3.	3.	
Subrang 4	4.	4. x 2	4. x 2	4. x 2	
Subrang 5	5. x 1	5. x 1	5.	5.	
Rang 2					
Subrang 1					
Subrang 2					
Subrang 3					
Subrang 4					
Subrang 5					

APPENDIX 3.

CALCULATION OF THE NORM.

INTRODUCTION.

Inasmuch as the exposition of the calculation of the norm in the quantitative system of classification and the tables of molecular numbers and percentage weights as originally published [1] may not now be readily accessible to all who use this collection of analyses, it has been thought that it would be useful to furnish these data in this volume.[2] The republication of this matter is the more advisable because the original statement of the calculation is very concise and because some changes have been suggested since the matter was first published.[3] A very clear and detailed statement of the methods of calculation, illustrated by many examples and accompanied by the numerical tables, has lately been published by Finlay.[4]

In the present work considerable change has been made in the presentation of the calculation, though without altering its general principles, and the tables have been to some extent rearranged so as to make them more convenient for the ready calculation of the norms of the great majority of rocks. Some sections have been expanded and some contracted, as dictated by much experience, and a few errors have been corrected.

In the calculation of the norms of thousands of analyses I have found that the formal way of setting down the data in columns, as proposed in the original publication, followed by Finlay and generally used, involves some needless repetition and waste of time. Thus in calculating the feldspars and lenads there is no need of repeating for Al_2O_3 the figures for K_2O, Na_2O, and CaO; or in calculating magnetite of setting down the figures for FeO and Fe_2O_3, as they are necessarily identical. After several trials I have adopted and used for some years the arrangement shown in figure 1 (p. 37). By adopting such an arrangement, not putting down more figures than are necessary, and with a little practice and experience, it will be found that the calculation of a norm takes but little time. For most rocks five minutes should suffice, but when readjustments have to be made (as because of deficiency in silica) the calculation may take ten minutes, or fifteen at the outside, in the most complicated norms.

The term *molecular number* [5] is adopted here, instead of the commonly and previously used *molecular ratio*, *molecular proportion*, or the term *mol number*, suggested by Wright and Van Orstrand,[6] because of the following considerations: The word *number* is preferable to *ratio* or *proportion* because the result obtained by dividing the weight percentage of any given constituent by its molecular weight is a number which is independent and irrespective of the other results similarly obtained. Thus, the result is not a ratio or proportion between such numbers. For rock analyses the term molecular is preferable to mol, as the quantities involved are molecules and are not related to any system of weights such as the definition of the term mol implies.

It is premised that in calculating the norm certain considerations should be borne in mind. The norm is the expression of the chemical composition of the rock in terms of standard mineral molecules, a list of which is given on page 1163. Some of the constituents enter only into "fixed" molecules, which are so called because they are incapable of change, whatever be the general chemical character of the rock. Thus ZrO_2 enters only into zircon (Z) as a standard mineral, P_2O_5 into apatite (ap), Cl into halite (hl), and so on. Other constituents may enter different mineral molecules according to the amounts of other constituents in the rock. Thus K_2O may enter orthoclase, leucite or kaliophilite; and Na_2O into albite or nephelite, according to the amount of available SiO_2.

As regards Al_2O_3, except when it is in excess of the sum of the alkalies and lime (the excess forming the corundum molecule), it is invariably present in the ratio of 1: 1 with K_2O, Na_2O, or CaO in the salic minerals orthoclase, leucite, kaliophilite, albite, nephelite, and anorthite. Consequently, where molecules of these minerals are considered in the following pages

[1] Cross, Whitman, Iddings, J. P., Pirsson, L. V., Washington, H. S., The quantitative classification of igneous rocks, pp. 186-203, 236-259, 1903.

[2] This republication has been suggested by a number of petrographers, among them Prof. A. Lacroix, of Paris, and Prof. A. Johannsen, of Chicago.

[3] Cross, Whitman, Iddings, J. P., Pirsson, L. V., Washington, H. S., Jour. Geology, vol. 20, p. 557, 1912; Washington, H. S., Wash. Acad. Sci. Jour., vol. 5, p. 345, 1915.

[4] Finlay, G. I., Introduction to the study of igneous rocks, New York, 1913.

[5] This term is used also by Finlay.

[6] Wright and Van Orstrand, Wash. Acad. Sci. Jour., vol. 3, p. 223, 1913.

any mention of K_2O, Na_2O, or CaO implies the consideration of an equal molecular amount of Al_2O_3. Stress must also be laid on the fact that only the CaO which with an equal amount of Al_2O_3 enters anorthite is salic. The excess of CaO over this is femic.

The adjustment of the SiO_2 is one of the most important features in the calculation of the norm. The general principle followed involves a recognition of the so-called affinity of the different bases for SiO_2 and of the relative proportions of SiO_2 to base which each base can bind.[1] The order of affinity for SiO_2, by which the distribution of this constituent is determined in calculating the norm, is as follows:

$$K_2O > Na_2O > CaO > MgO > FeO.$$

It should be noted that this order is not arbitrarily chosen but is founded on experience in petrography and mineralogy, supported by laboratory experiment, and that it accords in general with the occurrence of minerals in igneous rocks.

Stress must also be laid on the fact that the so-called standard minerals are understood to be *molecules* and not actual minerals. The misappreciation of this point has apparently led to some confusion of mind in regard to the norm.

NORMATIVE MINERAL MOLECULES.

Salic group.

Quartz (Q)	SiO_2.
Corundum (C)	Al_2O_3.
Zircon (Z)	$ZrO_2.SiO_2$.
Orthoclase (or)	$K_2O.Al_2O_3.6SiO_2$.
Albite (ab)	$Na_2O.Al_2O_3.6SiO_2$.
Anorthite (an)	$CaO.Al_2O_3.2SiO_2$.
Leucite (lc)	$K_2O.Al_2O_3.4SiO_2$.
Nephelite (ne)	$Na_2O.Al_2O_3.2SiO_2$.
Kaliophilite (kp)	$K_2O.Al_2O_3.2SiO_2$.
Halite (hl)	NaCl.
Thenardite (th)	$Na_2O.SO_3$.
Sodium carbonate (nc)	$Na_2O.CO_3$.

Femic group.

Acmite (ac)	$Na_2O.Fe_2O_3.4SiO_2$.
Sodium metasilicate (ns)	$Na_2O.SiO_2$.
Potassium metasilicate (ks)	$K_2O.SiO_2$.
Diopside (di)	$CaO(Mg,Fe)O.2SiO_2$.
Wollastonite (wo)	$CaO.SiO_2$.
Hypersthene (hy)	$(Mg,Fe)O.SiO_2$.
Olivine (ol)	$2(Mg,Fe)O.SiO_2$.
Calcium orthosilicate (cs)	$2CaO.SiO_2$.
Magnetite (mt)	$FeO.Fe_2O_3$.
Chromite (cm)	$FeO.Cr_2O_3$.
Ilmenite (il)	$FeO.TiO_2$.
Hematite (hm)	Fe_2O_3.
Titanite (tn)	$CaO.TiO_2.SiO_2$.
Perofskite (pf)	$CaO.TiO_2$.
Rutile (ru)	TiO_2.
Apatite (ap)	$3(3CaO.P_2O_3).CaF_2$.
Fluorite	CaF_2.
Pyrite (pr)	FeS_2.
Calcite (cc)	$CaO.CO_2$.

[1] Cf. Cross, Whitman, Iddings, J. P., Pirsson, L. V., Washington, H. S., The quantitative classification of igneous rocks, p. 191. Whether the order of this affinity is determined by something analogous to "chemical affinity" or is due to differences in solubility need not be discussed here. A general discussion of this subject and of the norm will form the subject of a separate paper.

Of these molecules quartz, corundum, sodium and potassium metasilicates, hematite, and rutile are what may be called "excess" molecules, as each represents an excess of some constituent over the amount which may be used to form other constituents.

THE CALCULATION.

The following statement of the rules for calculating the norm is based on the original presentation, but is modified in substance to accord with certain suggested minor changes and is modified in form so far as to represent the procedure adopted by me in calculating the norms found in Part I of the tables. In the description the word "amount" should always be understood to mean the molecular amount or the molecular number obtained by dividing the percentage weight of the constituent by its molecular weight.

1. The molecular number (amount) of each constituent is determined by reference to the table of molecular numbers, given on pages 1166–1170. If the result is less than 0.002 it may be neglected.

2. The amounts of MnO and NiO are to be added to that of FeO, and those of BaO and SrO to that of CaO.

The minor fixed molecules are first to be disposed of. The order in which this is done (3a–3i) is generally immaterial.

3a. An amount of CaO equal to 3.33 that of the P_2O_5 is allotted for apatite.

3b. An amount of Na_2O equal to that of the Cl_2 is allotted for halite.

3c. An amount of Na_2O equal to that of the SO_3 is allotted for thenardite. It must be remembered here that the SO_3 stated in the analysis often really represents the S of pyrite, so that rule 3c is applicable only when the rock contains minerals of the hauyne group.

3d. An amount of FeO equal to half that of S (or the S of erroneously stated SO_3 as above) is allotted for pyrite.

3e. An amount of FeO equal to that of the Cr_2O_3 is allotted for chromite.

3f. An amount of FeO equal to that of the TiO_2 is allotted for ilmenite. If there is an excess of TiO_2 an equal amount of CaO is to be allotted to it for provisional titanite, but only after the allotment of CaO to Al_2O_3 for anorthite (Rule 4d). If there is still an excess of TiO_2 it is calculated as rutile.

3g. An amount of CaO equal to half that of the F in excess of what is needed for apatite (that is, the 0.33 of CaO of 3a) is allotted for fluorite.

3h. If the rock is not decomposed and contains cancrinite, an amount of Na_2O equal to that of the CO_2 is allotted for sodium carbonate, which is to be considered as salic.[1] If the rock contains calcite, an amount of CaO equal to that of the CO_2 is allotted for calcite. If the modal calcite is primary, this normative calcite molecule is to be regarded as femic;

[1] This is a recent modification, see p. 31.

if the modal calcite is secondary or due to the assimilation of limestone, the calculated calcite molecule is to be disregarded as not forming part of the norm.

3i. An amount of SiO_2 equal to that of the ZrO_2 is allotted for zircon.

Of the allotments under Rule 3, only a and f are generally and b, c, and i occasionally necessary; the others are rarely called for.

4a. An amount of Al_2O_3 equal to that of the K_2O is allotted for provisional orthoclase.

4b. If there is an excess of K_2O over Al_2O_3 (an excess extremely rare), it is calculated as potassium metasilicate. For the Na_2O see Rules 5a and 5b.

4c. An excess of Al_2O_3 over the K_2O is allotted to an equal amount of remaining Na_2O for provisional albite. If there is insufficient Al_2O_3, see Rule 4g.

4d. If there is an excess of Al_2O_3 over the K_2O+Na_2O it is allotted to an equal amount of remaining CaO for anorthite.

4e. If there is an excess of Al_2O_3 over this CaO it is calculated as corundum.

4f. If there is an excess of CaO over this Al_2O_3 of 4d it is femic and reserved for diopside and wollastonite. (See Rules 7a and 7b.)

4g. If in 4c there is an excess of Na_2O over Al_2O_3 it is to be reserved for acmite and possibly for sodium metasilicate. (See Rules 5a and 5b.) There is then no anorthite in the norm.

5a. An amount of Fe_2O_3 equal to that of the excess of Na_2O over Al_2O_3 (see Rule 4g) is allotted to acmite.

5b. If there is still an excess of Na_2O over Fe_2O_3 (a rare excess) it is calculated as sodium metasilicate.

5c. If, as usually happens, there is an excess of Fe_2O_3 over Na_2O it is assigned to magnetite, an equal amount of FeO being allotted to it out of what remains from the formation of pyrite, chromite, and ilmenite. (See Rules 3d, 3e, 3f.)

5d. If there is still an excess of Fe_2O_3 it is calculated as hematite.

6. All the MgO and the FeO remaining from the previous allotments (see Rules 3d, 3e, 3f, and 5c) are added together and their relative proportions are ascertained (most easily by the use of a slide rule).

7a. To the amount of CaO from 4d is allotted provisionally an equal amount of MgO+FeO to form diopside, the relative proportions of these two being preserved.

7b. If there is an excess of CaO it is reserved for provisional wollastonite.

7c. If there is an excess of MgO+FeO over that needed for diopside (7a) it is reserved for provisional hypersthene.

All the oxides except SiO_2 have now been assigned to actual or provisional mineral molecules and we have next to consider the distribution of the silica.

8a. The sum of the amounts of silica needed to form zircon from ZrO_2 (Rule 3i, 1:1), titanite from CaO (Rule 3f, 1:1), acmite from excess Na_2O (Rule 5a, 4:1), potassium and sodium metasilicates from excess K_2O and Na_2O (Rules 4b, 5b, 1:1), and *provisional* orthoclase from K_2O (Rule 4a, 6:1), albite from Na_2O (Rule 4c, 6:1), anorthite from CaO (Rule 4d, 2:1), diopside from CaO + (Mg, Fe)O (Rule 7a, 1:1), wollastonite from excess CaO (Rule 7b, 1:1), and hypersthene from (Mg, Fe)O (Rule 7c, 1:1) is subtracted from the total SiO_2.

8b. If there is an excess of SiO_2, as there commonly is, it is calculated as quartz.

8c. If there is a deficiency of silica in 8a the SiO_2 allotted to hypersthene (Rule 7c) is subtracted from the general sum of 8a and the remainder subtracted from the total SiO_2. If there is here an excess of SiO_2 it is allotted to the (Mg,Fe)O of 7c to form hypersthene and olivine, and is distributed according to equations (1) and (2):

Let x = the number of hypersthene molecules and y = the number of olivine molecules, then—

(1) $x+y$ = the amount of available (Mg, Fe)O and

(2) $x+\frac{y}{2}$ = the amount of available SiO_2.

In this operation the relative proportion of MgO and FeO determined in 6 and used in forming diopside (Rule 7a) is to be preserved. The fixed and provisional molecules of Rule 8a are calculated into their percentage weights. If there is not enough silica to equal half the amount of (Mg, Fe)O of Rule 7c, all the (Mg, FeO) of Rule 7c is calculated as olivine, SiO_2 equal to half its amount being assigned to it.

8d. If there is a deficiency of SiO_2 in 8c, the SiO_2 allotted to titanite (3f) is subtracted from the general sum of 8a, and the $CaO+TiO_2$ calculated as perofskite.

To follow strictly the order of affinity for SiO_2 stated on page 1163 we should now distribute SiO_2 between wollastonite and calcium orthosilicate, but as calcium orthosilicate is represented modally—that is, among actual minerals—in igneous rocks only in the very rare melilite, which also always occurs in rocks containing little SiO_2 and abundant nephelite, little albite, and often considerable leucite, we next take up the distribution of SiO_2 between albite and nephelite as representing most closely the facts of actual mineral occurrence.

8e. The sum of the SiO_2 needed to form the molecules of 8a is deducted from the total SiO_2, except that olivine is substituted for hypersthene, and perofskite for titanite, and that albite is not included. If there is an excess of more than twice (and, of course, less than six times) that of the Na_2O for the provisional albite of 8a this is distributed between albite and nephelite according to equations (3) and (4):

Let x = the number of albite molecules and y = the number of nephelite molecules, then—

(3) $x+y$ = the amount of available Na_2O, and

(4) $6x+2y$ = the amount of available SiO_2.

8f. If there is still a deficiency of SiO_2—that is, in 8e, not enough to equal twice the amount of available Na_2O—all this Na_2O is allotted to nephelite and the K_2O is distributed between orthoclase and leucite, as follows: The sum of the SiO_2 needed for the molecules in 8a is subtracted from the total SiO_2, olivine being substituted for hypersthene, perofskite for titanite, and nephelite for albite, and orthoclase being disregarded. If there is an excess of more than four times (and, of course, less than six times) that of K_2O it is distributed between orthoclase and leucite according to equations (5) and (6):

Let x = the number of orthoclase molecules and y = the number of leucite molecules, then—

(5) $x + y$ = the amount of available K_2O, and
(6) $6x + 4y$ = the amount of available SiO_2.

8g. If there is still a deficiency of SiO_2—that is, in 8f not enough to equal four times the amount of K_2O—we have to distribute the CaO of wollastonite and diopside between these two and calcium orthosilicate, and the (Mg, Fe)O of diopside between diopside and olivine, according to the available SiO_2. This distribution is made as shown below.[1] There are two possible cases; either there is sufficient wollastonite to reduce to orthosilicate or there is not.

The most frequent case is that in which there is no wollastonite or its amount is insufficient to satisfy the deficiency in SiO_2. Here, after allotting SiO_2 to form leucite, nephelite, anorthite, acmite, olivine of rule 8c, and possibly zircon and sodium metasilicate, the amount thus used is deducted from the total SiO_2, the residue being the "available silica." Letting d = the number of new diopside molecules, f = the number of new olivine molecules, and c = the number of calcium orthosilicate molecules, we have the equations—

(7) $2d + f + c$ = the amount of available SiO_2.
(8) $d + 2f$ = the amount of (Mg,Fe)O (of provisional diopside).
(9) $d + 2c$ = the amount of CaO of provisional diopside and wollastonite.

These equations can be solved, of course, in several ways, but that which I have adopted is as follows: Subtracting (7) from the sum of (8) and (9) we get the value of $f + c$; substituting this in (7) d is found, and then from (8) and (9) f and c are found successively.

In the second case, where there is sufficient tentative wollastonite to meet the deficiency of SiO_2, the total amount of SiO_2 in the rock is subtracted from the sum of the SiO_2 which has been allotted to leucite, nephelite, anorthite, acmite, diopside, olivine, and to tentative wollastonite. The deficit is the number of molecules of necessary calcium orthosilicate, and also the amount of SiO_2 to be assigned to it. This requires twice as much CaO. The rest of the CaO remains in wollastonite and takes an equal amount of SiO_2, while the diopside remains unchanged.

8h. If, as may very rarely happen, there is not even enough SiO_2 to form leucite, we must assume the presence of the kaliophilite molecule in the norm and distribute the K_2O between this and leucite. For this the sum of the SiO_2 needed for nephelite, anorthite, acmite, sodium metasilicate, olivine, calcium orthosilicate, and zircon is subtracted from the total SiO_2, and the amounts of leucite and kaliophilite are calculated according to the following equations (10) and (11):

Let x = the number of leucite molecules and y = the number of kaliophilite molecules, then—

(10) $x + y$ = the amount of K_2O, and

(11) $4x + 2y$ = the amount of available SiO_2.

9. Having thus adjusted the amounts of the SiO_2, and all the other constituents between the fixed molecules and those with differing ratios of SiO_2 (the provisional becoming actual molecules), they are calculated into the percentage weights of the mineral molecules of the norm by the use of the tables on pages 1172–1180.

[1] Washington, H. S., Wash. Acad. Sci. Jour., vol. 5, p. 346, 1915.

APPENDIX 4.

MOLECULAR NUMBERS OF CHEMICAL COMPONENTS OF ROCKS.

SILICA, SiO_2 (MOLECULAR WEIGHT, 60).

(Divide percentage weight by 60.)

ALUMINA, Al_2O_3 (MOLECULAR WEIGHT, 102).

Per ct.	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Per ct.
0	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	0
1	.010	.011	.012	.013	.014	.015	.016	.017	.018	.019	1
2	.020	.021	.022	.023	.024	.025	.025	.026	.027	.028	2
3	.029	.030	.031	.032	.033	.034	.035	.036	.037	.038	3
4	.039	.040	.041	.042	.043	.044	.045	.046	.047	.048	4
5	.049	.050	.051	.052	.053	.054	.055	.056	.057	.058	5
6	.059	.060	.061	.062	.063	.064	.065	.066	.067	.068	6
7	.069	.070	.071	.072	.073	.074	.075	.075	.076	.078	7
8	.078	.079	.080	.081	.082	.083	.084	.085	.086	.087	8
9	.088	.089	.090	.091	.092	.093	.094	.095	.096	.097	9
10	.098	.099	.100	.101	.102	.103	.104	.105	.106	.107	10
11	.108	.109	.110	.111	.112	.113	.114	.115	.116	.117	11
12	.118	.119	.120	.121	.122	.123	.124	.125	.125	.126	12
13	.127	.128	.129	.130	.131	.132	.133	.134	.135	.136	13
14	.137	.138	.139	.140	.141	.142	.143	.144	.145	.146	14
15	.147	.148	.149	.150	.151	.152	.153	.154	.155	.156	15
16	.157	.158	.159	.160	.161	.162	.163	.164	.165	.166	16
17	.167	.168	.169	.170	.171	.172	.173	.174	.175	.175	17
18	.176	.177	.178	.179	.180	.181	.182	.183	.184	.185	18
19	.186	.187	.188	.189	.190	.191	.192	.193	.194	.195	19
20	.196	.197	.198	.199	.200	.201	.202	.203	.204	.205	20
21	.206	.207	.208	.209	.210	.211	.212	.213	.214	.215	21
22	.216	.217	.218	.219	.220	.221	.222	.223	.224	.225	22
23	.225	.226	.227	.228	.229	.230	.231	.232	.233	.234	23
24	.235	.236	.237	.238	.239	.240	.241	.242	.243	.244	24
25	.245	.246	.247	.248	.249	.250	.250	.252	.253	.254	25
26	.255	.256	.257	.258	.259	.260	.261	.262	.263	.264	26
27	.265	.266	.267	.268	.269	.270	.271	.272	.273	.274	27
28	.275	.275	.276	.277	.278	.279	.280	.281	.282	.283	28
29	.284	.285	.286	.287	.288	.289	.290	.291	.292	.293	29

FERRIC OXIDE, Fe_2O_3 (MOLECULAR WEIGHT, 160).

Per ct.	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Per ct.
0	0.000	0.001	0.001	0.002	0.003	0.003	0.004	0.004	0.005	0.006	0
1	.006	.007	.008	.008	.009	.009	.010	.011	.011	.012	1
2	.013	.013	.014	.014	.015	.016	.016	.017	.018	.018	2
3	.019	.019	.020	.021	.021	.022	.023	.023	.024	.024	3
4	.025	.026	.026	.027	.028	.028	.029	.029	.030	.031	4
5	.031	.032	.033	.033	.034	.034	.035	.036	.036	.037	5
6	.038	.038	.039	.039	.040	.041	.041	.042	.043	.043	6
7	.044	.044	.045	.046	.046	.047	.048	.048	.049	.049	7
8	.050	.051	.051	.052	.053	.053	.054	.054	.055	.056	8
9	.056	.057	.058	.058	.059	.059	.060	.061	.061	.062	9
10	.063	.063	.064	.064	.065	.066	.066	.067	.068	.068	10
11	.069	.069	.070	.071	.071	.072	.073	.073	.074	.074	11
12	.075	.076	.076	.077	.078	.078	.079	.079	.080	.081	12
13	.081	.082	.083	.083	.084	.084	.085	.086	.086	.087	13
14	.088	.088	.089	.089	.090	.091	.091	.092	.093	.093	14
15	.094	.094	.095	.096	.096	.097	.098	.098	.099	.099	15
16	.100	.101	.101	.102	.103	.103	.104	.104	.105	.106	16
17	.106	.107	.108	.108	.109	.109	.110	.111	.111	.112	17
18	.113	.113	.114	.114	.115	.116	.116	.117	.118	.118	18
19	.119	.119	.120	.121	.121	.122	.123	.123	.124	.124	19

FERROUS OXIDE, FeO (MOLECULAR WEIGHT, 72).

Per ct.	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Per ct.
0	0.000	0.001	0.003	0.004	0.006	0.007	0.008	0.010	0.011	0.013	0
1	.014	.015	.017	.018	.019	.021	.022	.024	.025	.026	1
2	.028	.029	.031	.032	.033	.035	.036	.038	.039	.040	2
3	.042	.043	.044	.046	.047	.049	.050	.051	.053	.054	3
4	.056	.057	.058	.060	.061	.063	.064	.065	.067	.068	4
5	.069	.071	.072	.074	.075	.076	.078	.079	.081	.082	5
6	.083	.085	.086	.088	.089	.090	.092	.093	.094	.096	6
7	.097	.099	.100	.101	.103	.104	.106	.107	.108	.110	7
8	.111	.113	.114	.115	.117	.118	.119	.121	.122	.124	8
9	.125	.126	.128	.129	.131	.132	.133	.135	.136	.138	9
10	.139	.140	.142	.143	.144	.146	.147	.149	.150	.151	10
11	.153	.154	.156	.157	.158	.160	.161	.163	.164	.165	11
12	.167	.168	.169	.171	.172	.174	.175	.176	.178	.179	12
13	.181	.182	.183	.185	.186	.188	.189	.190	.192	.193	13
14	.194	.196	.197	.199	.200	.201	.203	.204	.206	.207	14
15	.208	.210	.211	.213	.214	.215	.217	.218	.219	.221	15
16	.222	.224	.225	.226	.228	.229	.231	.232	.233	.235	16
17	.236	.238	.239	.240	.242	.243	.244	.246	.247	.249	17
18	.250	.251	.253	.354	.256	.257	.258	.260	.261	.263	18
19	.264	.265	.267	.268	.269	.271	.272	.274	.275	.276	19

MAGNESIA, MgO (MOLECULAR WEIGHT, 40).

(Divide percentage weight by 40.)

LIME, CaO (MOLECULAR WEIGHT, 56).

Per ct.	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Per ct.
0	0.000	0.002	0.004	0.005	0.007	0.009	0.011	0.013	0.014	0.016	0
1	.018	.020	.021	.023	.025	.027	.029	.030	.032	.034	1
2	.036	.038	.039	.041	.043	.045	.046	.048	.050	.052	2
3	.054	.055	.057	.059	.061	.063	.064	.066	.068	.070	3
4	.071	.073	.075	.077	.079	.080	.082	.084	.086	.088	4
5	.089	.091	.093	.095	.096	.098	.100	.102	.104	.105	5
6	.107	.109	.111	.113	.114	.116	.118	.120	.121	.123	6
7	.125	.127	.129	.130	.132	.134	.136	.138	.139	.141	7
8	.143	.145	.146	.148	.150	.152	.154	.155	.157	.159	8
9	.161	.163	.164	.166	.168	.170	.171	.173	.175	.177	9
10	.179	.180	.182	.184	.186	.188	.189	.191	.193	.195	10
11	.196	.198	.200	.202	.204	.205	.207	.209	.211	.213	11
12	.214	.216	.218	.220	.221	.223	.225	.227	.229	.230	12
13	.232	.234	.236	.238	.239	.241	.243	.245	.246	.248	13
14	.250	.252	.254	.255	.257	.259	.261	.263	.264	.266	14
15	.268	.270	.271	.273	.275	.277	.279	.280	.282	.284	15
16	.286	.288	.289	.291	.293	.295	.296	.298	.300	.302	16
17	.304	.305	.307	.309	.311	.313	.314	.316	.318	.320	17
18	.321	.323	.325	.327	.329	.330	.332	.334	.336	.338	18
19	.339	.341	.343	.345	.346	.348	.350	.352	.354	.355	19
20	.357	.358	.360	.362	.364	.336	.367	.369	.371	.373	20
21	.375	.376	.378	.380	.382	.383	.385	.387	.389	.391	21
22	.392	.394	.396	.398	.400	.401	.403	.405	.407	.408	22
23	.410	.412	.414	.416	.417	.419	.421	.423	.425	.426	23
24	.428	.430	.432	.433	.435	.437	.439	.441	.442	.444	24

SODA, Na_2O (MOLECULAR WEIGHT, 62).

Per ct.	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Per ct.
0	0.000	0.002	0.003	0.005	0.006	0.008	0.010	0.011	0.013	0.015	0
1	.016	.018	.019	.021	.023	.024	.026	.027	.029	.031	1
2	.032	.034	.035	.037	.039	.040	.042	.044	.045	.047	2
3	.048	.050	.052	.053	.055	.056	.058	.060	.061	.063	3
4	.065	.066	.068	.069	.071	.073	.074	.076	.077	.079	4
5	.081	.082	.084	.085	.087	.089	.090	.092	.094	.095	5
6	.097	.098	.100	.102	.103	.105	.106	.108	.110	.111	6
7	.113	.115	.116	.118	.119	.121	.123	.124	.126	.127	7
8	.129	.131	.132	.134	.135	.137	.139	.140	.142	.144	8
9	.145	.147	.148	.150	.152	.153	.155	.156	.158	.160	9
10	.161	.163	.165	.166	.168	.169	.171	.173	.174	.176	10
11	.177	.179	.181	.182	.184	.185	.187	.189	.190	.192	11
12	.194	.195	.197	.198	.200	.202	.203	.205	.206	.208	12
13	.210	.211	.213	.215	.216	.218	.219	.221	.223	.224	13
14	.226	.227	.229	.231	.232	.234	.235	.237	.239	.240	14
15	.242	.244	.245	.247	.248	.250	.252	.253	.255	.256	15
16	.258	.260	.261	.263	.265	.266	.268	.269	.271	.273	16
17	.274	.276	.277	.279	.281	.282	.284	.285	.287	.289	17
18	.290	.292	.294	.295	.297	.298	.300	.302	.303	.305	18
19	.306	.308	.310	.311	.313	.315	.316	.318	.319	.321	19

POTASH, K_2O (MOLECULAR WEIGHT, 94).

Per ct.	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Per ct.
0	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.009	0.010	0
1	.011	.012	.013	.014	.015	.016	.107	.018	.019	.020	1
2	.021	.022	.023	.024	.026	.027	.028	.029	.030	.031	2
3	.032	.033	.034	.035	.036	.037	.038	.039	.040	.041	3
4	.043	.044	.045	.046	.047	.048	.049	.050	.051	.052	4
5	.053	.054	.055	.056	.057	.059	.060	.061	.062	.063	5
6	.064	.065	.066	.067	.068	.069	.070	.071	.072	.073	6
7	.074	.076	.077	.078	.079	.080	.081	.082	.083	.084	7
8	.085	.086	.087	.088	.089	.090	.091	.093	.094	.095	8
9	.096	.097	.098	.099	.100	.101	.102	.103	.104	.105	9
10	.106	.107	.109	.110	.111	.112	.113	.114	.115	.116	10
11	.117	.118	.119	.120	.121	.122	.123	.124	.126	.127	11
12	.128	.129	.130	.131	.132	.133	.134	.135	.136	.137	12
13	.138	.139	.140	.141	.143	.144	.145	.146	.147	.148	13
14	.149	.150	.151	.152	.153	.154	.155	.156	.157	.159	14

TITANIUM DIOXIDE, TiO_2 (MOLECULAR WEIGHT, 80).

Per ct.	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Per ct.
0	0.000	0.001	0.003	0.004	0.005	0.006	0.008	0.009	0.010	0.011	0
1	.013	.014	.015	.016	.018	.019	.020	.021	.023	.024	1
2	.025	.026	.028	.029	.030	.031	.033	.034	.035	.036	2
3	.038	.039	.040	.041	.043	.044	.045	.046	.048	.049	3
4	.050	.051	.053	.054	.055	.056	.058	.059	.060	.061	4
5	.063	.064	.065	.066	.068	.069	.070	.071	.073	.074	5
6	.075	.076	.078	.079	.080	.081	.083	.084	.085	.086	6
7	.088	.089	.090	.091	.093	.094	.095	.096	.098	.099	7
8	.100	.101	.103	.104	.105	.106	.108	.109	.110	.111	8
9	.113	.114	.115	.116	.118	.119	.120	.121	.123	.124	9

PHOSPHORIC PENTOXIDE, P_2O_5 (MOLECULAR WEIGHT, 1.42).

Per ct.	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Per ct.
0	0.000	0.001	0.001	0.002	0.003	0.004	0.004	0.005	0.006	0.006	0
1	.007	.008	.008	.009	.010	.011	.011	.012	.013	.013	1
2	.014	.015	.015	.016	.017	.018	.018	.019	.020	.020	2
3	.021	.022	.023	.023	.024	.025	.025	.026	.027	.027	3
4	.028	.029	.030	.030	.031	.032	.032	.033	.034	.035	4
5	.035	.036	.037	.037	.038	.039	.039	.040	.041	.042	5

MANGANOUS OXIDE, MnO (MOLECULAR WEIGHT, 71).

Per ct.	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Per ct.
0	0.000	0.001	0.003	0.004	0.006	0.007	0.008	0.010	0.011	0.013	0
1	.014	.015	.017	.018	.020	.021	.023	.024	.025	.027	1
2	.028	.030	.031	.032	.034	.035	.037	.038	.039	.041	2
3	.042	.044	.045	.046	.048	.049	.051	.052	.054	.055	3

ZIRCONIA, ZrO_2 (MOLECULAR WEIGHT, 123).

Per ct.	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Per ct.
0	0.000	0.001	0.002	0.002	0.003	0.004	0.005	0.006	0.007	0.007	0
1	.008	.009	.010	.011	.011	.012	.013	.014	.015	.015	1
2	.016	.017	.018	.019	.020	.020	.021	.022	.023	.024	2
3	.024	.025	.026	.027	.028	.028	.029	.030	.031	.032	3
4	.033	.033	.034	.035	.036	.037	.037	.038	.039	.040	4
5	.041	.042	.042	.043	.044	.045	.046	.046	.047	.048	5

CARBON DIOXIDE, CO_2 (MOLECULAR WEIGHT, 44).

Per ct.	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Per ct.
0	0.000	0.002	0.005	0.007	0.009	0.011	0.014	0.016	0.018	0.020	0
1	.023	.025	.027	.030	.032	.034	.036	.039	.041	.043	1
2	.045	.048	.050	.052	.055	.057	.059	.061	.064	.066	2
3	.068	.070	.073	.075	.077	.080	.082	.084	.086	.089	3
4	.091	.093	.095	.098	.100	.102	.105	.107	.109	.111	4
5	.114	.116	.118	.120	.123	.125	.127	.130	.132	.134	5
6	.136	.139	.141	.143	.145	.148	.150	.152	.155	.157	6
7	.159	.161	.164	.166	.168	.170	.173	.175	.177	.180	7
8	.182	.184	.186	.189	.191	.193	.195	.198	.200	.202	8
9	.205	.207	.209	.211	.214	.216	.218	.220	.223	.225	9

SULPHUR TRIOXIDE, SO_3 (MOLECULAR WEIGHT, 80).

Per ct.	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Per ct.
0	0.000	0.001	0.003	0.004	0.005	0.006	0.008	0.009	0.010	0.011	0
1	.013	.014	.015	.016	.018	.019	.020	.021	.023	.024	1
2	.025	.026	.028	.029	.030	.031	.033	.034	.035	.036	2
3	.038	.039	.040	.041	.043	.044	.045	.046	.048	.049	3
4	.050	.051	.053	.054	.055	.056	.058	.059	.060	.061	4

CHLORINE, Cl_2 (MOLECULAR WEIGHT, 71).

Per ct.	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Per ct.
0	0.000	0.001	0.003	0.004	0.006	0.007	0.008	0.010	0.011	0.013	0
1	.014	.015	.017	.018	.020	.021	.023	.024	.025	.027	1
2	.028	.030	.031	.032	.034	.035	.037	.038	.039	.041	2
3	.042	.044	.045	.046	.048	.049	.051	.052	.054	.055	3

FLUORINE, F_2 (MOLECULAR WEIGHT, 38).

Per ct.	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Per ct.
0	0.000	0.003	0.005	0.008	0.010	0.013	0.016	0.018	0.021	0.024	0
1	.026	.029	.031	.034	.037	.039	.042	.045	.047	.050	1

SULPHUR, S (ATOMIC WEIGHT, 32).

Per ct.	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Per ct.
0	0.000	0.003	0.006	0.009	0.013	0.016	0.019	0.022	0.025	0.028	0
1	.031	.034	.038	.041	.044	.047	.050	.053	.056	.059	1
2	.063	.066	.069	.072	.075	.078	.081	.084	.088	.091	2
3	.094	.097	.100	.103	.106	.109	.113	.116	.119	.122	3
4	.125	.128	.131	.134	.138	.141	.144	.147	.150	.153	4
5	.156	.159	.163	.166	.169	.172	.175	.178	.181	.184	5

42423°—17——74

CHROMIC OXIDE, Cr_2O_3 (MOLECULAR WEIGHT, 152).

Per ct.	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Per ct.
0	0.000	0.001	0.001	0.002	0.003	0.003	0.004	0.005	0.005	0.006	0
1	.007	.007	.008	.009	.009	.010	.011	.011	.012	.013	1
2	.013	.014	.014	.015	.016	.016	.017	.018	.018	.019	2
3	.020	.020	.021	.022	.022	.023	.024	.024	.025	.026	3
4	.026	.027	.028	.028	.029	.030	.030	.031	.032	.032	4
5	.033	.034	.034	.035	.036	.036	.037	.038	.038	.039	5

NICKEL OXIDE, NiO (MOLECULAR WEIGHT, 75).
COBALT OXIDE, CoO (MOLECULAR WEIGHT, 75).

Per ct.	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Per ct.
0	0.000	0.001	0.003	0.004	0.005	0.007	0.008	0.009	0.011	0.012	0
1	.013	.015	.016	.017	.019	.020	.021	.023	.024	.025	1
2	.027	.028	.029	.031	.033	.033	.035	.036	.037	.039	2
3	.040	.041	.043	.044	.045	.047	.048	.049	.051	.052	3

BARYTA, BaO (MOLECULAR WEIGHT, 153.5).

Per ct.	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Per ct.
0	0.000	0.001	0.001	0.002	0.003	0.003	0.004	0.005	0.005	0.006	0
1	.007	.007	.008	.009	.009	.010	.010	.011	.012	.012	1
2	.013	.014	.014	.015	.016	.016	.017	.018	.018	.019	2
3	.020	.020	.021	.022	.022	.023	.024	.024	.025	.026	3

STRONTIA, SrO (MOLECULAR WEIGHT, 103.5).

Per ct.	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Per ct.
0	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	0
1	.010	.011	.012	.013	.014	.014	.015	.016	.017	.018	1

LITHIA, Li_2O (MOLECULAR WEIGHT, 30).

Per ct.	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Per ct.
0	0.000	0.003	0.007	0.010	0.013	0.017	0.020	0.023	0.027	0.030	0
1	.033	.037	.040	.043	.047	.050	.053	.057	.060	.063	1

APPENDIX 5.

PERCENTAGE WEIGHTS FOR NUMBERS OF MOLECULES OF THE NORMATIVE MINERALS.

QUARTZ, SiO_2 (MOLECULAR WEIGHT, 60).

(Multiply the molecular number of SiO_2 by 60.)

ORTHOCLASE, $K_2O.Al_2O_3.6SiO_2$ (MOLECULAR WEIGHT, 556).

Mol.	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Mol.
0.00	0.00	0.56	1.11	1.67	2.22	2.78	3.34	3.89	4.45	5.00	0.00
.01	5.56	6.12	6.67	7.23	7.78	8.34	8.90	9.45	10.01	10.56	.01
.02	11.12	11.68	12.23	12.79	13.34	13.90	14.46	15.01	15.57	16.12	.02
.03	16.68	17.24	17.79	18.35	18.90	19.46	20.02	20.57	21.13	21.68	.03
.04	22.24	22.80	23.35	23.91	24.46	25.02	25.58	26.13	26.69	27.24	.04
.05	27.80	28.36	28.91	29.47	30.02	30.58	31.14	31.69	32.25	32.80	.05
.06	33.36	33.92	34.47	35.03	35.58	36.14	36.70	37.25	37.81	38.36	.06
.07	38.92	39.48	40.03	40.59	41.14	41.70	42.26	42.81	43.37	43.92	.07
.08	44.48	45.04	45.59	46.15	46.70	47.26	47.82	48.37	48.93	49.48	.08
.09	50.04	50.60	51.15	51.71	52.26	52.82	53.38	53.93	54.49	55.04	.09
.10	55.60	56.16	56.71	57.27	57.82	58.38	58.94	59.49	60.05	60.60	.10
.11	61.16	61.72	62.27	62.83	63.38	63.94	64.50	65.05	65.61	66.16	.11
.12	66.72	67.28	67.83	68.39	68.94	69.50	70.06	70.61	71.17	71.72	.12
.13	72.28	72.84	73.39	73.95	74.50	75.06	75.62	76.17	76.73	77.28	.13
.14	77.84	78.40	78.95	79.51	80.06	80.62	81.18	81.73	82.29	82.84	.14
.15	83.40	83.96	84.51	85.07	85.62	86.18	86.74	87.39	87.85	88.40	.15
.16	88.96	89.52	90.07	90.63	91.18	91.74	92.30	92.85	93.41	93.96	.16
.17	94.52	95.08	95.63	96.19	96.74	97.30	97.85	98.41	98.97	99.52	.17
......	....	....	....	....	....	....	....	....	....	....	......

ALBITE, $Na_2O.Al_2O_3.6SiO_2$ (MOLECULAR WEIGHT, 524).

Mol.	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Mol.
0.00	0.00	0.52	1.05	1.57	2.10	2.62	3.14	3.67	4.19	4.72	0.00
.01	5.24	5.76	6.29	6.81	7.34	7.86	8.38	8.91	9.43	9.96	.01
.02	10.48	11.00	11.53	12.05	12.58	13.10	13.62	14.15	14.67	15.20	.02
.03	15.72	16.24	16.77	17.29	17.82	18.34	18.86	19.39	19.91	20.44	.03
.04	20.96	21.48	22.01	22.53	23.06	23.58	24.10	24.63	25.15	25.68	.04
.05	26.20	26.72	27.25	27.77	28.30	28.82	29.34	29.87	30.39	30.92	.05
.06	31.44	31.96	32.49	33.01	33.54	34.06	34.58	35.11	35.63	36.15	.06
.07	36.68	37.20	37.73	38.25	38.77	39.30	39.82	40.35	40.87	41.39	.07
.08	41.92	42.44	42.97	43.49	44.01	44.54	45.06	45.59	46.11	46.63	.08
.09	47.16	47.68	48.21	48.73	49.25	49.78	50.30	50.83	51.35	51.87	.09
.10	52.40	52.92	53.45	53.97	54.49	55.02	55.54	56.07	56.59	57.11	.10
.11	57.64	58.16	58.69	59.21	59.73	60.26	60.78	61.31	61.83	62.35	.11
.12	62.88	63.40	63.93	64.45	64.97	65.50	66.02	66.55	67.07	67.59	.12
.13	68.12	68.64	69.17	69.69	70.21	70.74	71.26	71.79	72.31	72.83	.13
.14	73.36	73.88	74.41	75.93	75.45	76.98	76.50	77.03	77.55	78.07	.14
.15	78.60	79.12	79.65	80.17	80.70	81.22	81.72	82.28	82.79	83.32	.15
.16	83.84	84.36	84.89	85.41	85.94	86.46	86.98	87.51	88.03	88.56	.16
.17	89.08	89.60	90.13	90.65	91.18	91.70	92.22	92.75	93.27	93.80	.17
.18	94.32	94.84	95.37	95.89	96.42	96.94	97.46	97.99	98.51	99.04	.18

ANORTHITE, $CaO.Al_2O_3.2SiO_2$ (MOLECULAR WEIGHT, 278).

Mol.	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Mol.
0.00	0.00	0.28	0.56	0.83	1.11	1.39	1.67	1.95	2.22	2.50	0.00
.01	2.78	3.06	3.34	3.61	3.89	4.17	4.45	4.73	5.00	5.28	.01
.02	5.56	5.84	6.12	6.39	6.67	6.95	7.23	7.51	7.78	8.06	.02
.03	8.34	8.62	8.90	9.17	9.45	9.73	10.01	10.29	10.56	10.84	.03
.04	11.12	11.40	11.68	11.95	12.23	12.51	12.79	13.07	13.34	13.62	.04
.05	13.90	14.18	14.46	14.73	15.01	15.29	15.57	15.85	16.12	16.40	.05
.06	16.68	16.96	17.24	17.51	17.79	18.07	18.35	18.63	18.90	19.18	.06
.07	19.46	19.74	20.02	20.29	20.57	20.85	21.13	21.41	21.68	21.96	.07
.08	22.24	22.52	22.80	23.07	23.35	23.63	23.91	24.19	24.46	24.74	.08
.09	25.02	25.30	25.58	25.85	26.13	26.41	26.69	26.97	27.24	27.52	.09
.10	27.80	28.08	28.36	28.63	28.91	29.19	29.47	29.75	30.02	30.30	.10
.11	30.58	30.86	31.14	31.41	31.69	31.97	32.25	32.53	32.80	33.08	.11
.12	33.36	33.64	33.92	34.19	34.47	34.75	35.03	35.31	35.58	35.86	.12
.13	36.14	36.42	36.70	36.97	37.25	37.53	37.81	38.09	38.36	38.64	.13
.14	38.92	39.20	39.48	39.75	40.03	40.31	40.59	40.87	41.14	41.42	14
.15	41.70	41.98	42.26	42.53	42.81	43.09	43.37	43.65	43.92	44.20	.15
.16	44.48	44.76	45.04	45.31	45.59	45.87	46.15	46.43	46.70	46.98	.16
.17	47.26	47.54	47.82	48.09	48.37	48.65	48.93	49.21	49.48	49.76	.17
.18	50.04	50.32	50.60	50.87	51.15	51.43	51.71	51.99	52.26	52.54	.18
.19	52.82	53.10	53.38	53.65	53.93	54.21	54.49	54.77	55.04	55.32	.19
.20	55.60	55.88	56.16	56.43	56.71	56.99	57.27	57.55	57.82	58.10	.20
.21	58.38	58.66	58.94	59.21	59.49	59.77	60.05	60.33	60.60	60.88	.21
.22	61.16	61.44	61.72	61.99	62.27	62.55	62.83	63.11	63.38	63.66	.22
.23	63.94	64.22	64.50	64.77	65.05	65.33	65.61	65.89	66.16	66.44	.23
.24	66.72	67.00	67.28	67.55	67.83	68.11	68.39	68.67	68.94	69.22	.24

NEPHELITE, $Na_2O.Al_2O_3.2SiO_2$ (MOLECULAR WEIGHT, 284).

Mol.	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Mol.
0.00	0.00	0.28	0.57	0.85	1.14	1.42	1.70	1.99	2.27	2.56	0.00
.01	2.84	3.12	3.41	3.69	3.98	4.26	4.54	4.83	5.11	5.40	.01
.02	5.68	5.96	6.25	6.53	6.82	7.10	7.38	7.67	7.95	8.24	.02
.03	8.52	8.80	9.09	9.37	9.66	9.94	10.22	10.51	10.79	11.08	.03
.04	11.36	11.64	11.93	12.21	12.50	12.78	13.06	13.35	13.63	13.92	.04
.05	14.20	14.48	14.77	15.05	15.34	15.62	15.90	16.19	16.47	16.76	.05
.06	17.04	17.32	17.61	17.89	18.18	18.46	18.74	19.03	19.31	19.60	.06
.07	19.88	20.16	20.45	20.73	21.02	21.30	21.58	21.87	22.15	22.44	.07
.08	22.72	23.00	23.28	23.57	23.86	24.14	24.42	24.71	24.99	25.28	08
.09	25.56	25.84	26.13	26.41	26.70	26.98	27.26	27.55	27.83	28.12	.09
.10	28.40	28.68	28.97	29.25	29.54	29.82	30.10	30.39	30.67	30.96	.10
.11	31.24	31.52	31.81	32.09	32.38	32.66	32.94	33.23	33.51	33.80	.11
.12	34.08	34.36	34.65	34.93	35.22	35.50	35.78	36.07	36.35	36.64	.12
.13	36.92	37.20	37.49	37.77	38.06	38.34	38.62	38.91	39.19	39.48	.13
.14	39.76	40.04	40.33	40.61	40.90	41.18	41.46	41.75	41.93	42.32	.14
.15	42.60	42.88	43.17	43.45	43.74	44.02	44.30	44.59	44.87	45.16	.15
.16	45.44	45.72	46.01	46.29	46.58	46.86	47.14	47.43	47.71	48.00	.16
.17	48.28	48.56	48.85	49.13	49.42	49.70	49.98	50.27	50.55	50.84	.17
18	51.12	51.40	51.69	51.97	52.26	52.54	52.82	53.11	53.39	53.68	.18
.19	53.96	54.24	54.53	54.81	55.10	55.38	56.66	55.95	56.23	56.52	.19

LEUCITE, $K_2O.Al_2O_3.4SiO_2$ (MOLECULAR WEIGHT, 436).

Mol.	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Mol.
0.00	0.00	0.44	0.87	1.31	1.74	2.18	2.62	3.05	3.49	3.92	0.00
.01	4.36	4.80	5.23	5.67	6.10	6.54	6.98	7.41	7.85	8.28	.01
.02	8.72	9.16	9.59	10.03	10.46	10.90	11.34	11.77	12.21	12.64	.02
.03	13.08	13.52	13.95	14.39	14.82	15.26	15.70	16.13	16.57	17.00	.03
.04	17.44	17.88	18.31	18.75	19.18	19.62	20.06	20.49	20.93	21.36	.04
.05	21.80	22.24	22.67	23.11	23.54	23.98	24.42	24.85	25.29	25.72	.05
.06	26.16	26.60	27.03	27.47	27.90	28.34	28.78	29.21	29.65	30.08	.06
.07	30.52	30.96	31.39	31.83	32.26	32.70	33.14	33.57	34.01	34.44	.07
.08	34.88	35.32	35.75	36.19	36.62	37.06	37.50	37.93	38.37	38.80	.08
.09	39.24	39.68	40.11	40.55	40.98	41.42	41.86	42.29	42.73	43.16	.09

CALCIUM METASILICATE (WOLLASTONITE), $CaO.SiO_2$ (MOLECULAR WEIGHT, 116).

Mol.	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Mol.
0.00	0.00	0.12	0.23	0.35	0.46	0.58	0.70	0.81	0.93	1.04	0.00
.01	1.16	1.28	1.39	1.51	1.63	1.74	1.86	1.97	2.09	2.20	.01
.02	2.32	2.44	2.55	2.67	2.78	2.90	3.02	3.13	3.25	3.36	.02
.03	3.48	3.60	3.71	3.83	3.94	4.06	4.18	4.29	4.41	4.52	.03
.04	4.64	4.76	4.87	4.99	5.10	5.22	5.34	5.45	5.57	5.68	.04
.04	5.80	5.92	6.03	6.15	6.26	6.38	6.50	6.61	6.73	6.84	.05
.06	6.96	7.08	7.19	7.31	7.42	7.54	7.66	7.77	7.89	8.00	.06
.07	8.12	8.24	8.35	8.47	8.58	8.70	8.82	8.93	9.05	9.16	.07
.08	9.28	9.40	9.51	9.63	9.74	9.86	9.78	10.09	10.21	10.32	.08
.09	10.44	10.56	10.67	10.79	10.90	11.02	11.14	11.25	11.37	11.48	.09
.10	11.60	11.72	11.83	11.95	12.06	12.18	12.30	12.41	12.53	12.64	.10
.11	12.76	12.88	12.99	13.11	13.22	13.34	13.46	13.57	13.69	13.80	.11
.12	13.92	14.04	14.15	14.27	14.38	14.50	14.62	14.73	14.85	14.96	.12
.13	15.08	15.20	15.31	15.43	15.54	15.66	15.78	15.89	16.01	16.12	.13
.14	16.24	16.36	16.47	16.59	16.70	16.82	16.93	17.05	17.17	17.28	.14
.15	17.40	17.52	17.63	17.75	17.86	17.98	18.10	18.21	18.33	18.44	.15
.16	18.56	18.68	18.79	18.91	19.02	19.14	19.26	19.37	19.49	19.60	.16
.17	19.72	19.84	19.95	20.07	20.18	20.30	20.42	20.53	20.65	20.76	.17
.18	20.88	21.00	21.11	21.23	21.34	21.46	21.58	21.69	21.81	21.92	.18
.19	22.04	22.16	22.27	22.39	22.50	22.62	22.74	22.85	22.97	23.08	.19
.20	23.20	23.32	23.43	23.55	23.66	23.78	23.90	24.01	24.13	24.24	.20
.21	24.36	24.48	24.59	24.71	24.82	24.94	25.06	25.17	25.29	25.40	.21
.22	25.52	25.64	25.75	25.87	25.98	26.10	26.22	26.33	26.45	26.56	.22
.23	26.68	26.80	26.91	27.03	27.14	27.26	27.38	27.49	27.61	27.72	.23
.24	27.84	27.96	28.07	28.19	28.30	28.42	28.54	28.65	28.77	28.88	.24
.25	29.00	29.12	29.23	29.35	29.46	29.58	29.70	29.81	29.93	30.04	.25
.25	30.16	30.28	30.39	30.51	30.63	30.74	30.86	30.97	31.09	31.20	.26
.27	31.32	31.44	31.55	31.67	31.78	31.90	32.02	32.13	32.25	32.36	.27
.28	32.48	32.60	32.71	32.83	32.94	33.06	33.18	33.29	33.41	33.52	.28
.29	33.64	33.76	33.87	33.99	34.10	34.22	34.34	34.54	34.57	34.68	.29
.30	34.80	34.92	35.03	35.15	35.26	35.38	35.50	35.61	35.73	35.84	.30
.31	35.96	36.08	36.19	36.31	36.42	36.54	36.66	36.77	36.89	37.00	.31
.32	37.12	37.24	37.35	37.47	37.58	37.70	37.82	37.93	38.05	38.16	.32
.33	38.28	38.40	38.51	38.63	38.74	38.86	38.78	39.09	39.21	39.32	.33
.34	39.44	39.56	39.67	39.79	39.90	40.02	40.14	40.25	40.37	40.48	.34
.35	40.60	40.72	40.83	40.95	41.06	41.18	41.30	41.41	41.53	41.64	.35
.36	41.76	41.88	41.99	42.11	42.22	42.34	42.46	42.57	42.69	42.80	.36
.37	42.92	43.04	43.15	43.27	43.38	43.50	43.62	43.73	43.85	43.96	.37
.38	44.08	44.20	44.31	44.43	44.54	44.66	44.78	44.89	45.01	45.12	.38
.39	45.24	45.36	45.47	45.59	45.70	45.82	45.93	46.05	46.17	46.28	.39

MAGNESIUM METASILICATE, $MgO.SiO_2$ (MOLECULAR WEIGHT, 100).

(Multiply molecular number of MgO by 100.)

IRON METASILICATE, $FeO.SiO_2$ (MOLECULAR WEIGHT, 132).

Mol.	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Mol.
0.00	0.00	0.13	0.26	0.40	0.53	0.66	0.79	0.92	1.06	1.19	0.00
.01	1.32	1.45	1.58	1.72	1.85	1.98	2.11	2.24	2.38	2.51	.01
.02	2.64	2.77	2.90	3.04	3.17	3.30	3.43	3.56	3.70	3.83	.02
.03	3.96	4.09	4.22	4.36	4.49	4.62	4.75	4.88	5.02	5.15	.03
.04	5.28	5.41	5.54	5.68	5.81	5.94	6.07	6.20	6.34	6.47	.04
.05	6.60	6.73	6.86	7.00	7.13	7.26	7.39	7.52	7.66	7.79	.05
.06	7.92	8.05	8.18	8.32	8.45	8.58	8.71	8.84	8.98	9.11	.06
.07	9.24	9.37	9.50	9.64	9.77	9.90	10.03	10.16	10.30	10.43	.07
.08	10.56	10.69	10.82	10.96	11.09	11.22	11.35	11.48	11.62	11.75	.08
.09	11.88	12.01	12.14	12.28	12.41	12.54	12.67	12.80	12.94	13.07	.09
.10	13.20	13.33	13.46	13.60	13.73	13.86	13.99	14.12	14.26	14.39	.10
.11	14.52	14.65	14.78	14.92	15.05	15.18	15.31	15.44	15.58	15.71	.11
.12	15.84	15.97	16.10	16.24	16.37	16.50	16.63	16.76	16.90	17.03	.12
.13	17.16	17.29	17.42	17.56	17.69	17.82	17.95	18.08	18.22	18.35	.13
.14	18.48	18.61	18.74	18.88	19.01	19.14	19.27	19.40	19.54	19.67	.14
.15	19.80	19.93	20.06	20.20	20.33	20.46	20.59	20.72	20.86	20.99	.15
.16	21.12	21.25	21.38	21.52	21.65	21.78	21.91	22.04	22.18	22.31	.16
.17	22.44	22.57	22.70	22.84	22.97	23.10	23.23	23.36	23.50	23.63	.17
.18	23.76	23.89	24.02	24.16	24.29	24.42	24.55	24.68	24.82	24.95	.18
.19	25.08	25.21	25.34	25.48	25.61	25.74	25.87	26.00	26.14	26.27	.19
.20	26.40	26.53	26.66	26.80	26.93	27.06	27.19	27.32	27.46	27.59	.20
.21	27.72	27.85	27.98	28.12	28.25	28.38	28.51	28.64	28.78	28.91	.21
.22	29.04	29.17	29.30	29.44	29.57	29.70	29.83	29.96	30.10	30.23	.22
.23	30.36	30.49	30.62	30.76	30.89	31.02	31.15	31.28	31.42	31.55	.23
.24	31.68	31.81	31.94	32.08	32.21	32.34	32.47	32.60	32.74	32.87	.24
.25	33.00	33.13	33.26	33.40	33.53	33.66	33.79	33.92	34.06	34.19	.25
.26	34.32	34.45	34.58	34.72	34.85	34.98	35.11	35.24	35.38	35.51	.26
.27	35.64	35.77	35.90	36.04	36.17	36.30	36.43	36.56	36.70	36.83	.27
.28	36.96	37.09	37.22	37.36	37.49	37.62	37.75	37.88	38.02	38.15	.28
.29	38.28	38.41	38.54	38.68	38.81	38.94	39.07	39.20	39.34	39.47	.29
.30	39.60	39.73	39.86	40.00	40.13	40.26	40.39	40.52	40.66	40.79	.30
.31	40.92	41.05	41.18	41.32	41.45	41.58	41.71	41.84	41.98	42.11	.31
.32	42.24	42.37	42.50	42.64	42.77	42.90	43.03	43.16	43.30	43.43	.32
.33	43.56	43.69	43.82	43.96	44.09	44.22	44.35	44.48	44.62	44.75	.33
.34	44.88	45.01	45.14	45.28	45.41	45.54	45.67	45.80	45.94	46.07	.34
.35	46.20	46.33	46.46	46.60	46.73	46.86	46.99	47.12	47.26	47.30	.35
.36	47.52	47.65	47.78	47.92	48.05	48.18	48.21	48.44	48.58	48.71	.36
.37	48.84	48.97	49.10	49.24	49.37	49.50	49.63	49.76	49.90	50.03	.37
.38	50.16	50.29	50.42	50.56	50.69	50.82	50.95	51.08	51.22	51.35	.38
.39	51.48	51.61	51.74	51.88	52.01	52.14	52.27	52.40	52.54	52.67	.39

MAGNESIUM ORTHOSILICATE (FORSTERITE), $2MgO.SiO_2$ (MOLECULAR WEIGHT, 140).

(Unit of calculation is one-half molecular number of MgO.)

Mol.	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Mol.
0.00	0.00	0.14	0.28	0.42	0.56	0.70	0.84	0.98	1.12	1.26	0.00
.01	1.40	1.54	1.68	1.82	1.96	2.10	2.24	2.38	2.52	2.66	.01
.02	2.80	2.94	3.08	3.22	3.36	3.50	3.64	3.78	3.92	4.06	.02
.03	4.20	4.34	4.48	4.62	4.76	4.90	5.04	5.18	5.32	5.46	.03
.04	5.60	5.74	5.88	6.02	6.16	6.30	6.44	6.58	6.72	6.86	.04
.05	7.00	7.14	7.28	7.42	7.56	7.70	7.84	7.98	8.12	8.26	.05
.06	8.40	8.54	8.68	8.82	8.96	9.10	9.24	9.38	9.52	9.66	.06
.07	9.80	9.94	10.08	10.22	10.36	10.50	10.64	10.78	10.92	11.06	.07
.08	11.20	11.34	11.48	11.62	11.76	11.90	12.04	12.18	12.32	12.46	.08
.09	12.60	12.74	12.88	13.02	13.16	13.30	13.44	13.58	13.72	13.86	.09
.10	14.00	14.14	14.28	14.42	14.56	14.70	14.84	14.98	15.12	15.26	.10
.11	15.40	15.54	15.68	15.82	15.96	16.10	16.24	16.38	16.52	16.66	.11
.12	16.80	16.94	17.08	17.22	17.36	17.50	17.64	17.78	17.92	18.06	.12
.13	18.20	18.34	18.48	18.62	18.76	18.90	19.04	19.18	19.32	19.46	.13
.14	19.60	19.74	19.88	20.02	20.16	20.30	20.44	20.58	20.72	20.86	.14
.15	21.00	21.14	21.28	21.42	21.56	21.70	21.84	21.98	22.12	22.26	.15
.16	22.40	22.54	22.68	22.82	22.96	23.10	23.24	23.38	23.52	23.66	.16
.17	23.80	23.94	24.08	24.22	24.36	24.50	24.64	24.78	24.92	25.06	.17
.18	25.20	25.34	25.48	25.62	25.76	25.90	26.04	26.18	26.32	26.46	.18
.19	26.60	26.74	26.88	27.02	27.16	27.30	27.44	27.58	27.72	27.86	.19
.20	28.00	28.14	28.28	28.42	28.56	28.70	28.84	28.98	29.12	29.26	.20
.21	29.40	29.54	29.68	29.82	29.96	30.10	30.24	30.38	30.52	30.66	.21
.22	30.80	30.94	31.08	31.22	31.36	31.50	31.64	31.78	31.92	32.06	.22
.23	32.20	32.34	32.48	32.62	32.76	32.90	33.04	33.18	33.32	33.46	.23
.24	33.60	33.74	33.88	34.02	34.16	34.30	34.44	34.58	34.72	34.86	.24
.25	35.00	35.14	35.28	35.42	35.56	35.70	35.84	35.98	36.12	36.26	.25
.26	36.40	36.54	36.68	36.82	36.96	37.10	37.24	37.38	37.52	37.66	.26
.27	37.80	37.94	38.08	38.22	38.36	38.50	38.64	38.78	38.92	39.06	.27
.28	39.20	39.34	39.48	39.62	39.76	39.90	40.04	40.18	40.32	40.46	.28
.29	40.60	40.74	40.88	41.02	41.16	41.30	41.44	41.58	41.72	41.86	.29
.30	42.00	42.14	42.28	42.42	42.56	42.70	42.84	42.98	43.12	43.26	.30
.31	43.40	43.54	43.68	43.82	43.96	44.10	44.24	44.38	44.52	44.66	.31
.32	44.80	44.94	45.08	45.22	45.36	45.50	45.64	45.78	45.92	46.06	.32
.33	46.20	46.34	46.48	46.62	46.76	46.90	47.04	47.17	47.32	47.46	.33
.34	47.60	47.74	47.88	48.02	48.16	48.30	48.44	48.58	48.72	48.86	.34
.35	49.00	49.14	49.28	49.42	49.56	49.70	49.84	49.98	50.12	20.26	.35
.36	50.40	50 54	50.68	50.82	50.96	51.10	51.24	51.38	51.52	51.66	.36
.37	51.80	51.94	52.08	52.22	52.36	52.50	52.64	52.78	52.92	53.06	.37
.38	53.20	53.34	53.48	53.62	53.76	53.90	54.04	54.18	54.32	54.46	.38
.39	54.60	54.74	54.88	55.02	55.16	55.30	55.44	55.58	55.72	55.86	.39

IRON ORTHOSILICATE (FAYALITE), $2FeO.SiO_2$ (MOLECULAR WEIGHT, 204).

(Unit of calculation is one-half molecular number of FeO.)

Mol.	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Mol.
0.00	0.00	0.20	0.41	0.61	0.82	1.02	1.22	1.43	1.63	1.84	0.00
.01	2.04	2.24	2.45	2.65	2.86	3.06	3.26	3.47	3.67	3.88	.01
.02	4.08	4.28	4.49	4.69	4.90	5.10	5.30	5.51	5.71	5.92	.02
.03	6.12	6.32	6.53	6.73	6.94	7.14	7.34	7.55	7.75	7.96	.03
.04	8.16	8.36	8.57	8.77	8.98	9.18	9.38	9.59	9.79	10.00	.04
.05	10.20	10.40	10.61	10.81	11.02	11.22	11.42	11.63	11.83	12.04	.05
.06	12.24	12.44	12.65	12.85	13.06	13.26	13.46	13.67	13.87	14.08	.06
.07	14.28	14.48	14.69	14.89	15.10	15.30	15.50	15.71	15.91	16.12	.07
.08	16.32	16.52	16.72	16.93	17.14	17.34	17.54	17.75	17.95	18.16	.08
.09	18.36	18.56	18.77	18.97	19.18	19.38	19.58	19.79	19.99	20.20	.09
.10	20.40	20.60	20.81	21.01	21.22	21.42	21.62	21.83	22.03	22.24	.10
.11	22.44	22.64	22.85	23.05	23.26	23.46	23.66	23.87	24.07	24.28	.11
.12	24.48	24.68	24.89	25.09	25.30	25.50	25.70	25.91	26.11	26.32	.12
.13	26.52	26.72	26.93	27.13	27.34	27 54	27.74	27.95	28.15	28.36	.13
.14	28.56	28.76	28.97	29.17	29.38	29.58	29.78	29.99	30.19	30.40	.14
.15	30.60	30.80	31.01	31.21	31.42	31.62	31.82	32.03	32.23	32.44	.15
.16	32.64	32.84	33.05	33.25	33.46	33.66	33.86	34.07	34.27	34.48	.16
.17	34.68	34.88	35.11	35.31	35.50	35.70	35.90	36.11	36.31	36.52	.17
.18	36.72	36.92	37.15	37.35	37.54	37.74	37.94	38.15	38.35	38.56	.18
.19	38.76	38.96	39.19	39.39	39.58	39.78	39.98	40.19	40.39	40.60	.19

CALCIUM ORTHOSILICATE, $2CaO.SiO_2$ (MOLECULAR WEIGHT, 172).

(Unit of calculation is one-half molecular number of CaO.)

Mol.	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Mol.
0.00	0.00	0.17	0.34	0.52	0.69	0.86	1.03	1.20	1.38	1.55	0.00
.01	1.72	1.89	2.06	2.24	2.41	2.58	2.75	2.92	3.10	3.27	.01
.02	3.44	3.61	3.78	3.96	4.13	4.30	4.47	4.64	4.82	4.99	.02
.03	5.16	5.33	5.50	5.66	5.85	6.02	6.19	6.36	6.54	6.71	.03
.04	6.88	7.05	7.22	7.40	7.57	7.74	7.91	8.08	8.26	8.43	.04
.05	8.00	8.77	8.94	9.12	9.29	9.46	9.63	9.80	9.98	10.15	.05
.06	10.32	10.49	10.66	10.84	11.01	11.18	11.35	11.52	11.70	11.87	.06
.07	12.04	12.21	12.38	12.56	12.73	12.90	13.07	13.24	13.42	13.59	.07
.08	13.76	13.93	14.10	14.28	14.45	14.62	14.79	14.96	15.14	15.31	.08
.09	15.48	15.65	15.82	16.00	16.17	16.34	16.51	16.68	16.86	17.03	.09

MAGNETITE, $FeO.Fe_2O_3$ (MOLECULAR WEIGHT, 232).

Mol.	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Mol.
0.00	0.00	0.23	0.46	0.70	0.93	1.16	1.39	1.62	1.86	2.09	0.00
.01	2.32	2.55	2.78	3.02	3.25	3.48	3.71	3.94	4.18	4.41	.01
.02	4.64	4.87	5.10	5.34	5.57	5.80	6.03	6.26	6.50	6.73	.02
.03	6.96	7.19	7.42	7.66	7.89	8.12	8.35	8.58	8.82	9.05	.03
.04	9.28	9.51	9.74	9.98	10.21	10.44	10.67	10.90	11.14	11.37	.04
.05	11.60	11.83	12.06	12.30	12.53	12.76	12.99	13.22	13.46	13.69	.05
.06	13.92	14.15	14.38	14.62	14.85	15.08	15.31	15.54	15.78	16.01	.06
.07	16.24	16.47	16.70	16.94	17.17	17.40	17.63	17.86	18.10	18.33	.07
.08	18.56	18.79	19.02	19.26	19.49	19.72	19.95	20.18	20.42	20.65	.08
.09	20.88	21.11	21.34	21.58	21.81	22.04	22.27	22.50	22.74	22.97	.09

ILMENITE, $FeO.TiO_2$ (MOLECULAR WEIGHT, 152).

Mol.	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Mol.
0.00	0.00	0.15	0.30	0.46	0.61	0.76	0.91	1.06	1.22	1.37	0.00
.01	1.52	1.67	1.82	1.98	2.13	2.28	2.43	2.58	2.74	2.89	.01
.02	3.04	3.19	3.34	3.50	3.65	3.80	3.95	4.10	4.26	4.41	.02
.03	4.56	4.71	4.86	5.02	5.17	5.32	5.47	5.62	5.78	5.93	.03
.04	6.08	6.23	6.38	6.54	6.69	6.84	6.99	7.14	7.30	7.45	.04
.05	7.60	7.75	7.90	8.06	8.21	8.36	8.51	8.66	8.82	8.97	.05
.06	9.12	9.27	9.42	9.58	9.73	9.88	10.03	10.18	10.34	10.49	.06
.07	10.64	10.79	10.94	11.10	11.25	11.40	11.55	11.70	11.86	12.01	.07
.08	12.16	12.31	12.46	12.62	12.77	12.92	13.07	13.22	13.38	13.53	.08
.09	13.68	13.83	13.98	14.14	14.29	14.44	14.59	14.74	14.90	15.05	.09

HEMATITE, Fe_2O_3 (MOLECULAR WEIGHT, 160).

Mol.	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Mol.
0.00	0.00	0.16	0.32	0.48	0.64	0.80	0.96	1.12	1.28	1.44	0.00
.01	1.60	1.76	1.92	2.08	2.24	2.40	2.56	2.72	2.88	3.04	.01
.02	3.20	3.36	3.52	3.68	3.84	4.00	4.16	4.32	4.48	4.64	.02
.03	4.80	4.96	5.12	5.28	5.44	5.60	5.76	5.92	6.08	6.24	.03
.04	6.40	6.56	6.72	6.88	7.04	7.20	7.36	7.52	7.68	7.84	.04

APATITE, $3CaO.P_2O_5+\frac{CaF_2}{3}$ (MOLECULAR WEIGHT, 336).

(Unit of calculation is molecular proportion of P_2O_5.)

Mol.	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Mol.
0.00	0.00	0.34	0.67	1.01	1.34	1.68	2.02	2.35	2.69	3.02	0.00
.01	3.36	3.70	4.03	4.37	4.70	5.04	5.38	5.71	6.05	6.38	.01
.02	6.72	7.06	7.39	7.73	8.06	8.40	8.74	9.07	9.41	9.74	.02
.03	10.08	10.42	10.75	11.09	11.42	11.76	12.10	12.43	12.77	13.10	.03
.04	13.44	13.78	14.11	14.45	14.78	15.12	15.46	15.79	16.13	16.46	.04

ACMITE, $Na_2O.Fe_2O_3.4SiO_2$ (MOLECULAR WEIGHT, 462).

Mol.	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Mol.
0.00	0.00	0.46	0.92	1.39	1.85	2.31	2.77	3.23	3.70	4.16	0.00
.01	4.62	5.08	5.54	6.01	6.47	6.93	7.39	7.85	8.32	8.78	.01
.02	9.24	9.70	10.16	10.63	11.09	11.55	12.01	12.47	12.94	13.40	.02
.03	13.86	14.32	14.78	15.25	15.71	16.17	16.63	17.09	17.56	18.02	.03
.04	18.48	18.94	19.40	19.87	20.33	20.79	21.25	21.71	22.18	22.64	.04
.05	23.10	23.56	24.02	24.49	24.95	25.41	25.87	26.33	26.80	27.26	.05
.06	27.72	28.18	28.64	29.11	29.57	30.03	30.49	30.95	31.42	31.88	.06
.07	32.34	32.80	33.26	33.73	34.19	34.65	35.11	35.57	36.04	36.50	.07
.08	36.96	37.42	37.88	38.35	38.81	39.27	39.73	40.19	40.66	41.12	.08
.09	41.58	42.04	42.50	42.97	43.43	43.89	44.35	44.81	45.28	45.74	.09

CORUNDUM, Al_2O_3 (MOLECULAR WEIGHT, 102).

Mol.	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Mol.
0.00	0.00	0.10	0.20	0.31	0.41	0.51	0.61	0.71	0.82	0.92	0.00
.01	1.02	1.12	1.22	1.33	1.43	1.53	1.63	1.73	1.84	1.94	.01
.02	2.04	2.14	2.24	2.35	2.45	2.55	2.65	2.75	2.86	2.96	.02
.03	3.06	3.16	3.26	3.37	3.47	3.57	3.67	3.77	3.88	3.98	.03
.04	4.08	4.18	4.28	4.39	4.49	4.59	4.69	4.79	4.90	5.00	.04
.05	5.10	5.20	5.30	5.41	5.51	5.61	5.71	5.81	5.92	6.02	.05
.06	6.12	6.22	6.32	6.43	6.53	6.63	6.73	6.83	6.94	7.04	.06
.07	7.14	7.24	7.34	7.45	7.55	7.65	7.75	7.85	7.96	8.06	.07
.08	8.16	8.26	8.36	8.47	8.57	8.67	8.77	8.87	8.98	9.08	.08
.09	9.18	9.28	9.38	9.49	9.59	9.69	9.76	9.89	10.00	10.10	.09

ZIRCON, $ZrO_2.SiO_2$ (MOLECULAR WEIGHT, 183).

Mol.	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Mol.
0.00	0.00	0.18	0.37	0.55	0.73	0.91	1.10	1.28	1.46	1.65	0.00
.01	1.83	2.01	2.20	2.38	2.56	2.75	2.93	3.11	3.29	3.48	.01
.02	3.66	3.84	4.03	4.21	4.39	4.58	4.76	4.94	5.12	5.31	.02
.03	5.49	5.67	5.86	6.04	6.22	6.41	6.59	6.77	6.95	7.14	.03
.04	7.32	7.50	7.78	7.87	8.05	8.24	8.42	8.60	8.78	8.97	.04

HALITE, Na_2Cl_2 (MOLECULAR WEIGHT, 117).

Mol.	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Mol.
0.00	0.00	0.12	0.23	0.35	0.47	0.59	0.70	0.82	0.94	1.05	0.00
.01	1.17	1.29	1.40	1.52	1.64	1.76	1.87	1.99	2.11	2.22	.01
.02	2.34	2.46	2.57	2.69	2.81	2.93	3.04	3.16	3.28	3.39	.02
.03	3.51	3.63	3.74	3.86	3.98	4.10	4.21	4.33	4.45	4.56	.03
.04	4.68	4.80	4.91	5.03	5.15	5.27	5.38	5.50	5.62	5.73	.04

THENARDITE, Na_2SO_4 (MOLECULAR WEIGHT, 142).

Mol.	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Mol.
0.00	0.00	0.14	0.28	0.43	0.57	0.71	0.85	0.99	1.14	1.28	0.00
.01	1.42	1.56	1.70	1.85	1.99	2.13	2.27	2.41	2.56	2.70	.01
.02	2.84	2.98	3.12	3.27	3.41	3.55	3.69	3.83	3.98	4.12	.02
.03	4.26	4.40	4.54	4.69	4.83	4.97	5.11	5.25	5.40	5.54	.03
.04	5.68	5.82	5.96	6.11	6.25	6.39	6.53	6.67	6.82	6.96	.04

SODIUM METASILICATE, $Na_2O.SiO_2$ (MOLECULAR WEIGHT, 122).

Mol.	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Mol.
0.00	0.00	0.12	0.24	0.37	0.49	0.61	0.73	0.85	0.98	1.10	0.00
.01	1.22	1.34	1.46	1.59	1.71	1.83	1.95	2.07	2.20	2.32	.01
.02	2.44	2.56	2.68	2.81	2.93	3.05	3.17	3.29	3.42	3.54	.02
.03	3.66	3.78	3.90	4.03	4.15	4.27	4.39	4.51	4.64	4.76	.03
.04	4.88	5.00	5.12	5.25	5.37	5.49	5.61	5.73	5.86	5.98	.04

TITANITE, $CaO.TiO_2.SiO_2$ (MOLECULAR WEIGHT, 196).

Mol.	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Mol.
0.00	0.00	0.20	0.39	0.59	0.78	0.98	1.18	1.37	1.57	1.76	0.00
.01	96	2.16	2.35	2.55	2.74	2.94	3.14	3.33	3.53	3.72	.01
.02	92	4.12	4.31	4.51	4.70	4.90	5.10	5.29	5.49	5.68	.02
.03	88	6.08	6.27	6.47	6.66	6.86	7.06	7.25	7.45	7.64	.03
.04	7.84	8.04	8.23	8.43	8.62	8.82	9.02	9.21	9.41	9.60	.04

PEROFSKITE, $CaO.TiO_2$ (MOLECULAR WEIGHT, 136).

Mol.	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Mol.
0.00	0.00	0.14	0.27	0.41	0.54	0.68	0.82	0.95	1.09	1.22	0.00
.01	1.36	1.50	1.63	1.77	1.90	2.04	2.18	2.31	2.45	2.58	.01
.02	2.72	2.86	2.99	3.13	3.26	3.40	3.54	3.67	3.81	3.94	.02
.03	4.08	4.22	4.35	4.49	4.62	4.76	4.90	5.03	5.17	5.30	.03
.04	5.44	5.58	5.71	5.85	5.98	6.12	6.26	6.39	6.53	6.66	.04

FLUORITE, CaF_2 (MOLECULAR WEIGHT, 78).

Mol.	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Mol.
0.00	0.00	0.07	0.16	0.23	0.31	0.39	0.47	0.55	0.62	0.70	0.00
.01	.78	.86	.94	1.01	1.09	1.17	1.25	1.33	1.40	1.48	.01
.02	1.56	1.64	1.72	1.79	1.87	1.95	2.03	2.11	2.18	2.26	.02
.03	2.34	2.42	2.50	2.57	2.65	2.73	2.81	2.89	2.96	3.04	.03
.04	3.12	3.20	3.28	3.35	3.43	3.51	3.59	3.67	3.74	3.82	.04

SODIUM CARBONATE, $Na_2O.CO_2$ (MOLECULAR WEIGHT, 106).

Mol.	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	Mol.
0.00	0.00	0.11	0.21	0.32	0.42	0.53	0.64	0.74	0.85	0.95	0.00
.01	1.07	1.17	1.27	1.38	1.48	1.59	1.70	1.80	1.91	2.01	.01
.02	2.12	2.23	2.33	2.44	2.54	2.65	2.76	2.86	2.97	3.07	.02
.03	3.18	3.29	3.39	3.50	3.60	3.71	3.82	3.92	4.03	4.13	.03
.04	4.24	4.35	4.45	4.56	4.66	4.77	4.88	4.98	5.09	5.19	.04

CALCITE, $CaO.CO_2$ (MOLECULAR WEIGHT, 100).

(Multiply molecular number by 100.)

THE INDEXES.

PREFATORY NOTE.

Because of the typographical arrangement of the tables a page reference to the part of this work that is covered by them implies also the opposite page, both pages being considered together. The odd-numbered (right-hand) page is the one generally referred to, as on this page appear the rock name, locality, reference, and other details.

The title "Index to new rock names," formerly used, has been changed to "Index to normative names" to emphasize the fact that the names of the divisions of the quantitative system are not names of *rocks* but designate the chemical and standard mineral characters that are embraced in the term "normative." Also the word *old* has been omitted from the former title "Index to old rock names," as this adjective is inappropriate in view of the present general use of these names and because such names are now being given to rocks and will doubtless continue to be given to them in the future.

The "Index to the text," which includes the index to the appendixes, has been made very detailed, possibly too much so; but it has been thought better to err on the side of including too much rather than too little. The "Index to normative names" includes all names that have been proposed, so far as known, up to 1917. Those that have been accepted and are used in Part I of the tables are followed by their symbols, which show their magmatic positions. Those that have been rejected and not so used are printed in *italics*. They are discussed on pages 34–36.

In the "Index to rock names" and the "Index to localities" the page numbers that refer to Part I of the tables are separated by a dash (—) from those that refer to the other parts. The page numbers that refer to Part IV (inferior analyses) are printed in *italics*. It may be well to mention that if a rock or locality name is not found on the page given in the index it may possibly be found on the succeeding (odd-numbered) page.

In the "Index to rock names" mineral qualifiers have been omitted where the qualifier would imply no especially important or interesting magmatic or mineralogic character. Thus biotite andesite and hornblende andesite are to be looked for under andesite. Olivine basalt and olivine gabbro are indexed under basalt and gabbro, respectively. Granitite is to be looked for under granite. If, however, the mineral qualifier indicates a peculiarly interesting or unusual magmatic or modal character, or if the mineral mentioned is of rare occurrence, the qualifier is retained, as in the names of aegirite granite, analcite basalt, cancrinite syenite, magnetite basalt, and quartz basalt. The mineral qualifier is of course retained in such names as nephelite syenite and quartz diorite. Textural qualifiers are usually omitted from the index; for example, andesite porphyry will be found under andesite, though granite porphyry and diorite porphyry are retained.

In using this index the existence of many synonyms should be borne in mind. Thus some rocks that might be called liparite may be found under rhyolite, some dolerites under basalt, and vice versa. The French labradorites are also indexed under basalt. The usage of the terms "porphyry" and "porphyrite" in the literature has not been uniform, and the two are frequently interchanged. In the index these names imply that no mineral qualifier is used by the describer or that the qualifier is the name of a common mafic mineral, such as augite, biotite, or hornblende. Quartz porphyry is retained in the index. Such textural terms as obsidian and pumice (indexed alone) imply that no qualifier has been used by the describer of the rock. A "trachyte obsidian" or "rhyolite pumice" is to be found under these full terms, respectively.

Inclusions (such as "segregations" and "secretions") and schlieren are indexed both under the name of the inclosing rock and under the terms "inclusions" and "schlieren," as they may be of special interest for some investigations. The few analyses of rock fragments brought up from the ocean floor are also indexed collectively under the term "dredged blocks."

The "Index to localities" has been the subject of considerable thought and consultation. The convenience of the petrologist, rather than consistency, has been the chief consideration. The attempt has been made to keep together, so far as possible, page references to analyses of rocks that occur in the same district or analyses that are given in the same paper. Arrays of figures such as are given in the first edition under Italy, California, and Montana, and such as would be very much more numerous in the present work, which contains three times as many analyses, would be inconvenient and of very little use, consuming much time in looking up an analysis and hiding many petrographic or bibliographic relations. To obviate this objection the present index has been prepared in much greater detail, and in general a district or locality is indexed separately if it is represented on three or more pages.

The primary grouping is by countries, colonies, and detached or oceanic islands. Under countries and colonies the arrangement is to a large extent by States, Provinces, and such political subdivisions, though here the selection is not always that of a present-day political division, such as Scania in Sweden and Auvergne and Brittany in France. The colonies that form the Australian Federation are indexed under Australia, but those that now form the Union of South Africa are indexed separately.

For some countries—such as Germany, Italy, and Sweden—there is a primary subdivision into both political divisions and petrographic districts on an equal footing. The political divisions and geographical nomenclature of Germany especially are so complex, and the analyses of rocks from that country are so numerous, that it has required special treatment. A district or a mountain group that lies wholly within one German State is treated as a subheading under that State, as, for example, the Hegau and the Kaiserstuhl, which are subheadings under Baden. On the other hand, such districts as the Harz, Lausitz, and Odenwald, which border on or form part of several provinces and are petrographically important and well known, are given separate main headings. The Vosges are referred to France and the Erzgebirge to Germany. Some countries and States proved to be not readily subdivided or are represented by too few analyses to justify their subdivision. A further subdivision of States or Provinces into petrographic or mining districts is made if it seems to be called for in assisting reference.

If a country or State is subdivided into districts, the districts are given in alphabetic order, closing with the heading "Miscellaneous," under which are placed the page references to analyses from localities not thus separately grouped. As my detailed knowledge of many regions is inadequate, and as time was lacking for reconsultation of many papers, it may be well for a petrographer who is seeking all the analyses of a district to consult also the "Miscellaneous" list.

The treatment of the islands offered some peculiar problems. In general, islands that lie near the coast of a country to which they belong politically are indexed as subheadings under that country. Thus, the Channel Islands, The Isle of Man, and the Orkney Islands are subheadings under Great Britain; Corsica is a subheading under France; and the Aeolian Islands, Capraia, Elba, Sardinia, and Sicily are subheadings under Italy. Pantelleria and Linosa, however, are indexed separately. The islands in the Aegean Sea, whatever their past or present political status, are indexed under Greece, with the subheading Aegean Islands.

Oceanic islands and those that are widely detached from the country to which they belong (such as the Bermuda, Galapagos, and Juan Fernandez islands) are indexed separately. The name of the ocean in which they lie is added when they are small or are little known, to facilitate study of petrographic provinces. The small islands of the Malay Archipelago (such as Ambon, Bawean, Flores, and Timor) are also indexed separately, on an equal footing with Borneo, Celebes, Java, and Sumatra, the term "Malay Archipelago" being appended to them.

INDEX TO THE TEXT.

INDEX TO NORMATIVE NAMES.

INDEX TO ROCK NAMES.

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H.

I.

J.

K.

T.

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V.

W.

Y.

INDEX TO LOCALITIES.

[1] The collection of analyses of rocks from Prussia is not complete; cf. p. 36, note 3.