U.S. DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

THE FORD-FLEISCHER FILE OF MINERALOGICAL REFERENCES, 1978-1980 INCLUSIVE

by

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In 1916, Prof. W.E. Ford of Yale University, having just published the third Appendix to Dana's System of Mineralogy, 6th Edition, began to plan for the 7th Edition. He decided to create a file, with a separate folder for each mineral (or for each mineral group) into which he would place a citation to any paper that seemed to contain data that should be considered in the revision of the 6th Edition. He maintained the file in duplicate, with one copy going to Harvard University, when it was agreed in the early 1930's that Palache, Berman, and Frondel there would have the main burden of the revision. A number of assistants were hired for the project, including C.W. Wolfe and M.A. Peacock to gather crystallographic data at Harvard, and Michael Fleischer to collect and evaluate chemical data at Yale.

After Prof. Ford's death in March 1939, the second set of his files came to the U.S. Geological Survey and the literature has been covered since then by Michael Fleischer. Copies are now at the U.S. Geological Survey at Reston, Va., Denver, Colo., and Menlo Park, Cal., and at the U.S. National Museum, Washington, D.C.

Since 1978, the references have been typed into a computer. Alphabetized computer print-outs are now also put on open-file. The first such update covering additions from 1978 through 1980 is now available. Attempts will be made to release all new additions to the file annually.

Coverage of the Files

From its inception, it has been intended that the file should contain indicative abstracts of every paper that contains significant data on the physical and chemical properties of minerals. Especially in recent years, the attempt has been made to include references to studies on synthesis and on stability relations of minerals. It is needless to state that there are probably many pertinent references that have been missed, especially in recent years. There is also no doubt that carelessness in the use of the files has very likely caused the loss of some references; this type of loss is difficult to correct.

During the Ford years, the most important mineralogical journals (Mineral. Mag.; Am. Mineral.; Can. Mineral.; Bull. Soc. Fr. Mineral. Cristallogr. (now Bull. Mineral.); Z. Kristallogr.; Tschermaks Mineral. Petrogr. Mitt.; Periodico Mineral.; Neues Jahrb. Mineral., Monatsh.; Neues Jahrb. Mineral., Beil.-Bd. (now Abh.); and others were covered directly. In addition, abstract journals were covered (Mineral. Abstr.; Neues Jahrb. Mineral., Ref. (later Zentralbl. Mineral. and Z. Kristallogr. abstracts).

Since 1939, the important mineralogical journals have been covered, but Chemical Abstracts and Mineralogical Abstracts are relied on for much of the coverage. Sections of Chemical Abstracts covered (1981) are Nos. 49 (Industrial Inorganic Chemicals), 53 (Mineralogical and Geological Chemistry), 68 (Equilibrium), 69 (Thermodynamics), 75 (Crystallography), and 78 (Inorganic Chemical Reactions). The sections on Magnetism and Spectroscopy, which have occasional references to data on minerals, are not usually checked, in the hope that Mineralogical Abstracts will report these.

It has become evident in the past few years that the coverage of primary journals listed above is no longer sufficient. This is mainly because of the widespread use of the electron microprobe. Petrological papers, which ten years ago might have a few mineral analyses, now commonly contain many microprobe analyses (a paper with 50 analyses of 8 different minerals is not unusual), and these are often not mentioned in the abstract journals. It has become necessary, beginning in 1980, to check regularly such journals as Contrib. Mineral. Petrol., Chem. Geol., J. Petrol., Lithos, and similar ones. It is certain that many such analyses have been missed in past years.

In each folder (except for minerals described since 1940), there is usually a summary of occurrences. These were prepared by Prof. Ford in the early 1930's, after he had checked specimens in the leading museums of the U.S., England, France, Germany, Austria, and Italy. Many folders have summaries of the chemistry, prepared by Fleischer about 1935. Many have summaries of the optical properties, especially in relation to composition, assembled by Fleischer, usually in the interval 1975-1980.

Michael Fleischer

March 1981

ABELSONITE. Milton et al., Am. Mineral. 63, 930-937 (1978). New mineral, nickel porphyrin, C31 H32 N4 Ni, from Utah. Triclinic, a 8.44, b 11.12, c 7.28A, alpha 90 degrees 53', beta 113 degrees 45', gamma 79 degrees 34', Z=1, G calcd. 1.45. X-ray data.

ACANTHITE. Shcherbina, (Geokhimiia, 1444-1451 (1978)) Chem. Abstr. 90, no. 4, 26235 (1979). Geochemistry and formation at low temperatures.

ACANTHITE. Smith, Mineral. Pa. 18-19 (1978). Occurrence in Pa.

ADAMITE. Dunin-Barkovskaya and Moiseeva, (Miner. Uzb. 3, 7-9 (1976)) Chem. Abstr. 91, no. 14, 110207 (1979). Four analyses of cuproan (CuO 2.4-21.2%), optics from Uzbekistan.

ADAMITE. Keller et al., Neues Jahrb. Mineral., Abh. 134, 147-156 (1979). Refinement of crystal structure.

ADAMITE. Toman, (Acta Crystallogr., Sect. B, B34, 715-721 (1978)) Mineral. Abstr. 30, 354-355 (1979). Ordering in solid solutions olivenite-adamite.

ADAMITE. Walenta and Greil, (Chem. Erde 38, 218-222 (1979)) Chem. Abstr. 92, no. 4, 32345 (1980). Pseudotetrag. cuproadamite (Zn:Cu=2:1) has a 8.50, c 5.97A, n(alpha) 1.732, n(gamma) 1.773.

ADELITE. Dunn, Mineral. Rec. 10, 160-165 (1979). Occurrence at Franklin, N.J. Probe analysis with 14.2% ZnO.

ADMONTITE. Walenta, (Tschermaks Mineral. Petrogr. Mitt. 26, 69-77 (1979)) Am. Mineral. 65, 205 (1980). Abstract of original description.

ADMONTITE. Walenta, (Tschermaks Mineral. Petrogr. Mitt. 26, 69-77 (1979)) Chem. Abstr. 91, no. 22, 178246 (1979). Abstract of original description.

ADMONTITE. Walenta, Tschermaks Mineral. Petrogr. Mitt. 26, 69-77 (1979). New mineral from Styria, Austria, Mg2 B12 O20 . 15 H2O. Monoclinic, P2(1)/c, a 12.68, b 10.07, c 11.32A, beta 109.68 degrees, Z=2. Analysis, x-ray data, optics.

AENIGMATITE. Ferguson, J. Geol. Soc. Aust. 25, 185-197 (1978). Electron microprobe from Victoria, Australia.

AENIGMATITE. Grapes et al., (Contrib. Mineral. Petrol. 69, 97-103 (1979)) Chem. Abstr. 91, no. 16, 126165 (1979). Occurrence in syenite, Morotu, Japan.

AENIGMATITE. Grapes et al., Contrib. Mineral. Petrol. 69, 97-103 (1979). Probe analyses (8) from Morotu, Sakhalin. Zoned.

AENIGMATITE. Velde, Am. Mineral. 63, 771-778 (1978). Probe analyses (3) from trachyte, Maui, Hawaii.

AESCHYNITE. Grundmann and Koller, (Neues Jahrb. Mineral., Abh. 135, 36-47 (1979)) Chem. Abstr. 91, no. 16, 126172 (1979). Occurrence in Habachtal, Austria, a 5.24, b 10.91, c 7.39A.

AESCHYNITE. Grundmann and Koller, (Neues Jahrb. Mineral., Abh. 135, 36-47 (1979)) Mineral. Abstr. 30, 420 (1979). Microprobe analyses from Austria, a 5.24, b 10.91, c 7.39A.

AESCHYNITE. Makarochkin, (Tr. Il'menskogo Zapov. 16, 84-88 (1978)) Chem. Abstr. 91, no. 18, 143411 (1979). Analysis and rare earths, from Ilmen Mts.

AESCHYNITE. Makarochkin, Geol. Geofiz., no. 1, 150-152 (1979). Analyses of 2 varieties from Urals.

AFGHANITE. Hogarth, Can. Mineral. 17, 47-52 (1979). New microprobe analyses from type locality and Pamir lead to idealized formula (Na,Ca,K)8 (Si,Al)12 O24 (SO4,Cl,CO3)3.

AFGHANITE. Leoni et al., Rend. Soc. Ital. Mineral. Petrol. 35, 713-719 (1979). New analyses from Italy (2), a 12.847, 12.796, c 21.464, 21.361A, G 2.44, 2.53, optics.

AFGHANITE. Rinaldi and Wenk, (Acta Crystallogr., Sect. A, A35, 825-828 (1979)) Chem. Abstr. 91, no. 20, 160486 (1979). Transmission electron microscopy of

stacking faults.

AFWILLITE. Pertsev, (Tr. Mineral. Muz., Akad. Nauk SSSR 26, 205-208 (1978)) Chem. Abstr. 90, no. 8, 58133 (1979). Occurrence, Siberia. X-ray and optical data.

AGRELLITE. Ghose and Wan, Am. Mineral. 64, 563-572 (1979). Structure triclinic, $P\bar{1}$, a 7.759, b 18.946, c 6.986A, alpha 89.88 degrees, beta 116.65 degrees, gamma 94.32 degrees, Z=4, Na (Ca,RE)2 Si4 O10 F.

AIKINITE. Boldyreva, Mineraly. Paragenezisy Mineral. Gorn. Porod Rud. 1979, 133-141 (1979). Reflectance at 14 wave lengths.

AIKINITE. Guebelin, (J. Gemmol. 16, 357-362 (1979)) Chem. Abstr. 91, no. 16, 126194 (1979). Inclusion of aikinite and CO2-NaCl fluid phase in phenakite.

AIKINITE. Hurny and Kristin, (Geol. Zb. (Bratislava) 29, 161-171 (1978)(English)) Chem. Abstr. 90, no. 4, 26234 (1979). Three microprobe analyses, Slovinsky, Czechoslovakia.

AIKINITE. Imai and Ogawa, (Mem. Sch. Sci. Eng., Waseda Univ. 41, 39-54 (1977)(Pub. 1978)(English)) Chem. Abstr. 91, no. 20, 160459 (1979). Probe analysis, x-ray data, optics, from Kuroko ore, Fukushima Pref.

AIKINITE. Makovicky and Makovicky, Can. Mineral. 16, 405-409 (1978). Formula in series bismuthinite-aikinite.

AIKINITE. Mariolacos, Neues Jahrb. Mineral., Monatsh., 73-80 (1979)(English). Stability in system Cu2S-PbS-Bi2S3. Solid solutions.

AKAGANEITE. Galbraith et al., Acta Crystallogr. 35A, 197-200 (1979). Structural changes caused by radiation.

AKTASHITE. Kaplunnik et al., (Dokl. Akad. Nauk SSSR 251, 96-98 (1980)[Crystallogr.]) Chem. Abstr. 92, no. 26, 224689 (1980). Structure. Trig., R3, a 13.730, c 9.329A, Z=3.

ALABANDITE. Kayupova et al., Miner. Paragenezisy Miner. Gornykh Porod Rud, 141-144 (1979). Microprobe analyses from Burultas deposit, Balknash, Co 1.0%.

ALABANDITE. Weinke et al., Meteoritics 14, 561-564 (1979). Probe analysis, Waterville meteorite.

ALABANDITE. Wood and Strens, Mineral. Mag. 43, 509-518 (1979). Reflectance spectrum.

ALAMOSITE. Bideaux, Mineral. Rec. 11, 155-181 (1980). Occurrence in Ariz.

ALBRITTONITE. Crook and Marcotty, (Am. Mineral. 63, 410-412 (1978)) Am. Mineral. 63, 1284 (1978). Correction. For space group I2/m, a 8.899, b 7.065, c 6.644, beta 97.25 degrees, Z=2; for space group C2/m, a 10.331, b 7.065, c 6.644A, beta 122.38 degrees, Z=2.

ALEKSITE. Lipovetshii et al., (Zap. Vses. Mineral. O-va. 107, 315-321 (1978)) Mineral. Abstr. 30, 422 (1979). Abstract of original description.

ALEKSITE. Lipovetskii et al., (Zap. Vses. Mineral. O-va. 107, 315-321 (1978)) Am. Mineral. 64, 652 (1979). Abstract of original description.

ALEKSITE. Lipovetskii et al., (Zap. Vses. Mineral. O-va. 107, 315-321 (1978)) Chem. Abstr. 89, no. 20, 166234 (1978). Abstract of original description.

ALGODONITE. Makovicky et al., Neues Jahrb. Mineral., Abh. 135, 221-269 (1979). Stability in system Cu-Ag-S at 350-500 degrees C.

ALGODONITE. Sinyakov, (Tr. Inst. Geol. Geofiz., Akad. Nauk SSSR, Sib. Otd. 370, 178-182, 227 (1977)) Chem. Abstr. 89, no. 6, 46417 (1978). Occurrence in Fe deposits, Gornaya Shoria. Analysis, x-ray, optics.

ALIETTITE. Mejsner, (Arch. Mineral. 35, 33-36 (1979)) Chem. Abstr. 92, no. 16, 132130 (1980). Mixed layer silicate with alternating montmorillonite and muscovite-like layers.

ALLANITE. Azimov and Smirnova, (Miner. Uzb. 3, 129-133 (1976)) Chem. Abstr. 91,

no. 14, 110251 (1979). Occurrences in Uzbekistan. Optics, analyses (not in abs.).

ALLANITE. Gable, Geol. Surv. Prof. Pap. (U.S.) 1101, 66-86 (1980). Chem. and spectrographic analyses (5), Boulder Creek batholith, Colo.

ALLANITE. Ipat'eva and Leskova, (Miner. Endog. Obraz. Yakutii, 116-122 (1977)) Chem. Abstr. 91, no. 2, 7490 (1979). Analyses, REE from granites, NE USSR. Optics.

ALLANITE. Korovushkin and Moiseev, (Zap. Vses. Mineral. O-va. 108, 720-725 (1979)) Chem. Abstr. 92, no. 16, 132158 (1980). Mossbauer study of crystalline and metamict.

ALLANITE. Rao et al., Mineral. Mag. 43, 312 (1979). Analysis and x-ray data (F 1.10%) from Garividi, India.

ALLARGENTUM. Karup-Moeller et al., Bull. - Groenl. Geol. Unders. 126, 1-47 (1978). Analyses (3), optics from Ilimaussaq, Greenland.

ALLARGENTUM. Picot and Ruhlmann, Bull. Mineral. 101, 563-569 (1978). Probe analyses (5) from granite, southern Vosges.

ALLARGENTUM. Sakharova and Bryzgalov, Dokl. Akad. Nauk SSSR 250, 702-704 (1980). Analysis.

ALLCHARITE. Donnay and Donnay, Bull. Mineral. 101, 531-535 (1978). Allcharite could have been identified as goethite by the use of the Barker index.

ALLEGHANYITE. Chopin, Bull. Mineral. 101, 514-531 (1978). Probe analyses (2) from Haute-Maurienne, France.

ALLOCLASE. Ixer et al., Mineral. Mag. 43, 389-395 (1979). Probe analyses (11) from northern England.

ALLOCLASITE. Besson and Picot, Notes Mem. Serv. Geol. (Morocco) 272, 163-182 (1978). Electron microprobe analyses from Bon-Azzer, Morocco.

ALLOCLASITE. Karup-Moeller and Makovicky, (Neues Jahrb. Mineral., Abh. 136, 310-325 (1979)) Chem. Abstr. 92, no. 10, 79582 (1980). Analysis of nickeloan (Co 0.56 Ni 0.45). X-ray data, marcasite-like.

ALLOCLASITE. Smith, Mineral. Pa. 20-21 (1978). Occurrence in Pa. X-ray data.

ALLOPHANE. Henmi, (Clay Miner. 14, 333-338 (1979)) Chem. Abstr. 92, no. 14, 113620 (1980). Analysis, x-ray, DTA, infra-red, from Ehime Pref., Japan.

ALLOPHANE. Henmi, (Clays Clay Miner. 28, 92-96 (1980)) Chem. Abstr. 93, no. 8, 75964 (1980). Effect of Si/Al ratio on DTA.

ALLOPHANE. Moiseeva et al., Miner. Uzb. 3, 343-366 (1976). Occurrence in Uzbekistan. Analyses, optics, DTA, x-ray.

ALLOPHANE. Wada et al., (J. Soil Sci. 30, 347-355 (1979)(English)) Chem. Abstr. 91, no. 22, 178284 (1979). Synthesis at 95-100 degrees.

ALSTONITE. Roberts, (Geol. Surv. Pap. (Geol. Surv. Can.) 78-1C, 49-52 (1978)) Chem. Abstr. 90, no. 6, 41420 (1979). Analysis and x-ray data, unit cell, a 8.6923, c 6.1484A of hex. dimorph of alstonite. Optics.

ALTAITE. Annenkova and Ivanova, Nov. Dannye Miner. SSSR 27, 210 (1978). Optics. Alpha 1.774 $\pm$ 0.05, gamma > 2.06 $\pm$ 0.05.

ALTAITE. Herrmann et al., (Phys. Status Solidi A, 59, 51-56 (1980)(English)) Chem. Abstr. 93, no. 6, 58396 (1980). Growth of single crystals from vapor phase.

ALTAITE. Moniri and Petot, (Journ. Calorim. Anal. Therm., [Prepr.], 9-B, B24, 195-201 (1978)) Chem. Abstr. 90, no. 24, 193148 (1979). Study of system Pb-Te. Free energy of formation.

ALTAITE. Petukhov et al., (Izv. Akad. Nauk SSSR, Neorg. Mater. 16, 358-359 (1980)) Chem. Abstr. 92, no. 16, 136303 (1980). Heat of fusion - 9.4 $\pm$ 0.7 kcal/mole.

ALTHAUSITE. Raade, Fortschr. Mineral., Beih. 58, 107-108 (1980)(abs.).

Hydrothermal synthesis.

ALTHAUSITE. Raade, Lithos 12, 288 (1979). Orth., Pnam or Pnma, a 8.258, b 14.383, c 6.054A. Cleavage perfect {010}, distinct {110}.

ALTHAUSITE. Raade, (Lithos 12, 288 (1979)) Chem. Abstr. 92, no. 20, 166617 (1980). Corrections. Orth., Pnam, a 8.258, b 14.383, c 6.054A, Z=8. Change of optical orientation and cleavage.

ALTHAUSITE. Romming and Raade, Am. Mineral. 65, 488-498 (1980). Structure. Orth., Pnma, a 8.258, b 6.054, c 14.383A, Z=4, Mg4 (PO4)2 (OH,O) F. Cleavage {001} perfect, §101† distinct. Hydrothermal synthesis.

ALTMARKITE. Kaemmel et al., (Z. Angew. Geol. 23, 535-536 (1978)) Chem. Abstr. 89, no. 14, 114034 (1978). New mineral, Hg Pb2, tetrag., a 3.52, c 4.53A.

ALTMARKITE. Kaemmel et al., (Z. Angew. Geol. 23, 535-536 (1978)) Am. Mineral. 64, 652 (1979). Abstract of original description.

ALUM. Gits-Leon et al., (Bull. Mineral. 101, 399-402 (1978)) Chem. Abstr. 90, no. 6, 41374 (1979). Growth defects in natural and synthetic crystals.

ALUMINITE. Dombrovaskaya et al., (Kora Vyvetrivaniya 15, 162-167 (1976)) Chem. Abstr. 90, no. 2, 8990 (1979). Analysis from Lake Baikal region, x-ray, infra-red data.

ALUMINITE. Farkas and Werner, (Z. Kristallogr. 151, 141-152 (1980)(English)) Chem. Abstr. 93, no. 4, 35382 (1980). Structure. Monoclinic, a 11.444, b 15.849, c 7.4397A, beta 106.85 degrees.

ALUMINITE. Sabelli and Ferroni, (Acta Crystallogr., Sect. B, B34, 2407-2412 (1978)) Chem. Abstr. 89, no. 16, 138694 (1978). Structure. Monoclinic, P2 sub 1/c, a 7.440, b 15.583, c 11.700A, beta 110.18 degrees, Z=4.

ALUMINITE. Sabelli and Ferroni, (Acta Crystallogr., Sect. B, B34, 2407-2412 (1978)) Mineral. Abstr. 31, 22 (1980). Structure. Monoclinic, P2(1)/c, a 7.440, b 15.583, c 11.700A, beta 110.18 degrees, Z=4.

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ALUMINUM. Oleinikov et al., (Dokl. Akad. Nauk SSSR 243, 191-194 (1978)) Am. Mineral. 65, 205 (1980). Abstract of original description.

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ALUNITE. Gevorkyan, Konst. Svoistva Miner. 12, 54-61 (1978). Infra-red spectran.

ALUNITE. Keith et al., Geol. Surv. Prof. Pap. (U.S.) 1124C, C1-C5 (1980). Coexisting alunite and jarosite, Goldfield, Nev.

ALUNITE. Muchi et al., (Bull. Fukuoka Univ. Educ., Part 3, 24, 99-117 (1974)) Mineral. Abstr. 30, 70 (1979). Analysis (K1.97 Na1.18) Al8.94 Fe0.12 (SO4)5.72 (OH)18.92, from Kagoshima Pref. DTA.

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ALUNOGEN. Bariand et al., (Mem. Hors-Ser. Soc. Geol. Fr. 8, 77-85 (1977)) Chem. Abstr. 91, no. 20, 160473 (1979). Occurrence near Yazd, Iran. No data in abs.

AMALGAM. Salamon, Pr. Mineral. (Pol. Akad. Nauk, Oddzial Krakowie, Kom. Nauk Mineral.) 62, 1-58 (1979). Probe analyses (8) from Polish Cu deposits.

AMARANTITE. Bariand et al., (Mem. Hors-Ser. Soc. Geol. Fr. 8, 77-85 (1977)) Chem. Abstr. 91, no. 20, 160473 (1979). Occurrence near Yazd, Iran. No

data in abs.

AMBLYGONITE. Kozanov and Lavrinenko, Redkomet. Pegmatity Ukr. 1-138 (1979). Analyses (4) from Ukraine pegmatites.

AMESITE. Giese, (Clays Clay Miner. 28, 81-86 (1980)) Chem. Abstr. 93, no. 8, 75962 (1980). Hydroxyl orientation and interlayer bonding in.

AMESITE. Hall and Bailey, (Clays Clay Miner. 27, 241-247 (1979)(English)) Chem. Abstr. 91, 115696 (1979). Cation ordering in amesite.

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AMICITE. Alberti and Vezzalini, (Acta Crystallogr., Sect. B, B35, 2866-2869 (1979)) Chem. Abstr. 92, no. 8, 68004 (1980). Structure. Monoclinic, pseudo-tetragonal, I2, a 10.226, b 10.422, c 9.884A, beta 88 degrees 19'.

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AMICITE. Alberti et al., (Neues Jahrb. Mineral., Monatsh., 481-488 (1979)) Am. Mineral. 65, 808 (1980). Abstract of original description.

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AMPHIBOLE. Andronov, (Tr. Mineral. Muz., Akad. Nauk SSSR 26, 183-185 (1978)) Chem. Abstr. 90, no. 8, 58130 (1979). Analyses, optics of intergrown hornblende and cummingtonite. X-ray data.

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AMPHIBOLE. Baldwin et al., Econ. Geol. 73, 690-702 (1978). Probe analyses (8) from Panguna, Bougainville, porphyry copper.

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AMPHIBOLE. Beeson, Contrib. Mineral. Petrol. 66, 5-14 (1978). Major and trace element analyses (18), Bamble, Norway.

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AMPHIBOLE. Berner et al., (Science (Washington, D.C.) 207(4436), 1205-1206 (1980)) Chem. Abstr. 92, no. 24, 201044 (1980). Study of dissolution during

weathering (hornblende).

AMPHIBOLE. Bertolani and Ghittoni, Rend. Soc. Ital. Mineral. Petrol. 35, 791-813 (1979). Probe analyses (13) from Rocca d'Argimonia, Italy.

AMPHIBOLE. Blight, (Annu. Rep. - West. Aust., Dep. Mines, 149-152 (1978)(Pub. 1979)) Chem. Abstr. 92, no. 26, 218093 (1980). Analyses of 10 hornblendes.

AMPHIBOLE. Bocchio et al., (Rend. Soc. Ital. Mineral. Petrol. 34, 453-470 (1978)(English)) Chem. Abstr. 91, no. 8, 66686 (1979). Unit cells on 13 ecologitic amphiboles, Switzerland.

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AMPHIBOLE. Bocchio, (Rend. Soc. Ital. Mineral. Petrol. 33, 519-529 (1977)) Mineral. Abstr. 30, 414 (1979). Analysis and optics of ferropargasite, Gorduno, Italy. a 9.845, b 17.987, c 5.303A, beta 105.11 degrees.

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AMPHIBOLE. Bushliakov and Sobolev, Petrol., Mineral., Geokhim. Granitoidov Verkhisetskogo Massiva, p. 93, 106, 158 (1976). Trace elements from Verkhisetsh massif, Urals. Six analyses.

AMPHIBOLE. Cameron and Papike, (Fortschr. Mineral. 57, 28-67 (1979)) Mineral. Abstr. 31, 17 (1980). Detailed review of crystal chemistry.

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