DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

TO ACCOMPANY MAP MF-799

MAPS SHOWING SAMPLE LOCALITIES AND TERNARY PLOTS AND GRAPHS SHOWING MODAL AND CHEMICAL DATA FOR GRANITIC ROCKS OF THE SANTA LUCIA RANGE, SALINIAN BLOCK, CALIFORNIA COAST RANGES

By Donald C. Ross

INTRODUCTION

The maps, diagrams, and tables of this report, designed to illustrate the modal and chemical patterns for granitic rocks of the Santa Lucia Range, are intended to supplement the geologic map of the pre-Cenozoic basement rocks of the range (Ross, 1976a). A companion report (Ross, 1976b) provides additional supplementary data on the metamorphic rocks of this area. Each of the granitic units is briefly described in Ross (1976a), and the numbers and informal names used here (fig. 1) are the same as in that report. No modal data on the ultramafic and mafic rocks (units 1 and 2 of Ross, 1976a) are presented here, but five chemical analyses of ultramafic rocks from Compton (1960) and R. C. Pearson (written commun., 1968) are included in the chemical data plots. Most of the modes of the granitic rocks reported here are new, except as noted on tables 1 to 16. By contrast, about half of the chemical analyses have been previously published (see supplement to tables 17 to 23 for source credit), but it was thought desirable to present all the presently available chemical data together. The granitic terrane of the Santa Lucia Range covers more than 700 km^2. Next to the Gabilan Range (800 km^2 of granitic rock), it is the largest area of exposed granitic rocks in the Salinian block. Together these two granitic terranes, whose outcrop patterns and modal and chemical characteristics are now fairly well established, provide a rather solid base from which to match (or reject) potentially correlative basement terranes across the San Andreas fault.

In the Gabilan Range (Ross, 1972b) granitic rocks dominate the basement. Although metamorphic rocks are widely distributed and locally important, they occur mostly in isolated pendants, septa, and discrete inclusion masses. In the Santa Lucia Range by contrast, metamorphic rocks are much more common, granitic and metamorphic rocks are much more mixed, and migmatitic terranes are abundant. This difference is also reflected in the relation between granitic units in the two ranges. Although exposed contacts are very rare, my limited observations suggest that contacts between granitic bodies in the Gabilan Range are relatively sharp whereas those in the Santa Lucia Range are gradational, suggesting that, at least in part, younger granitic bodies were intruded into incompletely crystallized and "mushy" granitic rock. Although some units are quite homogeneous over large areas, particularly in the northwest part of the Santa Lucia Range where granitic rocks dominate (for example, the porphyritic granodiorite of Monterey and the hornblende-biotite quartz diorite of Soberanes Point), most of the granitic units of the Santa Lucia Range are less homogeneous than those of the Gabilan Range.

Tables 1 to 16 list modes for each unit, tables 17 to 23 list chemical analyses and norms, and table 24 lists the semiquantitative spectrographic data on trace elements. These are the basic data used for the graphic presentations on sheets 2 and 3.

SHEET 1

The generalized geologic map (fig. 1) shows clearly that granitic rocks dominate the northwest part of the range but become subordinate to metamorphic rocks to the southeast. In general the granitic rock extends southeastward in two "tongues," one to the Paraiso-Paloma and Sand Creek area, and the other down to the Bear Mountain area. The bodies of charnockitic tonalite of Compton (1960) and related(?) rocks are poor in quartz, and it is possible that they are not comagnetic with the rest of the granitic suite. They also occur to the west in a dominantly metamorphic terrane that may be structurally detached from the rest of the granitic terrane. Figure 2 shows the sample coverage for each granitic unit. The density of sampling varies widely for the different units, but in general I believe the specimens analyzed give fairly good representation for most units. Figure 3 shows the sample coverage for rocks selected for chemical analysis. The larger and more homogeneous units to the north and west were sampled by me, and the central and southeast granitic terrane was sampled by R. C. Pearson (written commun., 1968) and Compton (1966). The central and southeast rocks are in smaller masses and tend to be more heterogeneous, so that individual samples may be less meaningful, but I believe that, overall, the chemical analyses adequately sample the granitic terrane.

SHEET 2

Figure 4 shows a composite plot of all the modes. The generally consistent amount of quartz across the modal field from granite to quartz diorite is the most noteworthy feature of this plot. The bulk of the modes have quartz between 20 and 35 percent. In figure 5, which shows modal averages, the Corral de Tierra mass and the charnockitic tonalite of Compton (1960) and related(?) quartz diorite are notably poor in quartz relative to the other units. Figure 6, the modal plot of chemically analyzed specimens, shows that the specimens selected for chemical analysis are representative of the total modal field as the trend and general field compares well with the modal field of figure 4. Figure 7 emphasizes the low quartz content of the granitic rocks west of the Palo Colorado fault and demonstrates the similarity of the related(?) quartz diorite to the charnockitic rocks. Figure 8 separates and identifies the modes for each granitic unit east of the Palo Colorado fault. Figure 8A shows modes but in addition reveals the extent of oversampling (see fig. 2G) relative to many of the units. Figure 8B shows the relations of the three masses of quartz diorite that may be correlative. It emphasizes the distinctive quartz-poor Bear Mountain and quartz-rich Paraiso-Paloma masses relative to the more average Soberanes mass, which may represent the normal rock type. The Bear Mountain unit is made up of many small masses, is somewhat heterogeneous, and probably is inadequately sampled. This mass may be darker and poorer in quartz owing to contamination and mixing with metamorphic rocks. Much of the Paraiso-Paloma unit appears to be more differentiated, but it does range throughout the field of the three quartz diorite units, which suggests that it has the same parent magma as the Soberanes mass. Figure 8C compares two porphyritic granodiorites that are physically very similar in the field. Both have similar ranges of quartz, mafic minerals, and total feldspar, and the modal data are certainly compatible with their correlation. Figure 8D shows the Cachagua mass, which is considered to be a unit transitional between the Monterey mass and the Soberanes and Paraiso-Paloma masses. The modal field looks much like those two quartz diorite fields minus hornblende. Figure 8E, of the porphyritic granodiorite of Monterey, shows that total feldspar is quite constant at 60 to 70 percent but that the ratio of plagioclase to K-feldspar varies considerably. The coarsely porphyritic nature of this mass, which has K-feldspar phenocrysts as large as 15 cm locally, makes modal analysis difficult. Possibly K-feldspar tends to be slighted in slab modes, but I suspect that the average is valid considering the number of samples. Figure 8F shows modal plots of three masses that may be correlative and exemplifies the heterogeneity of some of the smaller granitic masses. Figure 8G is a grouping of a number of felsic masses that probably represent the youngest bodies in the granitic terrane. They are composed of nearly equal amounts of plagioclase, K-feldspar, and quartz of the type characteristic of the low melting trough.

SHEET 3

Figure 9 shows four of the standard plots of chemical data. The A-C-F plot shows the rather normal clustering on and above the An-F join and a distinctly different plot of the ultramafic rocks below the An-F join. Sample P-222 plots outside the Triangle because TiO_2 (anomalously high in this felsic rock) exceeds the sum of $FeO+MnO+MgO+2Fe_2O_3$, giving the rock a slightly negative "F" value. The rock was collected, analyzed, and a small chip was given to me by R. C. Pearson (written commun., 1968). He called it a "pegmatoid granite." The small specimen is a felsic granitic rock, rich in K-feldspar and containing no opaque minerals. Unless the analyzed material contained some unusual concentrations of a titanium mineral such as rutile, I am at a loss to explain the anomaly--unless the analysis is in error. The normative feldspar plot (Ab-Or-An) shows a rather good trend for all the granitic rocks and a distinct and separate grouping for the relatively anorthite-rich ultramafic rocks. The ternary plot that compares somewhat with the modal plot (Ab+An-Or-Q) has a very pronounced and similar trend for all the plutonic rocks but, in contrast to the modal trend, plunges sharply to the plagioclase corner. One of the best plots for showing trends in granitic data is the Alk-F-M plot. For rocks of the Santa Lucia Range this plot shows three rather distinct groupings: ultramafic rocks, charnockitic tonalite, and all the other granitic rocks.

Figure 10 brings out graphically the relation between quartz and both plagioclase and dark minerals. Though this is an obvious generalization for probably most granitic rocks, it does illustrate the pattern for this particular suite and emphasizes the contrast between the rocks on opposite sides of the Palo Colorado fault. Figure 11 illustrates the relation of specific gravity to both dark minerals and quartz. This diagram was prepared because it seemed that the relations were not so obvious (or consistent) as I would have expected in working with individual modes. Yet the overall plot shows a surprisingly strong correlation between dark-mineral percentage and specific gravity. The correlation between quartz and specific gravity is weaker where all specimens are plotted but quite strong for the modal averages. The distribution of trace elements (fig. 12; table 24) is very similar to that for the granitic rocks of the Gabilan Range (Ross, 1975) and the central Sierra Nevada batholith (Dodge, 1972). The Santa Lucia values are lower than Taylor's (1965) averages for granodiorite for chromium, copper, niobium, nickel, and yttrium and somewhat higher for barium, gallium, and lanthanum, but the differences are not great. Standard silica variations for the common oxides (fig. 13) show generally quite linear trends. K_2O, in contrast to most such plots, bends sharply upward at the silicic end. The Peacock index is nearly the same as that for the Gabilan Range (Ross, 1975). Both suites are in Peacock's (1931) calcic field near the boundary with the calc-alkalic field.

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Table 1.--Modes of charnockitic tonalite of Compton (1960)

[tr. = trace]

No.	Plagio-clase	K-feldspar	Quartz	Biotite	Horn-blende	Ortho-pyroxene	"Alteration" (largely actinolite and chlorite)	Other
CR-19(small)	64.5	3.5	7	5	9	9	--	2 opaque
CR-19(large)	60	--	16	3	11	--	10	--
CR-19(large)	53	--	23	--	3	--	8	13 garnet
DR-999	55	--	10	--	20	--	15	--
DR-1001	71	1	1	2	14	4	--	6 garnet 1 opaque
DR-2274	47	1(?)	13	--	7	--	22	10 garnet
DR-2278	62	<1	7	3.5	3.5	--	24	--
DR-2280	62	--	13	--	7	--	18	--
DR-2279	68	--	20	1	--	--	11	--
DR-2283A	64	4	10	3.5	6	11.5	--	1 opaque
DR-2284	63	--	3	tr.	8	--	4 brown chl. 21 actinolite	1 opaque
DR-2285	60	--	--	--	27	--	13	--
2286	55	--	10	5	13	--	17	--
2287A	56	--	11	1	19	--	13	--
2288	65	--	17	2.5	3.5	--	11	1 opaque
2290	56	--	12	--	14	--	18	--
2291	57	--	11	1	17	--	12	2 clino-pyroxene
2292B	56	<1	9	--	22	--	13	--
2296	65	--	6	3	2	--	22	1 garnet 1 opaque
2301	72	<1	15	5	--	--	--	8 garnet
2304	58	<1	12	<1	22.5	--	6.5	1 opaque
2306A	57	--	11	--	21	3	7	1 opaque
2315	61	<1	8	1	21	--	9	--
2331	61	--	16	5	--	--	17	1 opaque
Average	60	<1	11	2-	12+	1	12	2
Compton avg. mode (1960, p. 620)	62	0.5	18	3	7	9	--	0.5 opaque

Table 2. Modes of quartz diorite bodies related(?) to charnockitic tonalite

No.	Plagioclase	K-feldspar	Quartz	Biotite®	Hornblende	Other	Specific gravity
DR-1002A	63	-	3	15	18	1 metallic opaque	2.76
DR-2172	70	-	11	13	6	-	2.74
DR-2173A	58	8	24	10	-	-	2.67
DR-2175	54	<1	13	12	21	-	2.79
DR-2229A	70	-	9.5	12	8.5	-	-
DR-2230A	80	-	3	7	10	-	-
DR-2230C	71	-	2	10	15	2 garnet	-
DR-2234	67	<1	7	12	11	3 garnet	-
DR-2235A	71	-	11	10	8	-	-
Bixby-1	62	-	7	9	22	-	-
DR-2324A ∅	55	-	39	6		-	-
DR-2324B ∅	51	-	14	9		24.5 garnet 1.5 opaque	-
Average	67	1	9	11	12	<1	-

® Includes chloritized biotite, bleached biotite with prehnite lenses, and uralitic masses [pseudomorphs of pyroxene(?)].

∅ Not included in average.

Table 3. Modes of hornblende-biotite quartz diorite and diorite of Corral de Tierra

[tr. = trace]

No.	Plagioclase	K-feldspar	Quartz	Biotite	Hornblende	Other	Specific gravity
DR-1600B	55	-	21	14	10	-	2.77
DR-1600C	64	-	14	10	12	-	2.78
DR-1623-1⊛	63	-	16	12	9	-	2.77
DR-1853A	61	-	-	3	34	2 metallic opaque	2.88
DR-1854A	58	1	-	3	37	1 metallic opaque	2.85
DR-1944	50	-	25	19	6	-	2.76
DR-2043	56	-	22	16	5	-	-
DR-2052B	75	2	3	4	16	-	2.74
DR-2052C	65	1?	5	9	20	-	2.82
V-1(318')	57	tr.	22	11	10	-	-
V-3(255')	51	-	26	17	6	-	-
V-5(210')	63	1?	<1	6	30	-	-
H-3(982')	46	-	6	30	18	-	-
Average	59	<1	12.5	12	16.5	<1	2.80

⊛ Float

Table 4. Modes of granodiorite-quartz diorite of Bear Mountain

[tr. = trace]

No.	Plagioclase	K-feldspar	Quartz	Biotite	Hornblende & other	Specific gravity
DR-1819A	61	-	5	6	28	2.86
DR-1823	65	-	8	7	20	2.78
DR-2070A	53	tr.	24	15.5	7.5	2.74
DR-2075	48	10	16	15	11	2.71
DR-2076A	43	18	24	8	7	2.73
DR-2076D	43	18	22	10	7	2.74
594140(D) ⊠	63	-	12	11	13 (1 ore)	-
58-7B ⊖	71	-	10	15	4	-
58-10A ⊖	50	-	19	15	13 (1 sphene, 2 clinopyroxene)	-
CP-2-1 ⊖	60	-	8	24	8	-
CP-2-11 ⊖	31	37	19	13	-	-
JSP-20 ⊖	53	5	23	19	-	-
BC-1-5P ⊖	46	16	28	10	-	-
BC-1-6 ⊖	42	18	29	11⊛		-
15-206-1 ⊖	44	15	18	15	8	-
15-206-4B ⊖	47	9	19	18	6 (magnetite + sphene 1)	-
JSP-1-4B ⊖	45	15	25	15	-	-
DR-2336A	66	<1	11	23	-	-
Average	51.5	9	17.5	14	8	-

⊠ Specimen borrowed from D.L. Durham

⊖ Specimens borrowed from R.R. Compton

⊛ Biotite and hornblende undivided

Table 5. Modes of porphyritic granodiorite of Junipero Serra Peak

No.	Plagioclase	K-feldspar	Quartz	Biotite	Other	Specific gravity
DR-2068	38	27	27	8	-	2.62
DR-2071A	40	28	26	6	-	2.64
611006(D) ⊗	52	11	19	9	5 hornblende 1 sphene 3 magnetite	-
CP-2-10 ⊖	42	21	29	8	-	-
Reliz-4 ⊖	46	27	20	7	-	-
R-5-1 ⊖	50	18	19	12	1 magnetite	-
JSP-6-1 ⊖	46	27	20	8	1 magnetite 1 other	-
JSP-6-2 ⊖	42	20	29	9	-	-
58-11 ⊖	47	18	20	12	2 hornblende 1 magnetite	-
CP-2-6 ⊖	27	36	32	5	-	-
Average	43	23	24	8.5	1.5	-

⊗ Specimen borrowed from D.L. Durham
⊖ Specimens borrowed from R.R. Compton

Table 6. Modes of quartz monzonite of Pinyon Peak

No.	Plagioclase	K-feldspar	Quartz	Biotite	Other	Specific gravity
DR-2061	41	22	29	7	1 hornblende	2.62
DR-2063A	38	22	29	10	1 metallic opaque	2.65
DR-2066	47	20	25	8	-	2.65
DR-2085A	33	35	28	4	-	2.63
Pinyon 1 ⊗	25	45	29	1	-	-
Pinyon 2 ⊗	32	34	31	3	-	-
Pinyon 3 ⊗	22	41	32	5	-	-
JS-1 ⊗	31	39	24	6	-	-
JS-4 ⊗	27	34	32	7	-	-
58-12 ⊗	35	37	24	4	-	-
JSP-6-3 ⊗	23	47	29	1	-	-
Average	32	34	28	6	<1	-

⊗ Specimens borrowed from R.R. Compton

Table 7. Modes of hornblende-biotite quartz diorite of the Paraiso-Paloma area

No.	Plagioclase	K-feldspar	Quartz	Biotite	Hornblende and other	Specific gravity
DR-1723A	52	tr.?	38	10	-	2.68
DR-1724	57	1.5	27	13.5	1	2.71
DR-1725	58	tr.	29	12	1	2.70
DR-1727	56	1	30	13	-	2.68
DR-1730	59	-	19	14	8	2.77
DR-1734A	52	3	26	14	4 (1 metallic) opaque	2.71
DR-1734B	47	13	35	5	-	2.65
DR-1735B	47	13	32	8	-	2.65
DR-1757A	55	1	25	19	-	2.74
DR-1760A	57	2	23	17	1	2.74
DR-1761B	48	4	41	7	-	2.67
DR-1765	47	12	24	14	3	2.71
DR-1766	48	16	24	10	2	2.69
DR-1770	59	-	19	11	11	2.76
DR-1770-71	55	-	21	15	9	-
DR-1774	54	2	29	15	-	2.73
DR-1842	60	4	20	15	- (1 sphene)	2.70
DR-1843	57	8	11	23	- (1 sphene)	2.73
DR-1851	54	1	21	18	5 (1 sphene)	2.74
DR-1852	53	-	24	15	8	2.75
DR-1857	58	-	19	12	11	2.77
DR-1985	41	14	27	13	4 (1 sphene)	2.71
DR-1986A	59	<1?	24	10	6 (1 sphene)	2.71
DR-2409A	43	17.5	32.5	6	1	-
672006 ⊗	55	-	33	10	2	-
672043 ⊗	46	14	34	6	tr.	-
Average	53	5	26	12.5	3.5	2.71
Similar to Paraiso-Paloma mass, not in outcrop area						
DR-1832A	49	1	44	6	-	2.67
DR-1834A	55	-	25	18	- (2 garnet)	2.73
DR-2397	58	1	24	17	(tr. garnet)	-
DR-2399C	49	5	30	15	(1 garnet)	-
DR-2401A	44	3	38	15	-	-
Average	51	2	32	14	(1 garnet)	-

⊗ Specimens borrowed from D.L. Durham

Table 8. Modes of porphyritic granodiorite of Sand Creek

No.	Plagioclase	K-feldspar	Quartz	Biotite	Hornblende and other	Specific gravity
674032(D)⊠	49	10	27	10	4	-
DR-1738	53	7	22	13	4 (1 sphene)	-
DR-1747	36	26	30	7	1 hornblende and opaque	2.67
DR-1748B	61	2	17	15	4 (1 sphene)	-
DR-1850	40	24.5	24.5	10	- (1 sphene)	2.68
DR-2122B	50	13	24	11	2	2.70
DR-2126B	52	11	25	11	1	2.71
DR-2129	40	24	24	10	2	2.68
DR-2140	47	13	25	12	2 (1 sphene)	2.73
Average	48	15	24	11	2	2.70

⊠ Specimen borrowed from D.L. Durham

Table 9. Modes of hornblende-biotite quartz diorite of Soberanes Point

[tr. = trace]

No.	Plagioclase	K-feldspar	Quartz	Biotite	Hornblende	Other	Specific gravity
CR-20	58	2	20	11	9	-	-
DR-1878	49	4	25	17	5	-	2.68
DR-1916	53	4	21	15	7	-	2.74
DR-1918	47	9	22	16	6	-	2.74
DR-1934	47	6	26	16	5	-	2.73
DR-1937	44	13	29	11	3	-	-
DR-1938	47	9	23	16	5	-	2.75
DR-1940	54	5	20	14	7	-	2.75
DR-1982A	63	1	18	13	5	-	2.75
DR-1983	59	tr.	23	14	4	-	2.73
DR-2164	52	4	25	18	1	-	2.73
DR-2165A	54	9	19	13	5	-	2.72
DR-2167	55	6	18	15	6	-	2.75
DR-2169A	52	7	19	12	10	-	2.72
DR-2181	55	6	20	15	4	-	2.72
DR-2193	51	2	21	13	13	-	2.74
DR-2194A	52	4	18	13	12	1 sphene	2.72
DR-2197	59	<1	20	17	4	-	2.74
DR-2205	55	-	20	14	11	-	2.76
DR-2216	53	2	25	19	1	-	2.74
DR-2221B	58	tr.	12	20	10	-	2.81
DR-2350	48	5	25	16	6	-	-
DR-2352	41	10	31	14	4	-	-
DR-2358	49	5	24	15	7	-	-
DR-2361B	46	11	23	16	4	-	-
DR-2366	59	-	18	18.5	4.5	-	-
W-108●	57	6	18	15	4	-	-
W-123●	45	12	24	12	6	1	-
W-154●	54	4	20	14	7	1	-
W-198●	50	12	22	11	5	-	-
P-82 ■	53	6	20	14	7	-	-
P-94 ■	47	16	21	10	6	-	-
P-135■	48	13	19	10	10	-	-
Average	52	6	22	14	6	-	2.74

● From Wiebe, 1970, p. 109. ■ From Pearson (written commun., 1968)

Table 10. Modes of felsic variant of mass of Soberanes Point

[Possibly related to and correlative with porphyritic granodiorite of Sand Creek and Junipero Serra Peak]

No.	Plagioclase	K-feldspar	Quartz	Biotite	Other	Specific gravity
DR-1936	19	40	38	3	-	2.62
DR-1942	37	22	36	5	-	2.63
DR-2163	33	31	31	5	-	2.63
DR-2351C	28	36	32	4	-	-
DR-2365	19	46	33	2	-	-
DR-2366A⍁	31	31	30	8	Mafic θ	-
DR-2366B⍁	46	20	24	10	Mafic θ	-
Average	30	32	32	6 θ		-

⍁ Float

θ Biotite and altered hornblende undivided

Table 11, Modes of granodiorite of Cachagua

No.	Plagioclase	K-feldspar	Quartz	Biotite	Other	Specific gravity
DR-1862A	49	8	30	13	-	2.68
DR-1865A	51	2	24	19	(3 hornblende (1 sphene	2.73
DR-1870	53	-	29	18	-	2.71
DR-1873	47	4	38	11	-	2.68
DR-1880	36	34	24	5	1 muscovite	2.64
DR-1881A	45	11	35	9	-	2.68
DR-1885	37	21	29	12	1 muscovite	2.67
DR-1980	38	27	28	7	-	2.65
DR-1981A	50	12	26	10	(1 magnetite (1 sphene	2.69
DR-1981B	53	15	23	8	1 sphene	2.69
DR-1987A	57	4	29	10	-	2.69
DR-1988	56	5	26	13	-	2.71
DR-2179A	57	6	22	15	-	2.68
DR-2182	37	24	28	7	(3 hornblende (1 sphene	2.66
DR-2190A	53	11	21	14	1 sphene	2.72
DR-2191	58	7	24	11	-	2.68
DR-2380	31	25	34	10	-	-
DR-2383A	47	10	25	16	2 hornblende	-
DR-2385	53	2	28	17	-	-
DR-2387A	52	1	31	16	-	-
DR-2389	58	—	27	12	3 hornblende	-
DR-2412	53	4	36	7	-	-
DR-2413	56	—	32	12	-	-
DR-1885-87-1	53	2	32	13	-	2.69
DR-1885-87-2	41	23	27	9	-	2.64
DR-1885-87-3	40	19	27	14	-	2.66
Average	49	11	28	12	<1	2.69

Not in mapped Cachaqua, but lithologically similar

No.	Plagioclase	K-feldspar	Quartz	Biotite	Other	Specific gravity
DR-1888	50	7	32	11	-	2.70
DR-1892	55	2	33	10	-	2.69
DR-1902-1	43	20	29	8	-	2.65
DR-1958	53	7	21	18	1 muscovite	-
DR-1997A	56	-	28	16	-	2.73
DR-1998	55	-	33	12	-	2.71
DR-2003A	43	12	33	12	-	2.68
DR-2004A	44	22	25	9	-	2.66
DR-2004B	32	19	20	20	-	2.71
DR-2005	55	<1	27	18	-	2.69
DR-2006A	41	20	30	9	-	2.65
DR-2007A	49	6	31	14	-	2.70
DR-2007B	49	5	40	6	-	2.71
CB-3B	52	8	24	16	-	-
Average	48	10	29	13	—	2.69

Table 12, Modes of porphyritic granodiorite of Monterey

No.	Plagioclase	K-feldspar	Quartz	Biotite	Other	Specific gravity
Asilomar	48	13	33	6	-	-
MO-1	41	20	34	5	-	2.62
MOP-1	41	21	33	5	-	2.64
Carmel	46	18	32	4	-	-
H-39 ⊗	33	27	33	7	-	-
Alf (A+b)	46	14	30	10	-	-
G-10(1)	44	26	25	5	-	-
G-28	53	10	30	7	-	-
G-45	42	25	27	6	-	-
G-47-1	40	21	35	4	-	-
G-54	43	23	27	7	-	-
CB-2	49	13	28	10	-	-
DR-1006	51	13	24	12	-	2.67
DR-1879A	40	22	33	5	-	2.64
DR-1881B	41	22	30	7	-	2.65
DR-1884	41	22	30	7	-	2.64
DR-1897	38	19	36	7	-	2.66
DR-1900A	40	28	25	7	-	2.64
DR-1901	32	35	30	3	-	2.63
DR-1903A	36	30	28	6	-	2.66
DR-1955	46	6	37	11	-	2.68
DR-1956B	47	12	30	10	1 muscovite	2.69
DR-1957	37	30	19	14	-	-
DR-1965	47	11	34	7	1 muscovite	2.66
DR-1971	45	15	31	8	1 sphene	2.65
DR-1973	51	15	28	5	1 muscovite	2.66
DR-1974	46	12	36	5	1 muscovite	2.66
DR-1976	46	13	35	5	1 muscovite	2.66
DR-1977A	43	22	28	7	-	2.64
DR-1993	45	17	29	9	-	2.68
DR-2159	40	24	29	7	-	2.64
DR-2184	48	16	28	8	-	2.67
DR-2188	51	9	32	8	-	2.66
DR-2225	52	10	30	8	-	2.68
DR-2347	45	18	30	7	-	-
DR-2395B	23	43	29	5	-	-
DR-2396A	44	18	26	12	-	-
DR-2396B	43	23	27	7	-	-
Average	43	20	30	7	-	2.66
Felsic intrusive rocks in Monterey mass						
G-47-2	47	16	33	4	-	-
G-54-3	34	32	27	7	-	-
CB-3A	31	27	34	8	-	-
Average	37.5	25	31.5	6	-	-

⊗ From R.C. Pearson (written commun., 1968)

Table 13. Modes of variable quartz monzonite-granodiorite of Big Pines and Island Mountain (Wiebe, 1966) and similar(?) mass of Willow Creek

No.	Plagioclase	K-feldspar	Quartz	Biotite	Other	Specific gravity
DR-1802	58	<1	28	14	-	2.71
DR-1804B	61	4	21	14	-	-
DR-1808	61	2	23	14	-	2.71
DR-1925	42	17	29	8	4 hornblende	2.68
DR-1926	52	8	29	10	(1 muscovite, <1 ore	2.69
DR-1927	53	10	22	13	2 hornblende	2.69
DR-1930	54	-	31	15	<1 muscovite	2.71
DR-2223	33	23	33	10	1 ore	2.67
P-222 ■	19	44	34	3	-	-
W-329 ●	42	19	31	8	-	-
Average	47	13	28	11	1	2.69

■ From R. C. Pearson (written commun., 1968)

● From Wiebe (1970, p. 111)

Table 14. Modes of garnetiferous quartz monzonite of Little Sur and South Ventana Cone (Wiebe, 1966) and possibly related rocks near Arroyo Seco

No.	Plagioclase	K-feldspar	Quartz	Biotite	Other	Specific gravity
DR-1790A	24	37	36	2	1 garnet	2.61
DR-1801	40	23	32	5	-	2.60
DR-1803	29	41	27	2	1 garnet	2.63
DR-1804A	28	31	39	2	-	-
DR-1813A	17	49	32	-	2 garnet	2.62
DR-1816	25	37	36	<1	2 garnet	2.61
DR-1827	45	10	36	7	2 garnet	2.69
DR-2100	37	26	28	7.5	1.5 garnet	2.67
DR-2268	50.5	2	46.5	<1	1 garnet	-
JSP-19 ⧄	16	46	35	1	2 garnet	-
W-19 ⊖	39	26	32	2	1 garnet	-
W-29 ⊖	38	27	29	4	2 garnet	-
W-171 ⊖	40	24	30	6	<1 garnet	-
W-174 ⊖	36.5	29	28	6.5	<1 garnet	-
W-175 ⊖	36	30.5	29.5	4	<1 garnet	-
W-176 ⊖	31.5	34	29	5.5	<1 garnet	-
W-212 ⊖	42	24	26	7	1 garnet	-
W-214* ⊖	38	24	30	7	1 garnet	-
H-76 ⊗	28	34	34	3	1 garnet	-
H-185 ⊗	37	27	26	8	2 garnet	-
Average	34	29	32	4	1 garnet	2.63

⧄ Specimen borrowed from R.R. Compton

⊖ From Wiebe (1970, p. 111)

⊗ From R.C. Pearson (written commun., 1968)

* In heterogeneous granitic complex of Wiebe (1966)

Table 15. Modes of garnetiferous quartz monzonite of Pine Canyon

[tr. = trace]

No.	Plagioclase	K-feldspar	Quartz	Biotite	Other	Specific gravity
586	36	26	33	4	(1 muscovite (tr. garnet	2.64
DR-1614	39	30	30	1	-	2.61
DR-1615	38	28	29	5	-	2.60
DR-1616A	40	31	26	2	(1 muscovite (tr. garnet	2.63
DR-1618	28	35	34	3	-	2.61
DR-1619B	35	29	32	3	1 muscovite	2.59
DR-1620	43	18	33	5	1 muscovite	2.64
DR-1621	41	28	27	4	-	2.63
DR-1630	38	19	37	6	-	2.62
DR-1647	28	44	26	1	1 garnet	2.61
DR-1661	38	17	42	3	-	2.64
DR-1669	28	40	30	2	-	2.56
DR-1671	33	32	32	3	-	2.62
DR-1877	37	30	30	2	1 garnet	2.63
Average	36	29	32	3	-	2.61

Table 16. Modes of heterogeneous granitic complex of Wiebe (1966)

No.	Plagioclase	K-feldspar	Quartz	Mafic minerals
W-53 ●	35.5	22.5	35	7
W-118 ●	32	29	33	9
W-288 ●	37	18	33	12
Average	35.5	23	32.5	9

● From Wiebe (1970, p. 111)

Table 17. Ultramafic rocks.

Chemical analyses (weight percent)

	CP-8-68A[1/]	P-43	P-144	H-135	BC-3-32B[2/]
SiO_2	47.82	46.6	47.4	52.5	53.04
Al_2O_3	5.10	8.7	14.5	14.5	9.98
Fe_2O_3	1.03	2.4	2.8	1.7	1.20
FeO	8.45	9.4	9.5	6.7	7.30
MgO	20.43	19.8	9.6	9.1	13.58
CaO	14.57	9.3	10.6	9.1	10.53
Na_2O	0.53	1.1	1.4	1.8	1.08
K_2O	0.11	.56	.9	1.0	0.36
H_2O^+	1.12	.86	.12	1.5	1.04
H_2O^-	0.26	---	.16	.06	.46
TiO_2	0.56	.56	1.7	1.2	0.61
P_2O_5	----	.23	.38	.42	----
MnO	----	.26	.24	.20	----
CO_2	----	.08	<.05	<.05	----
Total	100.32	99.85	99.30	99.78	100.11

Norms (weight percent)

	CP-8-68A	P-43	P-144	H-135	BC-3-32B
Q	---	---	---	5.2	4.6
or	.7	3.3	5.4	6.0	2.2
ab	4.5	9.4	12.0	15.5	9.2
(Norm. An)	*(72)*	*(65)*	*(72)*	*(65)*	*(70)*
an	11.4	17.3	30.9	29.0	21.7
$FeSiO_3$	6.0	5.5	10.7	9.5	10.8
$MgSiO_3$	22.7	18.4	20.0	23.1	34.4
$CaSiO_3$	25.8	11.4	8.2	5.9	13.0
mt	1.5	3.5	4.1	2.5	1.8
il	1.1	1.1	3.3	2.3	1.2
ap	---	.6	.9	1.0	---
fo	20.1	22.0	2.9	---	---
fa	5.8	7.3	1.7	---	---
	.5(other)	.2(cc)	---	---	1.0(other)
Total	100.1	100.0	100.1	100.0	99.9

[1/] Also includes:

0.22 Cr_2O_3
0.11 S
0.007 Cl

[2/] Also includes:

0.19 Cr_2O_3
0.32 S
0.050 F
0.007 Cl

Table 18. Charnockitic tonalite of Compton (1960).

Chemical analyses (weight percent)

	Compton 1-3	DR-2315	DR-2172	DR-2291	DR-2283A	Compton 1-1	Average
SiO_2	52.08	54.59	55.09	57.00	59.62	60.39	56.46
Al_2O_3	21.39	18.49	18.55	17.53	17.00	17.76	18.45
Fe_2O_3	1.04	1.36	1.61	1.43	2.18	.75	1.40
FeO	6.88	6.89	6.76	5.93	5.27	5.92	6.28
MgO	2.84	3.86	2.72	4.04	2.25	2.41	3.02
CaO	8.03	7.02	6.42	7.28	5.68	6.26	6.78
Na_2O	3.92	3.55	4.42	3.36	3.76	3.33	3.72
K_2O	.86	1.02	.89	.87	1.52	.72	.98
H_2O^+	.48	2.16	.92	1.15	1.10	.96	1.13
H_2O^-	.16	<.02	.02	<.02	.12	.15	.08
TiO_2	1.45	1.05	1.16	.90	.99	.86	1.07
P_2O_5	.38	.24	.30	.14	.20	.27	.26
MnO	.02	.14	.16	.13	.12	----	.10
CO_2	.23	.22	.10	<.05	.09	----	.11
Total	99.76	100.59	99.12	99.76	99.90	99.78	99.84

Norms (weight percent)

	Compton 1-3	DR-2315	DR-2172	DR-2291	DR-2283A	Compton 1-1	Average
Q	1.74	6.12	5.31	10.27	14.75	18.84	9.51
or	5.56	6.12	5.36	5.21	9.10	3.89	6.27
ab	33.54	30.52	38.09	28.83	32.24	28.30	31.92
(Norm.An)	*(52)*	*(51)*	*(43)*	*(52)*	*(44)*	*(51)*	*(51)*
an	36.14	32.01	28.67	30.61	25.35	29.47	33.25
$FeSiO_3$	9.24	10.22	9.64	8.58	6.55	8.84	
$MgSiO_3$	7.20	9.77	6.90	10.20	5.70	6.10	
mt	1.62	2.00	2.38	2.10	3.20	1.16	
il	2.89	2.03	2.24	1.73	1.91	1.67	
ap	1.01	.58	.72	.34	.48	.67	
C	.82	----	----	----	----	.92	
$CaSiO_3$	----	.15	.47	2.13	.54	----	
cc	----	.51	.23	----	.21	----	
Total	100.26	100.03	100.01	100.00	100.03	99.86	

Table 19. Hornblende-biotite quartz diorite of the Paraiso-Paloma area.

Chemical analyses (weight percent)

	DR-1730	DR-1758-1	DR-1771	DR-1734	Average
SiO_2	60.31	61.07	62.44	62.74	61.64
Al_2O_3	17.49	17.16	16.81	16.92	17.10
Fe_2O_3	1.81	1.76	.62	1.51	1.43
FeO	4.12	3.98	4.28	3.32	3.93
MgO	2.79	2.38	2.18	2.13	2.37
CaO	5.54	5.48	5.50	4.70	5.31
Na_2O	3.85	4.04	3.78	3.84	3.88
K_2O	1.50	1.74	1.62	2.20	1.77
H_2O^+	1.67	.70	1.08	.82	1.07
H_2O^-	.68	<.02	<.02	<.02	.17
TiO_2	1.32	.92	.91	1.03	1.05
P_2O_5	.31	.26	.27	.29	.28
MnO	.11	.10	.07	.07	.09
CO_2	.05	.09	.11	.07	.08
Total	101.54	99.68	99.67	99.64	100.17

Norms (weight percent)

	DR-1730	DR-1758-1	DR-1771	DR-1734	Average
Q	15.42	15.00	17.97	18.47	16.72
or	8.94	10.39	9.71	13.16	10.55
ab	32.84	34.54	32.44	32.88	33.18
(Norm.An)	*(44)*	*(41)*	*(43)*	*(39)*	*(42)*
an	25.35	23.79	24.46	21.23	23.71
$FeSiO_3$	4.13	4.57	6.06	3.32	
$MgSiO_3$	7.01	5.99	5.51	5.37	
mt	2.65	2.58	.91	2.22	
il	2.53	1.77	1.75	1.98	
ap	.74	.62	.65	.70	
C	.32	---	---	.54	
$CaSiO_3$	---	.58	.30	---	
cc	.12	.21	.25	.16	
Total	100.05	100.04	100.01	100.03	

Table 20. Hornblende-biotite quartz diorite of Soberanes Point.

Chemical analyses (weight percent)

	DR-2169	DR-1982	DR-2165	P-82	P-135	P-94	Average
SiO_2	60.89	61.96	62.81	63.4	64.0	64.2	62.9
Al_2O_3	16.38	18.03	16.58	15.9	16.5	15.9	16.6
Fe_2O_3	1.27	1.30	1.13	1.5	1.4	1.5	1.4
FeO	4.29	3.56	3.64	3.4	2.7	2.7	3.4
MgO	2.92	2.01	2.20	2.5	1.8	2.0	2.2
CaO	4.94	5.18	4.85	5.5	5.1	5.1	5.1
Na_2O	3.58	4.58	3.66	3.4	3.5	3.3	3.7
K_2O	2.22	1.86	2.40	2.0	2.8	2.9	2.4
H_2O^+	.74	.65	.50	.95	.83	.88	.8
H_2O^-	.10	<.02	<.02	.04	.02	.08	<.1
TiO_2	1.05	.85	.87	.90	.66	.74	.9
P_2O_5	.21	.23	.21	.37	.36	.36	.3
MnO	.084	.085	.074	.13	.12	.12	.1
CO_2	.10	<.05	.24	<.05	<.05	.10	.1
Total	98.77	100.30	99.16	100.0	99.79	99.88	99.9

Norms (weight percent)

	DR-2169	DR-1982	DR-2165	P-82	P-135	P-94	Average
Q	15.53	13.10	18.13	20.6	19.6	20.8	18.0
or	13.40	11.03	14.38	11.9	16.7	17.3	14.1
ab	30.93	38.89	31.39	29.1	29.9	28.2	31.4
(Norm. An)	*(42)*	*(37)*	*(41)*	*(44)*	*(42)*	*(42)*	*(41)*
an	22.54	23.23	21.46	22.4	21.3	20.2	21.9
$FeSiO_3$	5.35	4.24	4.51	3.8	3.0	2.8	
$MgSiO_3$	7.43	5.02	5.55	6.3	4.5	5.0	
mt	1.88	1.89	1.66	2.2	2.1	2.2	
il	2.04	1.62	1.68	1.7	1.3	1.4	
ap	.51	.55	.50	.9	.9	.9	
C	----	----	.21	---	---	---	
$CaSiO_3$	.19	.44	----	1.1	.8	1.0	
cc	.23	----	.55	---	---	.2	
Total	100.03	100.01	100.02	100.0	100.1	100.0	

Table 21. Granodiorite of Cachagua.

Chemical analyses (weight percent)

	DR-1865	DR-1886	DR-1980	DR-2179	Average
SiO_2	63.62	65.63	68.68	73.72	67.91
Al_2O_3	16.61	16.54	16.14	14.17	15.87
Fe_2O_3	1.78	.67	.96	.82	1.06
FeO	2.99	3.39	2.09	1.07	2.39
MgO	1.90	1.43	.86	.54	1.18
CaO	4.08	3.94	3.18	1.66	3.22
Na_2O	3.53	3.74	4.17	3.06	3.63
K_2O	2.50	2.08	2.42	4.47	2.87
H_2O^+	.92	.82	.61	.79	.79
H_2O^-	<.02	.02	<.02	<.02	.01
TiO_2	.97	.79	.54	.32	.66
P_2O_5	.25	.22	.16	.09	.18
MnO	.054	.054	.038	.024	.04
CO_2	.28	<.05	<.05	.10	.10
Total	99.48	99.32	99.85	100.83	99.91

Norms (weight percent)

	DR-1865	DR-1886	DR-1980	DR-2179	Average
Q	22.60	24.30	26.71	34.62	27.06
or	14.99	12.48	14.41	26.69	17.14
ab	30.31	32.14	35.56	25.68	30.92
(Norm. An)	*(36)*	*(36)*	*(29)*	*(21)*	*(32)*
an	17.08	18.39	14.84	6.95	14.32
$FeSiO_3$	2.55	4.53	2.25	.79	
$MgSiO_3$	4.80	3.62	2.16	1.40	
mt	2.62	.99	1.40	1.73	
il	1.87	1.52	1.03	0.61	
ap	.60	.53	.38	0.34	
C	1.95	1.52	1.27	1.73	
cc	.65	---	---	0.2	
Total	100.02	100.02	100.01	100.74	

Table 22. Porphyritic granodiorite of Monterey.

[tr. = trace]

Chemical analyses (weight percent)

	CB-2	DR-1973	Lawson (1893)	DR-1974	MOP-1-336	H-39	MO-1B	Average
SiO_2	67.5	69.2	71.63	72.3	73.2	73.3	73.5	71.5
Al_2O_3	16.7	16.5	13.86	15.6	15.3	14.3	14.4	15.2
Fe_2O_3	1.2	1.2	.46	.80	1.9	.36	.53	.9
FeO	2.6	1.7	2.76	1.0	.08	.76	.88	1.4
MgO	1.2	.56	tr.	.42	.45	.50	.33	.5
CaO	2.4	2.6	3.26	2.2	2.1	2.3	2.1	2.4
Na_2O	3.8	3.8	3.40	3.3	2.4	3.1	3.7	3.4
K_2O	2.4	2.8	2.65	3.1	3.2	4.0	3.3	3.1
H_2O^+	.96	.67	} .89	.50	.34	.57	.68	} .8
H_2O^-	.24	.24		.24	.39	.00	.09	
TiO_2	.63	.43	tr.	.26	.23	.24	.20	.3
P_2O_5	.19	.10	.20	.06	.06	.21	.05	.1
MnO	.08	.06	----	.06	.06	.06	.08	.1
CO_2	<.05	<.05	----	<.05	<.05	<.05	<.05	
Total	99.90	98.95	99.11	99.84	99.71	99.70	99.84	99.7

Norms (weight percent)

	CB-2	DR-1973	Lawson (1893)	DR-1974	MOP-1-336	H-39	MO-1B	Average
Q	28.6	30.2	33.67	36.8	42.6	34.8	34.4	34.4
or	14.4	16.7	16.12	18.3	18.9	23.8	19.7	18.3
ab	33.0	32.5	29.34	27.8	20.4	26.5	31.6	28.7
(Norm.An)	*(25)*	*(27)*	*(33)*	*(26)*	*(32)*	*(28)*	*(24)*	*(28)*
an	11.1	12.2	14.73	10.0	9.7	10.1	10.2	11.2
$FeSiO_3$	2.8	1.6	4.75	.8	---	.8	1.0	
$MgSiO_3$	3.0	1.0	----	1.0	1.3	1.3	.8	
mt	1.8	1.9	.70	1.2	---	.5	.8	
il	1.2	.8	----	.6	.3	.5	.4	
ap	.3	.3	.34	.3	.3	.5	.1	
C	3.8	2.8	----	3.2	4.5	1.2	1.1	
$CaSiO_3$	---	----	.35	---	---	---	---	
ru	----	----	----	---	.1	---	---	
hm	----	----	----	---	1.9	---	---	
Total	100.0	100.0	100.00	100.0	100.0	100.0	100.1	

Table 23. Miscellaneous granitic rocks.

Chemical analyses (weight percent)

	Pine Canyon	Little Sur	S. Ventana Cone	Big Pines (pegm.)?	Pinyon Peak		Junipero Serra Peak	Bear Mtn
	DR-586	H-185	H-76	P-222	JS-1	BC-1-4(?)	JSP-6-2	CP-2-1
SiO_2	74.82	72.0	74.2	73.1	71.90	73.65	71.74	55.85
Al_2O_3	14.76	14.7	13.6	14.0	14.76	13.86	13.46	19.64
Fe_2O_3	.87	.76	.40	.23	.06	.35	1.52	1.70
FeO	.56	1.4	1.0	.24	1.55	.79	2.03	5.59
MgO	.34	.31	.30	.20	.63	.43	.94	2.38
CaO	1.61	1.5	1.2	.90	2.11	.82	2.22	6.29
Na_2O	3.50	3.8	3.2	2.8	3.10	1.92	3.35	4.64
K_2O	3.37	4.3	4.7	6.5	4.50	6.79	3.30	1.32
H_2O^+	.68	.85	.74	.67	.43	.26	.69	1.01
H_2O^-	.14	.02	.00	.03	.16	.25	.33	.31
TiO_2	.16	.14	.12	1.0	.45	.16	.42	1.19
P_2O_5	.04	.16	.22	.15	----	----	----	----
MnO	.06	.10	.17	.06	----	----	----	----
				/	BaO	BaO	BaO	BaO
CO_2	.05	<.05	.06	<.05	.05	.10	.02	.03
	100.96	100.04	99.91	99.88	99.70	99.38	100.02	99.95

Norms (weight percent)

	DR-586	H-185	H-76	P-222	JS-1	BC-1-4(?)	JSP-6-2	CP-2-1
Q	37.73	29.6	34.9	30.4	30.5	34.0	33.0	4.2
or	19.89	25.6	28.0	38.7	26.8	40.6	19.7	7.9
ab	29.58	32.4	27.3	23.9	26.5	16.4	28.6	39.8
(Norm.An)	*(20)*	*(17)*	*(13)*	*(13)*	*(29)*	*(21)*	*(28)*	*(42)*
an	7.40	6.5	4.2	3.5	10.7	4.3	11.2	29.3
$FeSiO_3$	.16	1.9	1.6	.5	2.1	.9	1.8	7.0
$MgSiO_3$	.85	.8	.8	---	1.6	1.1	2.4	6.0
mt	1.26	1.1	.6	---	.1	.5	2.2	2.5
il	.30	.3	.2	.6	.9	.3	.8	2.3
ap	.10	.4	.5	.4	---	---	---	---
C	2.64	1.5	1.7	1.1	.9	1.8	.3	---
cc	.11	---	.1	---	---	---	---	---
$CaSiO_3$	---	---	---	---	---	---	---	1.0
hm	---	---	---	.2	---	---	---	---
ru	---	---	---	.7	---	---	---	---
Total	99.99	100.1	99.9	100.0	100.1	99.1	100.0	100.0

Sources of chemical analyses of tables 17 to 23

Compton (1960); Compton 1-1, Compton 1-3 (table 17)

Compton (1966); CP-8-68, BC-3-32B (table 17), JS-1, BC-1-4, JSP-6-2, CP-2-1 (table 23).

Lawson (1893) (table 22)

R. C. Pearson (written commun., 1968); P-43, P-144, H-135 (table 17), P-82, P-135, P-94 (table 20), H-39 (table 22), H-185, H-76, P-222 (table 23)

Ross (1972a); Mo-1B (table 22)

U.S. Geol. Survey (this report); DR-1973, DR-1974, CB-2, MOP-1-336 (table 22) analyzed by P. L. D. Elmore. All others analyzed by H. N. Elsheimer, Laureano Espos, and J. H. Tillman.

Table 24. Semiquantitative spectrographic analyses (parts per million)

(Analyses by Chris Heropoulos, except as noted)

	Ultramafic rocks			Charnockitic tonalite of Compton (1960)				Hornblende-biotite quartz diorite of the Paraiso-Paloma area				Hornblende-biotite quartz diorite of Soberanes Point					
	P-43[1/]	P-144[1/]	H-135[1/]	DR-2315	DR-2172	DR-2291	DR-2283A	DR-1730	DR-1758-1	DR-1771	DR-1734	DR-2169	DR-1982	DR-2165	P-82[1/]	P-135[1/]	P-94[1/]
B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ba	150	100	150	1000	300	700	1500	1000	700	1000	1000	1000	700	1000	1000	1000	1500
Be	--	--	--	1.5	2	1.5	1.5	2	2	2	2	2	3	2	2	1	1
Ce	--	--	--	--	70	--	--	--	100	100	100	70	100	100	--	--	--
Co	70	50	20	15	10	15	10	10	10	15	7	10	10	10	15	10	10
Cr	1000	100	500	20	7	30	7	20	7	10	7	20	7	15	70	30	50
Cu	200	70	50	15	15	15	5	3	3	7	1	10	7	7	15	7	10
Ga	10	15	15	30	30	30	20	30	30	50	20	20	30	20	15	15	15
La	--	--	--	--	30	20	15	20	70	50	50	30	50	50	70	70	70
Nb	--	--	--	--	7	--	--	--	--	--	7	7	7	7	7	7	10
Ni	150	--	100	10	1.5	7	2	5	5	5	3	5	3	5	--	--	--
Pb	15	10	10	7	10	7	7	10	7	7	5	10	20	10	15	20	30
Sc	50	50	30	20	15	20	15	15	15	15	7	10	10	10	15	15	20
Sr	200	300	200	300	500	300	300	1000	500	1000	500	500	700	500	500	500	500
V	100	500	100	100	70	150	70	70	100	100	70	100	70	70	70	70	70
Y	10	15	15	30	30	20	20	10	20	30	20	10	15	10	30	30	30
Yb	--	--	--	5	5	3	5	2	3	5	2	3	3	2	--	--	--
Zn	--	--	--	150	200	100	100	100	100	100	100	100	150	100	--	--	--
Zr	50	10	20	100	300	100	150	100	150	150	150	100	150	150	300	300	200
					Nd 50			Nd 50				Nd 50					

[1/]Pearson, Hayes, and Fillo(1967)

Table 24. (continued)

	Granodiorite of Cachagua				Porphyritic granodiorite of Monterey						Miscellaneous granitic rocks			
											Pine Canyon	Little Sur	S. Ventana Cone	Big Pines(?)
	DR-1865	DR-1886	DR-1980	DR-2179	CB-2	DR-1973	DR-1974	MOP-1-336	H-39[1/]	MO-1B	DR-586	H-135[1/]	H-76[1/]	P-222[1/]
B	--	2	--	2	--	--	--	--	--	--	7	--	--	--
Ba	1500	1000	1000	1500	700	1000	1000	1000	1500	1000	1500	1500	1500	1500
Be	2	2	2	1	1.5	2	1.5	2	1	2	3	2	1	--
Ce	100	150	50	50	--	--	--	--	--	--	100	--	--	--
Co	10	7	3	2	--	--	--	--	3	--	--	--	3	--
Cr	10	7	3	5	3	2	2	2	7	1.5	5	5	7	--
Cu	10	1.5	--	--	1.5	2	1	10	3	7	.7	5	--	--
Ga	30	30	20	20	20	20	15	15	15	10	20	20	10	15
La	50	70	20	15	70	--	--	--	30	50	30	30	70	30
Nb	7	7	7	7	--	--	--	--	7	10	10	5	5	--
Ni	5	2	1.5	--	--	--	--	--	--	3	1.5	--	--	--
Pb	15	10	10	20	15	15	20	20	30	20	30	20	50	70
Sc	5	7	5	5	--	--	--	--	--	--	5	5	5	--
Sr	700	700	300	300	700	500	500	500	300	500	300	150	300	200
V	70	70	20	15	15	7	--	--	--	--	5	--	7	--
Y	7	10	5	2	--	--	--	--	--	30	15	-20	30	15
Yb	1	1.5	1	.7	--	--	--	--	--	3	3	--	--	--
Zn	100	100	100	--	--	--	--	--	--	--	50	--	--	--
Zr	150	150	100	70	150	150	100	100	200	150	70	200	150	150