

801258

Specimen #N1-741' (747')

TYPE I - SLIGHTLY PORPH. GRANODIORITE  
TYPE II - PEG. GRANITE = K-F. VEINING.  
(BOTH DISTINCTLY ALTERED)

The rock consists of two "granitic" types. Type I, which is probably the host rock, is a medium grey, non-foliated, relatively homogeneous, slightly porphyritic (phenocrysts are of sodic plagioclase) granodiorite. Type II, which is probably a later material than I, is coarser grained than I. It is a non-foliated, homogeneous pink granite composed predominantly of pink orthoclase. Whether II is veining or is a distinct "granitic phase" is obviously impossible to determine from the core specimen. The contact between the two phases is relatively well defined, but there is no chilled margin.

TYPE II = K-F-  
PEGMATITIC  
VEINING.

Mineralization consists predominantly of pyrite with a minor amount of hematite. The ores occur disseminated in both "phases" and in veinlets, lenses, and stringers associated with epidote, chlorite and very minor quartz.

Alteration consists of saussuritization and sericitization of the plagioclase and a cloudy brown, very fine dusting (clay mineral(s)?) together with fine sericite, in orthoclase. The relatively abundant chlorite is probably secondary, resulting from the complete alteration of the primary ferromagnesian mineral(s).

The granodiorite - type I:

The mode, based on 350 points, of the host "phase" is as follows.

Quartz		18.1%
Plagioclase	phenocrysts	4.9%
	"matrix"	37.1%
* Orthoclase	phenocrysts	0.9%
	"matrix"	14.9%
Chlorite (penninite)		13.3%
Epidote		4.6%
Pyrite		4.9%
Hematite		1.3%

Accessories include apatite and sphene.

\* N. B. K-feldspar estimated from cobaltinitrite stained hand-specimen.

The plagioclase is generally moderately altered. Products are fine saussurite aggregates and sericite (distinct, but minute flakes and flake clusters). Crystals are subhedral (predominantly) to anhedral, slender lath-shaped, and are randomly oriented. Size varies 0.2 to 0.6 mm. The plagioclase composition was estimated to be

in the calcic oligoclase to sodic andesine range. Scattered phenocrysts of plagioclase occur ranging in size 0.7 to 1.5 mm. These are euhedral to subhedral, stout lath-shaped, and have undergone a similar degree of alteration as the "matrix" plagioclase, with the same alteration products.

Quartz is anhedral and exhibits only mild undulose extinction. It occurs interstitially, and varies in size 0.05 to 0.4 mm.

Orthoclase also occurs interstitially. It is anhedral and ranges in size 0.1 to 0.6 mm. Alteration is mild to moderate and products are an indistinct very fine dusting of clay mineral(s)<sup>(?)</sup>, and fine flakes or flake clusters of sericite. The occasional subhedral to anhedral phenocryst of orthoclase is sporadically present. In hand-specimen the K-feldspar is pinkish coloured. However, some of the orthoclase may be related to the type II "granitic" material.

Small anhedral flakes of very pale green chlorite (penninite) occur scattered throughout. The chlorite is probably secondary and undoubtedly represents the alteration of former ferromagnesian mineral(s). Size ranges 0.05 to 0.2 mm.

Subhedral to anhedral epidote is sparsely present. Some undoubtedly is an alteration product of the plagioclase breakdown while much of the remainder is probably related to the late veining which contains abundant epidote. Size varies 0.05 to 0.2 mm.

Accessories include minute euhedral to subhedral apatite and some anhedral sphene.

#### The granite - type II:

The orthoclase-rich material contains at least 65-70% orthoclase, with 10-15% chlorite, 5-10% sodic plagioclase, and the remainder of quartz, pyrite, very minor hematite, and epidote.

The orthoclase occurs as subhedral crystals (slender to stout lath-shaped). It is randomly oriented and varies in size 0.5 to 3 mm. Alteration is mild to moderate and consists of very fine murky brown aggregates of clay mineral(s) (?) and scattered fine flakes and flake aggregates of sericite. In the core specimen, K-feldspar is decidedly pinkish in colour.

The plagioclase is finer in grain size (0.2 - 0.8 mm) and is subhedral to anhedral (slender laths). Alteration is similar in degree and type to the granodiorite

*K.F. act in  
phase affects  
plagioclases  
but persists to  
itself*

component.

The quartz, which is very minor, is interstitial, slightly strained and anhedral. Size varies 0.05 to 0.3 mm.

Chlorite is ubiquitously present as ragged flakes or flake clusters. Again it is probably secondary. Subhedral to anhedral epidote is scattered throughout.

*after Bi. - under KF-Bi at a zone in contact*

The opaque minerals consist almost entirely of pyrite with a very minor amount of hematite. They occur either disseminated in the matrix of both "granitic" types or in veinlets, lenses and stringers. In the latter case they occur with epidote (most abundant), chlorite (perminite), and minor quartz.

The pyrite occurs as euhedral to anhedral crystals ranging in size 0.05 to 0.6 mm. (commonly 0.1 - 0.3 mm). The hematite is anhedral and much smaller in grain size (0.05 to 0.2 mm).

Specimen #N1-620

*ALTERED  
SLIGHTLY PORPHYRITIC GRANODIORITE.  
WITH K-FELD. VEINING & REPLACEMENT.*

This rock is very similar in composition and texture to the granodiorite (type I) of specimen #N1-747. It is a medium grey coloured (mottled green), non-foliated, relatively homogeneous, slightly porphyritic (phenocrysts of sodic plagioclase and quartz) granodiorite. The rock is finely veined by orthoclase-rich material and sporadically "peppered" with pink orthoclase which is probably related to this veining.

Mineralization consists of pyrite, limonite, and hematite. Much of the limonite occurs associated with the matrix chlorite. The opaques occur both disseminated and in fine veinlets and stringers together with epidote, orthoclase, and quartz.

The alteration consists of saussuritization and sericitization of the plagioclase, and a very fine murky brown dusting (unrecognizable clay mineral(s) ?) together with fine sericite in orthoclase. Chlorite occurring in the matrix is probably secondary, resulting from the alteration of primary ferromagnesian mineral(s).

The mode of the rock based on 400 points is as follows.

Quartz	phenocrysts	0.8%
	"matrix"	15.4%
Plagioclase	phenocrysts	3.2%
	"matrix"	39.4%
Orthoclase	phenocrysts	0.8%
	"matrix"	16.1%
Chlorite		9.8%
Epidote		3.7%
Pyrite		2.5%
Limonite		7.5%
Hematite		0.8%

The plagioclase is predominantly subhedral (slender lath-shaped). The crystals are randomly oriented and vary in size 0.2 to 0.8 mm (commonly 0.3 to 0.6 mm). Alteration is mild to moderate and consists of a fine murky brown dusting of saussurite and sporadic sericite flakes or flake aggregates. The plagioclase composition was estimated to be in the calcic oligoclase - sodic andesine range. Phenocrysts of plagioclase are scattered sporadically throughout and exhibit a similar degree of alteration and the same products as the matrix plagioclase. They are subhedral (stout laths), and vary in size 1 - 3 mm. The composition is the same as the matrix plagioclase.

The orthoclase is subhedral to anhedral and varies 0.1 to 0.5 mm in size. Alteration is of a similar degree to the plagioclase and consists of very fine grained indistinct murky brown aggregates (clay mineral(s) ?) and irregular clusters of fine sericite. Orthoclase occasionally occurs as phenocrysts up to 1.5 mm in size, but this may, in part at least, be associated with the introduced material.

The quartz is anhedral and occurs interstitially. It is very slightly strained and ranges in size 0.05 to 0.3 mm. Quartz is occasionally present as phenocrysts, which vary in size 0.6 to 1 mm.

Chlorite occurs ubiquitously throughout in ragged anhedral flakes or flake clusters. It probably represents the alteration product of former ferromagnesian mineral(s).

Size ranges 0.05 to 0.2 mm. Opaques occur intergrown with the chlorite. They consist predominantly of limonite, with minor magnetite and hematite.

Epidote is sporadically present in clusters of very pale yellow subhedral to anhedral crystals ranging in size 0.05 to 0.2 mm. Accessories include anhedral sphene and euhedral to subhedral apatite.

The opaques occur both disseminated in the matrix and in veinlets and stringers. They consist of euhedral to subhedral pyrite (size ranges 0.1 to 0.6 mm), and very minor anhedral hematite (ranging 0.05 to 0.2 mm). Limonite, as was mentioned above, is abundant and associated with the matrix chlorite. The veinlets also carry varying amounts of epidote, orthoclase, and quartz.

Specimen #N1-343

*ALTERED  
QUARTZ FELDSPAR PORPHYRY.*

The rock is much finer grained than the other two specimens. It is a pale to medium pinkish grey, very fine grained, relatively homogeneous, non-foliated, plagioclase-quartz porphyry (probably dacitic in view of the paucity of K-feldspar as revealed by cobaltinitrite staining). The rock contains abundant somewhat rounded inclusions (highly variable in size) of a much finer grained material. The latter are texturally similar to the host rock, but if anything, they contain a greater abundance of plagioclase.

Mineralization includes limonite, pyrite, and very minor hematite which occur disseminated in the matrix and also in quartz-rich veinlets and stringers. Alteration again consists of fine saussuritization and sericitization of the feldspars, and scattered chlorite is probably the alteration product of original mafic mineral(s).

The mode of the rock based on 400 points is below.

Phenocrysts	{	Quartz	1.2%
		Plagioclase	6.2%
		Groundmass	47.5%
		Fine-grained "inclusions"	36.0%
		Chlorite	2.3%
		Pyrite	1.6%
		Limonite	4.2%
		Hematite	0.5%
		Calcite	0.5%

Accessories include apatite and epidote.

The quartz phenocrysts occur sporadically and are anhedral and very slightly strained. They vary in size 0.1 - 0.3 mm. The plagioclase phenocrysts are subhedral (predominant) to anhedral and are somewhat randomly oriented. They are mildly to moderately altered to fine murky brown aggregates of saussurite with minute flakes and flake clusters of sericite. Composition was roughly estimated to be in the oligoclase - andesine range. Size varies 0.5 to 1.2 mm.

The matrix is holocrystalline and very fine grained, and consists predominantly of quartz and plagioclase. Fineness of grain size coupled with the moderate alteration prevents a consistent recognition of the felsic constituents. Consequently no mode was attempted of the matrix. Hydrofluoric acid etching and cobaltinitrite staining reveals at least some matrix K-feldspar (probably 2 to 3%). Alteration products of the feldspars appear to be saussurite and sericite, but fineness of grain size makes recognition of the mineralogy of the alteration exceedingly difficult. Fine very pale green chlorite occurs sporadically and calcite is also sparsely present.

The rock contains irregular but rounded areas consisting of much finer grained plagioclase-rich material. The fragments contain a similar mineralogy to the matrix but plagioclase is however more abundant in the fragments. Size of fragments varies from 0.5 mm to 2 cms. at the greatest diameter. Alteration of the plagioclases is similar in degree and type to that of the host rock plagioclase.

The opaque minerals occur both disseminated in the matrix and in quartz-rich veinlets, stringers, and patches. The matrix opaques consist predominantly of anhedral limonite ranging in size 0.05 to 0.3 mm. with scattered subhedral to anhedral pyrite (size varies 0.1 to 0.3 mm). The ores in the veinlets etc. consist mainly of pyrite with minor limonite. Size range of the two minerals in the veinlets is similar to that of the matrix opaques. Hematite, which is present both in the matrix and in the veining, is very minor.