

Sample Number : 10964

R.H. 16 336.9m

Identification : Moderately sericitized and carbonated, crystal lithic tuff with conspicuous pyrite and sphalerite

Description :

The hand specimen is a drill core sample of unweathered, hard, greyish orange pink, massive rock with numerous yellowish grey flecks, a few light olive grey flecks, irregularly distributed dark grey flecks and several veins of fine pyrite.

A cobaltinitrite staining test revealed that the sample consists of abundant small phenocrysts or phenoclasts set in a fine groundmass which is dominated by fine K-feldspar.

In thin section the least altered parts of the sample are seen to consist of heavily altered phenoclasts, about 0.3 to 1mm in size, set in a sutured, microcrystalline matrix of K-feldspar and minor quartz, about 0.02 to 0.1mm in grain size. The distinct phenoclasts are all plagioclase, heavily sericitized and in some cases carbonated. Small, recrystallized and weakly strained phenoclasts are quartz. Former lithic clasts, up to several millimetres in size, consist of interlocked quartz and sericitized feldspar laths with interstitial fine opaques and secondary rutile.

The most altered parts of the sample have patches of carbonate replacement (apparently calcite) cut by an irregular network of replacement veins and patches of sericite. Replacement patches of fine, anhedral, orange brown sphalerite and subhedral pyrite are common, especially in altered lithic clasts. Grain sizes of the sulphides are generally finer than 0.1mm. Late sulphide replacement veins (0.5 to several millimetres thick) consist of abundant fine pyrite accompanied by sericite and quartz in the thin veins and by carbonate and yellowish sphalerite in the thick vein.

An approximate mode of this inhomogeneous sample is :

20-25%	heavily sericitized, lightly carbonated feldspar phenoclasts
2-5%	heavily altered lithic clasts
8-10%	quartz as small phenoclasts and groundmass grains
50-60%	groundmass feldspar, largely potassic
2-4%	carbonate (probably calcite) as replacement patches and veins
5-8%	sericite replacement patches and veins
0.2-0.3%	vein quartz
3-4%	pyrite
0.4-0.7%	sphalerite

Comments and Interpretation :

This sample is fairly confidently interpreted to have originated as a tuff of rhyolitic or quartz-trachytic composition. There is no evidence of aqueous reworking and prior to alteration and recrystallization the sample consisted of phenoclasts and lithic fragments dispersed through a fine matrix. Subsequent hydrothermal alteration seems to have involved moderate development of carbonate and sericite with accompanying fine pyrite and sphalerite. The apparent paragenesis is complex, probably with early carbonate, then sericite with orange brown sphalerite and pyrite, then pyrite with quartz and sericite, then pyrite with carbonate and yellow sphalerite. Metamorphic effects are limited to minor recrystallization and strain.