

Sample Number :

11456

418198

Identification :

Sandy, siliceous and albitic shale

Description :

The hand specimen is a hard, locally iron-stained, greenish grey, fine-grained rock.

A cobaltinitrite staining test revealed no K-feldspar.

In thin section the sample is seen to have a sedimentary texture, with abundant subrounded sand grains of quartz and aligned, bent, variously altered detrital flakes of mica dispersed through a "cherty" matrix.

The sand grains of quartz are unstrained to weakly strained and about 0.2 to 0.5mm in size. The detrital mica appears to have consisted of thin flakes of brown biotite, commonly 1mm wide, but it is in varying degrees of alteration to chlorite and sericite and in most cases it has been heavily stained by limonite from apparently recent weathering. There are a few small detrital grains of zircon and a few inconspicuous cloudy lithic clasts of fine-grained uncertain sedimentary or volcanic derivation; some appear clay-rich and some are cryptocrystalline and siliceous.

The matrix has a grainsize generally of about 0.01 to 0.05mm and is dominated by a cherty mosaic which contains not only quartz but also albite (weakly twinned in some of the coarsest grains). There is also fine, pale chlorite and a few flecks of sericite or illite.

There are a few anhedral porphyroblasts of pyrite (partly weathered), up to 0.2mm in size.

A diffuse replacement vein, about 2mm wide, carries twinned and untwinned anhedral albite (up to 0.1mm in size) and abundant carbonate, largely removed by weathering and represented by limonitic pores, about 0.03 to 0.1mm in size.

An approximate mode is :

25-35%	quartz sand grains
0.2-0.3%	lithic sand grains
3-5%	detrital biotite, variously chloritic, sericitic and weathered
tr	detrital zircon
50-70%	matrix "cherty" quartz and albite
3-5%	matrix chlorite
0.3-0.5%	matrix sericite or illite
1-2%	vein albite and carbonate (now weathered)
0.1-0.2%	pyrite and oxidation products

Comments and Interpretation :

This sample is interpreted confidently to represent a dominantly clastic sediment deposited under aqueous conditions which gave poor sorting. It is considered to be a sandy siliceous and albitic shale. The sand grains consist of quartz, biotite, zircon and a few indeterminate lithic clasts. There are no features which positively identify them as being of volcanic derivation and feldspar clasts are notably absent. The matrix has a somewhat cherty texture but this could be a result of diagenetic/low grade metamorphic recrystallization rather than chemical precipitation. Pyrite appears to be of sedimentary/diagenetic origin.