

RRGE-3 3970

A feldspathic graywacke composed of well sorted grains floating in a clay matrix in contact with a shale consisting of well sorted silt-sized grains also floating in a clay matrix. Many of the opaques appear to be organic. The shale unit is finely laminated. Compaction is indicated by the orientation of elongate minerals.

Minor portions of the matrix are altering to carbonate. All other grains present are detrital.

The rock consists of 13% quartz, 12% plagioclase, 4% muscovite, 3% opaques, 2% rock fragments, 1% biotite, 64% matrix, 1% carbonate, and a trace of microcline and augite.

MINERALS

Quartz - detrital; subangular to subrounded; .25mm x .2mm to .02mm x .02mm.

Plagioclase - detrital; subangular to subrounded; .18mm x .18mm to .02mm by .02mm.

Microcline - detrital; subangular to subrounded; .5mm x .4mm to .12mm x .07mm.

Carbonate - detrital; subrounded; .14mm x .08mm to .07mm x .07mm.

Muscovite - detrital; subangular and elongate; .18mm x .04mm to .04mm long.

Biotite - detrital; subangular and elongate; .35mm x .1mm to .14mm x .05mm.

Rock fragments - subangular to subrounded; volcanic; .2mm x .18mm to .09mm x .07mm.

Opaques - detrital and secondary; subrounded; .7mm x .7mm to .02mm x .02mm.

Augite - detrital; subangular; .18mm x .18mm.

An angular-grained well sorted tuffaceous sandstone with an ashy matrix altering the carbonate. Glass shards are present and have altered to carbonate. Broken fossil fragments are also present but are unidentifiable. A large carbonate vein fills a fracture running through the slide. Zeolites also occurs in parts of this vein. The rock shows graded bedding with the finer-grained portion showing less carbonate cement and more ashy matrix. A few thin clay-rich beds are present and show the offset caused by the fracture. Many of the grains are rimmed with carbonate.

All grains present are detrital. Secondary minerals are carbonate and zeolites in veins.

The rock consists of 22% quartz, 15% plagioclase, 5% opaques, 1% rock fragments, 1% muscovite, 32% matrix, 24% carbonate cement, and a trace of microcline.

MINERALS

Quartz - detrital; subangular; .2mm x .15mm to .07mm x .06mm.

Plagioclase - detrital; subangular to subrounded; .2mm x .15mm to .07mm x .05mm.

Muscovite - detrital; subangular and elongate; .12mm x .04mm to .04mm long.

Opaques - detrital and secondary; subrounded; .14mm x .12mm to .07mm x .04mm.

Rock fragments - subrounded; volcanic; .3mm x .3mm to .14mm x .1mm.

Microcline - detrital; subangular; .2mm x .18mm.

A tuff in which many of the grains and glass shards have altered to carbonate and all of the matrix has altered to carbonate and clay. Carbonate and zeolite veins are present and sometimes occur together.

The rock appears to have been a very fine-grained tuff interbedded with thin clay-rich beds. Carbonate alteration has masked most of the original texture. Extensive fracturing has brecciated the rock. The sediments were still soft during fracturing as the coarser grains and glass shards from an overlying bed appear to have flowed into the larger fractures. Carbonate appears to have precipitated in two stages. One stage fills fractures as veins and another stage replaces the matrix.

All grains are detrital with carbonate and zeolites being secondary. Some of the opaques follow grain boundaries and may also be secondary.

The rock consists of 2% quartz, 4% plagioclase, 5% opaques, 35% carbonate cement, and 54% matrix.

MINERALS

Quartz - detrital; angular to subangular; .25mm x .18 mm to .03mm to .03mm.

Plagioclase - detrital; angular to subangular; .2mm x .1mm to .08mm x .07mm; some have euhedral shapes.

Muscovite - detrital; subangular and elongate; .09mm x .04mm to .07mm x .03mm.

Opaques - detrital; subrounded; .18mm x .12mm to .07mm x .04mm.

An angular-grained well sorted feldspathic quartz arenite with a small amount of ashy and clay matrix. The rock is laminated with some very fine-grained clay-rich beds. Portions of the matrix are altering to carbonate. Some of the opaques follow grain boundaries and may be secondary.

Detrital grains are plagioclase, quartz, rock fragments, monazite, microcline, muscovite, biotite, opaques, and garnet. Carbonate cement is the only secondary mineral.

This rock consists of 39% quartz, 26% plagioclase, 7% rock fragments, 5% matrix, 5% biotite, 5% opaques, 6% carbonate, 4% microcline, 3% muscovite, and a trace of monazite and garnet.

MINERALS

Plagioclase - detrital; subangular to subrounded; .6mm x .2mm to .12mm x .07mm; some grains were poikilitic.

Quartz - detrital; angular to subrounded; .5mm x .2mm to .07mm x .07mm.

Rock fragments - subrounded; volcanic; .2mm x .2mm to .18mm x .09mm.

Monazite - detrital; subangular; .09mm x .09mm to .07mm x .05mm.

Microcline - detrital; subangular to subrounded; .35mm x .14mm to .2mm x .1mm.

Muscovite - detrital; subangular and elongate; .35mm x .1mm to .04mm x .02mm.

Biotite - detrital; subangular to elongate; .14mm x .04mm to .5mm x .1mm; some altering to chlorite.

Opaques - detrital and secondary ; 1.0mm x .2mm to .3mm x .1mm.

Garnet - detrital; subangular; .35mm x .2mm.

RRGE-3C 5269

A shale with a few silt-sized grains floating in a matrix of clay and ash. Much of the matrix is altering to carbonate cement. Many elongate opaques are present and may be organic. Several microfaults are present throughout the slide.

Detrital grains present are quartz, plagioclase, muscovite, and opaques. Carbonate occurs as secondary cement.

The rock consists of 3% quartz, 2% plagioclase, 1% muscovite, 10% opaques, 20% ashy matrix, 31% clay matrix, and 23% carbonate cement.

MINERALS

Quartz - detrital; angular to subangular; .14mm x .06mm to .03mm x .03mm.

Plagioclase - detrital; subangular to subrounded; .07mm x .07mm to .05mm to .04mm.

Opaques - detrital; subangular and elongate; .08mm x .05mm to .03mm long.

Muscovite - detrital; subangular; .4mm x .12mm to .14mm long.

RRGE-3C 5268

A quartzite with some carbonate cement and crystalloblastic muscovite. Porphyroblasts of quartz and plagioclase are present with sutured boundaries and undulatory extinction. Veins are present and have carbonate lining the walls with silica crystallizing on the inside. Another type of silica is present flowing around the grains.

This rock consists of 78% quartz, 8% plagioclase, 4% sphene, 3% silica, 3% muscovite, 2% carbonate, 1% muscovite, 1% opaques, and a trace of epidote, microcline, and monazite.

MINERALS

Epidote - subhedral; .18mm x .1mm.

Microcline - anhedral; .2mm x .14mm.

Monazite - subhedral; .35mm x .2mm to .03mm x .03mm.

Quartz - anhedral; 2.0mm x .7mm to .12mm x .07mm.

Plagioclase - anhedral; 1.7mm x .5mm to .15mm x .1mm.

Opaque - anhedral; .14mm x .04mm to .03mm x .03mm.

Sphene - anhedral; .2mm x .05mm to .03mm x .03mm.

RRGE-3C 5551.5

A quartzite with porphyroblasts of quartz and feldspar. Sutured boundaries and undulose extinction exists throughout and a slight schistosity of muscovite grains is present.

This rock consists of 57% quartz, 38% plagioclase, 3% muscovite, 1% sphene, 1% opaques, and a trace of microcline and monazite.

MINERALS

Plagioclase - anhedral; 3.0mm x 1.5mm to .35mm x .2mm.

Monazite - subhedral to anhedral; .1mm x .1mm to .9mm x .05mm.

Microcline - subhedral; .14mm x .07mm to .3mm x .15mm.

Quartz - subhedral; 3.5mm x 1.0mm to .14mm x .07mm.

Muscovite - subhedral; .1mm x .03mm to .02mm long.

Sphene - subhedral; .07mm x .07mm to .02mm x .01mm.

Opaques - euhedral to subhedral; .07mm x .07mm to .01mm x .01mm.

RRGE-3 2804

A siltstone with well sorted grains floating in an ashy matrix. A few very thin beds have clay matrix. Compaction is indicated by the orientation of the elongate grains parallel to the bedding. Some very large opaques (possibly secondary) are concentrated in certain beds.

All grains appear to be detrital except for some small patches of carbonate cement and possibly a very large opaque.

The rock consists of 11% quartz, 11% plagioclase, 7% opaques, 7% muscovite, 4% carbonate cement, 35% ashy matrix, 25% clay matrix, and a trace of biotite.

MINERALS

Muscovite - subangular; detrital; .35mm x .07mm to .06mm long.

Opaques - detrital and secondary; subangular to subrounded; a few elongate opaques that parallel the bedding may be organic; .35mm x .3mm to .01mm x .01mm.

Plagioclase - detrital; angular to subrounded; .15mm x .09mm to .03mm x .01mm.

Quartz - detrital; angular to subangular; .2mm x .17mm to .03mm x .01mm.

Biotite - detrital; subangular to subrounded; .14mm x .04mm to .08mm long.