

Sample: ISC47113; Location: Sidewali Core 1, 3617 m

Rock Name:

Compact lithic sandstone

Thin Section:

This sample is similar in many respects to those described above in that it contains a relatively large proportion of clay material most of which has been derived from lithic fragments which were deposited at the same time as the sand-grade quartz grains. Occlusion of the original porosity and permeability of the sand has occurred mainly by physical squeezing and distortion of the relatively soft lithic clasts between the more rigid quartz grains. Many fields of view in the thin section simply consist of a randomly oriented aggregate of quartz grains and fine-grained patches on a scale of about 0.2 to 0.3 mm.

The lithic fragments range from siliceous types which are probably cherty through fairly well defined foliated schistose and slaty rock to very fine-grained argillaceous lithologies which are probably shales or their metamorphic equivalents. The more quartz-rich fragments retain a compact detrital outline but many of the softer fragments can be seen to be conformable to the shape of the adjacent quartz grains.

The lithic fragments probably comprise about 30 to 35% of the volume of the rock but authigenic kaolinite is present only to a very small extent and probably comprises not more than about 2%. Even so, the kaolinite does tend to form well defined monomineralic patches up to about 0.2 mm in overall size.

Some parts of the thin section contain rather large aggregates of a completely opaque constituent which may well represent plant debris. The largest aggregates of this material are several millimetres in length and up to about 1 mm in width.

The thin section contains some porosity but it is likely that this is a result of preparation of the sample before microscopy and it seems unlikely that the reservoir at this depth has good petrophysical properties both in terms of the overall amount of porosity and permeability and also in view of the wide variety of potentially reactive minerals present.