

Sample: TSC47108; Location: Sidewall Core 47, 3159 m

Rock Name:

Compact lithic sandstone

Thin Section:

Fine-grained clays and minor carbonate comprise fully 25% of the volume of this rock. Amongst this material there is a minor amount of kaolinite which forms compact monomineralic aggregates between the quartz grains but most of the material is heterogeneous and thought, therefore, to have been derived from lithic fragments which were deposited at the same time as the abundant quartz grains. This lithic material ranges from fairly well defined fine-grained aggregates of quartz and oriented phyllosilicates, which are clearly of metasedimentary origin, to more indeterminate aggregates of very fine-grained clay which commonly have been markedly distorted by squeezing between the quartz grains during compaction. Many of these more indeterminate clay aggregates show moderate birefringence and are likely to be illitic in character. There is a small proportion of chert grains and these tend to retain compact detrital outlines.

The quartz grains are well sorted and have an average size of 0.3 mm. Most show some evidence of the development of long and curved contacts and in some instances they are separated from each other by films of clay material. Overgrowths are not common but the shape of the grains is a clear indication of the extent of pressure solution and porosity reduction by modification of the quartz grains.

The thin section contains a very small proportion of pores which are interpreted as being integral to the sandstone; these are up to 0.2 mm in size and are probably of secondary origin. Taken overall, however, the sample is probably impermeable and has poor reservoir qualities. As well as containing abundant clay, it is likely that there is a considerable range of clay minerals in rocks such as this, in that there is heterogeneous lithic material as well as apparently well crystallised authigenic kaolinite.