Sample: TSC47106; Location: Sidewall Core 41, 3198.5 m

Rock Name:
Compact lithic sandstone

Thin Section:

Lithic fragments comprise about 20% of the volume of this sandstone and the remainder is comprised very largely of quartz grains with a moderate proportion of authigenic carbonate. Authigenic kaolinite is present only to a very small extent. The rock appears to be impervious as a result of modifications to the original quartz grains, distortion of the lithic fragments and the crystallisation of the authigenic carbonate mineral.

The quartz grains are moderately well sorted and commonly range in size from 0.15 mm to about 0.4 mm. In some places there are long and curved contacts between the grains with some incipient suturing but for the most part the grains are separated by aggregates or thin films of fine-grained material and it is likely that the abundance of this has somewhat inhibited free circulation of pore waters which would enhance the development of pressure solution effects.

The lithic material is heterogeneous and ranges from rare siliceous rocks (both of metamorphic origin and chert) to apparently monomineralic aggregates of fine-grained birefringent clay (probably illitic) many of these illitic fragments have been markedly distorted and now form cuspate and irregular aggregates or, in some instances, films and seams between the quartz grains.

Carbonate is present both as relatively large aggregates and widely disseminated crystals and it is sufficiently abundant to have been a major influence in reducing the original porosity. In contrast, authigenic kaolinite, although it is present and forms some relatively large monomineralic aggregates, is quantitatively less abundant than the carbonate.

The thin section does show some porosity but it is thought that the bulk of this has been induced by collection of the sidewall core and preparation of the thin section. The rock is likely to be distinctly impervious and impermeable. There is some evidence of ferruginous staining in the sample and some of the clays have a distinctly yellow colour. There is also a little opaque and semi-opaque material which is present both in incipient microstylolite zones and as rare, apparently detritai, fragments.