

Sample: TSC47082; Location: Pelican-5, Core 3; 2885.1 m

Rock Name:

Lithic sandstone

Thin Section:

An optical estimate of the constituent gives the following:

|                      | %     |
|----------------------|-------|
| Quartz               | 70    |
| Lithic fragments     | 20-25 |
| Pores                | <5    |
| Carbonate            | 5     |
| Authigenic kaolinite | 2     |
| Mica                 | 1     |
| Feldspar             | <1    |

As the list of minerals above indicates, the sample is characterised by the abundance of heterogeneous clay material which is clearly derived entirely from lithic fragments deposited essentially at the same time as those of quartz and feldspar. These fragments now occur as patches of clay similar in size to adjacent quartz grains and ranging widely in mineralogical characteristics, colour and crystal size. Some of the fragments clearly show the effect of being squeezed between the more rigid adjacent quartz grains but others show more evidence of an original compact outline. As well as wholly argillaceous varieties, the rock contains fine-grained metamorphic quartz-bearing lithologies and one or two apparently quartzofeldspathic rocks which may be high level, fine-grained volcanics. During compaction of the sandstone many of the lithic fragments were compressed so that they tended to squeeze into the interstices between the grains thereby reducing the porosity and permeability; this process was probably the most important in reducing the porosity from that of the original sand to the present level of probably less than 5%.

Carbonate is present in the rock as widely dispersed fine-grained material which also occurs as fine-grained monomineralic patches up to 0.2 mm in size. These latter may be derived from limestone detrital fragments which have been somewhat recrystallised and it seems likely, in any case, that the carbonate was derived from a relatively adjacent source within the sandstone body. Authigenic kaolinite forms isolated monomineralic patches similar to those in other rocks in this collection.