

Sample: TSC47083; Location: Pelican-5, Core 3; 2886.5 m

Rock Name:

Argillaceous sandstone

Thin Section:

An optical estimate of the constituents gives the following:

	%
Quartz	65
Lithic fragments	20
Carbonate	7-10
Pores	5-7
Authigenic kaolinite	<2
Mica	<1
Feldspar	<1

In most features this sample is similar to that from 2885.1 m but carbonate tends to occur predominantly as monomineralic very fine-grained patches and the rock is probably a little more porous. The pores in this case are generally not more than about 0.1 to 0.15 mm in size and some appear to be associated with very porous aggregates of clay. To this extent, therefore, it seems likely that the pores are mainly of secondary origin and have been derived from recrystallisation, alteration or dissolution of clays in some of the lithic fragments. As in the sample described above, it is the abundance of lithic material which has been responsible for the apparent impervious nature of the sample; the lithic fragments comprise fully 20% of the volume of the rock and deformation of these during compaction has resulted in pore throats and original cavities being filled by the plastically deformed clay aggregates. In addition to this there is fine-grained authigenic carbonate which appears to be either derived from the recrystallisation of detrital limestone fragments or has been introduced into the system with circulating pore waters. This mineral forms either isolated patches or widely distributed small granules and crystals. As in other samples, however, the authigenic kaolinite forms distinct compact monomineralic patches.

The quartz grains are fairly well sorted about an average size of 0.15 to 0.2 mm and some show the presence of long or slightly curved boundaries; suturing is not present and it is thought likely that extreme modifications to the detrital quartz grains were inhibited by a relatively early process by which the lithic fragments choked off a considerable amount of the original permeability.