

Sample: TSC47071; Location: Pelican-5, Core 2; 2875.1 m

Rock Name:

Compact lithic sandstone

Hand Specimen:

A slightly friable cream to pale grey rock which appears to be massive in the hand specimen. The sandstone shows some spotting by rare white patches.

Thin Section:

An optical estimate of the constituents gives the following:

	%
Quartz	80
Lithic fragments	15
Pores	3
Mica	1
Authigenic kaolinite	<1
Carbonate	Rare

This is a somewhat coarser grained and distinctly tighter rock than many others from core 2; in fact the sample is characterised by abundant concavo-convex grain boundaries and by the paucity of pores. There are small amounts of authigenic kaolinite and very fine-grained aggregates of carbonate; however, the apparent impervious nature of the sample is a result of modifications to the quartz grains during diagenesis and to a somewhat smaller extent compaction and deformation of soft lithic clasts between the relatively rigid grains of quartz. Pores now appear to be not well interconnected in three dimensions and many are not more than about 0.1 mm in size. Most of these small pores could readily be interpreted as being of primary origin, slightly modified during compaction of the rock. There is a small proportion of somewhat larger pores very widely distributed over the area of the thin section. These may well be of secondary origin and related to the preferential dissolution of some types of argillaceous fragments. The clay material in the rock and other fine-grained constituents are notably heterogeneous and varied. There are some monomineralic cherts but most of the fine-grained material consists of quartz and phyllosilicate with varying relative proportions and crystal sizes. As well, there are patches in which argillaceous material forms a network between the grains and this, also, has probably resulted in a marked reduction of any original permeability.

Authigenic kaolinite forms small isolated patches which are relatively coarsely grained, clear and monomineralic and are thought to represent a precipitate from circulating pore waters. In this rock, as in others from this core, feldspar is relatively fresh and is not spatially associated with the kaolinite and hence the kaolinite is not thought to have been derived from alteration of detrital feldspar.

Carbonate forms patches up to as much as 0.4 mm in size which are extremely fine-grained and appear to be almost opaque in plane polarised light. This is an unusual habit for authigenic carbonate and it is possible that these aggregates of carbonate represent original limestone clasts probably somewhat recrystallised during diagenesis of the rock.