

Sample: TSC47072; Location: Pelican-5, Core 2; 2877 m

Rock Name:

Compact lithic sandstone

Hand Specimen:

A very pale somewhat spotted fine-grained sandstone.

Thin Section:

An optical estimate of the constituents gives the following:

	%
Quartz	85
Lithic	7
Authigenic kaolinite	2
Carbonate	2
Pores	<2

This is a distinctly tight sandstone which shows numerous examples of most of the characteristics which are likely to lead to a reduction in porosity. The pores in the thin section are rather isolated from each other and tend to be not more than 0.2 mm in size. Most are interpreted as being probably of secondary origin.

The quartz grains are moderately to well sorted and have an average size of about 0.2 mm. Most of the grains are equant and compact in shape but many have slightly irregular and subangular outlines as a result of the development of concavo-convex boundaries and examples of suturing. Identifiable overgrowths on the quartz grains are present only to a relatively small extent.

When the sample is examined under high magnification and intense illumination it can be seen that there is a considerable amount of widely dispersed carbonate. This is invariably very fine-grained and ranges from almost opaque irregular patches up to 0.3 mm in size to a fine dusting of authigenic crystals within fine-grained patches of lithic material. Authigenic kaolinite is also somewhat more abundant in this rock than in most of the others from core 2 but it tends to form discrete monomineralic isolated patches and is not dispersed throughout every field of view. The kaolinite is well crystallised and appears to be a genuine precipitate from pore waters. Unlike the carbonate, the kaolinite tends to fill (on a microscopic scale) all of the intergranular space where it occurs.

As the list of minerals above indicate, the rock contains a fine-grained material which is interpreted as being of lithic origin. Much of this appears to be relatively quartz-rich and some grains are definitely cherty. Others have some clay or phyllosilicate content and are most likely to be rather altered and deformed sedimentary or metasedimentary rocks.

The sample shows more evidence of pressure solution effects (particularly suturing) and of the authigenic crystallisation of kaolinite and carbonate than any of the samples described above, consequently the rock has the lowest apparent porosity in thin section.