

Sample: TSC47070; Location: Pelican-5, Core 2; 2873 m

Rock Name:

Lithic sandstone

Hand Specimen:

A slightly friable, pale grey sandstone with a small proportion of distinctive white spots.

Thin Section:

An optical estimate of the constituents gives the following:

	%
Quartz	80-85
Lithic fragments	7
Pores	7(+)
Authigenic kaolinite	≤1
Feldspar	Trace
Mica	Trace
Carbonate	Rare

This sandstone is a little cleaner than that described above and has, therefore, somewhat more porosity. There are fields of view in this thin section in which long and concavo-convex boundaries between the quartz grains are abundant and the low porosity stems from the pressure solution effects on the quartz grains. Considering the thin section overall, however, it is likely that an equally important effect has been the deformation of relatively soft lithic fragments during compaction and lithification. The distribution of these lithic clasts is somewhat patchy in the thin section and it seems likely that although the rock may have a reasonable porosity the permeability may be somewhat restricted. The lithic fragments themselves are extremely variable and include cherts, psammitic metamorphic rocks and distinctly more argillaceous sedimentary and metasedimentary varieties. Clay is also represented by small patches of authigenic kaolinite. These occur in this rock, as in others in this well, as isolated monomineralic patches which generally fill the intergranular space where they occur. The kaolinite invariably has a patchy distribution and the estimated proportion of this mineral in the rock is an indication of the extent to which it will have reduced the original porosity.

The pores in the thin section are generally about 0.1 to 0.4 mm in size and do not appear to well interconnected in three dimensions. There is somewhat more evidence in this rock of the pores being of primary origin in some cases and some, indeed, are small cusped or triangular patches surrounded by clean faces of quartz crystals or grains. Other areas of the thin section are somewhat more porous with a greater proportion of large secondary pores which appear to have been derived from the dissolution of original grains.

In brief, therefore, this sample shows rather more the effect of pressure solution having reduced the original porosity to a similar extent to the process of deformation of original lithic fragments.