

Sample: TSC47073; Location: Pelican-5, Core 2; 2878.9 m

Rock Name:

Very compact sandstone

Hand Specimen:

This is a compact apparently relatively thinly bedded sandstone which shows some evidence of incipient microstylolites. The core samples appears to have split along some of these better developed microstylolitic zones.

Thin Section:

An optical estimate of the constituents gives the following:

	%
Quartz	85
Carbonate	5
Lithic fragments	5
Mica	2
Authigenic kaolinite	1
Pores	<2

Sutured grain boundaries are amongst the commonest type present in this thin section and the sample therefore shows extreme effects of pressure solution and the reduction of porosity by localised dissolution of the quartz grains. As well as this, there is a relatively large amount of fine-grained authigenic carbonate which forms both discrete patches and in narrow intergranular spaces and within the sutured grain contacts. Pores in the thin section are isolated from each other but range in size occasionally to as much as 0.2 mm. These relatively large pores are commonly associated with rather loose aggregates of clay or have clay at their margins and hence appear to be most likely of secondary origin. Although there is clear evidence of the dissolution of quartz, optically continuous overgrowths are not at all abundant in the thin section.

The average grain size of this sample is about 0.2 mm but the shape of the grains has been affected by pressure solution and most grains, although equant in shape have distinctly irregular and rather angular outlines. In some of the incipient microstylolitic zones there appears to have been a genuine reduction in the average size of the quartz grains. The clay material is distinctly heterogeneous and is interpreted as having been derived entirely from original lithic fragments. Some of these are cherty but most are fine-grained quartz and clay aggregates which probably can be regarded as metasedimentary rocks. Some quartz-rich types have rather varying crystal sizes and spherulitic patches which may suggest their origin as acid igneous rocks.

The sample appears to have essentially similar mineralogical characteristics to most of those described above and it is not apparent from examination of this thin section alone, why this sample should show such marked suturing of the grain contacts; however, it is clear that this process has been the principal factor in reducing the original porosity. It seems likely that the suturing was a relatively late process in the diagenesis in that it has affected quartz overgrowths and the authigenic carbonate.