

3.10 King #1, Core plug 24, depth 1431.23m

Thin section description

The sample is a very poorly sorted, mineralogically mature sandy siltstone with weakly defined bedding. Beds are outlined by the alignment and concentration of elongate grains of coarse sand floating in the silt. Grain size is bimodal (Fig. 12). The medium silt fraction ranges in diameter from 0.004mm (very fine silt) to 0.035mm (coarse silt) and is subangular with low to moderate sphericity. The sand fraction has an average grain size of coarse sand and ranges in diameter from 0.14mm (fine sand) to 1.5mm (very coarse sand). Sand grains are commonly subrounded with low to moderate sphericity. Texturally the sample is grain supported with dominantly tangential and concavo-convex grain contacts.

Porosity is better developed in the sandy beds where there is a reduction in the percentage of clay matrix. Pores are commonly secondary in nature and either grain sized or enlarged and intergranular. Examples of honeycomb porosity have resulted from the partial corrosion of feldspars along preferred crystallographic axes. Minor fracturing that parallels bedding is probably an artefact of sampling that has enhanced permeability.

Framework grains are comprised of quartz, K-feldspar, mica, epidote, opaques, sphene and zircon. Pale brown clays and opaque stringers represent the detrital matrix. Mica flakes converted to kaolin, pyrite framboids and cubes, patches of micrite and iron oxide are the only authigenic minerals evident.

Visual Estimate of Composition		%
Framework grains	Quartz	66
	Feldspar	1
	Mica	4
	Accessory minerals	tr
Matrix	Clay	5
	Opaque material	6
Authigenic minerals and cements	Carbonate	tr
	Pyrite	2
	Kaolin	tr
	Iron oxide	tr
Porosity	Intergranular	5
	Dissolution	8
	Fractures	2

X-ray diffraction

The clay fraction from this sample (Fig. 13) is dominated by highly crystalline kaolinite. In addition there is a trace of illite 2M1 and quartz.