

PART 2: VITRINITE MEASUREMENT AND KEROGEN TYPING

ANALYTICAL PROCEDURE

Representative portions of each sample (crushed to -14+35 BSS mesh) were obtained with a sample splitter and then mounted in cold setting Glasscraft resin using a 2.5 cm diameter mould. Each block was ground flat using diamond impregnated laps and carborundum paper. The surface was then polished with aluminium oxide and finally magnesium oxide.

Reflectance measurements were made with a Leitz MPV1.1 microphotometer fitted to a Leitz Ortholux microscope and calibrated against synthetic standards. All measurements were taken using oil immersion ($n = 1.518$) and incident monochromatic light (wavelength 546 nm) at a temperature of 23 ± 1 C. Fluorescence observations were made on the same microscope utilising a 3 mm BG3 excitation filter, a TK400 dichroic mirror and a K510 suppression filter.

RESULTS

Vitrinite reflectance determinations are summarised in Table 1. Figure 1 is a plot of vitrinite reflectance versus depth. Histogram plots of this data are presented in Appendix 1. Descriptions of the dispersed organic matter in these samples are presented in Tables 2-4.

DISCUSSION

Maturity

The vitrinite reflectance data (Table 1, Figure 1) indicate that the sedimentary section penetrated by Koorkah-1 is sufficiently mature for the generation of light oil from resinite-rich dispersed organic matter (DOM) below approximately 1950 metres depth (threshold VR = 0.45%; Snowdon and Powell, 1982).

Significant gas generation from woody-herbaceous DOM (vitrinite, and to a lesser extent, inertinite) commences at VR = 0.6% (Monier et al., 1983). On this basis, sediments below 2800 metres depth in Koorkah-1 should be sufficiently mature to generate significant quantities of gas.

Oil generation from terrestrial organic matter rich in exinites other than resinite commences at VR = 0.7% (Connan and Cassou, 1980). The top of this oil generation window occurs at approximately 2950 metres depth in Koorkah-1.

Narrow intervals of mature and overmature sediments occur above and below the sill (2085-2129 metres depth). These intervals are similar in thickness to the sill.