

## DISCUSSION OF THE RESULTS

### A. Thermal Maturity of Sediments

Five vitrinite reflectance measurements between 1740m and 2709m indicate sediments within this interval are immature to, at best, marginally mature. Headspace gas data (Figure 1) confirms this interpretation.  $iC_4/nC_4$  ratios are high in most instances, indicating sediments are of low thermal maturity. However, these ratios do decrease in the deeper section of this well (1950m to 3000m). % Gas wetness is fairly uniform throughout, suggesting significant oil generation has not yet commenced.

Tmax temperatures recorded between 1740m and 2709m average less than 430° C. Again, this indicates sediments penetrated by the Chat 1 well are pre oil generative. On the basis of the above data, the sediments encountered in Chat 1 have been divided into the following maturity intervals:

<u>Interval (m)</u>	<u>Maturation</u>	<u>Generation Capability</u>
0 - 2000	Immature	Pre oil generative
2000 - 3000	Marginally mature	Initial hydrocarbon generation.

### B. Hydrocarbon Source Character

Organic richness (TOC) of the picked shale and coal lithologies is excellent (Table 2). However, it must be remembered that in some cases the organic rich shales and coals comprised as little as five percent of the bulk sample. Similarly hydrogen indices in most samples are high, indicating the shales are predominantly oil prone. This may be true for the picked lithologies, but overall these rocks may in fact possess a more gas prone character. Coal maceral descriptions (Table 3), seem to support this, with gas prone vitrinite predominating over the other macerals in all samples.

Volatile hydrocarbon yields ( $S_1$ ) from the carbonaceous shales and coals suggest hydrocarbon generation may have commenced from these intervals. However, these sediments are of low thermal maturity and it is unlikely that major quantities of oil or gas have been sourced from these horizons at present. However, at greater levels of thermal maturity the carbonaceous shales encountered in Chat 1 would probably be excellent oil sources. Unfortunately, the volume of hydrocarbon generated from these source rocks may be limited by the restricted thickness of these organic-rich, oil prone shales.