Poster 4

Source rock evaluation and geochemical characteristics of hydrocarbons from Sabah and Sarawak

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As part of NW Borneo regional review initiative, a study is carried out to compile and review all available geochemical data of evaluated source rocks, hydrocarbons and source rock extracts from Sabah and Sarawak. Preliminary results from this study indicate that:

- Based on VR analysis, source rocks from Sabah are generally immature and only attain early maturity at around 6,000'. On the other hand, source rocks from Sarawak reach early maturity at around 4,000', with samples at greater depths entering the oil generating window around 6,000'. The difference in source rock maturity could be due to different tectonic and geothermal regimes in these areas.
- Source rocks in Sabah are generally poorer in quality in comparison to those from Sarawak, where coaly samples are common (high TOC). In general, higher TOC reflects better generating potential (S2).
- Rock-Eval pyrolysis data suggest the presence of predominantly gas-prone Type III, land plant derived kerogen with some mixed oil- and gas-prone Type II/III kerogen. The presence of Type II/III kerogen is commonly attributed to bacteria reworking/marine influence of terrigenous organic matter. However, the potential presence of marine organic matter cannot be dismissed
- Isoprenoid/n-alkane ratios (Pr/C17 vs Ph/C18) infer source rock deposition and preservation occurred mainly in oxidising environment. However, there are a number of samples from Sarawak exhibiting mixed organic sources.
- Stable carbon isotope ratios for saturated vs aromatic hydrocarbons also show mainly terrigenous organic matter, albeit the ratios for some samples also indicate significant presence of marine organic matter.
- Similarly, predominance of C29 steranes relative to C27 and C28 steranes suggest the existence of mainly terrigenous organic matter, with insignificant contribution from marine organic matter in Sabah, whilst samples from Sarawak show significant marine influence, especially for those from the Central Luconia Province.

In general, the above observations confirm the common knowledge of hydrocarbons in the study area being derived mainly from higher plants, land derived organic matter. However, recent studies by other researchers using the advance GCMS(MS) finger-printing technique have shown the existence of marine source rocks in Sarawak (e.g. Scherer and Abolins, 1999), although little is yet known of the geological controls on their distribution and extent. It is hoped that by year-end, additional oil samples that are selected for detailed biomarker analysis, which are currently being analysed will provide some insights into the potential presence of marine source rocks in the study area.

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