

## NEW DATA ON TRINIDAD GEOCHEMISTRY

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### ABSTRACT

A significant quantity of new data was found as a result of a recent comprehensive study of aspects of the geochemistry of Trinidad crudes and source rocks. The study formed part of an "Atlas of Stratigraphy", a multi-client report, done by a group of local and international consultants and was aimed, *inter alia*, at identifying timing of hydrocarbon generation and migration and extent of current thermal maturities of the different basins. It also sought to identify migration effects in Trinidad crude oils.

A total of 39 samples were analysed for source rocks. These samples were obtained from surface outcrops and from cores and cutting of wells from different parts of Trinidad, both on-shore and offshore; 24 oil samples and two oil sands were analysed from onshore and all offshore east coast fields, High Resolution Gas Chromatographs were done on all oils and GCMS's were done on selected crudes. YUKI ERPC one dimensional basin modeling software was used to quantify the various chemical and physical processes in five different areas of offshore and onshore Trinidad.

The oils distributed throughout onshore and offshore Trinidad within reservoirs at different structural and stratigraphic levels were confirmed to have been derived from source rocks containing predominantly marine organic matter. The oils are of one genetic type and are essentially derived from the Upper Cretaceous marine Naparima Hill and Gautier Formations, which are organic rich, oil prone, thermally mature and lie within the oil and gas generation windows in large areas of Trinidad, both onshore and offshore.

A number of significant not previously recognized features have in addition, come to light, namely: Most of the oils have been found to be of low maturity and to have undergone a process of evaporative fractionation. This raises the possibility of oil accumulations below the large gas and condensate fields, in areas previously thought to have no deeper potential. Other results indicate that north of a major thrust within the Central Range, the generally preserved Cuche shales are overmature, to the gas phase. In addition the younger oil prone Naparima Hill and Gautier are largely missing. South of this thrust however, the Naparima Hill sources within the Central Range are immature to marginally mature. These rocks are interpreted to become mature to the oil and gas generation window below the thrust, giving scope for deep exploration in the southern areas of the Central Range.