Aspects of Organic Geochemistry of Shales Associated with the Nigerian Tar Sands.

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Abstract:

Ten shale samples from three Geological Consultancy Unit, University of Ife, boreholes (Nos. 19, 20 and 25) drilled within the Ondo State tar sand belt were analysed. Bitumen was extracted from all the samples using a standard Soxhiet apparatus. Organic carbon was determined and kerogen isolated from eight samples. Elemental analysis was also carried out on six samples. Organic carbon ranged from 1.6 - 4.9 wt.% and shows that the shales contain adequate organic carbon for source-rocks. The extractable bitumen (SOM) ranged from 1,293 ppm to 28,432 ppm with the aliphatic, aromatic/ester and nitrogen, sulphur and oxygen containing compounds (NS0's) constituting 4 - 340 ppm, 57 - 788 ppm and 631 - 8,879 ppm, respectively of the SOM. Microscopic examination of the kerogen shows that amorphous, herbaceous and coaly organic matter types constitute 53 - 74%, 16 - 41%, and 6 - 21%, respectively.

A plot of the hydrogen/carbon and oxygen/carbon atomic ratios on a Van Krevelen diagram indicates that kerogens are types II and III, and are thermally immature. This shows that the shales associated with the tar sands are not the source for the bitumen in the tar sands.

Keywords: Shales/ tar sand/ kerogens

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