Geochemical Correlation of oils and Source Rocks from Melut basin – Sudan

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Abstract:

Results obtained from the geochemical analysis of 31 DSTs oils and 65 rock samples selected from Melut basin, were used to identify types of source available, depositional environment and maturity assessments.

Different analytical techniques including LCC, GC, GCMS, VRo and Rock-Eval pyrolysis were used to characterize the oil and rock samples.

Hierarchical cluster analysis (HCA), principal component analysis (PCA) and biomarker distributions were used to establish oil-oil and oil-source correlations to describe geochemical character of the oil, determine the number of genetically related crude oil families and to carryout genetic correlation of potential and effective source rocks. The oils are separated into two groups.

Group 1 which contain two sub groups have been described as a lacustrine derived source with low salinity i.e. fresh to brackish lacutrine deposited in suboxic/anoxic depositional environment in group 1a and saline lacustrine derived source with relative contribution to algae deposited in oxic/suboxic environment in group 1b. Group-2 has been described as a lacustrine derived source with relative high contribution to algae deposited in oxic/suboxic environment.

Positive correlation has been observed between ten oil samples and four rock extracts from Galhak formation. The maturity parameters suggest that the oils were generated from mature source rocks at early to peak oil generative window.