

## SOURCE ROCK EVALUATION OF PETM GENERATED DISANG SHALES OCCURRING IN PARTS OF ARUNACHAL PRADESH, NE INDIA

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### Abstract

The sedimentation of Disang Group in NE India about 55 Ma ago, bordering Myanmar merely coincides the global phenomena of Paleocene-Eocene Thermal Maximum (PETM). The group is dominated by kerogen rich shales with minor volume of sandstones. It is regarded as a source, contributing hydrocarbons to the petroliferous Upper Assam basin of NE India. There is, however, no published work on the source rock characterization of Disangs, as it is constrained by the non availability of core samples till date. The Group has about 3000 m vertical extension and laterally a vast regional span with continuous occurrence along the Indo-Burma-Range (IBR). The present tasks of source rock characterization of Disangs exposed in parts of Changlang, Khonsa and Longding of Arunachal Pradesh, NE India are primarily based on sedimentary structures, geochemical parameters, diagenetic status of associated sandstones and to a lesser extent on the rock eval parameters.

The sedimentary profile is characterized by flysch type sediments deposited on an active continental margin representing distal shelf to tidal flat environment under conditions of relatively hot anoxic bottom water. The geochemical parameters viz., enrichment factor (EF), paleo-redox indices (PI) and the low negative cerium anomaly indicate an anoxic bottom water condition of the basin of sedimentation. The anoxic bottom water condition is also documented by the occasional presence and preservation of dispersed pyrite framboids in the constituent shales. The effect of lithification, diagenesis and consequent transformation of organic matter to hydrocarbon was assessed based on sandstone petrography and clay mineralogy. The results indicate that the sandstones attained phylomorphic stage of diagenesis, an effective condition that led to the transformation of organic matter to hydrocarbon.

The estimated rock-eval parameters are found less informative at this stage of source rock characterization as the TOC,  $T_{max}$  indicate immature to over maturity of organic matter present. Also, the hydrogen and oxygen indices of kerogen refer to the type III organic matter, suggesting a poor source rock quality. Even though, the evaluated organic geochemistry does not support much of the parameters of effective source rock, the geochemical parameters and sedimentary features offer a perfect state of affairs of source rock production.

*Keywords:* PETM, Disang shales, active continental margin, TOC,  $T_{max}$ , Paleo-redox indices, framboidal pyrites, anoxic bottom water, phylomorphic stage of diagenesis.