

Petroleum Source Rock Evaluation of Argillaceous Sediments in a Part of the Cauvery Basin

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The Cauvery Basin Extends along the East Coast of India, bounded by - latitudes 8 ° 30' and 12 ° 30'N and longitudes 78 ° 30'E and 80 ° 20'E. It covers an area of 1.5 lakh sq. km comprising on land (25,000 sq.km) and shallow offshore areas (30,000 sq km). In addition, there is about 95,000 sq km of deep-water offshore areas in the Cauvery Basin.

The Cauvery basin was formed during Late Jurassic time by sagging of a part of the Indian shield, mainly along the dominant northeast-southwest basement trends. The basin consists of several depressions separated from each other by subsurface basement ridges aligned parallel or sub parallel with the dominant basement trends. The sedimentation in the respective depressions was controlled by movements along these trends since late Jurassic. The depocenters, which were mainly open toward the west during Upper Gondwana deposition, shifted toward the east as a result of general basinal tilt at the beginning of the Tertiary. These movements were responsible for repeated transgressions and regressions, as is evidenced by lithofacies, biofacies, and thickness variations, as well as by sedimentation breaks. (Berner Z., Stuben D., Rajkumar M. 2004)

This is an intracratonic basin, characterized by the following observations:

1. The basin has a linear geometry with a large length (400 km) to breadth (170 km) ratio.
2. Both the margins of the basin area bounded by basin margin faults.
3. The basin forms a high angle with the east coast margin of India and is underlain by continental crust.
4. The basement faults are generally of the gravity type with a listric character.
5. The basin has Narimanam oil field in Tertiary sediment (Oligocene age) in the Karaikal Horst. The present study is aimed to identify the possible petroleum kitchen from where the oil migrated to four parts in this field.

From the cutting and cored well data set geochemical analysis of the argillaceous sediments of Cauvery Basin by ONGC an effort has been made to evaluate argillaceous sediments of various stratigraphic units for their source to generate petroleum hydrocarbon in commercial quantity in part of Cauvery basin with the following observations

1. Evaluation of abundance of organic matter (for potential to generate commercial quantity of hydrocarbon).
2. Evaluation of quantity of organic matter to assure their parameters for generation of hydrocarbon.
3. Evaluation of thermal maturation stage of organic matter.
4. Identification of petroleum kitchen in these areas of study in space and time.