

EVALUATION OF SUB-SURFACE HYDROCARBON POTENTIAL USING MICROBIAL TECHNIQUE AS INDIRECT METHOD: A STUDY FROM NORTHERN PART OF BIKANER-NAGAUR BASIN, INDIA.

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Abstract

Surface geochemical survey for microbial studies was conducted in northern part of Bikaner-Nagaur Basin, Rajasthan for evaluation of hydrocarbon resource potential of the study area. Near Surface soil sampling was done in a close grid pattern of 1 km interval and total of 100 samples were collected from a depth of top 2 to 4 m from northern part of Bikaner Nagaur Basin, Rajasthan, India. Microbial technique is based on the principle that light hydrocarbons from oil and gas fields escape to the earth's surface and this increases hydrocarbon supply above the fields and creates conditions favorable for the development of highly specialized bacteria populations that feed on the hydrocarbons. Hence microbial anomalies observed in the area indicate the presence of hydrocarbons, which have been migrated from the subsurface. Microbial analysis revealed high bacteria counts for methane oxidizers (560×10^3 cfu/gm), ethane oxidizing bacteria (900×10^3 cfu/gm), propane oxidizing bacteria (833.3×10^3 cfu/gm) and butane oxidizing bacteria (498×10^3 cfu/gm) in soil samples. In the present study the anomalous zones of methane, ethane, propane and butane oxidizing bacteria were observed near the Mohanpura, Chak 12Q, Mirzawala, Prithwirajpur and Kesrisinghpur areas of Bikaner Nagaur Basin, Rajasthan, India. The microbial anomalous zones have been correlated with desorbed soil gases to validate hydrocarbon potential of study area.

Key Words: Hydrocarbons, Micro-seepage, Hydrocarbon oxidizing bacteria, Bikaner-Nagaur Basin, Rajasthan.