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Total Organic Carbon Enrichment and Source Rock Evaluation of the Lower Miocene Rocks Based on Well Logs: October Oil Field, Gulf of Suez-Egypt

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ABSTRACT

October oil field is one of the largest hydrocarbon-bearing fields which produces oil from the sand section of the Lower Miocene Asl Formation. Two marl (Asl Marl) and shale (Hawara Formation) sections of possible source enrichment are detected above and below this oil sand section, respectively. This study aims to identify the content of the total organic carbon based on the density log and a combination technique of the resistivity and porosity logs ($\Delta\log R$ Technique). The available geochemical analyses are used to calibrate the constants of the TOC and the level of maturity (LOM) used in the ($\Delta\log R$ Technique). The geochemical-based LOM is found as 9.0 and the calibrated constants of the Asl Marl and Hawara Formation are found as 11.68, 3.88 and 8.77, 2.80, respectively. Fair to good TOC% content values (0.88 to 1.85) were recorded for Asl Marl section in the majority of the studied wells, while less than 0.5% is recorded for the Hawara Formation. The lateral distribution maps show that most of the TOC% enrichments are concentrated at central and eastern parts of the study area, providing a good source for the hydrocarbons encountered in the underlying Asl Sand section.

KEYWORDS

Total Organic Carbon; Source Rocks; Well Logs; October Oil Field; Gulf of Suez

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