

Application of well logs analysis to identify the source rock capabilities of Rudeis and Kareem formations in Rudeis field, Gulf of Suez, Egypt

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The Gulf of Suez rift basin is considered the most prolific oil province in Egypt in spite of claiming its post-maturation stage. More research up till now considers the geological, geophysical and the geochemical study for the Gulf of Suez. Gulf of Suez region has remarkable and distinguishable geologic characteristics due to its geologic history and economic potentialities.

The main purpose of this paper is to identify the source rock capabilities of Rudeis and Kareem Formations by using five wells which are scattered in the Rudeis Area, Gulf of Suez, Egypt. This study is accomplished by different open-hole well log data such as gamma-ray, density, sonic, resistivity and neutron which are the commonly used wire line logs to identify and quantify source rock through the response of these logs. The volumes of shale are determined, in which the produced shale contents are corrected. Several models depending on the well logging data were utilized to evaluate the source rock indicator as the organic content (vol%), the total organic carbon (wt%) and the discriminant function which differentiate between the source rocks and non-source rocks of the shale and shaly units of Rudeis and Kareem Formation in the investigated area. The total organic carbon is calculated by using several models. Models of Schmoker were applied on 113M10, 113M14 and 113M17 wells, where there is all near relationships between GR and density, while the model of Passey was applied on 113M41 and 113M49 wells.

Moreover, the differentiation between the source rocks and non-source ones has been carried out through the calculation of the discriminative function by using the sonic-resistivity or the density-resistivity combinations. These indicators are represented as organic source analyses logs for the detected sections. Also, the types of the encountered hydrocarbon were defined depending on the relation between the discriminant function and the hydrocarbon preservation. As a result the analyzed formations have considerable total organic and total organic carbon contents, but they have not enough potentiality to produce indigenous oil. Therefore, the formations have been proved to be of non-source type, leading to the occurrence of exogenous type of hydrocarbons. The actual source rocks may be accumulated, somewhere, outside the study area, and the generated oil has been migrated to and accumulated in the study area, after transformation, affecting their log responses and reflecting the presence of mature organic carbon contents.

Biography:

Tarek Farag Shazly is working as a Professor in The Egyptian Petroleum Researches Institute (EPRI). He had the work experience on the topic of Monitoring and interpretation of the well logging data for reservoir analysis.