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THE GEOCHEMICAL PROSPECT OF THE JIHAR-5 WELL IN THE HAYAN BLOCK - SYRIA

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The Hayan contract block belongs to the Palmyride region in central Syria. The aim of our interest is the Jihar area situated on the north-west part of the block. The foregoing geochemical investigations suggested that Lower and Middle Triassic rocks were the possible source rocks for oils and condensates.

The main exploration targets are sediments of the Kurrachine Dolomite Formation of the Middle Triassic age. Geochemical prospects of the Jihar-5 well are focusing on the determination of possible source rocks throughout the well profile. Sediments have been studied in order to identify their source rocks characteristics, hydrocarbon potential, maturity stage and petroleum generation.

Fossiliferous and silty marlstones of Paleogene are determined as thermally immature source rocks with good hydrocarbon generative potential. Kerogen is mostly amorphous with traces of aquatic fragments. High percentage of sulphur (S=10,4%) in kerogen enables generation of bitumen even in a diagenetic stage of thermal evolution. EOM is immature to marginally mature with low hydrocarbons/nonhydrocarbons ratio, originated either from the terrestrial material mixed with aquatic, or from the bacterial and/or algal source, both deposited in anoxic conditions (Powell, 1984).

Upper Cretaceous sediments are organic-rich source rocks with good to very good hydrocarbon potential reaching the onset of the oil window. Pyrolysis results define kerogen type II and mixed (type II and III) kerogen. Nevertheless, the visual analyses of OM exhibit only the presence of solid bitumen (Engel *et al.,* 1993). EOM radically increases with specific vast values of heavier asphaltenes and NSO compounds, probably resulting from the short distance primary migration in the same and/or nearby high-sulphur organic-rich source rock (Orr, 1986). Gas chromatograms are typical for the mature bitumens originated from the marine algal source, deposited in reducing conditions.

Sediments of Kurrachine Dolomite Formation (Middle Triassic) are generally limited in organic matter, except shale/claystone sections with increasing values of TOC (1,47% average). Organic matter is in the main phase of oil generation with a fair to very good generative potential. Relatively low HI values can be misleading and specify the organic matter as kerogen type III. But considering other Rock Eval pyrolysis data, high S_2/S_3 ratio, catagenetic level of thermal evolution, as well as high sulphur content of kerogen (S=8,8%), it can be assumed that HI values are diminished due to exhaustion by the former hydrocarbon generation (Peters, 1986). The entirely amorphous composition of kerogen, their high maturity stage (peak of oil window) and abundance of framboidal pyrite presume a good source for hydrocarbon generation. Even though the cuttings have a lower amount of extractable organic mater (482-853 ppm) than the overlying sediments, core sample to the contrary has a rather high EOM amount (1703 ppm) and, consequently, high EOM/TOC ratio of 22,4%. The TLC/FID analyses of EOM show an enlargement of saturated hydrocarbons (48,3% average) and decrease of heterocomponents, which signifies a progressing in maturity during the thermal alteration processes. The GC chromatograms with a predominance of n-alkanes in the lower molecular range (C_{18}-C_{21}), apparent maximum of n-C_{17} and low Pr/n-C_{17}<1; Ph/n-C_{18}<1 ratios define the mature bitumen derived of marine/algal origin. Differences in Pr/Ph ratios lead to the conclusion that OM has been deposited in reducing, but also in slightly oxic environmental conditions.

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