

Geochemical Evaluation of Asmari and Bangestan Reservoirs in Marun Oilfield, Iran

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In this study, Asmari and Bangestan oils from Marun Oilfield were compared using biomarkers as well as carbon and sulfur isotopes. Also cause of H₂S pollution in Asmari reservoir was studied. Triangular diagram was drawn which show the chemical composition of two studied reservoirs as being praffinic. This approves that, these oils are having high maturity and were escaped from biodegradation. Pri/nC₁₇ versus Phy/nC₁₈, Terrigenous/Aquatic Ratio (TAR) and finally geochemical data, all show that the source rock for both Asmari and Bangestan reservoir is one and the same. This source rock was deposited in reducing environment with algae (kerogen type II) organic matter and without any higher plants as bacterial organic matter. Triangular diagram of C₂₇, C₂₈ and C₂₉ sterane, C₂₇, C₂₈ and C₂₉ monoaromatic triangular diagram and other geochemical parameters all show that both Asmari and Bangestan oils are generated from shaley carbonates, and carbonates had great effect on production of these oils. The values of ETR, Oleanane to Oleanane + Hopane ratio, C₂₈/C₂₉ sterane ratios All shows that the source rock of studied oils is shaley carbonates with middle Jurassic to lower Cretaceous. Since this formation is at great depth, it could not be sampled. Carbon Preference Index (CPI) for all studied oils is less than one, C₃₂-hopane 22S/(22S+22R) versus C₂₉-Sterane 20S/(20S+20R) and the geochemical parameters show high maturity of the crude oils being in the beginning of oil window. Stable carbon isotopes ($\delta^{13}\text{C}$) versus stable sulfur isotopes ($\delta^{34}\text{S}$), Galimov curves and methyldibenzothiophene ratio to dibenzothiophene (MDBTs/DBT) versus Dibenzothiophene to Phenanthrene ratio (DBT/Phen.), all indicate that H₂S gas pollution in Asmari reservoir is originated from Bangestan reservoir. Also thermal sulfate reduction could be the main process for H₂S formation.

Key words: Biomarker, Carbon and Sulfur Isotopes, H₂S pollution, Maturity, source Rock, Kerogen, Marun Oilfield.