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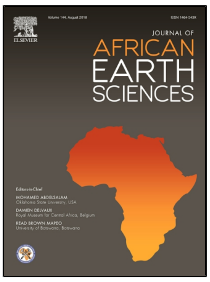

Oil-oil correlation, geochemical characteristics, and origin of hydrocarbons from Mansourabad oilfield, SW Iran

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Oil-oil correlation, geochemical characteristics, and origin of hydrocarbons from Mansourabad oilfield, SW Iran

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Abstract

Biological markers and carbon isotope data were used to delineate characteristics, maturity, and source of the crude oils from Asmari and Bangestan reservoirs of the Mansourabad oilfield, SW Iran. In spite of extremely similar source-related parameters reflecting an identical source, non-biodegraded Asmari and Bangestan oils have different gravities. Based on not-equilibrated maturity parameters, Bangestan oils are slightly more mature than Asmari oils resulting in higher API gravity. Geochemical indicators propose a carbonate-marl source rock deposited in a marine environment under anoxic-suboxic conditions as the source of the oils. Strong marine organic matter signature of predominantly algal origin along with robust signals of contribution from land plants were detected. Based on geochemical evidence, the Mansourabad field Asmari and Bangestan oils being sourced from a mix of Kazhdumi and Pabdeh organic matters. Carbon isotope composition and V/Ni ratio of the oils delineate Kazhdumi Formation of Albian age as the main source rock. Nevertheless, partial contribution of Pabdeh source rocks of Middle Eocene-Early Oligocene were also deduced based on medium concentration of oleanane, low sulfur content, and less than unity values of C_{29}/C_{30} hopanes ratio. It seems that the degree of contribution from Pabdeh-derived oils were insufficient to impact a typical mixed signature over the geochemical fingerprint of the reservoired oils. According to the stratigraphic levels, the latest more mature Kazhdumi-derived oils only charged the adjacent reservoir, resulting in higher overall maturity of the Bangestan oils. Since maturity and bulk geochemical properties of the Asmari and Bangestan oils are different, it can be concluded that fluids within the reservoirs are completely separated from each other by effective static barriers of dense Pabdeh and Gurpi beds.