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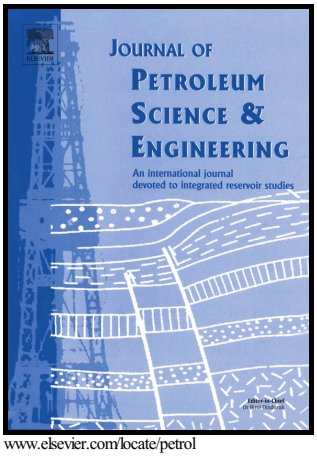

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Oil families and migration paths by biological markers in the eastern Iranian sector of Persian Gulf

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Abstract

A geochemical study of 66 rock and 29 oil samples was conducted to understand effective source rocks, genetic oil families, geographic extent of the petroleum systems and potential migration pathways in the eastern parts of the Persian Gulf. Chemometric analysis of selected source-related biomarker and isotope ratios defines two principal oil families, all derived from source rocks deposited in a marine carbonate environment. The family I occurs in the Late Cretaceous Ilam and Upper Sarvak reservoirs whereas the family II occurs mainly in the Jurassic to Early Cretaceous reservoirs of Dariyan, Gadvan and Upper Surmeh. The negative source rock – oil correlation rejects the source of Gurpi and Sarchahan Formations for these petroleum systems. The oil samples correlate satisfactorily with Middle Sarvak and Middle Surmeh samples. Accordingly, oils of family I were likely derived from Middle Sarvak in the kitchen near Sirri district and migrated westward to fill the Upper Sarvak and Ilam reservoirs. For family II, generation of oil likely occurred in the Middle Surmeh (Diyab) kitchen out of Iranian borders with migration northward over long distance through the Upper Surmeh, Gadvan and Dariyan reservoirs.

Key words: Persian Gulf, Source rock potential, Biomarkers, Oil family, Oil-Source rock correlation

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