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Controlling Factors of Porosity and Reservoir Quality in Carbonate Reservoirs

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In terms of geology and reservoir characteristics, carbonate reservoir rocks are very complex and heterogeneous due to the influence of diagenetic processes. This article studies the Fahliyan Formation oil reservoir in one of the largest hydrocarbon fields in southwestern Iran. Based on core data and petrophysical logs from two wells, the factors controlling the development of porosity and reservoir heterogeneity in this field have been examined. The study results indicate that the reservoir heterogeneity in this field is not inherited from the depositional environment and its prevailing conditions, but diagenetic processes have played a more prominent role. Most of the primary pores have been lost through diagenetic processes such as cementation and compaction, and the reservoir has a higher abundance of pores smaller than 4 microns (mesopores and micropores). Additionally, the integration of core data, XRD, and petrophysical logs shows that due to dolomitization in the middle parts of the reservoir rock, fractures have been created and developed, which is an important factor in oil production in the field.

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