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Permeability Determination using CMR log and core analysis in the Kangan Formation, South Pars Gas Field, Persian Gulf, Iran

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Abstract

Permeability is one of the most important reservoir properties, which is very difficult to measure correctly. It is directly determined in the laboratory on core plugs. In general, few wells in any given field are cored due to high cost associated with coring and some technical problems. Therefore, there was an attempt to find any possible easy applicable method to estimate the permeability. CMR log, which is recently used in petrophysics, as an indirect method, is a powerful tool to permeability estimation. This is because of its ability to recognize porosity and pore types. All of the answer that the CMR is renowned for in clastics, can also be realized in carbonates with some additional benefits exclusive to these complex reservoirs. Several methods such as SDR and Timur models were proposed if CMR log is used. In the present study, these procedures were employed to identify permeability of the Kangan formation (lower triassic) in the South Pars gas field. According to comparison of CMR derived permeability estimations with core permeability data, it is revealed a 0.35 and 0.12 scaling factor for SDR and Timur models, respectively. Due to sensitivity of SDR to hydrocarbon and its poorer match with core data, Timur model is preferred for permeability estimation.