Study of flow unit and electrofacies in the Mishrif Formation (upper part of the Sarvak Formation) and estimation of reservoir zone in Sirri Oil fields located in Persian Gulf

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Abstract

The upper part of the Sarvak Formation is one of important hydrocarbon reservoirs in the Middle East and Persian Gulf. This part of the Sarvak Formation is equivalent to the Mishrif Formation (with mid-Cenomanian age) in Persian Gulf and its neighboring countries. In this study, investigation of a set of well log data and their clustering basedon mathematic and statistical rules resulted in determination of reservoir electrofacies (EF1, EF2, EF3 and EF4) for the Mishrif Formation in three wells of Sirri fields in the Persian Gulf. Then, by using of core porosity and permeability data and flow zone indicator (FZI) method, flow units (A, B, C and D) were identified. With integration of the results from these two methods, reservoir zone thickness of SirriEsfand, Dena and Civand 62 ± 0.5m, 91± 0.5m and 39 ± 0.5m was determined, respectively. Finally, by utilization of water saturation factor, hydrocarbon column thickness in SirriEsfand, 34.5m; in Sirri Dena, 8.5m and in SirriCivand, 39.5m was calculated. Based on these results, hydrocarbon column thickness from SirriEsfand to Dena decreases, and it increases from Sirri Dena towards SirriCivand.

Keywords: Mishrif Formation, Flow Zone Indicator, Electrofacies, Reservoir Quality, Water Saturation