Facies, sedimentary environment, diagenesis, and reservoir quality of the Sarvak Formation in the Darquain oil field, southwest of Iran

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Abstract

The Sarvak Formation (Late Albian-Middle Turonian) is the most important carbonate reservoir rock in Abadan plain area in the southwest of Iran. The carbonate rocks of this formation have different and complex reservoir properties due to their tolerance to different diagenetic conditions and environments. This formation in the Darquain oil field mainly consists of white to cream limestone with thin interbedded of cream-colored argillaceous limestone and shale. The purpose of this study is to identify facies, interpret the sedimentary environment, identification of diagenetic processes, and their effect on the quality of the Sarvak reservoir in the Darquain oil field. For this reason, about 600 thin microscopic sections belonging to cores of wells No. 32 and 33 of this field were studied. Widespread laboratory studies show that the Sarvak formation consists of 9 facies associated with a homoclinal carbonate ramp platform. The most important diagenetic processes in the Sarvak Formation are cementation, dolomitization, dissolution, mechanical and chemical compaction, micritization, and fracturing, which all occurred in marine, meteoric, and burial diagenetic environments. The porosity of the Sarvak Formation in the Darquain oil field is about 10% to 15% and the permeability is variable between 0.1 to 100 milliDarcy. Based on the available evidence, the reservoir quality of this formation is generally good.

Keywords: Facies, Carbonate ramp, Diagenesis, Albian-Middle Turonian