

Neftyanoe Khozyaystvo - Oil Industry 2017 N2, pages 46-48

The Tournesian reservoir limestones on core petrophysical and geochemical data (Southern slope of South-Tatarian Arc)

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Abstract

This paper presents core data on the composition and reservoir properties of the Tournesian carbonate rocks in typical well section on the southern slope of South-Tatarian Arc. The core data include structures, minerals, reservoir properties measurements from previous studies and geochemical signs, just received by method of electron spin resonance (ESR). Investigated interval of 12 m thickness belongs to an upper part of the Tournesian stage. It is composed of two layers: upper grainstone layer (5 m) and lower packstone layer (7 m). The granulated fossils predominate in the studied limestones. A porous space is controlled by primary structures and also by leaching processes, a secondary calcite mineralization and stylolites. ESR data have been obtained on 21 samples collected with a step 0.4-0.6 m along the section. ESR spectra are characterized by narrow lines, pointing on a marine genesis of the carbonates. Paramagnetic centers of Mn²⁺ and SO²⁻ have been observed as typical features of the rocks due by primary processes of carbonate sedimentation. A spatial distribution of limestones types, its geochemical and reservoir signatures is explained by the sedimentary succession of progradation type. The calcite mineralization and a distribution of Mn²⁺ and SO²⁻ paramagnetic ions have been determined along the section profile simultaneously with reservoir zoning due by facies and a history of hydrocarbons.

Keywords

Geochemical labels alternation, Grainstones, Progradation, Tournesian oil saturated limestones

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