

Paramagnetic properties upper devonian reefs during voronezhskii horizon (Conodont scale L.Rhenana)

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Abstract

© SGEM2017. All Rights Reserved. The reef system (carbonate platform) is a geomorphological barrier and a sedimentary and chemical-biological filter in a directed flow of geo-biosphere processes. To carry out lithological and geochemical reconstructions of these processes, an analysis of the change in oxidation-reduction conditions, climate, intake of organic matter type and mineral composition is required. Increased attention to these carbonate platforms is due to the fact that within their boundaries hydrocarbon deposits are discovered, confined to the reef massifs. The purpose of this work was to study the paramagnetic properties of rocks of the Frasnian-Famennian stages of the upper Devonian along a section of the reference borehole for each horizon separately starting from the Voronezhskii horizon; and to highlight the physicochemical conditions of sedimentation and to compare with geophysical data. Thermochemical treatment allows us to detect the presence of organic matter from the spectra electron paramagnetic resonance (EPR) of aromatic carbon nanoclusters. When the samples are annealed at a temperature of 600° C, the EPR signal of insoluble organic matter C 600 with $g = 2.0027$ and a narrow line (~ 1 G) was detected. According to the results of the EPR core analysis at step Voronezhskii horizon (106 samples) was isolated rhythm sedimentation installed alternation pure limestone and dolomite, and was proposed geological and mineralogical criteria of the physicochemical conditions of sedimentation. The boundaries and dolomitization zones are determined by the population coefficient $\alpha = 15 \cdot \frac{1}{1} \frac{(MnMg)}{1} / \frac{2}{2} (MnCa)$ by the Mn²⁺ ions of Mg/Ca positions in the dolomite. Maximum concentrations of organic matter are confined to the shallowest conditions of sedimentation. The concentration of impurity ions in the manganese carbonates naturally increases as the shallowing of the basin and brings terrigenous increase. Criteria have been established for the reconstruction of the variations in oxidation-reduction conditions of sedimentation. For reducing conditions, higher concentrations of SO₂ - are characteristic, and for oxidizing conditions, higher concentrations of SO₃ - and Fe³⁺ are characteristic.

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Keywords

Carbonate, Electron paramagnetic resonance, Organic matter, Reef, Upper Devonian, Voronezhskii horizon

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