

The catalytic effects of carbonate minerals on characteristics of heavy oil in hydrothermal reactions

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Abstract

© 2018, © 2018 Taylor & Francis Group, LLC. Hydrothermal influences on heavy oil were simulated in laboratory conditions. The experimental model was composed of oil, calcite, dolomite, and manganese oxide. Oil to dominant mineral ratio was 1:1, where the content of manganese oxide was 5%. The hydrothermal reactions were carried out under the reservoir temperatures of 250–300°C and a pressure of 1–2 MPa. As a result of treatment, aromaticity of oil increased, while H:C ratio decreased from 1.92 to 1.61. The structures of newly formed light fractions were characterized by low molecular aromatic compounds, which were the destruction products of resins. The treatment provided removal of nitrogen and sulfur from crude oil, hence, decreasing the viscosity of products. The genotype of crude oil did not change. The quantitative changes in the ratio of isoprenoid alkanes to the linear ones were evaluated via geochemical coefficients of group composition.

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Keywords

calcite, dispersion, dolomite, geochemical coefficients, group composition, heavy oil, hydrothermal influences, rheology

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