

Micro-oil at great depth

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By the example of 6,5-9,6 km deep boreholes (West and East Siberia, North America), a comparative analysis of geochemical data on generation and destruction of micro-oil in the deposits with organic matter of different compositions and concentrations has been performed over a wide range of meso- and apocatagenesis, when vitrinite reflectance (R°) changes from 0,85 to 3,5 %.

It is shown that the ratio of these two processes and, hence, the lower depth of distribution of liquid hydrocarbons depend on the saturation of organic matter with lipids.

In mixed organic matter the generation is complete at R° 1,5-2,0 %, and the subsequent intense destruction of substantially humic and substantially sapropelic varieties manifests itself at R° 1,5-2,0 % and 2,0-2,5 %, respectively. The destruction is sharply retarded at R° 2,5-3,5 % . Qualitatively, it occurs as further aliphaticization of bitumen, in which thermally stable methane hydrocarbons and phthalate compounds become predominant. Aromatic hydrocarbons show prevailing bicyclic structures. Most common among *n*-alkanes are molecules with even carbon numbers, especially those with long chains (solid paraffins). They could be formed by the subdivision of cyclanes and detachment of branches from isoprenoids. Short chain volatile compounds appear to escape from bitumen, increasing the content of hydrocarbon gases in the rocks.

In the sapropelic varieties of organic matter, which are abundant in domankoid deposits, the generation at apocatagenesis is intense, and the destruction is insignificant.

On the basis of these data a limiting depth of commercial accumulations of liquid hydrocarbons is forecasted.