

SCIENTIFIC RESULTS OF SUPERDEEP DRILLING IN OIL- AND GAS-BEARING PROVINCES OF RUSSIA

BELOKON', T.V, GORBACHEV, V.I, KELLER, M.B, KAPLUN, V.A, SIROTENKO L.V. Scientific-Industrial Center for Superdeep Drilling and Comprehensive Studies of the Earth's Interior Nedra, Yaroslavl, Russia

Scientific results of superdeep drilling in oil- and gas-bearing provinces of Russia. BELOKON', T.V, GORBACHEV, V.I, KELLER, M.B, KAPLUN, V.A, SIROTENKO L.V. Scientific-Industrial Center for Superdeep Drilling and Comprehensive Studies of the Earth's Interior Nedra, Yaroslavl, Russia. Oil, gas and tar shows below 4 km have been discovered in all the wells with a depth of more than 6 km in Timano-Pechora and the northern part of West Siberian provinces of Russia. In the northern part of West Siberia we obtained a water-dissolved gas with a high content of methane enriched with a heavy isotope of carbon from a depth of 6.6 km. In Timano-Pechora province relicts of previously existed oil deposits were identified at depths below 6 km. We discovered reservoirs in various types of rocks: carbonate, terrigenous and magmatic. Basic factors which influence formation of rock voids at big depths were substantiated. We proved the provisions of a sedimentary-migration theory of oil genesis regarding the main zone of oil generation (oil window) and the lower boundary of oil existence which in regions under study is defined at depths of 4.5-5.5 km. It was discovered that a vertical zonality of oil- and gas-bearing capacity at big depths is mainly controlled by processes of a catagenetic transformation of organic matter. We developed a number of specific criteria of deep oil- and gas-bearing capacity which take into account processes of generation, migration, accumulation of hydrocarbons and preservation of deposits. The most favourable conditions for oil- and gas-bearing capacity at big depths are in zones of deep subduction of the basement at low values of paleo and current temperature gradients, high level of post-sedimentation changes of rocks and development of processes of unconsolidation of rocks to the main phases of oil and gas transformation.