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Bazhenovo formation as an intermediate hydrocarbon reservoir in fault zones (West Siberia)

E A Predtechenskaya¹ and O N Zlobina²¹Siberian Research Institute of Geology, Geophysics and Mineral Resources (SNIIGGiMS), Russia²Trofimuk Institute of Petroleum Geology and Geophysics, Russia

The Bazhenovo formation which contains about 15% of hydrocarbon (HC) resources of West Siberia is of a great interest as a target of HC accumulations in reservoirs of unconventional type. The bituminous Bazhenovo Formation belong among domanikoid formations and are characterized by abnormal reservoir pressures, higher temperatures, low viscosity and density of HC mixtures at their high gas saturation. The formation contains swelling clay minerals of hydromica-montmorillonite composition, interlayers of radiolarian silicites and pelecypodian shelly deposits of porous loose structure. This fact favors petroleum HC sorption and their concentration as local accumulations inside the oil-source strata. Interlayers of secondary altered radiolarites and pelecypodian shelly deposits in well logs show features typical of fine-grained sandstones and siltstones. Enhanced fracturing and ability to brecciation of rocks confined to zones of deep faults with events of dynamic fluid migration benefit anomalous processes of kaolinitization, partial carbonatization and silicification of rocks with the formation of secondary porosity and reservoirs of improved quality. Hydrothermal processes are often connected with a neotectonic stage of tectonic activation and caused by vertical migration of deep fluids. Siliceous (radiolarites), carbonate (shelly) and microlaminated silica-clay rocks of the Bazhenovo Formation undergone hydrothermal changes can serve as reservoirs accepting allochthonous hydrocarbons in addition to autochthonous ones. When the pressure forced by deep fluids exceeds the reservoir pressure in «oil-source» strata, there occurs a fluid fracturing, HCs migrate up the section and accumulate in overlying porous reservoirs. From this standpoint the Bazhenovo Formation may be thought of as an intermediate hydrocarbon reservoir.

Biography

E A Predtechenskaya defended her PhD thesis in 1984 and DSc thesis in 2011. She is a leading Scientist of the SNIIGGiMS JSC in Lithology and Petroleum Geology, the Head of the Postgraduate Studentship department, a member of two Dissertation Councils in the Institute of Oil and Gas Geology and Geophysics of the Siberian Branch of the Russian Academy of Sciences, an expert of the Russian Foundation of the Basic Research. She has published about 90 scientific papers in the fields of lithology, mineralogy, oil and gas geology, including a monograph and an inventor's certificate.

predel@sniiggims.ru

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