Short Reports

REGIONAL OIL AND GAS BEARING STRATIGRAPHIC COMPLEXES AND FORMATIONAL ANALYSIS DATA FOR TERRITORY OF THE YURYUZANO-SYLVINSKAYA DEPRESSION

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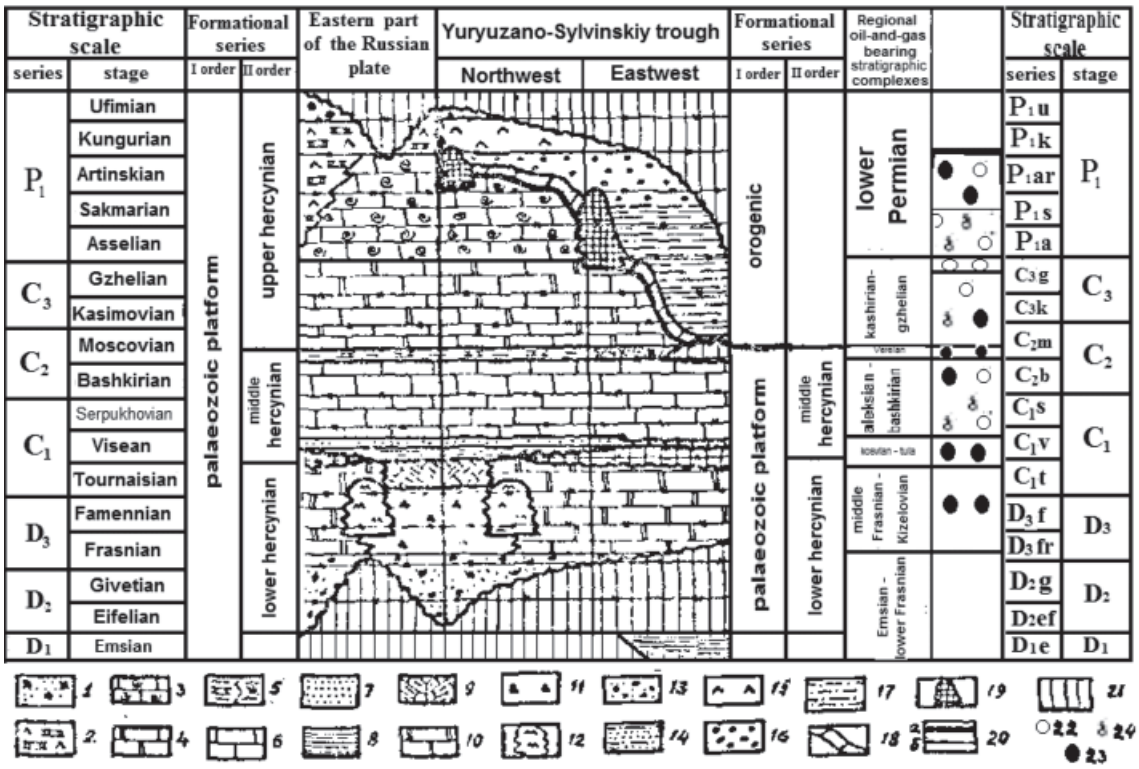
The thickness of paleozoic sedimentary series in the Yuryuzano-Sylvinskaya depression of the Pre-Urals foredeep changes from 2,3 to 5,5 km. This series has heterogeneous facial and formational composition. The formational analysis has been used to study the oil and gas deposits related to the Yuryuzano-Sylvinskaya depression and to study the regularities of its structure. An attempt to create the system model of the structure this area of the Earth's crust by means of the formations, the tectonics and the predictive oil and gas content has been made.

There are seven regional oil-and-gas bearing stratigraphic complexes and eighteen formations making up three formational series such as the Caledonian preplatform, the Hercynian platform and orogenic in the sedimentary rock mass of the Palaeozoic (Figure).



The comparison of the palaeozoic formational series of the Yuryuzano-Sylvinskaya depression with the regional oil-and-gas bearing stratigraphic complexes (on S.N. Kalabin, 1994 with changes and additions of authors). The legend:
1–14 – platform formation: 1 – red carbonate-terrigenous; 2 – sulfate limestone dolomite; 3 – limestone; 4 – kashirian-gzhelian limestone-dolomitic; 5 – carbonate-clayey; 6 – viseian-bashkirian dolomitic-limestone; 7;8 – sandy clay; 9 – siliceous carbonate wedgeform; 10 – limestone-dolomitic middle frasnian-tournaisian; 11 – siliceous clayey carbonate domanic; 12 – carbonate reefogenic; 13 – clayey sand; 14 – sandy silt; 15–19 – orogenic formations: 15 – saliferous; 16 – upper marine molasse; 17 – lower marine molasse; 18 – carbonate-clayey depression; 19 – carbonate reef; 20 – boundaries 21 – lack of accumulation; 22 – gas pool; 23 – oil pool; 24 – condensate

The territory of the Yuryuzano-Sylvinskaya depression (YSD) is characterized by various geological conditions of the oil-and-gas field distribution and different structures containing hydrocarbon accumulation. Most of the commercial oil and gas accumulations are found in the reservoir of the

Hercynian platform carbonate formations while the sandy shale formation, one of the main formations of the Russian Plate, has oil and gas content limited only by the western part of the YSD [1]. This is due to the considerable subsidence and heating and to the long term of rocks cooling of the sandy shale formation thus sandstones and siltstones lost their reservoir properties on the greater part of the YSD [1]. Among the carbonate formations the Visean-Baschkirien dolomite-limestone formation has the largest areal of oil-and-gas content. There is the tendency to section dislocation of oil and gas content upwards the depression formation (zonal-regional cap rock) in the rock mass of the Kashirskian-Gzhelskiy and Asseliaan-Artinskian carbonate formations. Oil and gas content in the eastern part of the YSD is related to the Upper Carboniferous «reefs». Oil-and-gas content in the northern part of the YSD is associated with the Asselian-Kungurian reef massif of the carbonate reef formation (Verkhnechusovskoe field). The carbonate-clay depression formation is replaced by lower molasse formation in the east. Gas and gas condensate production are associated with its terrigenous reservoirs [4]. Natural reservoirs of Kungurian salt and upper molasse formations have no prospects for oil and gas. In the north of the YSD the structures the Upper Devonian barrier reef of carbonate reef formation (Komarihinskoe field) and Tournaisian siliceous carbonate clinoforms (Verkhnechusovskoe field) are productive for oil and gas.

Original geological conditions of oil-and-gas field distribution let us consider the Yuryuzano-Sylvinskaya depression to be oil-and-gas bearing region of the Volgo-Ural oil-and-gas province [1].

Formational analysis of the territory of the YSD revealed the following regularities:

1) the main role of the oil-and-gas field distribution is associated with the reservoirs of Hercynian platform carbonate formations such as the Upper Visean-Baschkirien dolomite-limestone formation and limestone-dolomite Kashirian-Gzhelian formation that is not typical of the Perm krai;

2) relatively less importance in the oil-and-gas field distribution play the reservoirs of Vereian carbonate-terrigenous, Midlle Frasnian-Tournaisian limestone-dolomite, Tournaisian siliceous-carbonate and Asseliaan-Artinskian limestone formations. Oil and gas content of platform terrigenous formations is restricted to the western part of the Kyzylbaevsko-Chusovskoy tectonic block. This is different from the Kosvinsko-Tula regional oil-and-gas bearing stratigraphic complex of Perm krai in the way that it has the largest identified and potential resources of hydrocarbons. In the eastern part of the YSD among orogenic formations lower marine molasse formation is gas-containing and in the north and east oil and gas content is confined to carbonate reef formation;

3) commercial oil and gas content is confined to low amplitude geological high complicating tectonic blocks; the crucial role of the gas content distribution is played by the high amplitude structures associated with thrust-faults;

4) Perspective regional oil-and-gas bearing stratigraphic complexes of the Permskiy Krai from the terrigenous Emsian-Lower Frasnian till the Kashirian-Gzhelian occur under the Urals thrust-folds and collapse forming anticlinal folds that is a precondition for prospecting and exploration for new deposits in the south-eastern part of the YSD.

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