

The paragenesis of coal and oil deposits in paleozoic sediments in the east of the Eastern European platform

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Abstract

© SGEM2016. The Volga-Ural oil and gas province is located in the eastern part of the East European platform. The oil in Devonian sediments is the most important type of fossil fuels in the region. There are also known other types of caustobioliths in the Late Paleozoic sedimentary formations of this province. That is the coal (Carboniferous and Permian) and bitumen (Permian). The oil and bitumen deposits are being developed now. The economically important coal seams are also found in the terrigenous Visean deposits. The largest oil reserves in the region are associated with Devonian sediments. There are also the rocks, called domankites, in Devonian sediments. They contain high content of organic matter. The sediments could be interesting as a source of unconventional "shale" types of hydrocarbon raw materials. Large masses of fossil fuels are associated with deposits of Carboniferous (Visean stage). There are the resources of the coal and oil. Predicted resources of the coal reach about 3.5 billion tons. Visean sediments are filling the depressions on the ancient surface of Tournaisian carbonate deposits. The depressions were formed as a result of the erosion and karst processes. The Visean coal seams lie at the depth of about 1000 meters. The coal is characterized by relatively high quality parameters. They are characterized by 15- 26% ash, 3.1- 4.2% sulfur content, 29.9- 31.4 MJ / kg of calorific value. Some samples of the coal contain high content of trace elements, including REE. Visean coal-bearing sediments are also characterized by the high economic resources of the oil. The study of the drilling materials shows that many Visean coal seams contact with the oil reservoirs. The coal seams also may be of interest as an object for the development of the coalbed methane. The Permian sediments contain deposits of the coal and bitumen. The coal-bearing formation includes 4-6 coal seams up to 1.75 m. Permian coal is brown, with medium-high sulfur content (up to 4%) and with an ash content of 40-48%. Permian coal deposits are not of practical interest at present because of their small sizes. But there are numerous deposits of bitumen in Permian, which are of commercial interest as high-viscosity oils. The bitumen deposits lie at depths up to 400 m. In this connection, one of the most interesting sedimentological and geological problems is a finding of genetic links between the different types of caustobioliths. As research shows, paragenetic communication between the various caustobioliths may be caused by the paleogeographic conditions of their sedimentation. That creates prerequisites for the accumulation of various types of caustobioliths in a limited area. Co-occurrence of the different caustobioliths (oil, coal, bitumen) allows to speak about possibility of their integrated development.

Keywords

Carboniferous, Coal, Deposits, Oil, Permian