Organic matter in the fossil sediments of the West Siberian marine basin (Tithonian-Lower Berriasian)

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The Tithonian-Lower Berriasian Bazhenov Formation of black shales occupies an area of above 1 million sq. km. It is a source rock formation for the largest oil fields of the West Siberian megabasin. The formation thickness is low, 25-30 m. The main types of the formation rocks are carbonaceous argillites and carbonaceous-argillaceous-siliceous, mainly biogenic rocks. The West Siberian Late Jurassic sea was to 500 m deep. The accumulation of organic matter occurred under the conditions of high biogenic productivity and very slow terrigenous sedimentation. Due to intermittent changes of the amount of fresh water coming into the basin, rates of terrigenous sedimentation, the connection of the basin with the Boreal ocean, the salt composition of sea water, level of hydrogen sulphide contamination and biota composition were variable. This resulted in the periodical development of plankton, benthic fauna, replacement of the biogenic sedimentation regime by terrigenous one. The formation rocks contain high concentrations of organic matter, from 5 to 25%. Kerogen of the Formation is formed due to polymerization in sediments in anoxic and hyrogen oxide contamination environments of lipid complexes of planktonic and bacterial living matter. It is enriched in ^{12}C carbon isotope, hydrogen (7-8% wt.) and sulphur. Bitumen biochemistry is related to the environments in the different parts of the basin. The relationship between oil composition and the main types of environments (biogeochemical facies) has been established. Similarity in the depositional environments of the Upper Proterozoic and Phanerozoic marine black shale sequences has been marked.