

Lithology and formation conditions of the Triassic-Jurassic sediments of the South Barents Basin (well Arctic, Murmansk)

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The Barents Sea basin is one of the largest oil and gas basins of Russia with proven productivity. The unique Shtokman and large Ice, Ludlov, Arctic and Murmansk gas and oil fields were discovered in the Jurassic-Triassic deposits in the Russian part of the Barents Sea. The partial or total absence of Jurassic deposits in certain areas of the Barents Sea, the lack of well and seismic material complicate the selection and prediction of areas of natural distribution of the reservoir in the Barents Sea. New seismic data obtained in the Russian and Norwegian parts of the Barents Sea allowed us to determine the distribution of the Jurassic-Triassic oil and gas complex, estimate its thickness.

A comprehensive analysis of the regional structure of the Jurassic oil and gas complex and detailed studies of individual areas provide an opportunity to predict the distribution zones of Jurassic and Triassic high-capacity reservoirs on BMS structures and assess the prospects for their oil and gas potential. In the master's work the core of 2 wells was investigated: Arctic, where the deposits of the Lower and Middle Jurassic - Middle and Upper Triassic, are opened in the depth interval of 2416-4515 m with core removal of 594 m; and Murmansk, where the Triassic deposits, with an interval of depths of 2204.26-3028.30 m and a core removal of 824m. For research, reference core samples were provided; 120 pieces; X-ray phase analysis data.

The aim of the study was to identify the genetic characteristics of sediments and the restoration of sedimentation environments. During the study, the following tasks were set: 1. Detailed material characteristics of the cuts; 2. Isolation and systematics of lithological types of sediments composing well sections, analysis of their turnover by section and area; 3. Genetic interpretation; 4. Typification of secondary changes affecting the reservoir properties of rocks.

The research tasks were solved by a complex of methods: a macroscopic description; study of rocks in thin sections; the study of X-ray phase analysis data - these methods allowed to characterize in detail the material component of sediments and to identify lithological types. The complex of methods for genetic analysis (structural-textural analysis, regularity of turnover in the section) made it possible to carry out genetic interpretation and, drawing on literary data, to identify sedimentation environments. The application of the method of stadial analysis made it possible to classify secondary changes of rocks, to trace the processes and stages, and also to consider their influence on reservoir properties.

As a result of the study, detailed material characteristics of Triassic-Jurassic deposits in 2 wells were given; genetic interpretation was carried out with the restoration of sedimentation environments; secondary changes of rocks with the construction of a model of lithogenesis are typified and their influence on reservoir properties is traced.

Источники и литература

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