

Секция «Геология»

New data on the geochemical studies of oils of the "anomalous" wells within the Minibayevskaya area of Romashkinskoye field.

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This paper is dedicated to the problem of definition of geochemical criteria of selection of hydrocarbons deposit reformation zone in the sample wells of Minibaevskaya area of Romashkinskoye field. While carrying out this work we examined 11 samples of oil from the Upper Devonian Pashiysky horizon. Four oil samples were collected from wells reckoned among the "anomalous" zones that were marked out according to the results of geophysical, oil field and geological research. The wells where the signs of hydrocarbons influx from the deep zones of the crust were recorded are considered to be "anomalous". A number of scientists connect this fact to the hypothesis about periodic influx of deep hydrocarbons to the oil deposits of Romashkinskoye field. Other researchers believe that the source rocks of the adjacent valleys sedimentary cover generate gases when entering the main zone of gas formation, which then migrate up the section and passing through the previously formed deposits of oil, change and "lighten" their composition. Regardless of the point of view on the source of the hydrocarbons, the study of the process of deposits refilling with light hydrocarbons is an important fundamental task of exceptional practical importance. Geochemical studies of oils were conducted in the laboratory of geochemistry of fossil fuels Kazan (Volga-region) Federal University. These studies included the following steps: 1) oil dehydration, 2) determination of group composition of oil (percentage of oils, resins and asphaltenes content), 3) Gas chromatographic studies lube fraction of oil, 4) investigation of C1-C6 gases in oil samples with the help of vapor-phase analysis method, 5) determination of the elemental composition of oil, 6) determination of the $\delta^{13}\text{C}$ isotopes in the analyzed oils and their components. The complex of these techniques allowed us to determine: 1) the type of the original organic matter (OM), 2) the conditions for the formation of OM, 3) the degree catagenetic maturity, 4) correlation in the "oil-oil" system. According to the results of chromatographic studies we ascertained the following: 9 oil samples can be attributed to the same family according to the composition of organic matter, 1 oil sample from the well 231 proves to be immature, heavy oil, while the sample from the well 9589 according to the composition of its OM proves to be more mature and light oil, enriched with light hydrocarbons. The study of C1-C6 gases was performed on a gas-liquid chromatograph equipped with a vapor-phase analyzer. The sample from the well 231 revealed the minimum content of gases, while the sample from the well 9589 - the maximum. Thus, catagenetically transformed oils can be characterized by a higher content of dissolved hydrocarbon C1-C6 gases. No significant differences were found with regards to the content of C, H, N, S, O elements in these oils. The isotopic composition of the studied oils is generally described basing on the oil samples, their lube and asphaltene fractions. The values of $\delta^{13}\text{C}$ 8203; 8203; range from -28.2811 to -30.5923, $\delta^{13}\text{C}$ for lube fractions from -28.4029 to -30.4898 and $\delta^{13}\text{C}$ of

asphaltene fractions from -29.4424 to -30.8964. The results of studies presented showed that the peculiarities of oil composition can be an additional criterion for the prediction of the "anomalous" zones and understanding of the mechanism of their occurrence.