ulometric analysis of the core samples and X-ray phase analysis for rocks mineral composition study require special equipment and they are labor-intensive and time-consuming.

The problem was to divide core samples into two groups depending on their clay content and, in this paper, application of the express method of the indicator solution for solving this essential problem of samples segregation was proposed [3, 4]. The degree of transparency of water solution of methylene blue after the interaction with the rock was analyzed.

In the present work, the general mineralogical compositions of samples were determined using x-ray phase analysis (XPA). The mineralogical compositions of the samples were determined from the ratio of principal diagnostic reflections in diffraction patterns obtained under rigidly constant exposure conditions with observance of special safety requirements for working with sources of ionizing radiation.

The optical density of the indicator solution was determined on a KFK-3-01 photoelectric photometer using the optimum spectrum recording conditions. Solution optical density was measured at wavelength 665 nm, which corresponded to the absorption maximum of an aqueous solution of methylene blue.

For the experiment, several samples from the productive formations of the Western Siberia region were taken, represented by fine-grained sandstones. It is crucial to note that for siltstones and sandstones visual determination of clay content is the most difficult procedure.

The clay content in the samples varies from 14 to 33 %.

Clayey minerals were primarily kaolinite and chlorite.

Water solutions after interaction with the samples with high clay content (>30 % clay minerals content), do not have any color. Consequently, the temperature in oven, where dry core sample, should not exceed 70 °C.

Thus, indicator solution method in laboratory practice of chemical and petrophysical studies makes it possible to increase the efficiency of clay minerals content determination. It is crucial to note, that incorrect core samples separation based on their clay content may cause the structural damage of their pore space.

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INVESTIGATION THE EFFECT OF DIESEL FUEL FRACTIONAL COMPOSITION ON THE EFFECTIVENESS OF LOW-TEMPERATURE ADDITIVES

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The consumption level of the diesel fuel (DF) in Russia considerably increases every year. The climate of some country regions is cause of need for winter and arctic brand of diesel fuels. The simplest way to achieve the required low-temperature properties of the fuel is the using of additives. However, additives effect different on various fuels, because of existence of interaction between the additives components and the hydrocarbons which diesel consist [1].

Table 1. Fractional composition of diesel fuel sample

T, °C										
IBP	V, ml									
	10	20	30	40	50	60	70	80	90	95
138	161	179	204	227	247	266	284	306	330	–

Table 2. Low-temperature properties of diesel fuel samples

Sample	CP, °C	CFPP, °C	PP, °C
DF without additive	–12	–24	–45
DF with additive	–12	–26	–50

Table 3. Determination of CFPP for the blend of diesel fuel sample with the addition of low-temperature additive and heavy diesel fraction

CFPP, °C		
Content of Diesel fraction 300–360 °C, % vol.		
1	5	10
–29	–34	–27

The aim of this work is to establish how the fractional composition of diesel fuel effects on the effectiveness of the low-temperature additive. The investigation was conducted for one diesel fuel sample and one low-temperature additive. The composition of diesel fuel sample was determined according to [2]. The result are presented in Table 1.

According to the results of fractional composition determining, the investigated sample is lightweight diesel fuel. For the investigated diesel fuel sample and the blend of diesel fuel with investigated additive, low-temperature properties were determined according to the standards [3, 4, 5].

Based on the results of the low-temperature properties determination (Table 2), the use of an additive does not change the cloud point (CP), and the effect on cold filter plugging point (CFPP) and pour point (PP) is insignificant. Therefore, the low temperature additive do not work effective. For the study the effect of the diesel fuel fractional composition on the effectiveness of low-temperature additives, the various amounts (1, 5, 10 % vol.) of heavy diesel fraction with 300–360 °C boiling range, were added to the blend of diesel fuel sample and low-temperature additive. For the resulting blend, the CFPP was determined similarly. The results are presented in Table 3.

From the results presented in Table 3 the weighting up of the diesel fuel has a positive effect on the effectiveness of the investigated low-temperature additive. However, it is important to note that, when the content of heavy diesel fraction is 10 % vol. the CFPP increase is occur, which indicates the need to search for the optimal content of heavy fractions in the composition of the fuel when low-temperature additives using.

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