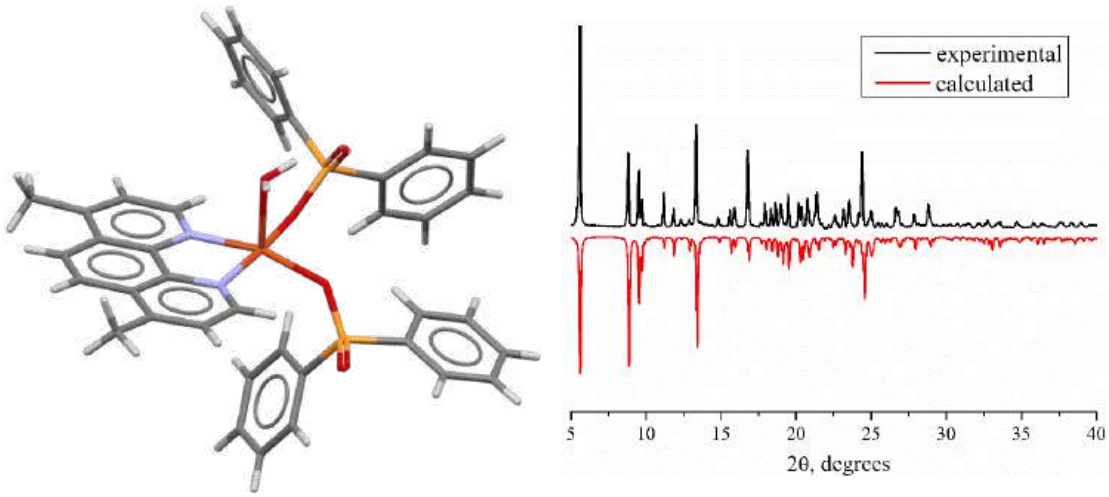

Fig. 1. *Crystal structure of [Cu(dmphen)(H_2O)L_2] and its X-ray powder pattern*

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IMPROVING THE LOW-TEMPERATURE PROPERTIES OF DIESEL FUEL BY ADDING A PETROLEUM RESINS

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According to statistical data presented in [1], there is an increase in consumption and production volumes of diesel fuel (DF) from 2017 to 2023. Nevertheless, the problem of increasing production volumes of low-solidification DF for the Arctic and Northern regions remains relevant. Taking into account the technological and economic aspects, the most suitable way to obtain low-solidification DF is the addition of depressant additives (depressants).

However, the use of depressants does not in all cases ensure the achievement of the necessary low-temperature properties of DF. Petroleum alcohol-benzene resins are natural depressants [2], therefore, when adding resins to DF, they are adsorbed on the primary centers of n-paraffin crystallization, due to which the growth rate of n-paraffin crystals significantly decreases. This, in turn, indicates the possibility of their use in order to increase the effectiveness of depressants.

The work examines the low-temperature properties of mixtures of DF with the addition of petroleum alcohol-benzene resins (ABR) in concentrations: 0.0025; 0.005; 0.0100; 0.0005 % wt. The results are presented in the Figure.

According to the Figure, introducing resins in concentrations of 0.0100 and 0.0500 % wt. contributes to the deterioration of DF cloud point (Cp). The best depression of Cp is achieved when resins are introduced at a concentration of 0.0050 % wt. With an increase in the concentration of added resins, the pour point (Pp) of DF improves. The best depression of Pp is achieved when resins are introduced at a concentration of 0.0500 % wt. However, with increasing resin concentration, the cold filter plugging point (CFPP) of DF deteriorates. As a result of the

introduction of resins in various concentrations, the DF grade was lowered from the interseasonal (E) grade to the summer (S) grade [3].

The deterioration of Cp and CFPP with increasing concentration is due to the fact that petroleum resins have greater polarity than molecules of n-paraffins included in DF. Therefore, there is a synergy between the interaction of resin molecules and n-paraffins, which accelerates the phase transition and the formation of crystals [2]. The improvement in Cp can be explained by the mechanism of interaction between resin molecules and n-paraffin molecules. Resins slow down the growth of n-paraffin crystals, as a result of which the fuel does not form framework structures longer and does not lose its mobility.

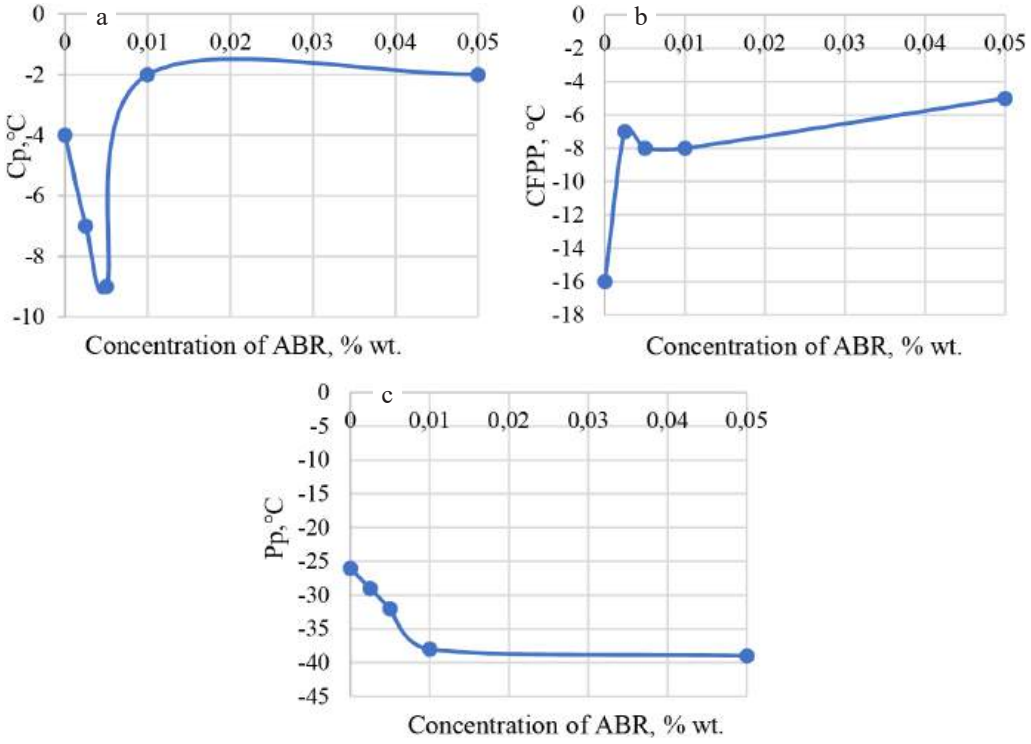

Fig. 1. *Effect of additional concentrations of ABR on: a) Cp, b) CFPP, c) Pp*

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