heavy n-paraffins (heneicosane and docosane) has a positive effect on the effectiveness of the additive, and with the addition of 3 % vol. heneicosane to the DF1/Ad blend, the greatest positive effect was observed.

Based on Figure 2, it can be seen that with an increase in the concentration of heavier n-paraffins, the positive effect on the effectiveness of the depressant additive decreases and turns into a negative one. It is also seen that the addition of cetane in any amount has a positive effect on the effectiveness of the additive, and at a cetane concentration of 5 % vol. the greatest improvement in the efficiency of the additive is observed.

Thus, it is shown that the depressant addiive with the same addition of pure hydrocarbons to diesel fuel samples gives a different effect, which is due to the difference in the initial composition of diesel fuel samples.

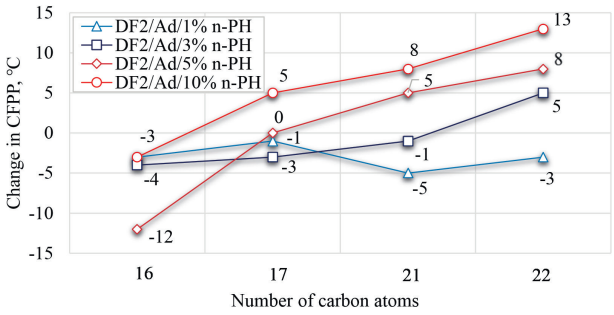

Fig. 2. *Changes in CFPP of DF2/Ad/n-PH blends relative to the properties of DF2/Ad blends*

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OBTAINING DIESEL FUELS WITH IMPROVED LOW TEMPERATURE PROPERTIES BY ADDING PETROLEUM RESINS, n-PARAFFINS AND A DEPRESSANT

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Nowadays the search for technologies and methods for obtaining diesel fuels with improved low temperature properties (DF) for regions located in the Arctic climatic zone has not lost its relevance [1]. Low-temperature characteristics, such as cloud point (Cp), Cold filter plugging point (CFPP) and pour point (Pp) of diesel fuel, mostly depend on the hydrocarbon composition of the fuel, especially on the content of long-chain alkanes (n-paraffins) having a high crystallization temperature [2]. The introduction of depressants, both synthetic (Ds) and natural (petroleum resins, Dn), allows diesel fuel to remain mobile at lower temperatures, blocking the growth of crystals during interactions with the initial crystallization centers of n-paraffins.

The research presents the results of studies of the effect of adding depressants of various nature on the low-temperature properties of the mixtures of DF and depressants (Table 1).

As can be seen from the results of the determination of low-temperature properties in Table 1, the addition of depressants of different nature leads to an improvement in cold filter plugging point (Δ16 °C and 1 °C, respectively) and pour point (Δ29 °C and 8 °C, respectively). Simultaneous addition of depressants of synthetic and natural origin gives the best result in relation to CFPP (Δ19 °C).

The effectiveness of low temperature additives is determined by the content of n-paraffins (P) in

Table 1. Low-temperature properties of diesel fuel with depressants mixtures

Sample	Cp	CFPP	Pp
	°C		
F	0	0	–8
FDs	–2	–16	–37
FDn	0	–1	–16
FDsDn	–2	–19	–36

Table 1. Low-temperature properties of diesel fuel with n-paraffin and depressants mixtures

Sample	Cp	Δ	CFPP	Δ	Pp	Δ
	°C					
FDs	–2	5↑	–16	3↓	–37	3↓
FPDs	3		–19		–40	
FDn	0	5↑	–1	1↑	–16	13↑
FPDn	5		0		–3	
FDsDn	–2	0	–19	2↓	–36	4↓
FPDsDn	–2		–21		–40	

the composition of diesel fuel. Table 2 shows the change in the low-temperature properties of mixtures of diesel fuel with depressants when additional n-paraffins are added into the mixture.

Results of determining the low-temperature properties in Table 2 show that the adding n-paraffins to samples of diesel fuel with synthetic polymer depressants improves the low-temperature properties of DF and leads to a decrease in CFPP and Pp (Δ3 °C) and an increase in Cp (Δ5 °C).

The addition of n-paraffins to DF samples with natural depressants (oil resins) leads to the deterioration of all low-temperature properties; new recipe of DF samples with n-paraffins, synthetic polymer and natural depressants leads to an improvement in the low-temperature properties of diesel fuel in relation to CFPP and Pp (Δ2 °C and 4 °C, respectively).

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MODELING PROCESSES USING ASPEN AND UNISIM WITH ETHYLENE GLYCOL AS ADSORBENT MATERIAL AND ANALYSIS OF RESULTS

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Natural gas is a component widely used in various sectors of society, whether for energy production, or for basic processes, or for the production of synthesis gas.

Cleaning natural gas is a necessary treatment because along with the gas there are components that harm the materials used to process it, such as pipes and tanks. These toxic components are varied, but the main ones are H_2S, CO_2 and water.

Water is not a toxic component, but its removal is carried out in order to optimize the energy of the refinery and processing plant, since changing the physical state of water requires a large amount of energy compared to gas.

Water removal is accomplished through the use of glycols in absorption processes where water is attached to the glycol molecule and separated from the gas.

With regard to hydrogen sulfide, the component causes corrosion of the materials used due to mixing with water and forming a more acidic solution. The use of amines is recognized worldwide as a component for H_2S removal, however it is important to emphasize that not only hydrogen sulfide but