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

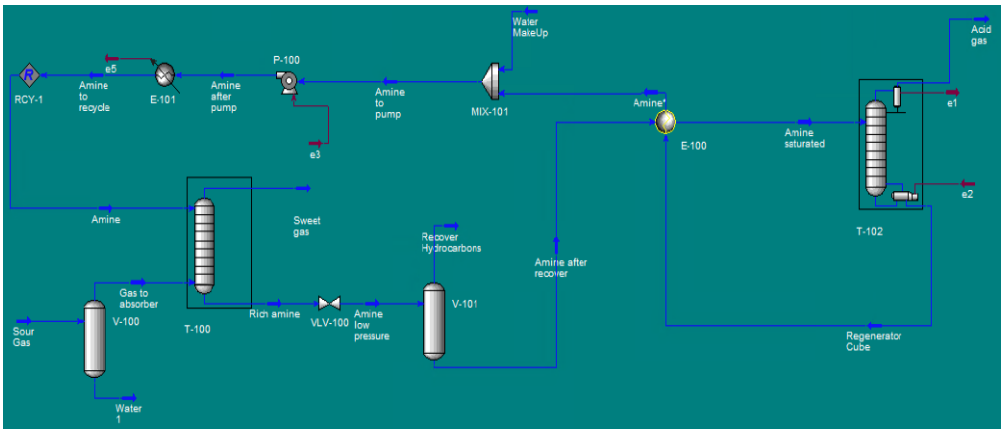

Fig. 1. *UniSim model for removal with EGlycol*

also CO_2 compete for preference in the absorption reaction with the amine.

Thus, a study was developed to monitor the transformation and purification of natural gas by amine using the programs Aspen and UniSim and a conclusion was drawn upon the best program for the evaluation of impurities removal. In Figure 1, the model using UniSim is shown.

In conclusion, UniSim is a great modeling tool. But in certain conditions of pressure and temperature, the software is ineffective to solve the presented problems. The Amines package that is included in the software is limited by the maximum concentration of solution that can be used, depending on the type of amine used. Thus, only a 35 % mass concentration study can be carried out with the DEA, since other formulations were not accepted by the program.

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SYNTHESIS AND APPLICATION OF ZEOLITES IN THE PROCESSES OF FIELD PREPARATION AND PROCESSING OF PETROLEUM FEEDSTOCK

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The ash from materials from the combustion of solid fuels for energy production can be an environmental liability due to the large amount of waste [1, 2]. One application for one of the residues, ash, can be used in the synthesis of zeolites, which in addition to being more valuable products, have several industrial applications due to their special ion exchange, adsorption and catalysis characteristics [2, 3].

The ease of use of this residue and its low cost have led to an increase in the volume of scientific work aimed at its use in the creation of new prod-