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COMPOSITION OF PARAFFIN INHIBITOR FOR OIL AND OIL PRODUCTS

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Kazakhstan is paraffin, i.e. contains a significant amount of alkanes of normal or lightly branched structure. The latter type is characterized by an increased pour point, which causes deterioration of the rheological properties (mobility, fluidity, etc.) of both the oil itself and its products. This fact has a negative impact on the process of oil extraction and transportation, and therefore is a subject for research in order to improve the technological effectiveness of the oil industry. Prevention of crystallization of paraffin is possible by heating the oil to 50-60 ° C, but this method sometimes leads to unnecessary costs and is not economically justified. Lowering the crystallization temperature can be achieved by mixing high-paraffin oil with low paraffin or solvents, which also leads to additional time and resources. Many compositions of popular solvents and additives were studied, as a result of which we came to the final choice of the necessary components for the development of this additive. Numerous organic solvents were used as the solvent, but for this type of additive, it did not show satisfactory results, which led to a study of the characteristics of the desired solvents with suitable properties. A new composition paraffin inhibitor consisting of synergistic compositions combined pour point depressant and paraffin inhibition action based on a polymeric component and a composition of surfactants is presented. The most effective way to improve the low-temperature properties of oils, fuels and oils is the use of paraffin deposition inhibitors. These are substances, due to the introduction of which, even in small doses (usually 0.05-0.10%), substantial prevention of the formation of paraffin and an improvement in fluidity at low temperatures are achieved. Initial components were polystyrene foam and chloroform. Polystyrene foam was dissolved in a solution of chloroform after filtration. As a result of the laboratory tests, significant results were obtained, but results differed with changing concentrations of components. After carrying out numerous tests with varying concentrations of components, data were obtained that allowed to determine those values at which we obtained the most optimal rational values. To improve the low-temperature and viscosity properties of oil and oil products, such as diesel fuel, we proposed to use the inhibitor-based polymer. It was established that the inhibitor additive is a 10% polymer solution in a chlorine derivative alkane. Introduction of an additive based on PSA-10 in the amount of 100-1500 ppm in hydrotreated diesel fuel and oil shows a significant results of freezing point (Table 1). When comparing the temperature of solidified diesel fuel with the Dodiflow product additive, it was found that the effect of the PSA-10 inhibitor-based additive is more effective than in the case of the product additive. The freezing point of diesel fuel with PSA-10 additive is –35 °C, whereas when using the Dodiflow additive is –34 °C.

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Figure-1: Initial components: a) polystyrene foam

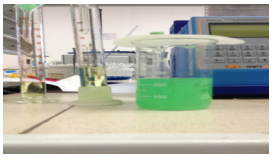

Figure-2: Initial components: b) mixture before filtration

Figure-2: Initial components: c) final inhibitor

Additive	Freezing point, ° C	
	Crude Oil	Diesel fuel
Without additive	-10	–20
Dodiflow	-21	–34
PSA-10	-23	-35

Table 1: Effect of additives to freezing point