



CHARACTERISTICS OF THE NEW TYPE OF ADDITIVE FOR DIESEL FUEL

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ABSTRACT

In this article, the properties of copolymers obtained on the basis of phenols and vinylacetylene are studied. The improvement of their properties by adding additives to diesel fuels has been studied. A number of research methods have been used in implementing these practices. Cloud point, filtration temperature and solidification temperature are examples of this.

KEYWORDS: vinylacetylene, phenol, o-m-p-cresol, KOH/DMSO/CsF, methyl methacrylate, cloud point, filtration point, solidification point.

INTRODUCTION

In the world today, products of organic synthesis, especially unsaturated vinyl derivatives of compounds with different functional groups, are widely used in various sectors of the economy, including agriculture, pharmaceuticals, chemical industry, textiles, paint and oil and gas chemistry[1-4].

Therefore, for the rapid development of the chemical, oil and gas industries, it is important to improve the properties of fuels by using the vinyl ethers of compounds containing various functional groups as additives[5-8].

The synthesized substances were used as additives to improve the low-temperature properties of diesel fuel[9-11].

MATERIAL AND METHOD

Another feature of diesel fuels is that a number of studies are being conducted to obtain additives that improve the cloud point. Currently, additives based on bi-polymers improve the clouding temperature of winter type diesel fuels by 3-5 °C.

There are three ways to evaluate the effect of diesel fuel depressants: 1) determination of the freezing or crystal formation temperature; 2) determining the blurring temperature; 3) determining the lower limit of filtration (crystals are trapped in the filter) temperature.

The properties of diesel fuel at lower temperatures after adding additives were determined (table-1).

Table-1.

Effects of synthesized β -phenoxybutadiene-1,3 and methyl methacrylate depressants on diesel fuel properties

No	The name of the sample	The amount of additives, %	Clouding temperature, °C	Solidification temperature, °C	Filtration (cold)
1	Diesel fuel	-	-5	-9	-6
2	Diesel fuel + NSH1 additive	0.1	-5	-25,8	-17
		0.5	-6	-26	-18,1
		1	-7	-31,6	-20,4
3	Diesel fuel + NSH2 additive	0.1	-5	-26.5	-18
		0.5	-6	-26.8	-19
		1	-7	-31	-20,5
4	Diesel fuel + NSH3 additive	0.1	-5	-28.5	-19
		0.5	-6	-35.6	-22
		1	-7	-37	-23,5



The results of the above-mentioned tests show that when adding depressor additives to diesel fuel in the amount of 0.1%, positive results were achieved in terms of fuel solidification and cold filtration indicators.

As can be seen from the table, the solidification temperature of the sample diesel fuel had a positive effect on the cold filtration performance when added in different amounts.

RESULT

According to the standard, no more than 0.1% of additives are added to diesel fuel. That is why the results were obtained with the addition of 0.1%. When a high amount of additives (0.5% by mass) was added to the fuel, the lubricity became worse. This is explained by the formation of corrosion-mechanical damage as a result of

the breakdown of calcium stearate contained in the additive.

The chemical activity of the functional groups in the composition of the compound as a factor determining the properties of the particles. The properties of the synthesized resins were compared with the properties of foreign additives (table-2).

If you pay attention to the table, you can find anti-aging products from BASF (Kerokorr LA 95, LA 96, LA 99 additives), “Clariant” (Dodilube V 4716, V 4377, V 4940 additives), “Lubrizol” (ADX 4104 B), compared with Inlineum (Paradyne 639 and 655) and Ciba (Irgalbe F 10) additives, it can be seen that each company uses chemical reagents with different chemical structures as anti-fouling additives.

Table-2.
Comparison of local and Foreign Additives

Additives		Kerokorr LA 95	Kerokorr LA 96	Kerokorr LA 99	Copolymer of phenoxybutadiene -1,3 with MMA
Chemical composition	Active ingredient	A mixture of nitrogenized condensation products with dispersants, antioxidants and metal deactivators	A mixture of complex esters of higher carboxylic acids and amides of carboxylic acids	Higher carboxylic acids and their derivatives	Copolymer of phenoxybutadiene-1,3 with methyl methacrylate
	Эритувчи	Aliphatic and aromatic hydrocarbons	Aliphatic and aromatic hydrocarbons	Aromatic hydrocarbons	Aromatic hydrocarbons
Concentration, % mass		0,005-0,03	0,005-0,03	0,02-0,04	0,001-0,01 %

CONCLUSION

In the obtained results, it can be seen that the properties of diesel fuel taken as a sample (solidification temperature, cold filtration indicators) are improved when different amounts are added. According to the results of research conducted in the central laboratory of the Bukhara Oil Refinery, adding methyl methacrylate and phenoxybutadiene-1.3-based additives to diesel fuel reduced the maximum solidification temperature and the lower limit of filtration temperature to the required level.

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