

IMPACT OF THE DEVELOPED ADDITIVE ON THE QUALITY PARAMETERS OF DIESEL FUEL AT BUKHARA OIL REFINERY LLC

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<https://doi.org/10.5281/zenodo.14887591>

Annotation. Among the additives used for diesel fuels in the market of most developed countries, additives that increase the cetane number are widespread. Analysis of the existing range of promising cetane-increasing additives showed that the main components of these additives are compounds such as cyclohexylnitrate or 2-ethylhexylnitrate. The development of an additive that increases the local cetane number based on cheap and available raw materials is a pressing problem and has great practical significance.

Keywords: additive, fuel, corrected wear spot, hydrotreated, mercaptan, sulfur, concentration, kinematic viscosity, density.

We conducted a study of the influence of additives on the cetane number of hydrotreated diesel fuel of the Bukhara Oil Refinery. The concentration range of the additives was chosen in the range from 0 to 0.5% by mass, in which a significant increase in the cetane number was observed, and with a further increase in the additive concentration, the increase in the cetane number slowed down. The dependence of the cetane number of diesel fuel on the concentration of the synthesized additive is shown in Fig. 1.

To meet the modern requirements of Euro-3 and higher standards, the value of the cetane number should not be less than 51.0 units. Fuels with a high cetane number in the range of 51-55 are required for new generation engines. Obtaining fuel with such a cetane number is associated with the production of components with a high cetane number value or the use of additives that increase the cetane number.

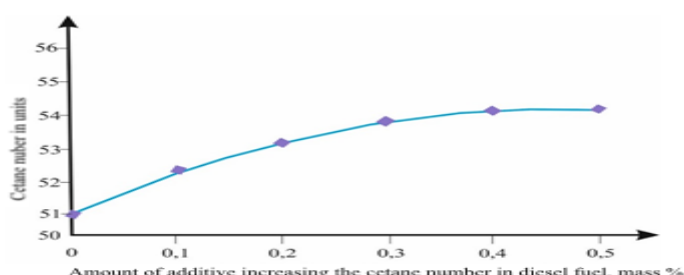


Figure 1. Dependence of the cetane number on the concentration of the additive in the diesel fuel of the refinery.

Therefore, when the developed additive, as can be seen from Figure 1, reaches 0.5% by weight in the fuel composition, it was possible to increase the cetane number of hydrotreated diesel fuel with the additive to 3.0 units compared to the initial hydrotreated diesel fuel.

As can be seen from Fig. 1, with an increase in the cetane number of diesel fuel by 0.1% by mass, the increase in the cetane number is 1.4 units. Diesel fuel cetane-increasing additive with a subsequent increase in the concentration of, the increase in the cetane number significantly slows down. For example, with an increase in the cetane number by 0.2% by mass, the increase is 0.8 units compared to diesel fuel containing an increase of 0.1% by mass, then from 0.2 to 0.3% by mass, the increase is 0.55 units, from 0.3 to 0.4% by mass, the increase is 0.3 units, and for the concentration interval from 0.4 to 0.5% by mass, the increase is 0.15 units.

Thus, the developed cetane-increasing additive made it possible to improve the operational properties of hydrotreated diesel fuel produced at the Fergana Oil Refinery.

Studies conducted on the influence of foreign manufacturers' cetane-increasing additives and the developed cetane-increasing additive on the quality indicators of hydrotreated diesel fuel of the Fergana Oil Refinery showed significant changes in the value of the cetane number. In this regard, we have developed samples of additives No. 1-8 of foreign manufacturers and samples cetane-increasing we summarized the experimentally obtained data on the influence of additives on the cetane number of hydrotreated diesel fuel produced at the FNPP.

It should be noted that the developed cetane-increasing additive in this concentration range is not inferior in efficiency to the cetane-increasing additives of foreign manufacturers. For example, the concentration of the cetane-increasing additive in diesel fuel is 0.1 wt. %, the value of the cetane number is 52.4 units.

Thus, when the synthesized additives are introduced into hydrotreated diesel fuel at a concentration of 0.01-0.5% by mass, an increase in the cetane number of diesel fuel from 51 to 54 is observed.



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