Another direction of our work concerns with the investigation of reactivity arylbenziodoxoboroles in presence of water. Arynes can be easily prepared from hypervalent iodine reagents, particularly, from diaryliodonium salts [9]. Some applications of mentioned chemical processes were shown [10].

We have developed an approach to synthesis of interesting class of phosphorous compounds – phosphonium salts – using hypervalent iodine reagent in mild conditions.

Hypervalent iodine compounds can be effectively utilized in various important chemical transformations in the presence of water. Moreover, the processes do not require the use of heavy metals compounds. In addition, water-soluble reagents can be easily regenerated using simple extraction and further oxidation in aqueous media. System of water-hypervalent iodine reagent is a great achievement of organic chemistry that corresponds to "Green chemistry".

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ASSESSMENT THE INFLUENCE OF CLOSE-CUT DIESEL FRACTIONS ON THE LOW TEMPERATURE PROPERTIES OF STRAIGHT-RUN DIESEL FUEL – DEPRESSANT ADDITIVE BLENDS

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The use of diesel fuel (DF) is growing every year. Use DF as a fuel for heavy-duty truck and technological equipment contributes most to the growth of its consumption. It is also important to note the growth in consumption of winter and arctic brands of DF, which is due to the development of new territories with a harsh climate.

The most effective and economical way to meet the requirements of the standards [1, 2] on low-temperature properties, is to use additives for DF that improve low-temperature properties. However, given the mechanism of action of depressant additives, the interaction between the hydrocarbons in the DF and the additive components may lead to the fact that the use of the additive will not bring the expected improvement in the low-temperature properties of the fuel [3].

The aim of this work is to establish how adding the close-cut diesel fractions influence on the effectiveness of the depressant additive. For the study blends of straight-run diesel fuel with additives (index Ad) and various amounts of light (LFDF) and heavy (HFDF) diesel fractions with boiling range of 180–240 °C and 300–360 °C respectively, were prepared.

The cloud point (CP), cold filter plugging point (CFPP) and pour point (PP), according to the procedures [1, 2], have been determined for the resulting blends. The results are presented in Tables 1, 2.

Table 1. Low-temperature properties (adding LFDF)

Blend	CP, °C	CFPP, °C	PP, °C
DF + Ad	–6	–25	–36
DF + 3 % vol. LFDF + Ad	–6	–15	–36
DF + 5 % vol. LFDF + Ad	–6	–20	–35

Table 2. Low-temperature properties (adding HFDF)

Blend	CP, °C	CFPP, °C	PP, °C
DF + Ad	–6	–25	–36
DF + 3 % vol. LFDF + Ad	–6	–19	–35
DF + 5 % vol. LFDF + Ad	–6	–17	–42

Based on the results presented in Table 1 the addition of LFDF to the DF sample has a negative effect on low-temperature characteristics. CP and PP doesn't change, but CFPP increases. More clearly, the reduction in the effectiveness of the additive when adding 3 % vol. LFDF (CFPP increased by 10 °C).

From the results presented in Table 2, the addition of 3 % vol. HFDF has no effect on PP, with the addition of 5 % vol. HFDF reduces the PP by 7 °C. Adding HFDF does not affect the CP of the blends, but it worsens the CFPP.

The observed effects can be explained: an increase in the content of light paraffins in the fuel when adding LFDF postpones the formation of large bound crystal structures, but when a certain temperature is reached, their formation occurs instantly and the additive does not have time to work, structures are formed that plug the filter (the CFPP worsens).

Heavy paraffins begin to crystallize first, which allows the additive to work earlier, thereby effectively slowing down the growth of crystals and preventing solidification of the fuel (reduce PP). However, an increase in the content of heavy paraffins in the fuel negatively affects the CFPP, since their crystals are initially larger and plug the filter faster, despite maintaining the fluidity of the fuel. It is also important to note that if HFDF is added too much, the additive will not be able to affect all paraffin molecules, which will reduce the effectiveness of its action.

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SYNTHESIS OF ARENDIAZONIUM TOSYLATES CONTAINING TETRAALKYLAMMONIUM GROUPS TO CREATE NEW ANTIBACTERIAL MATERIALS

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The design issues of new materials with programmable surface properties are one of the most important tasks for modern chemical science [1]. In this area, special attention is paid to materials with controlled charge characteristics, since they cause interaction of the material with the environment [2]. These include the positive charge on the surface that determines the interaction with bacterial cells, including pathogens [3].

The modification of the arendiazonium salt molecule with the tetraalkylammonium group will potentially make it possible to obtain materials with