Table 2. Low temperature properties of DF-1 and DF-2 samples

Samples	Concentration, common units														
	0			0.5			1			2			5		
	Characteristics, °C														
	CP	CFPP	PP	CP	CFPP	PP	CP	CFPP	PP	CP	CFPP	PP	CP	CFPP	PP
DF-1	0	0	–17	0	–1	–15	–2	–3	–20	–1	–5	–53	–1	–9	–48
DF-2	–12	–19	–22	–9	–20	–21	–9	–22	–24	–10	–27	–56	–9	–31	–60

the DF-1 sample, with an increase in concentration to 2 c.u. there is a significant decrease in PP, but at a concentration of 5 c.u. the PP increases by 5 °C, therefore there is a deterioration in PP. For DF-2, on the contrary, at a concentration of 5 c.u. the smallest value of PP is fixed.

Different trends in the influence of the PPD concentration possibly due to the difference in the compositions of DF. DF-1, according to table 1, contains more paraffin, which has the most influential on the low-temperature characteristics of DF. It is also known that depressants themselves in high concentrations are able to form spatial structures. Therefore, the increased content of paraffin and depressant in DF-1 at a concentration of 5 c.u. leads to the deterioration of PP.

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COMPARISON OF THE BIODIESEL FUEL PROPERTIES OBTAINED FROM PURE AND WASTE SUNFLOWER OIL

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Biodiesel is a relatively new type of fuel that can serve as an alternative to petroleum diesel fuel.

There are three generations of biofuels. This work study the properties of first generation biofuels (obtained from pure sunflower oil) and second generation biofuels (obtained from waste sunflower oil). The production of biofuels is based on a process called transesterification [1].

The methodology of obtaining biodiesel from pure and waste oil is the same. The difference is in the preparation of feedstock. The waste oil must be filtered.

The method of synthesis is as follows: the feedstock with a mass of 475.00 gram needs to be heated uniformly to a temperature of 45 °C with an electric stove and continuously stirring with a stirrer. Then dissolve an alkaline catalyst (sodium hydroxide) with a mass of 8.32 gram in ethyl alcohol with a mass of 138.00 gram and add the solution to the feedstock. The reaction time is 1 hour [2, 3].

Next, add 92.90 gram of glycerin to the resulting reaction blend, after the resulting blend is placed in a separating funnel on a day for settling.

One day later, the upper separated phase is taken and evaporated under vacuum at a temperature of 49 °C for 1 hour on a rotary evaporator, unreacted ethyl alcohol is distilled off.

Using this method, biodiesel was obtained from waste and pure sunflower oil. The yield of biodiesel

Table 1. Density, dynamic and kinematic viscosity of obtained biofuel samples

Biodiesel	Density at 15 °C, gm/cm^3	Viscosity at 20 °C	
		Kinematic, mm^2/s	Dynamic, mPa/s
From pure oil	0.8881	15.195	13.495
From waste oil	0.8908	14.345	12.779

from pure oil was 371.60 gram, and from waste oil was 237.80 gm.

The results of determining the density, dynamic and kinematic viscosity of the obtained biodiesels are presented in table 1.

Also, for the obtained biofuels using a low-temperature cryostat, the cloud point and pour point were determined. The results are presented in a table 2.

Table 2. Low-temperature properties of obtained biofuel samples

Biodiesel	Cloud point, °C	Pour point, °C
From pure oil	–3	–8
From waste oil	–3	–4

From the results presented in tables 1 and 2, it can be seen that biofuels synthesized from waste oil have a higher density value and, accordingly, a worse pour point, but lower viscosity compared to biodiesel obtained from pure oil.

Based on the obtained results, it can be concluded that the second-generation biodiesel is comparable in characteristics to the first-generation biodiesel, which makes used vegetable oils a promising feedstock for producing renewable and environmentally friendly fuel.

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OPTIMIZATION OF COLUMN FOR ORGANIC CONTAMINANTS ELIMINATION FROM BRINE WASTEWATER

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Many chemical productions that utilize acids as catalysts or raw materials such as production of acrylates, plasticizers, isocyanates and other have a neutralization and washing stage to remove product salts and unreacted base substances. It is well known that solubility of organic substance decries significantly in brine streams because of salting out effect but wastewater still contain organic contaminants.

Thus methylene diphenyl diisocyanate (MDI) based synthesis of polyisocyanates includes polyamine production stage at which contaminated with organic substances wastewater stream is formed. Main stream impurity is aniline that is used in excess quantity in reaction: