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FEATURES BIODIESEL PURIFICATION

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The factors affecting the quality of biodiesel and the features it clean. These indicators of quality biodiesel under ISO 6081: 2009.

Biodiesel, a methyl ester, glycerin, catalyst, wet, dry, transesterification.

Problem. Renewable fuels currently become an important role in meeting the world's energy needs. Due to the economic and environmental problems associated with fossil fuels, growing interest in liquid biofuels as a supplement to petroleum fuels, or as independent fuel. For engines with ignition gasoline used etanolvmisni. Studies are under way to obtain cheap butanol. For diesel engines the best alternative for diesel biodiesel is considered, which is the methyl esters of fatty acids derived from vegetable oils or animal fats and methanol in the presence of a catalyst (KOH). However, the production of biodiesel that remained on neproreahovani fats that adversely affect the operation of the engine, with an excess of methanol is given, the catalyst does not react, but accelerates it. Therefore, to obtain high-quality biodiesel according to ISO 6081 domestic: 2009 "Motor fuel. Methyl esters of fatty acids, oils and fats for diesel engines. Requirements" it must be clean.

Analysis of recent research. For quality biodiesel must withstand a number of requirements. After the reaction of transesterification a mixture of methyl ester and glycerol. According to ISO 6081: 2009, the total mass of glycerol in biodiesel should not exceed 0.25% [1]. Glycerol from Biodiesel is removed by settling. Glycerin, a heavier fraction (ρ = 1261 kg / m3), falls down, and methyl ester as a light (ρ = 860-900 kg / m3) is placed over it. Methyl ester and glycerol merge into a different capacity [2].

For rapid and complete transesterification reaction with excess methanol is taken because the resulting methyl ester containing up to 1.5%

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methanol, from which biodiesel must be cleaned because it causes corrosion of ferrous metals engine erodes rubber gaskets, paint and so on.

The purpose of research is to establish the characteristics of

biodiesel purification and bring it to the standard quality indicators.

Results. The catalyst is removed from biodiesel by mixing the latter with acidified water (if alkaline catalyst), resulting neutralization is the catalyst to form soap and it goes into Soap stock [5].

The most common method of purification of biodiesel catalyst is the use of acidified water. Acid neutralizing the alkaline catalyst contained in the product of transesterification, resulting in a salt. Effective means of cleaning water is spraying acid solution of biodiesel, resulting in formation of droplets that hitting the terrestrial environment, settle. Dispersion droplets allows you to effectively increase the contact surface air and water, which, compared to, for example, simple mixing, provides significant advantages of speed and cost of cleaning solution acidified water. Water washing after going to the bottom, and after upholding be deleted. Of course this method does not remove all the water, and a certain amount of it remains in the air.

The final stage of purification – drying biodiesel, since the presence of water adversely affects the operation of the diesel engine leads to microbial growth in biodiesel and promotes the formation of free fatty acids, which cause corrosion of metal parts [2]. According to ISO 6081: 2009, the mass fraction of water in biodiesel should not exceed 500 mg / kg, or less than 0.05% [1]. Removing water from biodiesel is made mainly by adsorption. Adsorbents are usually porous granules are tough substances capable of forming electrical (vandervaalsovi) relations between their surface molecules and molecules adsorbtyva. When the temperature or pressure reducing these links are broken due to temperature fluctuations (vibrations of molecules) and the process of desorption adsorbtyva. The main adsorbents are activated carbon, silica alyumoheli, zeolites and some varieties of clay. Activated carbon is produced from organic raw materials: coal, sawdust, wood waste leather, paper etc. and meat production. During their production using dry distillation of raw materials and the subsequent activation of steam or chemical reagents for the fine structure of the material. The specific surface area of activated carbon is 600-1700 m2 / g, the volume of micropores – 0.3-0.6 cm 3 / g, bulk density – 380-600 kg / m 3: Use of activated carbon in the form of granule size 1-7 mm or powders with particle size up to 0,15 mm. The structure of the activated carbon is uniform, it recovered and used many times. The disadvantages include flammability activated carbon at temperatures above 300 ° C and high cost. Silica are thermal and chemical processing of silicon dioxide. Their specific surface area is 300-750 m2 / g and specific total pore volume– 0,28-0,9 cm3 / g, bulk density – 500-800 kg / m3, the temperature regeneration – 100-200°C. Alyumoheli – adsorbents obtained from aluminum hydroxide. Their specific surface area of absorption is 180-200

m2 / g, more options – as in silica. Clay (bentonite, diatomite, tripoli, mold) have the worst adsorption properties (specific surface area is 35-150 m 2 / g, bulk density – 400-450 kg / m3), but much cheaper than other adsorbents [6]. Zeolites – alumina clay, which are composed of oxides of alkali and alkaline earth metals are different regular structure clear pores that are filled with natural temperature conditions water molecules. Zeolites absorb substances in their absorption time, but not all substances can penetrate and stay there. This is because the absorption pores interconnected pores size. Penetrate through the pores can only molecules critical diameter smaller diameter pores. By the principle of separation of zeolites different from other adsorbents – in molecules adsorbtyva "sifted" through the delicate structure of zeolite. In this regard, zeolites are characterized not specific surface area pore volume and pore filling adsorbate that is 0,2-0,25 cm3 / g. Bulk weight zeolite is 600-800 kg / m3. In nature, zeolites are found in sedimentary deposits tufohenno-type, formed by volcanic tuff changes in marine and continental basins. Depending on the formation of zeolites can be divided into two groups: endogenous and exogenous.

The use of zeolites in industrial processes tailor-made to the specific requirements of consumer properties of absorbers, which are not always answered natural zeolites. To meet these requirements in 1948 began work on the synthesis of zeolites. Over the years, more than 65 different synthesized zeolites, most of which have no analogues in nature.

Characterization of zeolites, which are produced at the moment, is presented in Table. 1.

1. Characteristics of zeolites [7].

Classification of CIS	CA	NaA	CaA	CaX	NaX
US Classification	3A	4A	5A	10x	13H
The diameter of the input windows nm	0.3	0.4	0.5	0.8	0.9

The structure of zeolites makes "NaA" and "CaA" consists of large and small (sodalitovyh) absorption pores. The structure of the unit cell belongs to one big and one small pores. Absorption pore zeolites marks "NaA" and "CaA" so small that they can penetrate almost only water molecules.

Zeolites marks "CaX" and "NaX" with large pores, which explains their greater absorptive capabilities compared to zeolites marks "NaA" and "CaA".

Zeolites mark "cargo" at ordinary temperatures in large numbers only absorb water. This property has defined their widespread use for dehydration unstable substances prone to polymerization reaction. The zeolites are used as molecular sieves and membranes. Molecular sieves

are zeolites balls, which is filled apparatus through which gas is passed to clean [7].

Zeolite membranes are used in the form of a thin layer deposited on a ceramic base, which allows the process with large flows. In most commercially available zeolite layer deposition on the inner surfaces of ceramic elements (pipes) to avoid wear and of optimal flow. Zeolites of "NaA" in the form of membranes can be applied to tubular base, are single or multichannel tubes [4].

Conclusion. For bidyzelya production of good quality, which meets national and international standards, methyl ester obtained after transesterification, empty. The main substances that affect the quality of biodiesel is the catalyst, methanol and water balances. The level of purity biodiesel has a significant influence on the properties of the fuel and engine life.

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Ustanovlenы factors, vlyyayuschye on Quality biodiesel and opredelenы Features ego purification. Quality indicators Pryvedenы biodiesel According to ISO 6081: 2009.

Biodiesel engine, metylovыy ether, glycerin, katalyzator, moisture, drying, pereeteryfykatsyya.

Installed factors affecting quality of biodiesel and defined specific features of its treatment. Provides indicators of quality of biodiesel according to DSTU 6081: 2009.

Biodiesel, methyl ether, glycerol, catalyst, moisture, drying.

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MODEL OF TECHNOLOGY-compensating prognostic VARIABLES application rate Process inputs

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The article presents the implementation model prognostic variables-compensation technology standards making process material using information technology systems for monitoring the status of agricultural land, which allows for

revised data on soil derived from the monitoring system to assess the state of agricultural land and adopt strategy of Agrobiological potential field.

***Monitor, model, variable rates of application, prognostic-compensation technology**.*

Problem. Currently, special importance is the question of modern crop production technologies that can improve the competitiveness of agricultural production, which will ensure food security, integration of the global agricultural production, creation of scientific and technological groundwork for a wide range of innovations in various sectors of agriculture.

Analysis of recent research. Integrated automatic control of technological processes [1-10] are the most promising and should ensure the creation of technology with its new economic, social and environmental performance. Important takes the level of integration of information technology systems used in agricultural production, which makes it possible to significantly improve the quality issue resolution process control agricultural production, which is expected intensive development of new technologies in this field.

To solve the problem, ensure quality execution of manufacturing operations in crop-designed prognostic variable compensation