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In Article rassmatryvayutsya factors, kotorыe vlyyayut Appearance on Road transportnыh proysshestvyy a village populated areas.

Avaryynost, road transportnoe proysshestvye, dorozhnaya Clothing, dorozhnыe signs transportnыy flow.

The factors which are the reason of car accidents in country are discussed in paper.

Accident rate, auto accident, pavement, traffic signs, traffic stream.

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TECHNOLOGY AND EQUIPMENT PRODUCTION BIODIESEL FROM VEGETABLE OILS AND ANIMAL FATS

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The article contains an overview of technologies and equipment for the production of biodiesel from vegetable oils and animal fats. The application of a process depending on production volumes.

Biodiesel, vegetable oil, animal fat, diesel, methyl ester process pereesteryfikatsiyi, methoxide.

Problem. Recently, more and more use as a fuel for engines are fuel

produced from vegetable oils and animal fats [1]. This is due to the simplicity and low emissions synthesis process from raw materials of plant and animal origin, relatively low cost and acceptable performance.

Research on the use of plant and animal fats and fuel are carried out on the basis dvyhunobudivnymy largest firms: Allis Chalmers, Caterpillar, Cummins, General Motors, John Deere, Harvester (US), Perkins, Ricardo (England), Mercedes-Benz, Daimler-Benz, Deutz, Volkswagen, MAN, Hatz Diesel, Henkel-hauzen, Porsche (Germany), Volvo (Sweden), Isuzu, Toyota, Komatsu (Japan) [1].

Conducted research on adapting diesel engines to work on the fatty acid esters of plant and animal origin and CIS: MVTU im.N.E.Baumana and MHAU them. V.P.Horyachkina, Peoples' Friendship University (Ore), NPP "Ahrodyzel" Kharkiv National Polytechnic Institute, National University of Life and Environmental Sciences of Ukraine, LLC "Aileron" and others.

Methyl esters of fatty acids (DOE) is widely used as a fuel for diesel engines in almost all Western European countries. In Germany, a fuel produced at 12 - you centralized plants and 80 - you regional decentralized. Production of fuel is also engaged in a large number of small German companies and it sold more than 1,500 gas stations. Price 1 liter Biofuels such as of August 2012., averaged 1.2 euros. Sold at gas stations in Germany as biofuel, which is a mixture of mineral diesel and ME. At the international conference held in 2005 in Magdeburg representative group Daimler Chrysler said that all cars produced concern prepared to work on fuel containing 10% biodiesel [1].

Analysis of recent research. Biodiesel - a alkilni esters of fatty acids derived pereesteryfikatsiyeyu common natural oils and fats lower alcohols (methanol, ethanol, etc.) In the presence of catalysts. Glycerides of fatty acids when heated with methyl or ethyl alcohol (even after boiling) remain almost unchanged. But if the oil is heated to about 60 ° C, added with good stirring add methyl alcohol, which dissolved potassium hydroxide (KOH), then after a few minutes of released glycerol solution formed as a separate phase. This exchange of alcohol in the ester alcohol or called by the name used alcohol, methanolysis, etanolizom etc. Overall alcoholism similar hydrolysis of fats. The difference is that instead of water, reagent alcohol.

Depth alcoholysis of glycerides depends on the composition of the reacting esters and alcohol. maximum depth alcoholysis of triglycerides in the application of methyl alcohol (about 98%). With increasing molecular weight alcohol alcoholysis depth decreases vyznachayuchys equation balance. Depth of alcoholism, such as sunflower oil when using ethanol for about 35.3%, and the use of amyl alcohol does not exceed 11.5% [3]. The balance may be affected alcoholysis change the ratio between the amounts of triglycerides and alcohol, or the derivation from the reaction zone of one of the products formed, such as glycerol. Thus, the reaction pereesteryfikatsiyi (methanolysis) can be represented as follows (Figure 1).

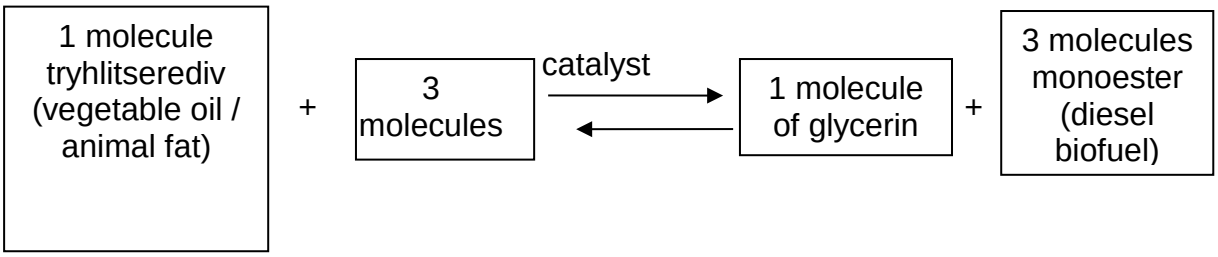

Fig. 1. Reactions pereesteryfikatsiyi rapeseed oil.

For pereesteryfikatsiyi natural triglyceride fatty acids by means of lower alcohols using different processes, which are described in the literature [4].

Pereesteryfikatsiya carried out at atmospheric pressure of 0,5 ÷ 1,0 molar excess alcohol in the presence of an alkaline catalyst at a temperature of 25 ° C to + ... 100 ° C pereesteryfikatsiyi process of alkaline catalysts at atmospheric pressure passes without any problems if the feedstock free of water and containing less than 0.5% (by weight) of free fatty acids, corresponding acid value of one. Fats and oils that have a relatively high content of free fatty acids may be pereesteryfikovani high pressure of 7 - 8 molar excess of methanol in the presence of an alkali or metal catalyst to form methyl esters of fatty acids. This process is carried out at a temperature of 240 ° C and a pressure of about 10.0 MPa [5]. Pereesteryfikatsiya at atmospheric pressure, compared with pereesteryfikatsiyeyu high pressure requires much less costly methanol and energy (due to a lower temperature the reaction) and does not require expensive reactors operating under pressure.

Results. In the technical literature describes a number of processes pereesteryfikatsiyi and plants for their conduct. Sheehan J. et al [5] describing pereesteryfikatsiyi and installation for the production of fuel from soybean oil, which is used in the United States. In pereesteryfikatsiyu served refined oil, free from phospholipids and free fatty acids. In the reaction of methanol using a double excess of stoichiometric quantities, and as a catalyst - sodium methoxide in an amount of 10% by weight of oil. Set includes two phasic reactor, allowing for each of the stages get access ethers approximately 89%. The reactor temperatures from 50 ° C to 120 ° C. With10455 kg triglycerides submitted in reactors obtained 10 397 kg methyl esters. After separation of the glycerol phase methyl esters washed with water to remove glycerol, methanol and other water-soluble compounds in several stages. After settling the water is removed. A biodiesel dried and filtered.

Sheehan J. et al [5] describe a number of plants for biodiesel production, operating in Europe since 1994. For example, the technology company Ballestra Sp.A. consists of three phases, each of which uses

stoichiometric excess of methanol to oil in the ratio 2: 1. Reactors operating under vacuum at a temperature below 50 ° C. As a by-product obtained crude glycerol. The technology is designed to produce methyl esters from raw materials of plant and animal origin.

Institut Fracois de Petrol (IFP) provides conversion process rapeseed oil for biodiesel and crude glycerol using mild reaction conditions: temperature 50 ° C, pressure, catalyst sodium methoxide [5].

Firms Fina and De Smet offers processes of biodiesel production at high temperatures and pressures [5]. Stern R. and several other researchers have developed a manufacturing process IFP mixture of esters of fatty acids using pereesteryfikatsiyi oils and fats, which may contain a significant amount of free fatty acids. This uses an acid catalyst, high blood pressure, temperature + 130 ° C, and the process takes place in three stages, with the third stage pereesteryfikatsiyi used alkaline catalyst.

Basu H. and Norris M. [6] proposed production process ethers, which by far the best of contemporary industrial processes. They developed a simple single phasic process of biodiesel production with different oils and animal fats, even those containing high concentrations of free fatty acids, diglycerides, monoglycerides and phospholipids impurities and polypeptides, and acidified with soap. The process pereesteryfikatsiyi triglycerides, diglycerides and monoglycerides and simultaneous esterification of free fatty acids contained in the oil or fat are using alcohol and carbon chain C1 - C5 (preferably anhydrous methanol or anhydrous ethanol) in the presence of a catalyst, which is a mixture of calcium acetate and acetate Barium (3: 1 by weight) by heating the reaction mixture in an autoclave at a temperature of 200-250 ° C for three hours and then rapidly cooled to 63 ° C. In the process used 3-4 molar excess of methanol or ethanol, and the concentration of the catalyst is

From a review it is clear that the core technology in developed countries based on triglyceride methanolysis of vegetable oils and animal fats using different catalysts. In the case of acid catalysts reaction time ranges from 1 ÷ 45 hours, and if the main catalyst - 1 ÷ 8 hours. (Depending on temperature and pressure, and in the initial period of the reaction is slow due to the nature dvohfaznoyi system). There are still unresolved issues catalyst and removing products after saponification reaction that is very important to ensure the quality of the product.

Japanese scientists Dadan Kusdiana and Shiro Saka developed technology for biofuels without catalysts [9], through the use of process pereesteryfikatsiyi rapeseed oil with methanol in supercritical conditions.

As reference compounds (esters) were esters of stearic, oleic, linoleic and linolenic acid rapeseed oil. This technology uses a large amount of alcohol in a ratio of 42: 1 to vegetable oil. In supercritical conditions (temperature 350 ÷ 400 ° C, pressure of 90 MPa) reaction occurs 3 ... 5 min. [4]. After the reaction necessary rapid cooling products derived from its implementation to avoid collapse.

The University of Iowa (USA), a new, less laborious method of producing biodiesel, using high catalyst [10]. University Professor Victor Lin and a group of scientists have suggested using biodiesel in obtaining the smallest particles - nanospheres with a diameter of only 250 billionths of a meter. Nanospheres have a porous structure in the form of porous channels. Channels can be filled with a catalyst necessary for the production of biodiesel. Nanospheres may also have chemical valves that prevent the penetration of oils and fats in the channels where a chemical reaction. As a result, the process of obtaining biodiesel is accelerated, and the catalyst can be reused. In addition, the production process is excluded fuel washing stage. The technology already was successfully tested in the laboratory and now scientists plan to test the effectiveness of its work in streaming mode [10].

The processes and equipment for the production of biodiesel can be classified on the basis of operating modes. This equipment working in cyclic mode and equipment operating in continuous mode. These features give the name and processes to produce biodiesel, cyclic Technology (CT) and continuous technology (BT). In turn, each of these technologies can be divided into subtypes. Thus, cyclic (periodic) technology can be divided into technology using catalysts, supercritical technology bezkatalizatorni technology. Continuous technology can be divided into: bahatoreaktorni technology, industrial processes II-Ester fip H and critical technologies.

Most widely cyclic (periodic) technology using catalysts and many continuous reactor. The first is mainly used in relatively small volumes of production. For large production volumes advisable to use continuous technology [4]. In Europe, the technology of cyclic methyl esters of rapeseed developed by RMEnergy, who received it in 2001 for patent number 10135297A1. In September 2004, based on an agreement between the companies and RMEnergy IBG Montors Oekotec GmbH & CO license RME production plants was transferred last.

The US equipment for biodiesel production mainly produces large companies, members of the National Association of producers and consumers of biodiesel and equipment for its production (National Biodiesel Board). The Association promotes biodiesel fuels market, promoting its production and use. Production of biodiesel is made by

traditional technology, so that there is strict regulation of the process and the physical and mechanical properties of the product.

In Ukraine, Russia and Belarus sales representative firm IBG Montors Oekotec GmbH & CO is a firm «Anatoli Juschin GDH», which is engaged in the sale and import of equipment for the production of biodiesel. In addition to representing European companies in the Ukraine producing and selling equipment for biodiesel production company engaged in the newly created "Biodiesel-Zaporizhia", "Biodiesel Dnepr", "Aileron", "Ukrhazbiodizel", "Biodiesel-Crimea", "EvroTehBiodizel" Group of Companies "Tekmash", LLC "Plant Ukrbudmash" SPE "trend", LLC "Special technology" [10] and others.

Conclusions

1. The world is mainly used traditional approaches to obtain biodiesel way pereesteryfikatsiyi alcohols of vegetable oils and animal fats.

2. Large companies and research centers are constantly improving existing and developing new technology production of biofuels from biomass. One of the promising directions of development of new methods for biofuel recognizes the use of various physical and chemical effects to speed up the reaction, and the production of methyl esters, the use of new raw materials, including technical animal fats, waste oils and fats from fat traps slaughterhouses.

3. The market biodiesel, technologies and equipment for its production is actively growing, thanks to substantial environmental benefits of fuel compared to traditional.

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In the work are given overview of technology and equipment for the production of diesel byotoplyva lZ rastytelnыh oils and animal fats. Application of Obosnovano Or ynoho of technological process in dependence from obъemov production.

Diesel byotoplyvo, rastytelnoe oil, Animals oil, diesel, metylovыy ether, pereэsteryfykatsyy process, methoxide.

This paper provides an overview of technologies and equipment for the production of biodiesel from vegetable oils and animal fats. The application of a particular process, depending on the volume of production.

Biodiesel, vegetable oil, animal fat, diesel, methyl ester transesterification process, methoxide.