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STUDY OF CONVERTING THE LOW-GRADE FEEDSTOCK INTO HIGH QUALITY BIODIESEL

The paper considers the most promising resources of raw materials for obtaining biodiesel. Demonstrated the possibility using waste as a raw material oil industry and food manufacturers.

Keywords: *biodiesel, acylglycerols, Catalyst.*

High world energy prices, the dependency of many countries on energy imports and the increasing awareness of the effects of global warming have put biodiesels high on the many countries agenda, in recent years many European countries (Germany, Austria, Italy, France and others) to increase task the diesel fuel produced from renewable raw materials. The first generation as a raw material was rapeseed oil, soya oil, palm oil as well as cooking oil and fats. Is employed to obtain fatty acid methyl esters (FAME), instead of biodiesel [1, 2].

However, without government subsidies and incentives the production of biodiesel is not profitable [3]. The global economic crisis had been influenced to ability of governments, which led to reduction of the support for biodiesel volume, a result of this circumstance the increase of production this type of fuel had decreased [4]. Since the world is moving to the low-cost sources for production biodiesel such as algae, where it is one of the best sources of biodiesel. In fact algae are the highest yielding feedstock for biodiesel. It can produce up to 250 times the amount of oil per acre as soybeans. In fact, producing biodiesel from algae may be only the way to produce enough automotive fuel to replace current gasoline usage. Algae produce 7 to 31 time greater oil than palm oil [5].

The department of energy in U.S. from 1978 to 1996 studied the algae with high oil content of the program «Aquatic Species Program». Researchers concluded that California, Hawaii and New Mexico are suitable for industrial production of algae in open ponds. During 6 years of algae grown in ponds of 1000 m pond in New Mexico has shown high efficiency in the biosorption of carbon dioxide. Yield was 50 g. algae from 1 m per day. At the same time 200,000 hectares of ponds can produce fuel, adequate for the annual consumption of 5 % of U.S. cars, these areas are less than 0,1 % of U.S. land suitable for cultivation of algae. But algae can be grown not only in artificial ponds, but also directly into the ocean (in good weather conditions), which takes place in California and Australia [6].

In Ukraine inasmuch as the climatic conditions influence to the reduction in yield of production biodiesel from microalgae, compared with the countries of the tropical belt [7]. Deliberately too many researchers in Ukraine to reduced cost option is to produce biodiesel by using the low-cost waste of oils and fats [8].

Where these wastes after bringing them from the manufacturing plants in the form of a commodity, which consists of a mixture of fats, fatty acids and water with a relatively small amount of phospholipids, proteins and sulfuric acid. These wastes in Ukraine produce about 10,000 tons/year on the basis of fatty acid [9].

Process them into biodiesel can be in many different ways. Our study finds the most appropriate should be considered as two of them. The first method soapstock was dried from water (by Vacuum Distillation), then, desirable purify the resulting mixture from phospholipids, proteins and other impurities. Purified mixture of acylglycerols and fatty acids (soapstock) subjected to solvolysis by using acid catalysts like homogeneous catalysts such as sulfuric acid, p-toluenesulfonic acid or by using heterogeneous for example Ion-exchange resin.

The second method is necessary to spend as much as possible to complete the saponification of soapstock. The resulting of soap is handle with acid (usually sulfuric). A mixture of fatty acid and aqueous solution of sodium sulfate which are separated sludge by centrifugation. Fatty acids can be clean with the adsorbent of impurities. Then the Esterification of mixture of acids and alcohols by the catalytic process to obtain of fatty acid methyl esters (FAME).

We consider the first study is preferable to produce (FAME). At the same time from a technological point of view of the preferred is the use of heterogeneous catalysts, especially if the process will be organized in the continuous mode. In addition to use fats or fatty acids to produce (FAME) needful low molecular weight of alcohol. If the relatively recent times as a low molecular weight alcohol, methyl alcohol was used exclusively, it currently

being considered other low molecular weight alcohols we can talk about the three alcohols.

Finally, the results obtained confirm the possibility of effective use of waste of vegetable oils and animal fats as a raw material for production biodiesel in Ukraine.

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ДОСЛІДЖЕННЯ ПЕРЕТВОРЕННЯ НИЗЬКОСОРТНОЇ СИРОВИНИ У БІОДИЗЕЛЬ ВИСОКОЇ ЯКОСТІ

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У доповіді розглянуті найбільш перспективні ресурси жирової сировини для отримання дизельного пального. Показана можливість використовувати в якості сировини відходи масложирової промисловості і підприємств громадського харчування.

Ключові слова: біодизель, триацилгліцерини, каталізатор.

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ИССЛЕДОВАНИЕ ПРЕОБРАЗОВАНИЯ НИЗКОСОРТНОГО СЫРЬЯ В БИОДИЗЕЛЬ ВЫСОКОГО КАЧЕСТВА

Садик Мунир Шавкат

В докладе рассмотрены наиболее перспективные ресурсы жирового сырья для получения дизельного горючего. Показана возможность использовать в качестве сырья отходов масложировой промышленности и предприятий общественного питания.

Ключевые слова: биодизель, триацилглицерины, катализатор.

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