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PRODUCTION OF ALCOHOL IN UZBEKISTAN AND THEIR USE IN CAR ENGINES

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Annotation
This article discusses the use of alcohol, one of the most promising types of fuel to replace the traditional fuel sources used in the internal combustion engines of modern cars.

Keywords: Oil resources, engine designs, fuel filters, heat engines, monohydric alcohols

Introduction

The sharp increase in the demand for oil fuels every year is leading to the depletion and rise in oil reserves. According to statistics, their reserves can reach 80-100 years. Limited oil resources require the use of non-oil fuels in internal combustion engines. In recent years, the use of new types of non-conventional fuels (alcohols, ammonia, biogas, hydrogen, etc.) as a fuel is being tested due to further improvements in engine design.

In recent years, the use of methanol (methyl alcohol) and ethanol (ethyl alcohol) instead of petroleum fuels has become more popular. Because the working mixture formed with methanol at the same temperature and pressure has the same combustion temperature as the working mixture with gasoline, moreover, the methanol-air mixture is denser and the efficiency is much higher. The octane number of pure methanol is 112 (by research), which indicates that it is possible to increase the engine's compression ratio to 14 and increase the engine's efficiency by 20%.

Although methyl and ethyl alcohols have high octane numbers, cetane numbers are low, so it is beneficial to use them in spark-ignited engines. However, under certain conditions, they can be mixed with diesel fuel and used in diesel engines.

One of the factors limiting the widespread use of alcohols as fuels is their corrosive activity, which affects the details of the fuel supply system; alcohols actively react with lead to form amorphous compounds that clog fuel filters and carburetor jichlorins; most gaskets swell under the influence of alcohol; due to the low heat of combustion, the volume of fuel tanks for them should be doubled.

At a time when many carburetor engines are being developed and used, it is advisable to use gasoline-alcohol mixtures as a first measure to save petroleum fuel. When a

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small amount of alcohol (up to 5% from methanol and up to 10% from ethanol) is added, the engine does not need to be modified and the performance does not change significantly. When aqueous alcohols are used, up to 2% isobutyl alcohol is added to stabilize the fuel mixture. All this allows you to save 3-5% on gasoline.

Adding large amounts of alcohol (up to 15% methanol, up to 20% ethanol) to gasoline requires some modification of the mixture formation and injection systems, which has a significant effect on engine performance.

Pure alcohols are less suitable for use in diesels because of their low cetane content (3–4 for methanol and 6–8 for ethanol) and high volatility. This will cause the engine to knock at high and medium loads.

When alcohol is used instead of diesel fuel, the formation of varnish, dry matter and coke on the parts is reduced, resulting in cleaner oil and reduced wear. However, when alcohols are oxidized, intermediate acids and salts are formed, which accelerate the corrosion and corrosion of parts. In order to address these shortcomings, active work is being done in countries such as the United States, Brazil, Germany and Sweden.

Methanol is currently a natural gas produced, a non-renewable fossil fuel. In the future, he hopes to produce biomass from biomethanol. This is technically feasible, but production is currently being delayed as cost-effectiveness is still expected. The methanol economy is an alternative to the hydrogen economy, producing hydrogen from natural gas for comparison today.

ABE fermentation (acetone, butanol, ethanol) generated by butanol (C_4H_9OH) and experimental modifications of the process show that the potential is high with clear energy gains only with butanol as a liquid product. Because of the low oxygen content of butanol, it produces more energy than ethanol and can allegedly be burned “directly” in existing gasoline engines (without modification in the engine or car), and to ethanol less corrosive and less soluble in water and can be distributed through existing infrastructure.

Methanol is a fuel for heat engines and fuel cells. Due to its high octane level it can be used directly as a fuel using flexible fuel-powered machines (including hybrid and plug-in hybrid available internal combustion engines (ICE)). Methanol can also be burned in other engines or can be heated when other liquid fuels are used.Fuel cells can use methanol directly inside Direct methanol fuel cells (DMFC) or indirectly (by hydrogen reforming after conversion)

The traditional pathway to methanol is combined with partial oxidation (or not) by steam correction that passes through the formation of synapses by methane. New and more efficient methods of converting methane to methanol are being developed. These include:

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• Methane oxidation sulfuric acid media with homogeneous catalysts
• Methane bromination, followed by hydrolysis of bromomethane
• Direct oxidation of methane with oxygen
• Microbial or photochemical conversion of methane
• Partial oxidation of methane with retention of partially oxidized product and subsequent replacement with copper and iron Zeolite (e.g. Alpha-oxygen)

All of these synthetic routes emit greenhouse gas carbon dioxide CO2. To reduce this, methanol can be made by minimizing CO emissions2. One solution is to produce it from syngas obtained from the gasification of biomass. Any biomass can be used for this, including wood, wood waste, grasses, agricultural crops and their products, animal waste, aquatic plants and household waste. There is no need to use food crops such as corn, sugar cane and ethanol from wheat.

Polyhydric alcohols are chemically similar to monohydric alcohols. However, the chemical properties of polyhydric alcohols are due to the presence of two or more hydroxyl groups in the molecule.

The hydrogen fuel supply system of the internal combustion engine contains a fuel tank 9 with alcohol and two fuel circuits. The first fuel circuit contains nozzles for supplying alcohol by the fuel pump 10 to the nozzles of the engine inlet pipeline. The second fuel circuit contains a fuel pump 13, a heat exchanger 15 for heating alcohol to a gaseous state, a thermochemical reactor 16 located in the outlet pipeline 7 for obtaining synthesis gas from gaseous alcohol, consisting of hydrogen and carbon monoxide, a heat exchanger for cooling synthesis gas, a regulator 18 cooled synthesis gas supply, solenoid valves and fuel pipes 20. Fuel pipes 20 are located in the inlet channels 21 in the engine cylinder head for supplying synthesis gas when the intake valves 23 are opened in the gap between them and their seats.

The task is to create a safer hydrogen fuel supply system for the internal combustion engine of a combined power plant.

The solution to the problem of improving the safety of the hydrogen fuel supply system of the internal combustion engine is ensured by the fact that the created hydrogen fuel supply system for the engine contains a fuel tank with alcohol, the first fuel circuit containing nozzles for supplying alcohol by the fuel pump to the engine inlet pipes, the second fuel circuit containing another a fuel pump, a heat exchanger for heating alcohol to a gaseous state, a thermochemical reactor located in the outlet pipeline for producing synthesis gas from gaseous alcohol, consisting of hydrogen and carbon monoxide, a heat exchanger for cooling synthesis gas, a cooled synthesis gas supply regulator, solenoid valves , fuel pipes,located in the inlet channels in the engine

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cylinder head for supplying synthesis gas when the inlet valves are opened in the gap between them and their seats.

A hydrogen fuel supply system for an internal combustion engine of a combined power plant, containing a fuel tank with alcohol, a first fuel circuit containing nozzles for supplying alcohol by a fuel pump to the engine inlet pipes, a second fuel circuit containing another fuel pump, a heat exchanger for heating alcohol to gaseous state, a thermochemical reactor located in the outlet pipeline for producing synthesis gas from gaseous alcohol, consisting of hydrogen and carbon monoxide, a heat exchanger for cooling synthesis gas, a cooled synthesis gas supply regulator, electromagnetic valves, fuel pipes located in inlet channels in engine cylinder head for supplying synthesis gas when opening intake valves in the gap between them and their seats.

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