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BIOLOGICAL GAS RECEIVING AND APPLICATION

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A B S T R A C T

The shortage of energy resources in the whole world and the constant increase in their price are directing world scientists to search for new ways of using renewable energy sources. Another direction in which the process of energy production from renewable sources is rapidly developing all over the world is the problem of environmental protection. The ecological problem calls for increasing the positive attitude towards nature day by day.

K E Y W O R D S

Introduction

Currently, while practical bioenergy is beginning to develop in Uzbekistan, there is still no large-scale biogas plant in our country. Production and use of biogas can make a significant contribution to the energy of the republic. The main raw material for a biogas plant is livestock waste in agriculture, and sewage and garbage in cities. But if we look at the development of livestock farms in recent times, instead of a large number of farms of large horned cattle, a small number of farms have been established, and the ease of feeding and keeping them is emerging. Taking this into account, it is required to use small mobile devices and to strengthen their performance. Therefore, it is desirable to work on small-scale mobile types of BGK and to speed up the process of processing in them, to increase its productivity by introducing additional processes.

Various types of such regulators (biofilters) can be found in world practice. These are mainly artificial biofilters, which are not used in the work process, and if they are brought back to their original state, their comparative economic indicators will increase. Uzbekistan has a very large biomass potential. Biomass is the cheapest and most abundant renewable energy source. By biomass we mean waste produced by any biological means. According to the data, 200 billion tons of waste is generated on Earth in one year, and this is 3×1024Dj if it is calculated as an energy equivalent.

Composition of biogas from waste.

1-Table

Description	Composition of biogas					Biogas mixture (CH_4 - 60% CO_2 – 40%)
	CH_4	CO_2	H_2	H_2S	N_2	
Volumetric quantity	55-70	20-49	1	1	3	100
Volumetric heat of combustion, MDj/m³	35,8	-	10,8	22,8	-	21,5
Flammability Limit (Composition in Air)%	5-15	-	4-30	4-45	-	5-12
Fire formation temperature, ^0C	+65+750	-	+585	-	-	+650+750
Average density g/l	0,72	1,98	0,9	1,54	-	1,2

The main part of this potential is made up of waste from agriculture and, in particular, livestock farms. Currently, there are large and medium-sized livestock farms in Uzbekistan, where cattle, sheep, pigs and poultry are raised.

When these low-cost biogas plants for livestock farms were tested, such a plant produced 10-15m3 of methane gas (SN4) per day for a livestock farm with five black cattle and ten sheep, which could fully meet the domestic needs of the farm.

The use of biogas devices in livestock farms of our republic allows to solve a number of important problems at the same time:

- environmental (complete processing of waste);
- energy (generation and processing of biogas);
- agrochemical (production of highly effective organic fertilizers);
- social (creating working conditions);
- economic (decreasing payments, reducing fuel consumption, profiting from the sale of fertilizers);

Environmentally friendly, liquid high-quality and effective organic fertilizers are created in the process of obtaining methane gas by biological processing of manure from the biogas plant. These fertilizers contain mineralized nitrogen in the form of ammonium salts (the best absorbed form of nitrogen), mineralized phosphorus, potassium and other biogenic macro and micro elements necessary for plants, biologically active substances that improve soil structure, vitamins, amino acids and humic compounds.

As a result of manure processing and biogas production, the amount of SO^2 released into the atmosphere is drastically reduced.

Another current direction of this alternative energy is the development of alternative fuel to the fuel used in internal combustion engines, which removes disease-spreading microbes, insects and weed seeds from various biological wastes that harm the environment, removes unpleasant odors, increases fertilizing capacity, and uses in internal combustion engines. 6-3.5 m^3 of biogas can be obtained. Gas heat release capacity is 4200-6000 kcal/m^3.

Biogas can again be used as fuel for internal combustion engines. Because biogas also meets the requirements for fuels used in internal combustion engines. The lower specific combustion temperature of biogas is 6450C, and the octane number is 110-115. The use of biogas in IYODs improves and eases the mixture formation process, as well as the distribution of the mixture along the cylinders in any conditions of use, because biogas is easily mixed with air in different proportions.

Compared to liquid fuels, biogas has a much wider concentration range of flame propagation, which means that it burns quickly and completely even when the amount of air in the mixture is much higher. All this makes it possible to simplify the device used to obtain a combustible mixture and use the ratio of fuel and air in it, which emits small amounts of toxic substances into the atmosphere. When biogas is used, there are no problems associated with fuel vaporization during cold start-up and unheated operation of IYOD, and cases of steam plug formation in the supply system disappear by themselves when the ambient temperature is high. Biogas has high anti-detonation properties compared to gasoline, which allows to increase the compression level of the engine and increase fuel economy. Also, the service life of motor oil in IYODs increases, that is, contamination with various additives disappears. But there is a 20% decrease in the power of IYODs.

In conclusion, the use of biological gases in IYODs provides direct economic, operational and environmental benefits. It also protects the atmosphere from SO2 and greenhouse gases, and saves oil, a non-renewable energy source.

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