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IMPROVE BIOGAS PLANT FOR ORGANIC WASTE RECYCLING

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Abstract

The biogas device we offer provides the greatest yield of biogas, and the simplicity of the design made it possible to implement it in any repair and mechanical workshop or enterprise. He greatly helped the developing farms engaged in animal husbandry. It should be said that international experiments have been conducted on burning, gasification, pyrolysis, obtaining alcohol or biogas from biomass as an energy source.

Keywords

Bio gas, fertilizer, animal husbandry, substrates, anaerobic, microbiological, humus.

INTRODUCTION

One of the classic types of alternative energy sources is biomass, by processing biomass and various organic wastes, it is possible to obtain biogas, generate methane gas by processing it, and then start producing heat and electricity from it. As a result of the introduction of biogas devices into practice, it is possible to solve environmental problems simultaneously with the use of waste methane gas and energy production[1]. Another noteworthy aspect is that it allows us to expand such "green technologies" in the fields of agriculture, energy, waste management, transport, education and science. In order to use biological waste as an energy source, biological waste is processed in large-scale reactors (hermetically closed vessels) [2]. With the help of biogas plants, manure (plant residues and animal waste) is processed, combustible gas and high-quality fertilizer humus are obtained. The working principle of biogas extraction devices is a practical expression of natural biological processes. Modern biogas production is based on processes that occur in nature, that is, the formation of methane from the waste that occurs as a result of digestive activity in the stomach of animals [3].

MATERIALS AND METHODS

Currently, the technology of obtaining biogas is well studied and is successfully used in a number of foreign countries. A lot of cattle and poultry are raised in our republic, which naturally means a lot of organic waste, but despite this, little attention is paid to the use of biological waste as an energy source.

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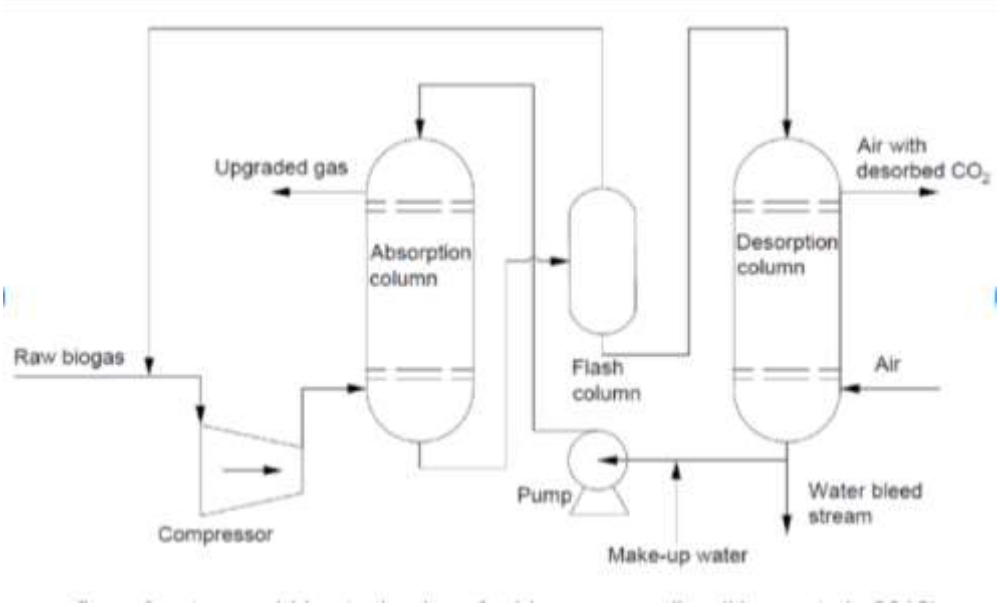
Therefore, a biogas plant was used to recycle this organic waste . We know that a biogas plant consists of a sealed vertical cylindrical vessel with process pipes equipped with a dome and a bottom, and a foam mixing device installed in the vessel. The disadvantages of this bioreactor are the low productivity of the treated substrate and the labor intensity of ensuring tightness when the substrate is anaerobically fermented, since special stuffing box devices are needed to seal the shaft of the mixing device. An important disadvantage of this technical solution is the reduction of the mass exchange coefficient between the foam working gas and the processed substrate along the height of the device. It is especially noticeable in the upper layers, because here a passive surface layer is formed, consisting of gas bubbles that rise up, and adhere to the substrate particles, preventing their further movement through the layer. All this affects the total mass of product exchange throughout the entire volume of the substrate. This negative process can be solved with the help of mechanical mixing or "floating" nozzles throughout the entire volume of the apparatus, which significantly increases the mass transfer coefficient. Since in the above cases the product undergoes anaerobic fermentation in a closed container with no access to oxygen, it was proposed to include this in a closed cycle, i.e. "spontaneous" gas bubbling. The task of the biogas plant for processing organic waste is to activate the mass exchange process and increase the productivity of the plant



1 – picture. Biogas extraction equipment

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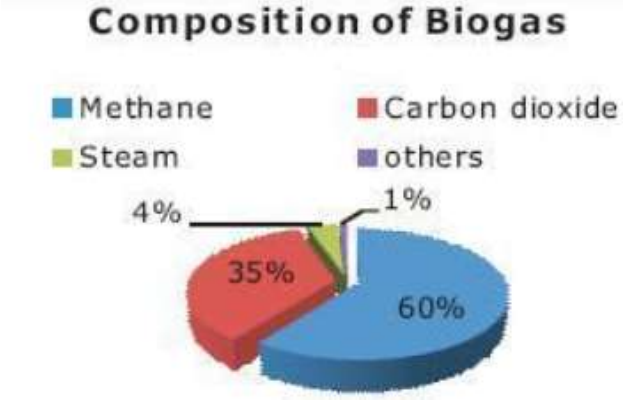
RESULTS

Biogas-organic substrates consist of a mixture of gases with a composition of 50-70% methane (CH4), as well as 30-40% CO2, small amounts of H2S, NH3, H2, CO, formed in anaerobic and microbiological processes. It can be seen in diagram 1.



CONSLUCION

The use of raw materials and energy throughout the world remains a global problem. One of the alternative ways to solve this problem is to introduce biogas production technology among the population and at the industrial level. Currently, the technology of obtaining biogas is well studied and is successfully used in a number of foreign countries.

In our republic, the installation of small power equipment in the production of energy using biogas in farms and households gives effective results. To develop work in this direction, it is necessary to use internal investments or bank loans.

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