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ACCELERATING UTILIZATION PROCESSES WASTEWATER

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Abstract
In the article the process of anaerobic digestion of sewage sludge in bioaerator was studied. The work was carried out on the basis of laboratory of Jizzakh city sewage treatment plant named "Uchtepe". As a result of studying this work, data on biogas yield and composition of sewage sludge were obtained. Special attention is paid to the development of technologies for biogas production. A promising direction of sewage sludge processing is biochemical conversion by anaerobic digestion in bioaerators.

Keywords: fuel, utilization, neutralization, environment, pathogenic bacteria, intensification, energy value.

Introduction
Constantly increasing prices for fossil fossil fuels make it very urgent to find alternative, constantly renewable sources of energy. The use of municipal waste as alternative and renewable sources of heat and electricity has long been one of the most important directions in the energy strategy of many countries of the world [1-5]. The technology excludes bacterial and chemical pollution of the environment and allows to obtain soil used in landscaping. Wastewater is formed as a result of human economic and domestic activities. They fall into the waters of reservoirs, rivers, seas and oceans, where all the variety of harmful substances are concentrated, the producer of which willingly or unwillingly is a man. Utilization and neutralization of wastewater is one of the most important environmental problems of the present time and in this direction there are many different technological methods, based on physical-chemical or biochemical processes of degradation of harmful components of wastewater.

Intensive construction of sewage networks began in Europe in the 19th century, but centralized sewage disposal led to a localized increase in pollution of water bodies[6-11]. Therefore, in England, as early as 1861, a law was issued to treat sewage from fecal and putrefactive substances before releasing it into rivers. The earliest developments in wastewater detoxification are soil treatment methods. This method is based on the self-purification capacity of the soil. Such

treatment is carried out in irrigation or filtration fields. However, wastewater treatment under natural conditions requires the disposal of large areas of fertile land.

The degree of wastewater treatment decreases in winter time due to the slowdown of biological processes at low temperatures. Domestic wastewater contains a large number of pathogenic bacteria and helminth eggs, more than 50% of which, getting into the soil and on vegetables, remain viable for a long time [12-16]. Therefore, the use of natural biological purification facilities is decreasing both in our country and in a number of industrialized foreign countries. Biological purification proceeds intensively in artificially created conditions. This process can be controlled and regulated, and therefore intensified.

It is the possibility of regulating the degree of purification led to the creation of a variety of technological methods, the criterion of effectiveness of which are the achieved degree of purification, i.e. the environmental factor and the cost of purification - the economic factor. In general, knowing the principle of metabolism of microorganisms, it is possible to achieve any degree of purification, but the limitation on the organization of a particular technology may be its cost, which, above all during the operation of treatment facilities depends on energy consumption and the number of service personnel. High and stable quality of wastewater treatment can provide aeration facilities, in which sorption and destruction are carried out by microorganisms (activated sludge) suspended in the treated wastewater. However, aeration tanks, oxidation channels, aerated ponds have the following disadvantages: significant power consumption (0.4-0.6 kWh per 1 m^3 of municipal wastewater) unreliability of blowers, high-pressure fans, mechanical aerators in long-term operation; deterioration of treatment quality in winter time due to cooling of the treated liquid during aeration with cold air [17-22].

In recent years, multi-sectional activated sludge schemes have become widespread in the world, simultaneously treating wastewater from organic pollutants and transforming nitrogen compounds. The combination of aerobic and anaerobic zones allows nitrification and denitrification processes. But for the majority of settlements and cities in the middle and northern part of Russia these schemes are not rational enough, as low temperatures of initial wastewater in the cold season (12-17 ºS), which tends to decrease during the process (on average by 2-5 ºS) have an unfavorable effect on the activity of nitrifier bacteria.

The personnel of sewage treatment facilities are in a high-risk atmosphere. At certain combinations of atmospheric moisture, air temperature and wind direction, pathogenic microflora retains its viability for a long time and enters settlements (sanitary protection zones are not a sufficient obstacle). The growth of cities leads to new problems: the need to lay new collectors, increased energy consumption for wastewater supply to treatment plants. One of the modern methods of solving the problems of wastewater treatment from large settlements, is partial or complete decentralization of wastewater disposal systems. However, in a number of cases, the realization of this method is difficult, due to the difficulty of alienating significant areas for the construction of bulky treatment facilities and the inability to maintain the required size of sanitary protection zones. Treatment facilities of the future should have minimal dimensions, be environmentally safe when located in the city limits, and the quality of treated wastewater should be able to use them for the technical needs of the city. Lack of clean natural waters and high demand of industry in water determine the necessity to continue works on further improvement of treatment systems. Under these conditions, the development of new technological solutions that provide high and stable quality of wastewater treatment is relevant and in demand[23-25].

The purpose of solving the problem is to improve the quality and reliable operation of treatment facilities, as well as to minimize the negative impact on the environment. In order to achieve the objectives it is planned to solve the following tasks:

1. Modernization of the shop of mechanical dewatering of sewage sludge.

2. Modernization of the technological network of biologically treated wastewater, bringing the actual capacity of treatment facilities up to 10,000 m^3/day.

As a result of the works, the capacity of the treatment facilities system will be increased and conditions will be created for connection of the real estate objects under construction (reconstruction) to the water disposal systems. Minimal costs for the creation of a technological unit for high-intensity grinding of wood and vegetation materials (or waste), their activation and modification together with sewage sludge and excess activated sludge. Possibility of organic integration of the technological block of modification of sewage sludge and activated sludge together with wood-plant materials or their waste into any traditional system of biological treatment facilities.

Reduction of energy consumption for sewage sludge and activated sludge processing. Use of continuous or pulsed exposure to microwave radiation for disinfection of sewage sludge. Expanding the range of obtaining target products of increasing their energy value for subsequent utilization in the form of fuel due to the possibility of maximum preservation and use of the organic part of sewage sludge and activated sludge[26-30]. The disadvantages of this method of improving the dewatering capacity of activated sludge are also enormous energy costs of thermal treatment of sludge and technological complexity of the process. Firstly, the presence of excessive activated sludge in the composition of sewage sludge complicates the process of their dewatering drying due to the content of bound water inside the cells and vacuoles, closed shells of living microorganisms and protozoa that form the biocenosis of activated sludge. The process of release of bound water is associated with its penetration through these shells.

CONCLUSION:

1. The main advantages of the proposed method of treatment of activated sludge and sewage sludge are;

2. Intensification of technological phases of dewatering and drying due to the increase of sludge moisture yield as a result of changes in their structural and mechanical parameters:

3. Reduction of time of technological process of treatment due to the absence of the need for long-term stabilization of the organic part of sewage sludge.

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