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A promising direction of sewage sludge processing is their biochemical transformation by anaerobic digestion in bioreactors - digesters. The technology eliminates bacterial and chemical contamination of the environment, allows you to get soil used in landscaping. Wastewater is formed as a result of domestic human 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 voluntarily or involuntarily is a man. Disposal and neutralization of wastewater is one of the most important environmental problems of the present time and in this direction a variety of technological methods, based on physical and chemical or biochemical processes of degradation of harmful components of wastewater, have been developed.

Intensive construction of sewage networks began in Europe in the 19th century, but centralized sewage disposal

FACTORS OF MODERN METHODS IN WASTEWATER TREATMENT PROCESSES

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ABSTRACT

The ever-increasing prices of fossil fossil fuels make the task of finding alternative, constantly renewable sources of energy very urgent. The use of municipal waste as an alternative and renewable source of heat and electricity has long been one of the most important directions in the energy strategy of many countries around the world. Particular attention is paid to the development of technologies for the production of biogas. As a result of the study of this work were obtained data on the biogas yield and composition of sewage sludge.

led to a local increase in pollution of water bodies. Therefore, in England as early as 1861 a law was issued on purification of sewage from fecal and decaying substances before releasing them into rivers. The earliest developments in wastewater detoxification are soil treatment methods. This method is based on the ability of self-purification of soil. This treatment is carried out on irrigation fields or filtration fields. However, for wastewater treatment in natural conditions requires the alienation of large areas of fertile land. The degree of wastewater treatment decreases in winter due to the slowdown of biological processes at low temperatures. Domestic sewage contains a large number of pathogenic bacteria and helminth eggs, more than 50% of which survive for a long time in the soil and on vegetables. Therefore, the use of natural biological treatment facilities is reduced both in our country and in a number of industrially developed foreign countries.



Biological purification proceeds intensively under artificially created conditions. This process can be controlled and regulated, and therefore intensified. It is the ability to regulate the degree of purification has led to the creation of a variety of technological methods, the criterion for the effectiveness of which is the degree of purification achieved. In general, knowing the principle of microbial metabolism, any degree of purification can be achieved, but the limit on the organization of a particular technology may be its cost, which is mainly during the operation of sewage treatment plants depends on energy costs and number of staff. High and consistent quality of wastewater treatment can provide aeration facilities, in which sorption and degradation are carried out by microorganisms (activated sludge) that are suspended in the treated wastewater. However, aeration tanks, oxidation channels, aerated ponds have the following drawbacks: significant power consumption (0.4-0.6 kW/h per 1 m³ 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 treated liquid during aeration by cold air. In recent years, multi-section schemes with activated sludge, which simultaneously purify wastewater from organic pollutants and nitrogen compounds transformation, have become widespread in the world. The combination of aerobic and anaerobic zones allows nitrification and denitrification processes.

But for most settlements and cities in the middle and northern part of Russia, these schemes are not rational enough, because low temperatures of waste water

in the cold season (12 - 17 °S), which tend to decrease during the process (an average of 2-5 °S) have an adverse effect on the activity of nitrification bacteria. In an atmosphere of high risk is the personnel of sewage treatment plants. Under certain combinations of atmospheric moisture, air temperature and wind direction, pathogenic microflora remain viable for a long time and enter populated areas (sanitary protection zones are not a sufficient barrier). Urban growth leads to new problems: the need to lay new collectors, increased energy costs for supplying wastewater to sewage 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 some cases the implementation of this method is difficult because of the difficulty of alienating large areas for the construction of cumbersome sewage treatment plants and the inability to maintain the required size of sanitary protection zones. Wastewater treatment facilities of the future must be of minimum size, be environmentally friendly when placed in the city limits, and the quality of treated wastewater should be able to use it for technical needs of the city. Lack of clean natural water and the high demand for water from the industry determine the need to continue work on the further improvement of treatment systems. Under these conditions, the development of new technological solutions to ensure high and stable quality of wastewater treatment is urgent and relevant. The aim of solving the problem is to improve the quality and reliability of sewage treatment facilities, as well as minimizing the negative impact on



the environment. To achieve the goals it is supposed to solve the following tasks:

1. Modernization of mechanical dewatering of sewage sludge;

2. Modernization of the technological network of biologically treated wastewater, bringing the actual capacity of sewage treatment plants to 10 000 m³ /day. As a result of the work will increase the capacity of the treatment plant system and create conditions for connecting the built (reconstructed) real estate to wastewater treatment systems.

CONCLUSIONS

The main advantages of the proposed processing method of activated sludge and sewage sludge are intensification of technological phases of dewatering and drying by increasing the moisture content of sludge as a result of changes in their structural and mechanical properties:

- Reducing the technological process time due to the lack of need for long-term stabilization of the organic part of sewage sludge. Minimal costs of creating a technological unit for high-intensive grinding of wood-plant materials (or waste) of their activation and modification together with sewage sludge and excessive activated sludge; Possibility of organic

integration of the technological unit of sewage sludge and activated sludge modification together with wood-plant materials or their waste into any traditional system of biological treatment plants.

- Reducing energy costs for the processing of sewage sludge and activated sludge. Expanding the range of target products, increasing their energy value with subsequent utilization as fuel due to the possibility of maximum preservation and use of the organic part of sewage sludge and activated sludge.

- The disadvantages of this method of improving the dewatering ability of activated sludge are also enormous energy costs for thermal treatment of sludge and technological complexity of the process. The presence of excessive activated sludge in the composition of sewage sludge complicates the process of dewatering and drying due to the presence of bound water inside the cells and vacuoles, closed shells of living microorganisms and protozoa, forming a biocoenosis of activated sludge. The process of release of bound water is associated with its penetration through these membranes.

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