NOVATEUR PUBLICATIONS
INTERNATIONAL JOURNAL OF INNOVATIONS IN ENGINEERING RESEARCH AND TECHNOLOGY
[IJIERT] ISSN: 2394-3696 Website: ijiert.org
VOLUME 9, ISSUE 9, Sep. -2022

FACTORS OF MODERN METHODS IN WASTEWATER TREATMENT PROCESSES

U. M. Qutlimurodov,
Associate Professor. DzhizPI, c. Dzhizak, Republic of Uzbekistan

M. K. Tursunov,
Senior Lecturer DzhizPI, c. Dzhizak, Republic of Uzbekistan

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.

Keywords: Wastewater, biogas, biomass, energy, degree of purification, sorption, sewage, dewatering.

INTRODUCTION

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 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 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 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 ºS), which tend to decrease during the process (an average of 2-5 ºS) 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 m^3 /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.

BIBLIOGRAPHY (REFERENCES):

1. Utlimurodov, U. M. (2020). Some aspects of environmental problems associated with road transport. In European Scientific Conference.-2020.-S (pp. 50-52).
2. Кутлимуродов У. М. РЕШЕНИЯ ДЛЯ ЭФФЕКТИВНОГО ИСПОЛЬЗОВАНИЯ ВОДНЫХ РЕСУРСОВ В РЕГИОНАХ РЕСПУБЛИКИ УЗБЕКИСТАН //Символ науки: международный научный журнал. – 2021. – №. 3. – С. 14-17.
3. Kutlimurodov, U. M. Atmospheric pollution with harmful substances and measures to reduce it. Ecology: yesterday, today, tomorrow.-2019.--S, 249-252.
4. Masharipovich Q.U. Laboratory Equipment of Overpressure Determination on Standard// International Journal of Development and Public Policy. – 2021. – Т. 1. – №. 6. – С. 138-143.
5. Мусаев,Ш.М.(2021).Ишлаб чиқариш корхоналаридан чиқадиган оқова сувларни механик услублар билан тозалаш самарадорлигини ошириш тўғрисида. Science and Education,2(5),343.
6. "Thermal conductivity of lightweight concrete depending on the moisture content of the material" XMM Shukurov, G., Musaev Sh M., Egamova MT International journal of recent Technology and engineering. 1 (2), 6381-6387, 2020.
7. Қутлимуродов, У. М. (2020). Некоторые аспекты экологических проблем, связанные с автомобильными транспортами. In European Scientific Conference (pp. 50-52).
8. Kutlimurodov U. M. Solutions for the efficient use of water resources in the regions of the republic of uzbekistan //Symbol of Science,(3). – 2021.
9. Kenjabayev A., Sultonov A. The issues of using information systems for evaluating the efficiency of using water //International Finance and Accounting. – 2018. – Т. 2018. – №. 3. – С. 2.
10. Sultonov A.O. Metodi ratsionalnogo ispolzovaniya void v oroshenii selskoxozyastvennix kultur //sovremennaya ekonomika: Aktualniye voprosi, dostijeniya i.–2019.–S. – 2019. – С. 207-209.
11. Obidovich, S. A. (2021). Effective Ways of Using Water with Information Systems. International Journal on Economics, Finance and Sustainable Development, 3(7), 28-32. https://doi.org/10.31149/ijefsd.v3i7.2051
12. Sultonov A.O. Problems of optimal use of water resources for crop irrigation //Journal of Central Asian Social Studies. – 2020. – Т. 1. – №. 01. – С. 26-33.
13. Sultonov A. Water use planning: a functional diagram of a decision-making system and its mathematical model //International Finance and Accounting. – 2019. – Т. 2019. – №. 5. – С. 19.
14. Obidovich S.A. The use of Modern Automated Information Systems as the Most Important Mechanism for the use of Water Resources in the Region //Test Engineering and Management. – 2020. – Т. 83. – С. 1897-1901.
15. Kutlimurodov U. M. Pollution of the atmosphere with harmful things and measures to reduce it //Ecology: yesterday, today, tomorrow. – 2019. – С. 249-252.

16. Қутлимуродов, У. М. (2021). Влияние сточных вод с ионами тяжелых металлов города джизака на окружающую среду. In Экономика и управление гостеприимством территории (pp. 51-55).
17. Уммат Холбоевич Холбоев, Бахтиёр Уктамович Мелиев. Резино-техник корхоналарда ишчи ва атроф-муҳит ҳавосини тозалаш. "Фан ва техника тараққиёти" ёш олимлар ва мутахассислар илмий-амалий конференциясининг материаллари. 100-101 b. 1990/5.
18. Бахтияр Уктамович Мелиев, "Способ получения сорбента". 1998 . Elibrary id: 38103017.
19. Сайдуллаев С. Р. Применение информационных систем в эффективном использовании воды // Наука и образование. - 2020. - Т. 1. - №. 7.
20. Сайдуллаев С. Р. Сувдан самарали фойдаланишда ахборот тизимларини қўллаш //Science and Education. – 2020. – Т. 1. – №. 7.
21. Қутлимуродов, У. М. (2021). ЭФФЕКТИВНОЕ ИСПОЛЬЗОВАНИЕ ВОДНЫХ РЕСУРСОВ В УЗБЕКИСТАНЕ. In Экономика и управление гостеприимством территории (pp. 56-60).
22. Ulugbek, M. (2019). Evolution, transformation and biological activity of degraded soils. EVOLUTION, 28(14), 88-99.
23. Kutlimurodov, U. M. (2022). Values of atmospheric sewage disposal from buildings and structures. Science and Education, 3(5), 321-328.
24. Kutlimurodov, U. M., & Meliev, B. U. (2022). Use of Urea-Formaldehyde Foam sorbents for Water and Soil Treatment from Petroleum Contaminants. EUROPEAN JOURNAL OF INNOVATION IN NONFORMAL EDUCATION, 2(6), 238-242.
25. Obidovich, S.A. (2020). The use of Modern Automated Information Systems as the Most Important Mechanism for the use of Water Resources in the Region. Test Engineering and Management, 83, 1897-1901.
26. Султонов А.О. Методы рационального использования воды в орошении сельскохозяйственных культур // Современная экономика: актуальные вопросы, достижения и инновации 2019. – С. 207-209.
27. U.M. Qutlimurodov. "Prevention of water losses in zarafshan-gagarin main water system" The Third International Scientific Conference Construction Mechanics, Hydraulics and Water Resources Engineering (CONMECHYDRO 2021 AS). AIPCP22-AR-CONMECHYDRO2021-00034. AIP Conference Proceedings 2022/7/23.
28. Kutlimurodov, U. M., & Meliev, B. U. (2022). Use of Urea-Formaldehyde Foam sorbents for Water and Soil Treatment from Petroleum Contaminants. EUROPEAN JOURNAL OF INNOVATION IN NONFORMAL EDUCATION, 2(6), 238-242.
29. Қутлимуродов, У., and И. Толлибоев. "Отвод атмосферных сточных вод от зданий и сооружений." Science and Education 3.6 (2022): 253-258.
30. Ulug'bek Masharipovich Qutlimurodov. "ОЧИСТКИ АВТОМОБИЛЬНЫХ ДОРОГ ОТ АТМОСФЕРНО-ОСАДОЧНЫХ СТОКОВ" СамГАСИ. Журнал "Меъморчилик ва қурилиш муаммолари". 4 - сон. 2021/12/30. 9-11 b.
31. Saydullaev, S. R. (2020). Decision-making system for the rational use of water resources. Journal of Central Asian Social Studies, 1(01), 56-65.
32. Ergashev, R., Azimov, A., Kholbutaev, B., & Mavlonov, L. (2021). Influence of cavitation on pressure pulsation through impeller of large pumps. In E3S Web of Conferences(Vol.264,p. 03004). EDP Sciences.
33. Хажиматова М. М. Некоторые гидродинамические эффекты, проявляемые при пузырьковом и снарядном режимах течения газожидкостной смеси // Science and Education–2021–Т.2.–№.4.– С. 257-264

34. Хажиматова М.М.Сооружение для забора подземных вод //Символ науки.–2021 №. 4-с.
35. Qutlimurodov U.M. Самарқанд ш. СамДАҚИ. "The importance of determining monometric Pressure in laboratory equipment" "Меъморчилик ва Қурилиш муаммолари" илмий журнали 28.03.2022. № 1 - сон. 63-65 бетлар.
36. Кутлимуродов У. УЛЬТРАФИЛЬТРАЦИОННЫЕ ОЧИСТКИ СТОЧНЫХ ВОД ПРЕДПРИЯТИЙ ПО ПРОИЗВОДСТВУ КОВРОВЫХ ИЗДЕЛИЙ //Ta'lim fidoyilari.–2022. – Т. 5. – №. 9.– С. 282-284.
37. Хажиматова М. М.,Саттаров А. Экологик таълимни ривожлантиришда инновация жараён лари //Me′ morchilik va qurilish muammolari. – 2019. – С. 48.
38. Мусаев Ш.М. Ишлаб чиқариш корхоналаридан чиқадиган оқова сувларни механик услублар билан тозалаш самарадорлигини ошириш тўғрисида //Science and Education.–2021.– Т. 2.– №. 5. – С. 343-354.
39. Мусаев Ш. М. и др. Насос агрегатларини ҳосил бўладиган гидравлик зарблардан ҳимоялаш усуллари тадқиқ этиш //Science and Education.–2021.–Т. 2.– №. 3. – С. 211-220.
40. Sultonov A. Water use planning: a functional diagram of a decision-making system and its mathematical model //International Finance and Accounting. – 2019. – Т. 2019. – №. 5. – С.Султонов, А.О. (2021). Саноат корхоналари оқова сувларини тозалашнинг долзарблиги. Science and Education, 2(6), 299-306.
41. Karimovich, T. M., & Obidovich, S. A. (2021). To increase the effectiveness of the use of Infor mation Systems in the use of water. Development issues of innovative economy in the agricultural sector, 222-225.
42. Сайдуллаев С. Р. Сувдан самарали фойдаланишда ахборот тизимларини қўллаш //Science and Education. – 2020. – Т. 1. – №. 7.
43. Сатторов А., Сайдуллаев С. Эски турдаги қозонхона ўчоқларида ёқилғи сарфини таҳлил қилиш //Меъморчилик ва қурилиш муаммолари" ОАК тасарруфидаги илмий-техник журнал Самарқанд. – 2020.
44. U.M.Qutlimurodov. "Suv taэminoti va oqava suvlarni oqizish tizimlari". // Darslik/Тошкент.: "IMPRESS MEDIA" MCHJ-2021. 246 bet.
45. Sh.M.Musaev. "Nasoslar va nasos stantsiyalari". Darslik - 2020/12/02. 225 bet. Toshkent: Lesson press - 2020.
46. S.R.Saydullayev. "Binolarning injenerlik kommunikatsiyalari". Darslik - 2021/08/18. Toshkent - 2020. Lesson press. 256 bet.
47. U.M.Qutlimurodov. "Oqava suv oqizish tizimlarini ekspluatatsiya qilish va boshqarish". Monografiya - 2020. OOO "Minus dezign grup". 104 bet.
48. N.U.Toshmatov. "Muhandislik kommunikatsiyalarini montaj qilish texnika va texnologiyasi". O'quv qo'llanma. OOO"Minus design group" 2021/05/31. 183 bet.
49. E.S.Buriev, D.E.,Maxmudova, N.U.Toshmatov, M.M.Xojimatova. "Muhandislik kommunika tsiyalari tizimlari montaji". O'quv qo'llanma. "Yoshlar matbuoti" Toshkent-2019.188 b.
50. Sh.M.Musaev. "Issiqlik ishlab chiqarish uskunalari". Oliy o'quv yurtlari talabalari uchun o'quv qo'llanma. Toshkent-2021. T: Lesson press. 158 bet.
51. M.M.Xajimatova. "Suv ta'minoti (Yer osti suv ta'minoti)".O'quv qo'llanma-2021-Toshkent 178 b