Applied Science and Innovative Research
ISSN 2474-4972 (Print) ISSN 2474-4980 (Online)
Vol. 7, No. 3, 2023
www.scholink.org/ojs/index.php/asir

Original Paper

Main Technical Analysis of Sewage Treatment in Environmental Engineering

Zhonglin Wu[1*]

[1] School of Food and Bioengineering, Xihua University, Chengdu, Sichuan 610039, China

[*] Zhonglin Wu is the first author and corresponding author of this article.

Received: July 5, 2023 Accepted: July 25, 2023 Online Published: July 28, 2023

doi:10.22158/asir.v7n3p56 URL: http://doi.org/10.22158/asir.v7n3p56

Abstract

In recent years, China has developed rapidly and is gradually moving towards a moderately prosperous society in all respects. In the context of this era, increasingly validated environmental issues have always plagued China's economic development. In the early stages of reform and opening up, while the economy developed rapidly, China's attention to environmental protection was not high, resulting in increasing pressure on environmental protection. The sewage generated by most urban life directly affects the development of the urban environment. Urban sewage treatment can recycle water resources, which has a good effect on protecting the social and ecological environment. This paper analyzes the common problems of sewage treatment in Environmental engineering, and expounds the common technologies of sewage treatment in China at present for your reference.

Keywords

Environmental engineering, Sewage treatment, Common Techniques

1. Introduction

Sewage treatment is not only a necessary work to strengthen urban construction and promote urban development, but also a cornerstone for safeguarding the ecological environment and maintaining human civilization. In recent years, the state has strengthened urban sewage treatment and issued a large number of environmental protection policies to support the smooth progress of sewage treatment in Environmental engineering. At present, the main sources of sewage in China are industrial wastewater, urban residents' domestic wastewater, urban precipitation, and some polluted surface water. Some highly toxic wastewater cannot meet the process requirements with ordinary treatment methods, and the treatment difficulty of domestic sewage is relatively small. Currently, the sewage treatment methods used in China can generally meet the standards. Overall, the application of sewage treatment

in China can achieve good results, but there are still some shortcomings that need to be improved and optimized.

2. Sewage Treatment in Environmental Engineering is very Important for China's Development

2.1 Improved Water Resource Utilization

In recent years, with the rapid development of China's social economy, the quality of life of the people has been effectively improved. However, the rise and development of many enterprises such as chemical and construction enterprises have led to increasingly serious environmental problems. In the new era, in order to break through this practical dilemma, it is necessary to optimize the original sewage treatment technology of Environmental engineering and apply new treatment concepts and methods. In the process of economic development in China, the quality of life has been greatly improved, and the awareness of environmental protection has been continuously strengthened. On the basis of this, the awareness of water resource utilization has also been continuously enhanced. Various types of wastewater generated can be treated through technical means to remove harmful substances such as parasites and microorganisms in the water, and then recycled and reused according to the practice.

2.2 Beneficial to the Sustainable Development of Chinese Cities

The significance of Environmental engineering is to maintain the balance of ecological environment and achieve good environmental quality. However, sewage treatment is an important part of Environmental engineering, and in order to improve the effect of sewage treatment, appropriate and reasonable treatment technologies need to be adopted. As the saying goes, the efficiency of sewage treatment in Environmental engineering can be effectively improved only when the pollution source is controlled from the source. The main sources of urban sewage in China are domestic sewage and industrial production. Pretreatment of sewage can be done before discharge, which can appropriately reduce the cost of sewage treatment. Doing a good job in sewage treatment of Environmental engineering can not only effectively improve the ecological environment around the city, but also promote the sustainable development of the city.

3. Common Problems in Sewage Treatment

3.1 Shortage of Funds Required for Sewage Treatment

In Environmental engineering, sewage treatment is an important work. In order to improve the effect of sewage treatment, appropriate treatment technologies and methods should be selected. At present, although there are over 4000 sewage treatment plants operating in China, they still cannot far meet the requirements of urban, rural, and industrial sewage treatment. Moreover, some small and medium-sized cities, especially in the northwest, have not included the planning and construction of sewage treatment in their urban development agenda. One of the main reasons is the lack of dedicated construction funds. In some areas, water pollution is becoming increasingly serious. If we wait for funds to invest before

building sewage treatment plants, it will worsen the environment and bring inconvenience to the local people's lives.

3.2 Maintenance of Imported Equipment

Due to the large-scale introduction of imported equipment from abroad into the sewage treatment industry in China, after several years of operation, these equipment will gradually encounter some minor problems, even component damage, which requires professional technical personnel. If foreign experts are invited for maintenance, the cost is very high. With professional maintenance personnel, there must also be sufficient spare parts, especially some equipment that is about to be phased out, which will be introduced to China, Spare parts will no longer be produced abroad, so domestic surveying, processing and manufacturing are necessary to save costs.

3.3 Insufficient Environmental Awareness among Personnel

At present, whether in rural or urban areas, the waste of water resources is very serious. Currently, personnel have insufficient environmental awareness, which affects the application results of various technologies. Failure to strictly follow the application requirements of sewage treatment technology and pipeline maintenance standards will affect the actual effectiveness of various work.

4. Common Technologies for Sewage Treatment in Environmental Engineering

4.1 Physical Sewage Treatment Technology

Common physical wastewater treatment technologies, such as adsorption, are also known as physical adsorption methods. Mainly utilizing minerals and activated sludge to adsorb impurities in wastewater, thereby purifying the wastewater. Among them, minerals are relatively excellent and ideal materials, as minerals themselves do not contain any toxic or harmful substances, mainly using diatomaceous earth and other materials. Its advantages are also very obvious. China has a large total amount of minerals, low cost, simple early production, and good adsorption effect on magazines, which can reduce secondary pollution.

4.2 A/O Method

Biological contact oxidation process is a domestic sewage treatment process between Activated sludge and biofilm process. The tank is equipped with fillers. Some microorganisms are fixed on the surface of the filler in the form of biofilm, and some are suspended in the water in the form of floc. It has the characteristics of both biological filter and Activated sludge process. The main characteristics of A/O method are: strong adaptability; Impact load resistance; High volume load; There is no sludge bulking; The amount of sludge discharged is very low; It has good denitrification effect.

4.3 A2/O

This method is a derivative method of A/O, which also has good nitrogen and phosphorus removal effects and is a common secondary sewage treatment process. By analyzing the nitrifying bacteria, denitrifying bacteria, and polyphosphate bacteria in the bacterial colonies of activated sludge. In the aerobic section, Nitrifying bacteria convert the ammonia nitrogen and organic nitrogen in the inflow

into ammonia nitrogen through biological Nitrification to nitrate; In the anoxic section, the denitrification bacteria will convert the nitrate brought in by the internal reflux into nitrogen and escape into the atmosphere through biological denitrification, so as to achieve the purpose of denitrification; In the anaerobic stage, phosphorus accumulating bacteria release phosphorus and absorb easily degradable organic matter such as low-level fatty acids; In the aerobic stage, phosphorus accumulating bacteria absorb excessive phosphorus and remove it through the discharge of excess sludge. The characteristic of this method is that the process flow is simple, and the total hydraulic retention time is also less than other similar processes. Due to alternating operation in anaerobic, anoxic, and aerobic environments, filamentous bacteria do not proliferate in large numbers, and SVI is generally less than 100, preventing filamentous expansion

4.4 UCT

It is another change based on A2/O, where ① the sludge directly flows back to the anaerobic tank instead of the anaerobic tank. ② Part of the mixed liquid in the anaerobic tank flows back to the anaerobic tank, adding an internal reflux. Compared to A2/O, it improves the efficiency of nitrogen and phosphorus removal.

4.5 UCT-MBR

The research group of Dr. Zhang Chuanyi from China University of Mining and Technology focuses on the study of chemical addition enhancement of UCT-MBR phosphorus removal function and membrane pollution control, combining UCT process and membrane process. Adding an MBR pool after UCT has become a serious problem for water eutrophication and differentiation in China and even around the world. In order to reduce the growth of algae in receiving water bodies, the total phosphorus (TP) discharge standards of sewage treatment plants are becoming increasingly strict. Membrane bioreactor (MBR) is an efficient wastewater treatment process, however, a single MBR system is insufficient in biological phosphorus removal due to the longer sludge retention time. Adding aluminum salts to the UCT-MBR process can further increase the TP removal rate, and the removal of NH4+- N and TN has no significant impact. The decrease in the concentration of extracellular polymer (EPS) on the outer membrane further reduces the accumulation of membrane pollutants, thereby effectively slowing down the rate of membrane fouling.

4.6 SBR

Intermittent Activated sludge has been widely used in sewage treatment engineering due to its series of characteristics superior to ordinary Activated sludge. In the SBR method, the aeration tank serves as a sedimentation tank, and anaerobic and aerobic processes are also carried out in the same tank. Its operation consists of five processes: inflow, reaction, sedimentation, discharge, and standby. By adjusting the time of each process, the effect of phosphorus and nitrogen removal can be achieved. The main characteristics of SBR process are: good effluent quality; Less land occupation; No sludge bulking occurs; The effect of phosphorus and nitrogen removal is good.

5. Conclusion

With the development of China's economy and the continuous enhancement of the country's comprehensive strength, the pace of urban industrial development in China has been accelerated under the influence of urbanization progress. However, in the process of industrial development, serious neglect of environmental protection has led to increasingly serious water pollution in China. At present, the issue of water pollution has attracted people's attention. In order to protect the environment for human survival, advanced sewage treatment technologies can be used to strengthen the protection of water resources in China. To sum up, sewage treatment of Environmental engineering is a systematic and urgent work. At this point, it is necessary to analyze the existing problems, choose a reasonable sewage treatment process based on the actual situation, fully utilize the advantages of sewage treatment processes, and effectively improve the sewage treatment effect. All types of urban sewage can only be discharged normally after corresponding treatment. From the current situation, most cities concentrate on treating existing urban sewage and have also invested a high proportion of sewage treatment funds and other treatment costs. Therefore, in the future practice, it is still necessary to completely divide sewage treatment into urban Environmental engineering, and give methods and ideas for sewage treatment according to local conditions.

References

Dai, R. Z. (2020). Main Technical Analysis of Sewage Treatment in Environmental engineering. *Environment and Development*, *32*(07), 85+87.

Dang, J. P. (2021). Analysis on Sewage Treatment Technology of Environmental engineering, *Smart City*, *7*(14), 115-116.

Guo, T. (2021). Technical Analysis of Sewage Treatment in Environmental engineering. *Chemical Design Communication*, *47*(02), 166-167.

Li, K. (2020). Main Technical Analysis of Sewage Treatment in Environmental engineering. *Environment and Development*, *32*(10), 117-118.

Liu, S., & Wang, Z. W. (2020). Technical Analysis of Sewage Treatment in Environmental engineering. *Resource Conservation and Environmental Protection*, *2020*(03), 105.

Liu, W. K. (2022). Discussion on Main Technologies of Sewage Treatment in Environmental engineering. *Chemical Fiber and Textile Technology*, *51*(10), 45-47.

Liu, X. X. (2019). Main Technical Analysis of Sewage Treatment in Environmental engineering. *Heilongjiang Water Conservancy Science and Technology*, 47(09), 95-96.

Ou, W. H. (2018). Analysis and Research on Urban Sewage Treatment Technology in Environmental engineering. *Chemical Management*, *2018*(30), 189.

Tang, G. P. (2022). Main Technical Analysis of Sewage Treatment in Environmental engineering. *Chemical engineering and Equipment*, *2022*(02), 250-251.

Wang, H., & Wang, P. W. (2020). Main Technical Analysis of Sewage Treatment in Environmental engineering. *Low Carbon World*, *10*(03), 13-14.

Xiao, S. N., & Lin, B. H. (2022). Analysis of Membrane Bioreaction Technology in Sewage Treatment of Environmental engineering. *Leather Production and Environmental Protection Technology*, *3*(02), 13-15.

Xing, J. (2020). Main Technical Analysis of Sewage Treatment in Environmental engineering. *Environment and Development*, *32*(06), 89-90.

Xu, L. (2019). Main Technical Analysis of Sewage Treatment in Environmental engineering. *Energy Conservation*, *38*(02), 97-98.

Zhang, J. F. (2019). Main Technical Analysis of Sewage Treatment in Environmental engineering. *Jiangxi Building Materials*, *2019*(12), 211-212.