

Analysis of Water Treatment of Petroleum-Contaminated Water

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Abstract: With the rapid development of science and technology, China's current demand for petroleum energy is very large. Not only is the amount of oil extracted in different regions of China large, but also due to the development of science and technology, petroleum is one of the common energy sources and its quality. And the use of effects can help society continue to develop. By analyzing the current situation in oil extraction, it is in a sustainable development situation. In this case, the treatment of petroleum-contaminated water sources is very critical. Because petroleum-contaminated water sources will cause great harm to human development and environmental protection, how to effectively treat petroleum-contaminated water sources has become the current technological development. The main purpose of this article is to analyze the current common treatment methods for petroleum-contaminated water sources, and to briefly analyze some new treatment methods.

1. Introduction

The times are constantly developing and the times are advancing. The current requirements for the treatment of petroleum water sources are gradually increasing, especially with the rapid development of science and technology, in order to better solve practical problems and achieve sustainable development of the ecological environment, The promotion of resource utilization and environmental development requires in-depth analysis of petroleum water sources. Because petroleum water sources and water pollution will have a lot of toxic substances, in order to reduce these toxic substances as much as possible, it will contribute to social development and human development. The negative impacts need to be analyzed in depth based on these basic levels to ensure the smooth implementation of oil water treatment and provide relevant reference theories.

2. The Main Hazards of Petroleum-Based Polluted Water

Water pollution often occurs in the process of oil extraction, which is also one of the inevitable problems in oil extraction. The pollution of water by petroleum and industrial wastewater is very harmful to the environment. Not only will it cause certain harm to the ecological environment of people's daily life, but it will also have a certain negative impact on people's drinking water safety. Because oily sewage contains a lot of bacteria and microorganisms, these bacteria and microorganisms have Some are carcinogenic and cause a very negative impact on the human body. If there is no effective water treatment for petroleum-contaminated water sources at present, or even if these contaminated water sources go directly into the groundwater, it will cause great damage to people's bodies. Threats to people's physical and mental health. The high frequency of food poisoning or high frequency of cancer has led to a turbulent state of social development. Among the hazards caused by petroleum-contaminated water, the hazards to the soil are also very prominent. As oil stains containing water continue to accumulate in the soil, the air exchange efficiency of the soil itself will gradually decrease, and a series of normal biological metabolism will occur. Adverse effects, causing crop death [1]. This will also have a certain negative impact on human development. Not only that, petroleum-contaminated water will cause harm to the water body itself, to rivers, rivers, lakes, moors, and plant organisms in the water body. Due to the obstruction of the exchange

of air and water, the plants and fish in the water cannot survive, which leads to a reduction in the utilization of water resources in a large area. It does not meet the development needs of our environment-friendly society, and it does not meet the construction of a resource-saving society .

3. Implementation of Water Treatment Methods for Petroleum-Contaminated Water Sources

3.1. New Technologies for Water Treatment of Petroleum-Contaminated Water Sources

As people's awareness of environmental protection becomes higher and higher, the quality and effect of treatment of petroleum-contaminated water resources in China are gradually increasing. It is not only to meet people's needs for the environment, but also to improve the efficiency of resource use and reduce environmental pollution caused by the use of non-renewable resources. At present, the technology used in China is relatively new. These petroleum-contaminated water treatment technologies can also help improve the overall treatment effect of petroleum-contaminated water sources. An analysis is made of new technologies currently used in China to treat petroleum-contaminated water sources. Among them, The following different technology options are included: First, advanced oxidation technology. The application of advanced oxidation technology is mainly to convert organic matter into non-toxic and inorganic matter. It is an important treatment technology and one of the more common technologies in the treatment of petroleum-contaminated water. The direct treatment of petroleum-contaminated water sources has contributed to the improvement of the overall level. In the use of advanced oxidation treatment technology, the chemical oxidation technology used is very important. This chemical oxidation technology can combine the physical principles to improve the overall treatment of petroleum-contaminated water sources and enhance the efficiency of water treatment, especially for petroleum. In terms of chemical wastewater treatment, advanced oxidation technology can be used to treat petrochemical wastewater, and the toxic and harmful organic substances contained in it can be converted into non-toxic and harmless inorganic substances. The active agent on the surface of the wastewater can also fully exert its activity. The use of advanced oxidation technology can improve the current situation of China's already polluted ecological environment and improve the overall quality of environmental protection [2].

Second, the application of magnetic separation processing technology. Magnetic separation treatment technology is also a new technology in the treatment of petroleum wastewater. It is mainly used for the treatment of new polluted water sources. Using magnetic separation technology can adsorb pollutants in petroleum-contaminated water sources. Because the magnetic separation technology itself uses a magnetized adsorption pollutant, the magnetic separation technology can further purify the water, and change the way that the traditional technology is difficult to improve the treatment effect when treating new petroleum wastewater. The use of magnetic polyurethane Cotton contains oil to treat oily waste water. The magnetic pu sponge contained in it can be used to treat the water source of petroleum oily waste water because of its super-hydrophobicity and super-lipophilicity. The treatment effect is gradually improved, and it can be effectively effective under this power. Separation of surface organics and water pollutants contained in petroleum wastewater.

Third, ultrasonic processing technology. In the treatment of new types of petroleum wastewater, ultrasonic treatment technology is often selected during the treatment process. This is one of the new petroleum wastewater treatment technologies brought about by scientific development. Because ultrasonic waves have a frequency higher than 20,000 Hz when treating wastewater, under this technology application, it can play a more active role in dehydrating crude oil contained in petroleum wastewater than traditional treatment methods, and at the same time ultrasonic irradiation It also has better heating effect than traditional. No matter from the analysis of de-salting performance or the analysis of de-oiling performance, it can be found that after a lot of practice shows that the use of ultrasound to treat petroleum wastewater has a power of 75 watts and it only takes six minutes to process. The initial slurry temperature of petroleum wastewater is 25 ° C, the mud-water ratio contained in it is 1: 4, and the oil recovery can reach 60%. The use of ultrasound to treat petroleum wastewater can have a positive impact on the treatment of petroleum wastewater

and the utilization of resources. From the perspective of development prospects, the treatment of petroleum wastewater by ultrasonic treatment technology has a very broad prospect in the current process of petroleum wastewater treatment in China, and it is also the most important current application.

Fourth, the three-phase internal circulating fluidized bed treatment technology. Since petroleum-contaminated water sources contain a large amount of floc in the water treatment process, it is only necessary to adsorb them. It is relatively important to use a three-phase internal circulating fluidized bed treatment technology at this stage. The purpose is to vulcanize the filler material existing in petroleum wastewater in the reactor. This method can directly increase the contact of organic matter and other reactants in the wastewater, thereby improving the overall efficiency of the reaction. A large number of actual experiments have shown that when the gas speed is 180 liters per hour, the solid content of organic matter can reach 3% to 5%. In this reactor, due to its high chemical oxygen demand, it can achieve the highest removal rate of petroleum contained in petroleum wastewater, so that the treated petroleum wastewater will have a large amount of oil or organic matter. Decreasing the magnitude and improving the efficiency of wastewater treatment will also allow China's petroleum wastewater to meet the actual needs of China's industrial wastewater discharge in the process of wastewater discharge, which is very important for protecting the environment.

3.2. Commonly used Technologies for Water Treatment of Petroleum-Contaminated Water Sources

Water treatment for petroleum-contaminated water sources has always been a top priority in China's environmental protection. By analyzing the current methods and quality of petroleum-contaminated water sources, it can be found that when treating petroleum-contaminated water sources, Fully focus on the use of science and technology, and improve the quality of sewage treatment and the overall effect of sewage treatment.

At present, the commonly used treatment technology is still membrane separation technology. Membrane separation technology can play its active role in the current development. This technology is the basic link of petrochemical wastewater odor treatment and it is also a top priority. In use, most of them are treated by reverse osmosis and microfiltration, which can effectively treat the odor of petroleum-contaminated water sources. When applied, its own application value is relatively high. Analysis of the membrane treatment technology found that in a large environment, the technology can ensure the overall quality of petroleum sewage treatment, and reduce the pollution caused by petroleum sewage to the environment as much as possible. A theoretical way of purely using physics. Porous membrane fingers are used for interception, and impurities contained in petroleum sewage pollution are directly retained on the pore membrane, and the function of separation treatment is completed. As the concentration of petroleum is constantly increasing and the permeation flux of petroleum itself is steadily decreasing, the current treatment methods using reverse osmosis and microfiltration to treat petroleum-contaminated water sources are relatively good. Application of dynamic membranes in the range of dripping oil concentration The permeate flux is also relatively high. The adsorption method is also a very common method in processing. The so-called adsorption method mainly uses the active characteristics of the surface of the lipophilic material itself to concentrate the concentration of molecular pollutants on the surface of the lipophilic material. It is removed by an adsorbent. In most cases, activated carbon, coal ash, coal ash, or bentonite is selected as a common adsorbent. At present, in the treatment of petroleum-contaminated water sources in China, the adsorption method is selected to deal with the high pollution degree of the polluted water source itself.

The more widely used in the treatment process is pva hydrogel, which is often used as an oil absorption material to treat the oil wastewater contained in petroleum wastewater water sources. This adsorption technology is currently the best technology that can be seen and widely used. When pva hydrogel is used as an oil-absorbing material for processing, its degreasing can reach 80% or more. It has an overall effect on the location of petroleum-contaminated water sources. Relatively good. According to the analysis of the relevant methods in the actual treatment process, you can

choose activated carbon powder adsorption or conventional process methods and combine them. You can find activated carbon powder as a good adsorbent. In the process of indirect adsorption, you can directly It is integrated into the waste water source and mixed uniformly. The adsorption method is used to adsorb pollutants, and the pollutants are separated from water by precipitation filtration. In the short-term treatment of petroleum-contaminated water sources, a good treatment effect can be achieved. During the treatment of petroleum-contaminated water sources, the blow-off method is also a common method. The treatment technology of the blow-off method is currently used when treating petroleum-type water sources. , Can also play a positive role. In the actual application process of this technology, the relevant substances in the air and wastewater are organically combined to treat the wastewater. Using the common separation principle in physical methods to treat petrochemical wastewater, the treatment method has a better application effect in the current development, and the application quality is higher, and the application frequency is also very high.

The stripping method technology has been popularized in various regions of China to treat petroleum wastewater water sources. This is a common method of treating petroleum water property pollution resources and can effectively achieve the overall effect of petroleum water treatment in China. The use of peroxidation treatment technology can improve the water treatment efficiency of petroleum-contaminated water sources. In the current development of petrochemical wastewater, due to certain differences in its composition, petrochemical wastewater in different regions also needs to be treated in different ways. The purpose is to better deal with petrochemical wastewater, because the components contained in petrochemical wastewater are very different. Therefore, in order to effectively treat the wastewater, it is necessary to do a comprehensive analysis of the wastewater components, and choose different oxidation methods to enhance the overall treatment effect of the wastewater. One of the more typical oxidation methods is to use a photocatalytic oxidation method without secondary pollution. . The photocatalytic oxidation method and other wet oxidation methods have the best treatment effect on the toxic and harmful substances present in petroleum wastewater. These chemical wastewater treatment methods, in actual application, whether it is the overall application effect or the quality of wastewater treatment, can meet the current development needs of our country, and can also bring about the overall treatment effect of petroleum wastewater, bringing very important The positive impact truly meets China 's actual requirements for the treatment of petroleum wastewater, and makes more and more people clear. For these common technologies and deep excavation of common technologies, China 's petroleum wastewater can be treated as a whole. As a result, its treatment effect truly meets the needs of environmental protection and improves the overall utilization of resources.

4. Conclusion

In summary, for all petroleum-contaminated water sources, when conducting water treatment work, different methods need to be selected in accordance with the overall condition of the petroleum-contaminated water sources during actual treatment. Each method is different for the petrochemical wastewater, and it should be combined with the actual basis to be able to truly treat the polluted water source and improve the overall quality of the polluted water source treatment. The purpose of the treatment and analysis of petroleum-contaminated water sources through theory is to allow more wastewater processors to improve the quality of wastewater treatment during treatment so that the wastewater can meet China's discharge standards. By improving the quality of wastewater treatment, Contribute to environmental protection.

References

[1] Guo Yongli, Wu Qing, Zhai Yuanzheng, Quan Xiqiang. Characteristics of petroleum organic pollution in groundwater in a water source area. People's Yellow River, vol. 40, no. 10, pp. 61-65 + 81, 2018.

[2] Dang Guangming, Nie Kun, Wang Guijie. Discussion on water treatment of petroleum-contaminated water source. Contemporary Chemical Research, no. 12, pp. 63-64, 2017.