

# Analysis of wastewater treatment process in fine chemical production

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**Abstract:** As the source of life, water moistens all things and provides power for all life on earth. However, due to the development of the industrial era, water pollution is becoming more and more serious, especially the pollution of wastewater from fine chemical industry to water resources. Compared with other production wastewater, wastewater from fine chemical industry has great harm to the environment and complex components. As a production enterprise, we should pay more attention to selecting appropriate source treatment process, and consider from multiple angles and aspects, starting from the source, Minimize pollutants, improve wastewater treatment rate, strengthen the awareness of enterprises to protect the environment, and shoulder the important task of benefiting mankind and protecting the environment.

## 1. Introduction

Water resources are not only one of the important resources, but also the most important resources for people's life. In the production and development of chemical industry, water resources is one of the important industrial components. Therefore, in the process of chemical production, chemical wastewater, as a necessary by-product of production, produces a large amount, including not only organic wastewater but also inorganic wastewater. Because different production wastewater is different in essence, the purification and treatment of wastewater is more difficult. In order to improve local ecology, promote the healthy development of industry and improve economic benefits, the state has clear regulations on the environmental protection work of production enterprises, stipulates that enterprises meet the discharge standard and carry out the timely purification and treatment of industrial wastewater. The industrial sewage treated correctly can not only alleviate the problem of water use in the chemical industry, but also obtain certain economic benefits for the development of the country, society and enterprises. Environmental protection has become the lifeline and competitiveness of enterprises. Timely purification and treatment of industrial sewage and Realization of recycling are of great significance to protect the environment and maintain ecological balance. The composition of fine chemical wastewater is quite complex. It belongs to mixed wastewater, which greatly damages the surrounding environment. At the same time, in the production process of fine chemical industry, there are a large number of reaction units and complex reaction types and intermediates. Therefore, the types and chemical properties of wastewater pollutants produced by each production unit are different, and the chemical reaction takes place in the form of mixing, which increases the company's demand for wastewater treatment. How to choose the correct treatment process and effective control measures to effectively improve the efficiency of wastewater treatment and reduce the generation of pollutants has become an urgent task for fine chemical enterprises.

## 2. Analysis of fine chemical wastewater

### 2.1 Definition of chemical wastewater

Chemical wastewater refers to the wastewater and waste liquid produced in the process of chemical production, including production wastewater, cooling water, production sewage, etc., which contains chemical production materials, intermediate products, by-products and pollutants produced in the production process. Chemical wastewater also contains many toxic substances, which can be discharged only after corresponding purification measures are taken for treatment.

Features: the nature of fine chemical wastewater is unique<sup>[1]</sup>. Compared with other chemical wastewater, the composition of fine chemical wastewater is more complex, and the wastewater contains high concentration COD and ammonia nitrogen, which is difficult to treat. Combined with the ion chromatography of fine chemical wastewater, it is found that it contains metal ions with relatively high concentration, which is related to the dyes in the wastewater. The metal ions react with the dyes to form metal complexes, resulting in a certain chromaticity (Fig. 1).



Figure 1 Chemical Wastewater

## 2.2 Harm of fine chemical wastewater

With the continuous development of the chemical industry and the improvement of relevant production technology, various hazards caused by wastewater are becoming more and more obvious. The main characteristics are as follows: first, the water quality composition is complex. In the production process of chemical products, some chemical reactions are incomplete, and the wastewater contains many by-products and solvents, resulting in the complex composition of fine chemical wastewater<sup>[2]</sup>. Secondly, biological oxygen demand (BOD) and chemical oxygen demand (COD) are too high. Chemical wastewater generally contains many organic oxides, in which the components of BOD and COD are very high. If the wastewater is discharged directly without treatment, it will react further in the water and pose a threat to aquatic organisms. Finally, there are many toxic and harmful substances. Many harmful substances will be produced during chemical production, which will be dissolved in chemical wastewater after product production, making the wastewater toxic and corrosive (Fig. 2).



Figure 2 Fine chemical wastewater

### 3. Importance of wastewater treatment in fine chemical industry

The reasons for people's lack of fine chemical wastewater treatment technology and control measures include lack of awareness and backward development ideas. The old fine chemical wastewater treatment technology and control measures are relatively backward, which can not meet the needs of modern society. Therefore, at present, we must actively seek correct methods to make up for the defects of the existing fine chemical wastewater treatment technology and control methods, strengthen the development and management of fine chemical wastewater treatment technology, and improve the existing fine chemical wastewater treatment technology and control measures, so as to effectively promote the development and rapid progress of environmental protection<sup>[3]</sup>. Due to the sustained and rapid development of economy and the improvement of people's living standards, it is necessary to continuously improve and improve the fine chemical wastewater treatment technology. Any type has the ability to clean up relative to the environment. The chemical industry is gradually developing in the development process of modern society, with greater and greater impact, resulting in more wastewater from fine chemicals. In order to ensure environmental safety, the improvement of refined wastewater treatment technology and control measures has become an integral part of environmental protection, which can not be replaced by any way. Comparing the results with the traditional fine wastewater treatment technology and control measures, it can be seen that the modern fine wastewater treatment technology and control measures have stronger wastewater treatment capacity and higher treatment efficiency. Improper treatment measures of fine chemical wastewater may damage people's health. Improving and improving the treatment technology and control measures of fine chemical wastewater can highly purify the fine chemical wastewater and make it pollution-free, which greatly protects people's production and health<sup>[4]</sup>. To meet the needs of the development of the times, we must improve the technology of fine chemical wastewater treatment and strengthen the development and control. Reasonable improvement of fine chemical wastewater treatment technology is an important means for the development of environmental protection in modern society and an important part of the improvement of people's living environment.

## **4. Fine chemical wastewater treatment technology**

### **4.1 Source quality separation treatment**

In the production process of fine chemicals, there are many raw materials, long production links and strict process conditions. The composition of wastewater is complex and some components cannot be determined<sup>[5]</sup>. Therefore, it is necessary to infer the composition and entrust monitoring of the production wastewater produced in each reaction step, and carry out targeted pretreatment for this composition. For example, pH adjustment, flocculation sedimentation and centrifugation are used to remove impurities and heavy metals in wastewater, so as to reduce the treatment cost and prevent the diffusion of pollution factors.

### **4.2 Membrane separation treatment**

In order to avoid the re pollution of wastewater and improve the application value of pollutants in water, membrane separation technology combined with filtration, reverse osmosis and other technologies are used to treat chemical wastewater<sup>[6]</sup>. After repeated tests, it is proved that the membrane separation technology has a relatively good effect on the final treatment of sewage. During the comparison of water odor and chromaticity, it is obvious that it can lay a good foundation for the control of environmental pollution. Its disadvantages are large investment, high maintenance cost and high requirements for the inflow conditions of production wastewater.

### **4.3 Oil separation treatment technology**

The basic treatment work is the first step to be done well in the whole chemical raw material wastewater treatment. First, put the chemical raw materials into a large isolation tank to make the earliest precipitation and separation of harmful pollutants and particles in the wastewater, and then deal with these precipitated pollutants, which is a simple oil separation method. As the most basic means of sewage treatment, processes such as air flotation and sedimentation tank can be used for pretreatment<sup>[7]</sup>. Due to the different auxiliary tools and practical processes in various aspects in the practical stage, the final effect is also different. The disadvantage is that the separation is not complete, but it can be used as a pretreatment process with high cost performance.

### **4.4 Oxidation treatment technology**

Because the components of industrial wastewater from chemical production are relatively complex and have obvious differences, the identification of components is the primary task, and then select appropriate oxidation methods for different components. Reasonable use of oxidation technology to treat chemical raw material wastewater can effectively control pollution. However, due to the relatively high investment cost of this technology and the need to provide energy to oxidize the organic matter in the wastewater into small molecules and harmless substances, enterprises need to choose the treatment process according to their own different conditions. If the amount of wastewater is too large, this technology is not suitable for use. Of course, there is no way. In order to fully show the effect of oxidation treatment, it is necessary to combine this technology with other wastewater treatment methods to degrade the content of harmful substances in wastewater. In this way, the treatment effect can be guaranteed.

### **4.5 Utilization and development of Green Biotechnology**

To ensure the quality of chemical products and clarify the treatment of waste, it is necessary to analyze and study the chemical process and the exploration of technical treatment. Chemical raw materials seem strange, but they are closely related to our life. They provide resources and materials for people's daily life and play an irreplaceable role in improving human life. Chemical raw materials themselves cannot be used directly, otherwise they will increase pollutants in the environment and affect human normal life. In order to save energy, we need to make use of green biotechnology and further develop green biotechnology<sup>[8]</sup>. Concentrating the industry in the chemical treatment process and combining diversified treatment processes can not only clarify the sustainable development of the chemical raw material industry, but also bring considerable

economic benefits.

## 5. Conclusion

With the continuous development of all aspects of the country, the number of chemical plants has also increased, and the following environmental problems have also become prominent. Therefore, for the sake of our living environment, we should deal with the problem of chemical sewage in time, improve the growth conditions of crops, improve the living environment of aquatic organisms, and alleviate the shortage of water resources from the source of pollution, In the process of industrial wastewater treatment, we will continue to innovate and improve the efficiency of wastewater treatment technology and economic benefits by using physical method, chemical method and biological method.

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