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ASSESSMENT OF ENVIRONMENTAL POLLUTION BY CHEMICAL INDUSTRY

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Abstract

Thesis analyzes sources of environmental pollution from chemical industry. Gaseous pollutants from technological processes in chemical industry are identified. Environmental pollution from cocking process is assessed.

Keywords: environment, pollution, chemical industry, contaminant, emission.

Introduction

The chemical industry plays an important role in the development of economy, indirectly affecting the speed of economic development. With the rapid development of the chemical industry, its role and status in the economy is increasing, it plays an important role in promoting industrial and agricultural production, improving people's quality of life and consolidating national defense [1]. But in the development of chemical industry, environmental protection has become a very important topic. From the perspective of chemical environmental pollution, the scope of pollution by chemical enterprises is also very extensive, involving water bodies, soil, atmosphere, and other environments. At the same time, there will be a variety of forms, such as solid waste, noise, photothermal pollution and so on [2]. Due to the high energy consumption and high pollution of chemical industry, the pollution of the environment is relatively large, and with the implementation of environmental protection policies in China's provinces and cities, the environmental governance effect is better, but there are still various problems. Some large chemical companies choose to develop in desert areas to avoid urban settlements, but this often makes it more difficult to carry out environmental protection work, and if the environment causes pollution, more money to clean up the environment [3].

Results

10 million kinds of chemical substances have been synthesized in the world, and about 1000 kinds are newly registered and put on the market every year. These chemicals have played a huge role in promoting progress, improving productivity, eliminating pests, reducing diseases, and facilitating people's lives, but they inevitably enter the environment and cause pollution in the process of production, transportation, use, and abandonment. The hazards caused by environmental pollution are manifold, among which the environmental pollution to food is directly related to human health. The potential food borne hazards caused by the chronic long-term intake of chemical and organic pollutants have become the focus of attention, including pesticide residues, veterinary drug residues, mycotoxins, some carcinogens and mutagens (such as nitrosamines) formed during food processing, and industrial pollutants, such as dioxins.

One of the most common chemical industries is sulfuric acid production. In this production process, because the main process materials such as sulfur dioxide, sulfur trioxide, sulfuric acid and other acidic substances are corrosive, they will cause corrosive damage to buildings, equipment, pipelines, instruments, electrical facilities, floors, equipment foundations, operating platforms, etc., affecting production safety. The human body is exposed to the diluted sulfuric acid or concentrated sulfuric acid leaked and splashed during the production process. The diluted sulfuric acid or concentrated sulfuric acid will cause corrosion to the human body and form chemical burns. Toxic gases such as sulfur dioxide, sulfur trioxide and carbon monoxide produced in the production process will cause human poisoning or death once leaked and inhaled. The dust is mainly generated from the raw material dust in the raw material section and the slag ash in the slag removal post of the fluidized bed furnace. Workers exposed to these dust environments for a long time will cause pneumoconiosis and other hazards due to inhalation of dust.

Another example of chemical industry is coking process. In the actual production process of coking plant, the main pollution factor is dust. For coking plants, the main raw material for production is coal. However, a large amount of coal dust will appear during the process of coal transportation, stacking and top coal loading.

The size of coal dust produced by the coking plant is directly related to many aspects, such as the production location of the plant, external climate factors, production technology and management. Through actual investigation, it is found that the dust in the coking plant will generally appear in the form of logarithmic curve due to its own weight and physical characteristics, and will also be arranged at a distance of 15~20m. The coal dust in coking plant has many characteristics, such as hygroscopicity, dispersion and cohesiveness. No matter what kind of characteristics, they will not only cause great pollution to the environment, but also threaten people's lives in serious cases. The main hazards of coal dust in coking plants can be summarized as follows. First, people working in the coking plant, because of long-term contact with a large amount of dust, will cause lung damage in the human body, lead to silicosis, pulmonary disease and other diseases, and ultimately seriously threaten the health of the human body. In addition, residents living around the coking plant will also be affected by different levels of dust pollution from the coking plant for a long time. Second, when the dust in the coking plant forms a certain concentration, if it encounters an open fire in a certain space, it will easily cause an explosion. In a serious case, it will also cause a fire, which will cause great losses to people's life and property safety, and also reduce the economic benefits of the enterprise. Third, in the normal production process of the coking plant, a large number of production equipment will be used, and the existence of dust will lead to the belt slipping or short circuit of the production equipment, which will not only affect the production work, but also require the enterprise to invest a large amount of money for maintenance or purchase of new production equipment. As the main raw material used in the production of coking plants, coal will produce solid coke, liquid coal tar and gaseous coke gas during the operation of the retorting process. In the process of source coal washing ->coking ->gas coking - coking product recovery, there is no doubt that there will be "three wastes" problems, among which the pollutants generated by coking wastewater are the most. However, the coking waste water generated most in the production process of ammonia distillation, benzene removal, tar processing, etc., contains many polycyclic aromatic compound pollutants such as phenol, benzene, naphthalene, pyridine, indole, etc., and the content of benzene ring organic compounds is also high. These substances are difficult to be effectively treated. Therefore, the benzene ring substances are the most typical of the sewage pollutants in the production process of coking plants, It is also the most difficult waste water substance to be treated.

Conclusion

In the process of production and development, chemical enterprises should pay attention to the protection of the environment. Based on the characteristics of the analytical chemistry industry and the environmental pollution caused by the chemical industry, this paper enumerates the production processes and environmental pollution of the sulphuric acid production plants and coking plants, and puts forward the prevention and control measures. Now the society has higher and higher demands on the environment, so the demands on the chemical industry are higher, more energy-saving and environmental protection. Only when we truly realize clean energy and circular economy can we minimize the pollution to the environment as much as possible.

REFERENCES

1. Yan Yu Qiang. Analysis of the importance of chemical safety and environmental protection. Chemical design communication, 2020(46): 238-239.

2. Liu Xiubo. Analysis of the importance of chemical safety and environmental protection. Engineering, 2017(7): 124-124.

3. Xie Weizeng. Study on the importance of chemical safety and environmental protection. China sci-tech Journal Database, 2017(03): 37-38.

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