Analysis of The Green Chemical Engineering and Technology Effect on Energy-saving Development of Chemical Industry

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Abstract: In the traditional chemical and technological production stages, the mode and use of production materials will cause a certain degree of ecological damage. Therefore, to make chemical production meet up with the needs of the developing times, it is necessary to use efficient green chemical to save energy in the chemical industry, thereby improving the continuity and resource utilization of chemical production. The author analyzes the characteristics and meanings of using green technology in green chemical production, and gives the driving effects of the use of green technology in chemical production to lay the foundation for future green development in the chemical industry.

***Keywords*:** green chemical industry, chemical energy saving, development efficiency, analysis

1. Introduction

The current social and economic changes have caused the environment to be destroyed to varying degrees, which not only affects the quality of life of the people, but also hinders the improvement of the production efficiency of the chemical industry. Therefore, we must pay attention to the key of resource reuse and use environmentally friendly processes to reduce pollution in production. Use green raw materials and biotechnology to reduce the discharge of waste, sewage and waste gas in chemical production, complete clean management and control in chemical production and disposal, and thus ensure the sustainable development of the ecological environment.

2. Brief introduction of green chemical industry

Chemical production is a component of China's socio-economic development, and its engineering production stage can easily cause chemical pollution. For the healthy development of chemical industry, it is necessary to uphold the concept of environmental protection for production. The use and processing of green chemical engineering can achieve this ambitious vision. The use and processing of green chemicals can also help avoid waste in the production stage when ensuring the high efficiency of production. Such greener production models will bring inestimable economic and social benefits to the chemical industry [1].

3. Analysis of the impact of green chemical industry on reducing pollution discharge

In the past, there were serious blocking properties during chemical processing and when disposing of toxic materials, and the treatment process was not very effective. Most companies use the corresponding strategies after the waste is formed [2]. At this stage, some toxic materials have caused pollution to the environment and soil layers through modes such as spreading and infiltration, which have brought negative effects to the living environment of the people, and this type of post-treatment mode does not cure the symptoms and the cost is still high and result to great negative effects to chemical companies.

Reducing pollution emissions is a basic feature of green chemistry. The development of green chemical products using the concept of greening usually includes the following three levels [3]. First, start with the roots of chemical reactions and reduce or completely eliminate the generation of toxic materials as much as possible, instead of implementing purification treatment after the formation of pollutants. Second, when selecting chemical agents or chemical solvents during the production stage, choose environmentally friendly Products to reduce energy consumption and ecological pollution; Thirdly, the optimization model is adopted to further optimize the chemical production process and avoid the formation of related chemical derivatives. At this stage, it is necessary to supervise and control chemical dangerous goods

and use corresponding models to control them [4].

4. Analysis of the role of green chemical industry and technology in the development of energy saving in chemical industry

4.1 Improve the process and reduce the generation of pollutants

In the production stage, technicians should improve production and processing according to the current situation, use high-end process models, optimize decomposition technology, and efficiently reduce waste in the production stage. For example, membrane separation technology, molecular distillation technology, etc. In addition, clean production technology can efficiently guide the production of chemical companies. The use of denitrification technology and desulfurization technology through the green energy-saving mode to deal with the toxic pollutants formed in the domestic dregs and production stages to transform them into reusable biogas resources.

4.2 Recycling and secondary utilization of catalysts to reduce energy consumption

In recent years, with the increasing intensity of research on green chemistry, there has been an essential breakthrough in the recovery and reuse of catalysts. Relevant technicians have carried out green research with catalysts and processing production materials, and have achieved certain results [5] . For example, the Changchun Institute of Applied Chemistry broke through the integrated technology of rare earth separation process and clean metallurgy, and took the lead in solving the ecological problems caused by the separation of debris and gaseous materials from the source of production worldwide. The recovery, reuse and recycling of catalysts can not only save energy and reduce energy consumption, but also bring double benefits to chemical companies [6].

4.3 Use of low pollution chemicals, scientific use of biotechnology

Biotechnology has a very critical impact in the green production stage, it usually includes biochemical and chemical bionics. Fusion of this technology with green chemistry will not only form renewable energy during the production stage and be used scientifically, the products have both green and energy-saving features. At present, both industrial enzymes and natural enzymes belong to the catalysts in the greening industry and are put into production practice. They have the effect of low pollution rate, excellent application characteristics, and can reduce emissions. Therefore, chemical companies should use non-toxic or low-pollution chemicals as much as possible to reduce the damage to nature and demonstrate the effectiveness of greening in depth [7].

4.4 Reduce the consumption rate of non-renewable energy

Non-renewable energy usually includes coal, oil, natural gas, metallic minerals, non-metallic minerals, etc. In the production stage, chemical companies should use renewable energy as much as possible to replace non-renewable energy to ensure the continuity of resources. Implement treatment for substances in the ecological world that have no meaning to the natural environment of human survival, such as research and development of non-freshwater energy, and then put it into chemical production to reduce the utilization of non-renewable energy to complete energy conservation and consumption reduction aims.

4.5 R & D and commissioning of green energy-saving products

Integrate the concept of green energy-saving and produce various energy-saving commodities. For example, clean gasoline can reduce the pollution to nature. At present, the commodity has been recognized in various fields of society. Therefore, the public must take responsibility and strengthen the shaping of environmental protection concepts. In daily life and production, promote the development of green commodities and complete sustainable development [8].

4.6 Efficient and rational use of cleaner production technology

The promoting role of green technology in the production of chemical industry is usually reflected in the use of clean technology. Clean technology has the characteristics of complicated application, but its green environmental protection function has a positive driving effect on chemical production. The use of clean production technology in the actual production stage can clean the materials derived from the production stage, and finally complete the disposal of production materials and fertilizers. At present, the most commonly used mode of clean production is green cleaning liquid, this type of cleaning products can destroy any poisonous things in the production stage. It is a type of environmentally friendly cleaning products.

4.7 Green chemical reactions

Increasing the selectivity of chemical reactions is the most basic requirement. By continuously increasing the selectivity of chemical reactions, you will often receive magical results. Therefore, in the specific R & D stage of greening

technology, the selectivity of chemical reactions should be improved. In addition, we must pay attention to increasing the utilization rate of resources and reducing the principal of chemical production during the research and development stage**.** For example, in general, in the petrochemical production stage, hydrocarbon-selective cyanide is selected. Because the chemical cost of this cyanide is very easy to be oxidized, and its products usually have pollution characteristics, which causes a series of environmental problems. Therefore, we should pay attention to the selectivity of chemical reactions, and continue to deepen research efforts to complete green production [9].

4.8 Environmental protection of solvents and auxiliaries

Solvents and additives are the key technical links that must be addressed in chemical production. Solvents and auxiliaries are usually toxic, and they are also used in the chemical separation operations that are more critical in the chemical reaction stage. Their toxicological effects are a major concern for health and ecological problems. The use of can effectively reduce energy consumption and promote the speed of chemical reactions. In order to completely isolate products from by-products, creating a new reaction environment in chemical reactions is using the ionic liquid theory. For example, in afforestation projects and processes, the production of acrylamide, the use of enzymes in the ecological world to replace the disposal of serious ecological problems, greatly reduce energy consumption, and no by-products that pollute the atmosphere. Therefore, the use of non-toxic solvents and additives in greening research has become the core.

5. Supplements-related strategies

In the chemical industry, the greening of resources means that from the obtained chemical materials to the formation of chemical reactions and reaction derivatives, there is a huge energy loss and energy consumption. However, in the chemical reaction stage of chemical production, if the reaction absorbs heat, energy must be added at the beginning of the reaction to promote the complete reaction; if the reaction releases energy, the thermal energy must be discharged after condensation to control the reaction. And in the separation and purification stage of the chemical industry stage, it must be achieved through rectification, refining, recrystallization and ultrafiltration, etc., which must also consume a large amount of energy. Therefore, seeking appropriate energy is the core research project of the greening industry. For example, relatively clean energy sources include energy sources such as electricity, light, microwave, and ultrasound [10]. Among them, electric energy is used at a high frequency. In the electrocatalytic reaction using a natural, non-toxic, chiral vitamin B12-position catalyst, it can complete free radical epoxidation in a neutral environment.

6. Concluding remarks

All in all, the greening project is of great help to the energy conservation and emission reduction of the chemical industry, and has a core function. However, in order to promote the development of chemical engineering more effectively, green chemical processes must be used. For example, greening materials, greening production processes, and greening catalysts. And under this premise, strengthen the clean production technology, clean excretion technology, biotechnology, green test and other models to achieve the energy saving goals of green chemicals. Moreover, we must also pay attention to fostering the awareness of the treatment of chemical waste. Do not think that green chemical energy conservation is just a piece of paper, but consider it as a job to improve.

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