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Problem Identification and Solution Research in Grassroots Environmental Monitoring: Meeting National and Public Needs for Environmental Protection

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Abstract: ***Environmental monitoring serves as the foundation and prerequisite of environmental protection, which is essential for national development, enterprise survival, and the safeguarding of public quality of life. Only when both the state and the public possess a profound understanding of environmental issues can rational plans be formulated to bring about substantive environmental improvement. As national requirements for environmental monitoring continue to rise and public environmental awareness strengthens, grassroots environmental monitoring institutions face considerable pressure and multifaceted challenges. Therefore, accurately identifying existing problems in monitoring practice and conducting in-depth research on corresponding solutions are necessary to better meet national and public needs and to contribute to environmental protection.***

Keywords: Green Chemical Technology, Petrochemical Industry, Technological Upgrading, Industrial Transformation, Sustainable Development, Environmental Protection, Application Strategies.

1. INTRODUCTION

With the rapid development of China's social economy, the increasing demand for petroleum resources has brought unprecedented development opportunities to the petrochemical industry, while also presenting more severe challenges. Traditional production processes generate a large amount of waste during the exploitation and processing of petroleum resources, causing certain environmental pollution. However, as public awareness of environmental protection gradually increases, green petrochemical technology has emerged. The application of new materials and technologies in petrochemical production and processing helps promote technological innovation and the overall improvement of enterprise and social economic benefits. In this context, green chemical technology has gradually become the main technology in the development of the petrochemical industry, effectively reducing the pollution of chemical materials to environmental resources while ensuring the economic interests of enterprises, which is conducive to promoting the harmonious development of man and nature.

2. APPLICATION STRATEGIES OF GREEN CHEMICAL TECHNOLOGY IN PETROCHEMICAL INDUSTRY

2.1 Application of Green Chemical Technology in Petrochemical Materials

In the petrochemical production process, to further enhance the application of green chemical technology, relevant technical personnel should fully understand and analyze this technical field and application management mechanism to promote the effective utilization of petrochemical resources. In the production and processing of petrochemical materials, natural resources such as petrochemical products are mainly used. These petrochemical products have strong market competitiveness. In the production process, green chemical technology needs to be effectively applied to ensure the green level of petrochemical raw materials. By continuously analyzing the performance of existing petrochemical materials, using various technologies, and replacing original petrochemical materials with new materials, the quality and safety of petrochemical products can be effectively improved to meet the needs of modern society for petrochemical enterprises. Therefore, in the actual production process, relevant personnel should fully conduct innovative research and development as well as optimization and improvement of green chemical technology, and scientifically control petrochemical materials from the source. In addition, to further save the consumption of natural resources and promote the conservation and optimization of petrochemical materials, relevant personnel should actively develop new green projects and encourage petrochemical enterprises to use green chemical raw materials, thereby promoting the sustainable development of petrochemical enterprises.

From the perspective of green chemical technology, its main application scope includes chemicals, polymer materials, biological materials, and catalysts. For example, the application of synthetic resins, synthetic rubbers, and synthetic resin catalysts in chemical production can not only improve the production efficiency of petrochemical enterprises but also effectively reduce environmental pollution caused by harmful gases generated during the production process. It can be seen that the use of green renewable petrochemical raw materials helps to improve the overall economic benefits of enterprises while ensuring product quality, thereby promoting the harmonious development of humans and nature.

2.2 Application of Green Chemical Technology in Petrochemical Reactions

Various chemical reactions are necessary processes for petrochemical enterprises to produce products. In the petrochemical production process, due to the particularity of its own structure, a large amount of harmful gases and liquids will be generated. To effectively control environmental pollution caused by the production process, relevant technical personnel need to reasonably apply green chemical technology in chemical reactions. Specifically, it is necessary to use catalysts with strong corrosion resistance to complete relevant chemical reactions and reduce the generation of toxic gases and liquids. In addition, ion exchange technology can be applied in the petrochemical chemical reaction process to effectively separate harmful gases and liquids in the production process. For example: in the petrochemical production process, ion exchange technology with strong corrosion resistance can be applied as a catalyst to effectively separate toxic gases and liquids. Membrane separation technology can also be used to separate organic chemical raw materials. In the specific production process, membrane separation technology is used to effectively separate organic chemical raw materials and water molecules, and then chemical technology is used to treat them. In addition, the continuous development of biochemical technology has also provided a new direction for the development of China's petrochemical industry, which can effectively realize the replacement of traditional energy, further reduce petrochemical energy consumption, and promote the sustainable development of the petrochemical industry. In the specific production process, relevant technical personnel must pay attention to increasing the research and development of biochemical technology to further improve the production efficiency of China's petrochemical industry. In the specific production process, it is necessary to scientifically select the types and application approaches of biotechnology to ensure the replacement of traditional energy by new materials, further strengthen the innovation and optimization of biochemical technology, and use modern biotechnology to further reduce production costs and promote the sustainable development of enterprises.

2.3 Application of Green Chemical Technology in Petroleum Catalysts

The application of petroleum catalysts is one of the extremely important links in the petrochemical production process. In its specific production process, green chemical technology can be combined with petrochemical technology to effectively realize the application of petroleum catalysts. From the current actual situation of China's petrochemical production, the applied petroleum catalysts are generally divided into three types: one is a catalyst with high activity, one is a catalyst that can react with petroleum raw materials, and the other is a catalyst that can extend the service life of products. Therefore, when applying petroleum catalysts using green chemical technology, relevant technical personnel should proceed from the actual situation and select appropriate petroleum catalysts to improve the speed and efficiency of chemical reactions in the petrochemical production process. On this basis, it can also ensure the safety of chemical reactions and effectively improve the production efficiency of petrochemical enterprises. In addition, in the actual application process, to further ensure the production safety of petrochemical enterprises, it is also necessary to formulate scientific and reasonable application systems in combination with the actual situation of petroleum production, requiring relevant staff to operate in strict accordance with the management system, thereby enhancing the safety, environmental protection and professional ethics awareness of relevant personnel, ensuring the implementation of safety and environmental protection concepts in petrochemical enterprises, thus guaranteeing production efficiency and quality, and further promoting the economic development of petrochemical enterprises.

2.4 Green Application of Petrochemical Technology

Petrochemical technology mainly refers to the use of relevant chemical technology to recycle harmful substances such as waste liquids and waste in the petrochemical production process, so that they can be converted into other usable resources, thereby reducing the environmental pollution caused by chemical production and promoting the sustainable development of the ecological environment. At this stage, the application of petrochemical technology mainly includes: first, making full use of petroleum resources, improving the utilization rate of petroleum

resources through recycling waste liquids, and reducing the waste of natural resources; second, adopting catalytic combustion technology to reduce pollution, save energy, realize green production, and effectively recycle renewable resources to achieve sustainable development; finally, scientifically applying extraction and separation technology to improve the quality of petrochemical production and minimize the harmful substances generated in the petrochemical production process. It can be seen that the application of green chemical technology in the petrochemical production process can effectively reduce pollution, improve the efficiency and quality of petrochemical production, and at the same time promote the sustainable development of China's economy and society to a certain extent, thereby building a community with a shared future for mankind.

2.5 Application of Green Chemical Technology in Petroleum Products

The application of green chemical technology in petroleum products aims to reduce environmental pollution, thereby improving the quality of the ecological environment and promoting the harmonious development of humans and nature. Through the application of green chemical technology in petroleum products, natural recycling and reuse can be effectively achieved, thereby reducing energy consumption. Taking gasoline as an example, in the specific production process, gasoline products can be produced through catalytic hydrogenation technology, catalytic cracking technology, and catalytic reforming technology. When processing gasoline, one-step production technology and catalytic cracking technology can be used to achieve effective treatment of gasoline. In addition, in the specific production process, relevant staff should actively promote energy-saving and emission-reduction technologies to further improve production efficiency. For example, new technical equipment can be actively used to optimize the process flow, and advanced energy-saving and emission-reduction technologies can be used to reduce raw material consumption and improve resource utilization. It is also possible to use non-polluting catalysts and catalyst regeneration processes in the petrochemical production process to treat waste in the petrochemical production process, and actively adopt recycling technologies to improve production efficiency. By rationally utilizing raw materials and by-products to reduce pollutant emissions, the economic benefits of petrochemical enterprises and the overall social benefits can be further improved on this basis.

3. CONCLUSION

In conclusion, the petrochemical industry has a profound impact on the global economy and is one of the pillar industries of modern countries. The important value of applying green chemical technology in the petrochemical production process is mainly manifested as follows: it helps to improve the economic benefits of petrochemical enterprises and lay a solid foundation for the future development of enterprises; it can effectively reduce pollutant emissions in the production process, reduce environmental pollution, and is of great significance for sustainable development; it helps to improve China's current energy structure and provide a solid foundation for China's future energy development; it helps to reduce energy consumption in the petrochemical production process, further reduce petrochemical production costs, and lay a solid foundation for the sustainable development of enterprises. It can be seen that the application of green chemical technology in petrochemical enterprises has important value. In the specific production process, relevant personnel must scientifically apply green chemical technology in accordance with the actual situation of petrochemical enterprises, give full play to its important value in petrochemical production, and thus promote the sustainable development of petrochemical enterprises.

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