IZDEVNIECĪBA
BALTIJA
PUBLISHING

INTERNATIONAL SCIENTIFIC CONFERENCE

DEVELOPMENT OF MODERN SCIENCE UNDER GLOBAL CHANGES

May 22th, 2020

Proceedings of the Conference

Riga, Latvia
2020

UDK 001(062)
De933

International Scientific Conference **Development of Modern Science Under Global Changes**: Conference Proceedings, 22th May, 2020. Riga, Latvia: Baltija Publishing. 104 pages.

ISBN: 978-9934-588-52-5

DOI: https://doi.org/10.30525/978-9934-588-52-5

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reactions strongly depends on the temperature level. Thus, during the oxidation of the limiting hydrocarbon at room or moderately elevated temperatures, hydroperoxide can be formed, and at higher temperatures, hydrogen peroxide occurs instead.

As a result of this process, hot gaseous combustion products are formed, which are to be sent to the heat exchanger. The heat exchanger, in turn, emits heat energy, which can be used for air heating or other needs, which can be consumed by plant workers.

Gas stream purified from carbon monoxide enters the catalytic converter of nitrogen oxides. The catalytic converter is installed in the exhaust system to reduce the content of harmful substances in the exhaust gases.

The neutralizer contains one reducing (rhodium) and two oxidizing (platinum and palladium) catalysts. Oxidation catalysts contribute to the oxidation of unburned (if any) in the previous block of hydrocarbons in water vapor, and carbon monoxide in carbon dioxide. The reducing catalyst reduces harmful oxides of nitrogen NO_x to harmless nitrogen. Since these neutralizers reduce the content of three harmful substances in the exhaust gases, they are called three-component.

After the neutralization process, a solution of nitric acid HNO_3 is formed, which is transferred to the pickling shop for further use according to technological processes.

After passing the devices of the entire technological scheme, the gas flow enters the receiver of gas emissions, i.e. into the atmosphere.

ENVIRONMENTAL PROTECTION TECHNOLOGIES IN THE PRODUCTION OF SODIUM HYPOCHLORITE

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DOI: https://doi.org/10.30525/978-9934-588-52-5-24

Today, regulatory and environmental acts have tightened requirements for the quality of drinking water. Sodium hypochlorite, in comparison with other chlorine-containing agents, is the least scarce and fairly cheap detoxifier. Due to its high antibacterial activity and a wide spectrum of action on various microorganisms, sodium hypochlorite is listed first in the list of chlorine

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substitutes, in addition, it is much cheaper and does not have such a strong corrosive effect on pipelines. Also important is the fact that the cost of sodium hypochlorite is 2.5–3 times cheaper than liquid chlorine. However, in the production of sodium hypochlorite, absorption gases with a chlorine content may enter the atmosphere.

The system of ensuring environmental safety of JSC «DniproAzot» [1] was chosen as the object of study. When forecasting and assessing changes in the state of atmospheric air, the resulting data on emissions and concentrations of harmful substances in the surface layer of the atmosphere on the existing state of the environment were obtained and evaluated. It was found that as a result of dispersion, the concentrations of harmful substances do not exceed the maximum permissible norms in the atmospheric air of populated areas.

In the course of the study, measures were developed to ensure the reduction of emissions of harmful substances, up to a halt in the operation of technological equipment in the event of failure of gas cleaning devices and in the prediction and occurrence of adverse weather conditions. Thus, gas emissions from the production of sodium hypochlorite will not change the nature of the use of the adjacent territory and will not have a harmful effect on the health of the population of the adjacent territories.

To reduce the formation and prevent the release of harmful substances into the atmosphere, the following measures should be taken to reduce the emission of harmful substances:

– carrying out technological process in sealed equipment;

– use of appropriate sealing devices and materials: fittings, plugs, gaskets, etc.;

– control, regulation, alarm and blocking of the most important technological parameters, which ensure normal safe conduct of the process and prevent the development of emergency situations;

– to prevent or drastically reduce emissions of harmful substances into the atmosphere, the installation of gas purification equipment is provided – an absorption column for capturing chlorine with a high efficiency of cleaning gas emissions.

For repeated use, the absorber should be regenerated, while an absorbent is removed from it, which can be further sold as raw materials for other processes or the target commercial product [2–3].

Thus, the proposed measures will significantly reduce the amount of chlorine entering the atmosphere as a result of the production of sodium hypochlorite at JSC DniproAzot, which will make it possible to increase the level of environmental safety of the production process of reagents for water disinfection and reduce anthropogenic pressure on the environment.

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ENVIRONMENTAL PROTECTION TECHNOLOGIES IN POWDER METALLURGY

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DOI: https://doi.org/10.30525/978-9934-588-52-5-25

The need to expand the special properties of structural materials has led to the wide development of new technologies for their production, in particular, powder metallurgy. Its application allows to increase the efficiency and accuracy of metal production processes with various properties and various functional purposes. A particular advantage of this process is the low level of waste generation and the high level of use of resources and raw materials. At the same time, like any other production, powder metallurgy is associated with the occurrence of negative environmental impacts. An urgent task is to reduce this impact in order to increase the level of environmental safety of the industry.

Since environmental pollution at powder metallurgy enterprises includes almost all types of impacts on it, the solutions that are planned to be implemented to reduce them should be comprehensive, aimed at eliminating the maximum number of problems that arise.

In this work, the State Enterprise «Powder Metallurgy Plant», located in the city of Brovary, one of the district centers of the Kiev region, Ukraine, was used as a direct object of study. The industrial complex of the enterprise consists of the following technological areas: production of iron powder; production of sintered anti-friction and structural products based on metals

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Iespiests tipogrāfijā SIA “Izdevniecība “Baltija Publishing”
Parakstīts iespiešanai: 2020. gada 29 maijs
Tirāža 100 eks.