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CHARGING OF THE NICKEL CATALYST WITH THE "JET" METHOD AS A COMPONENT OF THE SUSTAINABLE DEVELOPMENT OF UKRAINIAN CHEMICAL INDUSTRY

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The sustainable development of the chemical industry of Ukraine is appreciably complicated with the forced orientation of the domestic economy to the needs of the military field. The search of the methods of the industry's transition to the principles of green chemistry becomes especially relevant in such circumstances. Green chemistry aims to minimal using of hazardous substances in the industry. Today one of the most important chemical products in Ukraine is the group of mineral fertilizers which are 1.9% of the total volume of the country's exports (based on the data of January-February 2015), which corresponds to the second place in the list of chemical and related industries exports. On the other hand, the Ukrainian part in the world market of nitrogen fertilizers is about 8%. Keeping this part needs continuous improvement of the ammonia synthesis process as the basis for the nitrogen fertilizers production.

Devoted to this problem analysis of publications, allows to detect the preferential orientation of production innovations to reduce the consumption of natural gas, the main raw material for the production of ammonia. In addition, some companies introduce the development aiming at the consumption of recycled water reducing, the process steam recycling, the output of electrical energy on its basis and other fields of energy intensity production reducing.

The problems of the primary reforming of natural gas catalyst consumption reducing stand aside. In this catalyst nickel is the main active substance, which is prevalent in the environment at low concentrations. The prevalence of nickel causes its harmless substances erroneous labelling. At the same time, the World Health Organization (WHO) names Nickel one of the most dangerous environmental pollutants, i. e., ecotoxicants. Excess of nickel in an organism can provoke skin dermatitis, asthma, the increase of some central nervous system excitability, blood pressure drops, nose bleeding, eye diseases, brain and lung swelling or even cancer, nasal mucosa or sinuses cancer.

The present level of the chemical technology development cannot completely eliminate nickel catalysts for ammonia synthesis using. The way out of this situation is proposed by us the nickel catalyst longer lifetime (about 40%, according to our experience) at the expense of its patented "jet" method's charging with the reforming pipes layers ordering. It will also make possible a number of technological advantages, such as:

- preventing of localized pipes overheating owing to resulting structure of the catalyst homogeneity;
- the increase of the catalyst structure stability, excluding the shrinkage during the furnace operation;
- the temperature of pipes lowering due to their walls higher heat transfer by radial heat transfer improving;
- elimination of the catalyst crumbs and dust sifting needing due to performing of these operations during catalyst charging;
- the catalyst charge time reduction up to 4 days by the process in a single stage carrying out and the preparatory steps exception.

The described technological advantages of the "jet" method provide an supplementary increase of the resulting ammonia competitiveness, and as a result, nitrogen fertilizers which are produced on its basis. On one's part, it will not only keep our country's part in the nitrogen fertilizers world market, but it also will avoid a number of internal social problems resulting from the possible decline in employment and some reduction in payments to the national budget (as well as from foreign trade enterprises). Simultaneous the implementation of environmental, economic and social vectors of the industry growth on the basis of this development is a real component of the sustainable development transition.