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INSTALLATION FOR OBTAINING NUCLEAR-GRADE URANIUM DIOXIDE FROM AMMONIUM POLYURANATES

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This paper discusses the process of obtaining uranium dioxide from ammonium polyuranates in industry. The aim of the work is to study oxide nuclear fuel, its production in the ADU production plant, as well as the development and improvement of the technological scheme.

Currently, the method of obtaining uranium oxides from ammonium polyuranate is one of the key processes worldwide for obtaining uranium oxides, including uranium dioxide. The latter serves as an intermediate raw material in the production of various types of nuclear fuel. The characteristics of the main uranium oxides (UO_2 , UO_3 , U_3O_8) have been described here.

The characteristics of main types of fuel have been provided. After comparing their advantages and disadvantages and providing corresponding arguments, oxide fuel was chosen for study.

The production of this type of nuclear fuel in manufacturing has been also briefly touched. As a result of describing the methods of obtaining high-purity uranium oxides from various uranium compounds, the most promising method, consisting of two main stages, the ADU process, was chosen. The first stage involves obtaining ammonium polyuranate, which is precipitated from nitrate solutions (drying, calcination, and reduction). The second stage involves the formation of uranium oxide. At this point, uranium is reduced from ammonium polyuranate.

Based on the assignment given by the instructor, a technological scheme for obtaining uranium dioxide from ammonium polyuranate has been developed.

REFERENCES

1. *A.N. Zhiganov, V.V. Guzeev, G.G. Andreev. Technology of uranium dioxide for ceramic nuclear fuel. – 2002. – p.61-89*