



Features of involvement in the processing of industrial waste from mining and metallurgical industries

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ABSTRACT

The paper presents the features of involvement in the processing of man-made waste from mining and metallurgical industries.

Keywords: mineral raw materials, ore processing, mining and metallurgical, geological exploration, low-waste technology.

XXI century is the century of high technologies. Further scientific and technological progress, reaching the world level in quality and ensuring high rates of industrial production are forcing the intensive exploitation of natural resources, among which the share of mineral raw materials accounts for more than 70%.

Over the past 25 years, approximately the same amount of mineral raw materials has been extracted from the bowels of the earth as in the entire previous 100 years. In connection with a general decrease in the content of useful components in mineral raw materials, maintaining the achieved level of industrial production requires an increasing volume of raw materials. In the current situation, the physical volume of extraction of mineral raw materials doubles every 30 years, and of fossil fuels every 15 years.

World reserves of mineral raw materials are geographically distributed extremely unevenly, and there is no industrialized country in the world that could fully provide itself with its own mineral resources.

Unlike other countries, the economy of Uzbekistan is almost completely developing on its own raw material base and does not depend on the import of mineral raw materials from other countries. However, in our country, mineral resources are gradually being depleted.

Proceeding from this, along with the task of constantly increasing reserves of mineral raw materials through the development of geological exploration, one of the main ways to solve the problem of providing industry with fuel, chemical raw materials, ferrous, non-ferrous and light metals is the comprehensive and fuller use of mineral deposits and extracted mineral raw materials.

A reliable legal basis for the strategy for the development of environmentally friendly technologies in the development of mineral deposits, the integrated development of natural resources and the processing of industrial waste is provided by a number of laws of the Republic of Uzbekistan, in particular the Law "On Nature Protection", the Law "On Subsoil", the Law "On Waste", etc. These legislative documents state that a more complete and comprehensive use of ore raw materials is the most important factor in expanding resources for the production of ferrous and non-ferrous metals and reducing costs per unit of production, and also contributes to the prevention of environmental pollution by industrial emissions.

Despite the richness of natural mineral resources, effective forecasting of the country's economic development is impossible without taking into account the involvement of mining and metallurgical industry waste in processing, in which the content of valuable components is often significantly higher than in the extracted primary raw materials.

OJSC "Almalyk Mining and Metallurgical Combine" (AMMK) is one of the largest enterprises in Uzbekistan, which includes copper and zinc production complexes. Despite the advanced technologies used, mining and metallurgical production is not without waste.

At present, more than 1 billion tons of flotation tailings and 13 million tons of flotation tailings have been accumulated in the dumps of AMMK. tons of waste slag from a copper smelter. Annually, about 400 thousand tons of waste slag with an iron content of 35-40%, copper up to 0.7%, gold up to 0.2-0.4 g / t are stored here. 10 GK are occupied by dumps. land. Considerable funds are spent annually on the maintenance of dump farms. A very large volume of slags with valuable components, formed during the processing of copper ores, determines the urgency of the problem of their rational use.

For many years, scientists not only from our republic, but also from many other countries, have been studying the complex processing of waste, including slags from copper production. However, to date, no integrated processing technology has been implemented. AMMK uses the technology of slag flotation processing. However, this technology is hardly promising, since the extraction of copper into concentrate is small. In this case, the tailings of the slag are entirely directed to the production of building materials. This leads to the fact that a significant amount of copper is irretrievably lost and will never be disposed of. Considering that all over the world natural reserves of copper are decreasing and their prices are rising, such losses are unlikely to be justified.

The amount of copper and precious metals contained in man-made waste could ensure the operation of the AMMC without being involved in ore processing for many years to come. Of undoubted value are the oxides of iron, silicon, aluminum contained in them, which may well be used for obtaining additional products.

Creation of waste-free technology for any enterprise, as a rule, consists of two stages. At the first stage, the processing of waste generated in the production process is organized, the accumulation of which in this case stops. At the second stage, the processing of already accumulated waste is organized, which will allow, over time, to eliminate these dumps. From this point of view, the task of determining the optimal production capacity for waste processing is equivalent to the task for processing ores of a deposit with limited reserves.

In the first low-waste, non-waste technologies as the main way of engineering and environmental development, society was proposed in the mid-60s of the last century mainly by scientists from the CIS countries. On the basis of their application, it was assumed not only to make maximum use of the consumed raw materials, but also to try to

completely recycle the resulting waste. In the general case, according to the theory of the spread of pollution, for which the name "miasmotology" has been proposed, the following phenomena are observed in the development of any industrial production:

- in a continuous technological process, environmental pollution occurs as a result of incomplete disposal of waste due to imperfection of the process itself or the presence of significant impurities in the original product;
- any pollutant after being ejected and any part of the biosphere is dissolved to the limit in it, and also simultaneously penetrates into other parts of the biosphere and interacts with them.

Thus, according to these patterns, the main technological task is to process waste on site and at the time of its occurrence, the further the waste is removed from the place of its generation, the more complicated this task becomes and at some stage it becomes unsolvable. Therefore, when developing technological schemes for cleaning and disinfecting harmful emissions into the environment, one should proceed from the principles of local primary cleaning from a specific type of waste. It is permissible to combine waste related by components that require the same treatment.

A non-waste technological system should be understood as such production, as a result of which there are no emissions into the environment. Waste-free production is a set of organizational and technical measures, technological processes, equipment, materials that ensure maximum and comprehensive use of raw materials and allow minimizing the negative impact of waste on the environment.

Waste-free production can be characterized by all possible utilization of waste generated in direct technological processes. The ideal production model in most cases cannot be fully realized, but with the development of technological progress it is getting closer to it.

Low-waste technology is an intermediate stage to non-waste technology and differs from it in that it provides a finished product with not fully utilized waste.

Waste is a by-product released in the production process of the main types of products and is characterized by certain physical and chemical properties. Waste from production and consumption, suitable for processing into marketable products, refer to secondary material resources.

Waste-free technology can be developed in the following directions:

- creation of drainless technological schemes on the basis of existing, introduced and promising methods of purification. At the same time, a sharp decrease in water consumption is achieved, but, as a rule, secondary pollution formed in the form of solid precipitates or saturated solutions;

- development and implementation of systems for processing production and consumption waste, which should be considered as secondary material resources. During the operation of modern water and gas purification systems, solid waste is formed, which is a concentrated mixture of pollutants;

- organization of fundamentally new processes for obtaining products, allowing to exclude or reduce processing stages (or technological stages), which generate the bulk of waste;

Development and creation of territorial-industrial complexes (DCC) and a closed structure of material flows and raw materials and waste within DCC, with a minimum of emissions. In the conditions of Uzbekistan, such a DCC could be created on the basis of the AMMK and APO "Uzmetkombinat".

Previously, the process was based on an increase in labor productivity, but now – an increase in resource productivity. Rational consumption of resources and protection of the environment can be carried out by implementing the following solutions:

- closure in the cycle of effluents, emissions, energy resources;
- solid waste disposal;
- changing the technology of the main production of the main path when creating waste-free technologies. It can be implemented at levels such as;

- improving the professional level and culture of production operation;
- reconstruction and technical re-equipment of production;
- creation of fundamentally new resource-saving, waste-free production facilities characterized by a high level of engineering, economic and environmental excellence;

- saving resources;
- release of products of a fundamentally new quality.

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