

Technological simulation of slag and study of its properties for further use

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Abstract

At one metallurgical enterprise of the Far East in the processing of germanium-containing raw materials of the Pavlovsk brown coal deposit by the method of recovery – sulfiding cyclone smelting, it is planned to form waste of the production process-granulated slag. In accordance with the current requirements need to address the issue with the disposal of slag melting cyclone to the beginning of the operation of the facility. In the project document recommended the use of the cyclone melting furnace slag in the construction or production of construction materials. To determine the direction of utilization of cyclone smelting slag, it is necessary to know the chemical, granulometric composition of slag, as well as the properties of the material when interacting with water. In order to determine the properties of slag for possible disposal in the laboratory, an experimental simulation of the melting process with the addition of flux and sulfideizer was carried out. Samples of slag for subsequent studies were obtained. The compositions and properties of slag and additives were determined. Chemical analysis of slag on macro components and x-ray fluorescence analysis on micro components necessary for environmental assessment was performed. It was found that there are no toxic impurities in hazardous concentrations in the slag. Thus, the maximum size of slag particles is not more than 10 mm, and the content in the material of particles larger than 5 mm, not more than 9.7%, which meets the requirements of GOST 5578-94 for use in concrete. The density and humidity of the slag are also determined. It is found that in the interaction with water, the resulting solution is characterized by a weak alkaline reaction that does not prevent the use of the material in the industrial process. It is shown that the resulting slag is suitable for the subsequent disposal of slag.

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