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Mineral and chemical composition of metallurgical slags as an important aspect in their economic use

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Abstract

Metallurgical slags (after iron and steel production or after Zn-Pb ores production), depending on the type of a technological process, are characterized by a diversified mineral composition, they contain: glaze which is usually a dominant compound, metallic precipitations and non-metallic phases – oxides and silicates. Slags stored on dumping grounds for a longer time also contain carbonates and sulfates.

In a slag alloy the crystallization process is suddenly disrupted during cooling and in connection with this fact the majority of slags components congeals in the form of glaze. Some of them occur in the form of small crystalline nuclei, whereas well-developed crystals which can be identified during microscopic observations are rare. Phase components of slags are compared to minerals existing in nature, but they are richer in admixtures. Oxide and silicate phases in slags usually form solid solutions and their internal structure contains substitutions of elements which are not characteristic for minerals.

The chemical composition of slags is also variable and depends on: the type of the used furnace charge, fluxes, refining additives and a used melt technology.

It is very important to make some mineralogical and chemical researches of slags to come to know what are the forms of metals occurrence, what is the minerals resistance to weathering processes and in which conditions metals are liberated from slag components. This knowledge will be useful in making economic activities connected with using metallurgical slag as a secondary material. Utilization, which will economically cost effective and ecologically safe for the environment.

Key words: metallurgical slag, mineral and chemical composition, metals.

Povzetek

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Ključne besede: metalurška žlindra, mineraloška in kemična sestava, kovine.