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REVIEW

On the dissertation work of Osserov Timur Bolatkhanovych
«Mechanochemical synthesis of sulfidization for the processing copper ores» presented for the degree of Doctor of Philosophy (Ph.D) in specialty 6D070900-Metallurgy
The Dissertation is devoted to the synthesis of sodium polysulphide and to the study of its further use as a flotation agent in the processing of oxidized copper ores.

At present, the enrichment of difficult-to-refractory non-ferrous ores plays a huge role in the metallurgical transformation, since the reserves of sulphide copper ore are greatly reduced, while the oxidized ores are increasing and, on the background of natural hydration, they acquire a mass of mineralogical forms and species based on minerals malachite and azurite.

Classical flotation reagents and methods are not always applicable for the processing of complex oxidized ores, so there is a need to obtain and apply new chemical reagents, as well as combined methods of processing and flotation of refractory ores.

One of the modern trends in science is mechanochemistry, which makes it possible to synthesize and create various substances and compounds.

In this dissertation work, dissertator for the first time synthesized a mixture of sodium polysulphides mechanochemically and applied it successfully as a reagent in the flotation enrichment of oxidized copper ore.

The scientific results obtained by the author correspond to the requirements for PhD dissertation work, and are as follows:

- the thermodynamics of the preparation of sodium polysulphide by a mechanochemical method has been calculated and analyzed;
- synthesized sodium polysulphide in a planetary centrifugal mill;
- Samples were identified for the detection of sodium polysulfide in them using Raman spectroscopy and X-ray phase analysis;
- analysis of the ore under investigation;
- processing of ore by mechanoactivation in a planetary-centrifugal mill;
- the slurry yield is modeled and optimized during mechanoactivation of copper ore;
- synthesized sodium polysulphide is used as a flotation reagent for the processing of oxidized copper
- the effect of mechanical activation on chalcopyrite-containing copper concentrate was studied;
- experimentally shown the effect of mechanochemical activation on the leaching of copper concentrate.

The reliability of the scientific propositions defended in the dissertation and the formulated conclusions is justified by the conducted studies, thermodynamic calculations, the use of modern methods of analysis and control.

Dissertational work has an internal unity, logical sequence and interrelation of theoretical positions and practical results. All its sections are united by one task - the synthesis of sodium polysulphide and its application in the technology of enrichment of difficult-to-digest ore.

All the results obtained by the applicant are aimed at solving the actual problem-processing of difficult-to-digest copper ores.

The presented dissertation «Mechanochemical synthesis of sulfidization for the processing of copper ores» meets the requirements for doctoral dissertations of Ph.D, and its author, Osserov Timur Bolatkhanovich, deserves the award of the Ph.D. degree in the specialty "6D070900-Metallurgy".

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Ústav geotechniky
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