SECTION
TECHNOLOGY

IMPROVING EFFICIENCY OF IRON ORE THICKENING AND DESLURRYING

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Purpose. The research is aimed at improving efficiency of thickening and deslurrying products of iron ore concentration and quality of magnetite concentrate by means of dynamic effects of controlled high-energy ultrasound and the magnetic field impacting ore slurry solids in the output product of the deslimer.

Methodology. The research is based on the systemic approach used to define regularities of high-energy ultrasound propagation in heterogeneous media, develop mathematical and simulating models of these processes and methods of improving thickening and deslurrying of iron ore concentrate by combining impacts of the ultrasonic and magnetic fields.

Findings. The method of controlling magnetic deslurrying of iron ore by combining impacts of ultrasonic and magnetic fields is suggested, this enabling improved efficiency of the magnetic deslimer due to preliminary removal of slurry from ore particle surfaces and disintegration of ore masses that may contain both the useful component and other undesired components. Besides, it enables forecasting ground ore particles' gravitational deposition through assessing their behaviour under the action of the high-energy ultrasound in the magnetic field as well as controlling these impacts accordingly. Implementation of this approach provides increase of the Fe_{tot} mass fraction in concentrate, decrease of its extraction into deslurrying tailings and improvement of qualitative indices of multistage magnetic separation processes throughout the whole technological line of iron ore concentration.

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Key words: deslimer, simulating modelling, ultrasound

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DESTRUCTION OF ROCKS BY NON-EXPLOSIVE DESTROYING MIXTURES IN UNDERGROUND MINING

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Purpose. Study of hydration kinetics of non-explosive destructive mixtures and dynamics of pressure increase of their expansion.

Methodology. The first group of experiments was performed on an autodyne NMR spectrometer. Differential method of spectrum registration is used. The second group of experiments was performed in the laboratory on a triaxial compression unit.