عنوان مقاله:

The effect of high voltage electric pulse on the coarse particle flotation of sulfur-bearing iron ore samples

محل انتشار:

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خلاصه مقاله:

In this research, the effect of the high-voltage electric pulse (HVEP) crushing on the flotation of high-sulfur iron ore concentrate in the coarse particle fraction was studied compared to mechanical (conventional) crushing. A jaw crusher, a cone crusher, and a high-voltage electric pulse crushing device with a voltage level of ۵۰ kV were used to investigate the effect of mechanical and electrical crushing. The results showed that a coarser particle product was produced with less slime in primary crushing with electric pulses compared to primary mechanical crushing. It was due to the crushing mechanism, which is based on separating minerals with a different dielectric constant from their connection boundaries and also encompasses a selective separation process. The effect of the mentioned method on coarser fractions led to the creation of cracks/microcracks in particle structures that made grinding easier and faster. In investigating the effect of particle size on pyrite flotation and desulfurization at -۳۰۰ µm (d۸۰=۳۰۰µm), the sulfur grade of flotation iron concentrate samples using primary crushing was ۰.۸۶% and ۰.۳۶%, respectively, and at -۱۵۰ µm (d۸۰=۱۵۰µm) fraction, the sulfur grade was found to be ۰.۳۳% and ۰.۱۹% respectively for mechanical and electrical methods. Also, the sulfur removal (recovery) of the sample with primary electrical crushing was ۷۳.۷% at a -۳۰۰ µm fraction, almost equal to ۷۳.۲% at the size range of -۱۵۰ µm with applying the mechanical method. These results indicated the flotation possibility of coarser particles using electrical crushing and desulfurization similarity to the .samples with primary mechanical crushing in finer fractions

کلمات کلیدی:

High voltage electrical pulses, Grindability, Coarse particle flotation, Desulfurization, Iron ore