

Flotation applied to iron ores with complex mineralogy

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ABSTRACT

Iron ore flotation has been investigated by many researchers over the years. This technique is very powerful to enriching low-grade iron ores because it allows the beneficiation under some conditions not very well adapted for utilisation by other separation methods, such as a wide particle size distribution, for instance. Low complexity iron ores, most of the times composed only by iron oxides and quartz, respond very well to flotation. These minerals have well defined surfaces and the reagents used are most of the time able to modify their wettability properties to produce efficient separation. The same is not observed however in low-grade iron ores with high mineralogical complexity. These ores are very often composed by several minerals phases, sometimes showing liberation issues on top of the complex mineralogy. A low-grade iron ore from one of the largest Mexican mines was investigated. Flotation was performed on samples with different particle size distribution to verify the influence of liberation and evaluate iron loss in case of a possible screening prior flotation. The results show that there is a considerable difference in the quality of the final product from flotation between the samples which proves that liberation is a very important factor for the flotation process.