

Improving Flotation Separation of Apatite ore Using Calcium Lignosulphonate and Tannin as Combined Depressant

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Abstract : Apatite is separated from carbonate minerals via direct flotation by using lignosulphonate as a depressant, but its dosage is high, and its inhibition ability is insufficient. Therefore a combination of depressant calcium lignosulphonate and depressant tannin was considered to improve flotation selectivity and decrease the dosage of depressant. In the present work, the effects of several reagents- pH regulators (sodium carbonate and sodium hydroxide), combined depressant (calcium lignosulphonate and tannin) and collector (fatty acid amide soap) on the flotation performance of apatite ore were investigated using Design Expert software. Flotation results showed that the combined depressant had not only more excellent inhibition ability compared with the individual depressant respectively, but also lower dosage. In the raw ore containing 6.65% P₂O₅, a concentrate containing 32.93% P₂O₅ with 93.24% recovery was obtained using 3.5kg/t sodium carbonate, 0.75kg/t sodium hydroxide, 1kg/t calcium lignosulphonate, 50g/t tannin and 100g/t fatty acid amide soap in the rougher flotation.

Keywords : apatite flotation, combined depressant, calcium lignosulphonate, tannin

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