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十二烷基胍对铝硅矿物的浮选分离

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摘 要: 采用含有胍基的长碳链季铵盐作捕收剂, 研究一水硬铝石、高岭石、叶腊石和伊利石单矿物的浮选行为、铝硅人工混合矿样的浮选分离以及河南铝土矿的精选。结果表明: 在捕收剂用量为 2×10^{-4} mol/L条件下, 在广泛的pH范围内, 十二烷基胍对硅酸盐矿物具有较好的捕收能力, 平均浮选回收率可达80%; 强碱性条件下, 一水硬铝石的浮选回收率从80%急剧下降至20%, 与高岭石、叶腊石和伊利石之间形成较大差异; 以十二烷基胍为捕收剂可望实现铝硅矿物反浮选分离; 实际铝土矿(原矿铝硅比为5.70)经过反浮选脱硅, 精矿铝硅比达11.08, 铝浮选回收率为75%; 与传统的阳离子捕收剂十二胺相比, 胍类阳离子捕收剂对硅酸盐矿物浮选能力强、受pH的影响小, 是一种新型高效的铝硅矿物浮选分离捕收剂。

关键字: 十二烷基胍; 一水硬铝石; 硅酸盐矿物; 浮选; 分离

Flotation separation of diaspore from aluminosilicates by using dodecylguanidine

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Abstract: The flotation behaviors of diaspore and aluminosilicate minerals including kaolinite, pyrophyllite and illite, the flotation separation of artificial mixed minerals with diaspore and aluminosilicates were all investigated, and the flotation of one bauxite ore by using a guanidine cationic surfactant dodecylguanidine sulfate was also studied. The results show that with 2×10^{-4} mol/L dodecylguanidine collector, the floatabilities of kaolinite, pyrophyllite and illite are good, with average recovery rates of about 80%. Whereas the flotability of diaspore is pH-dependent in alkaline region, and the recovery rate drops from 80% to 20%. So the flotation separation of diaspore against the aluminosilicates is feasible by using guanidine collector in high alkaline. When the bauxite ore has the mass ratio of Al to Si of 5.70, the obtained concentrate has the mass ratio of Al to Si

of 11.08, and the recovery rate of Al is 75%. Comparing with dodecylamine, the dodecylguanidine is an effective collector because of its strong collecting power and pH-independence.

Key words: dodecylguanidine; diaspoire; aluminosilicte; flotation; separation

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