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脂类捕收剂DLZ对黄铁矿浮选的影响及其作用机理

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摘 要: 通过浮选实验, 吸附量和红外光谱测定, 考察脂类捕收剂DLZ对黄铁矿可浮性的影响及作用机理。研究表明, DLZ在整个pH范围内对黄铁矿的捕收能力弱, 黄铁矿回收率小于24%; 在低铜离子浓度(1 mol/L)下, 对黄铁矿回收率影响不大; 当铜离子浓度增加至4 mol/L, pH值为2.7时, 黄铁矿回收率达到42%; 在碱性条件下, 黄铁矿回收率与不加铜离子时的回收率相当; DLZ在黄铁矿表面的吸附量随其用量的增加而增大; 加入铜离子对DLZ在黄铁矿表面的吸附有促进作用; DLZ与黄铁矿作用前后, 以及加入铜离子后的红外光谱图基本没有变化, 即DLZ在黄铁矿表面的吸附属于物理吸附; 加入CaO后在873.7 cm⁻¹和797.7 cm⁻¹处出现2个吸收峰, 表明黄铁矿表面附着Ca(OH)₂等含钙的化合物, 阻止了DLZ在矿物表面的吸附, 降低了黄铁矿的可浮性。

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关键字: 黄铁矿; 捕收剂; 吸附量; 浮选

Effects of collector-DLZ on flotation of pyrite and its mechanism

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Abstract: The interaction mechanism of collector-DLZ in flotation of pyrite was investigated by flotation experiments, adsorption capacity measurements and FTIR-DRIR. The flotation experimental results show that the collecting ability of DLZ to pyrite is feeble in the whole rang of pH. The recovery of pyrite is less than 24%, and has little change in the presence of low concentration Cu²⁺ (1 mol/L). Increasing dosage of Cu²⁺ to 4 mol/L, the recovery of pyrite reaches 42% at pH=2.7, while in alkaline condition, there is no significant change. Adsorption capacity measurements demonstrate that the adsorption capacity of DLZ on pyrite surface is proportional to the dosage of DLZ. The presence of Cu²⁺ enhances the adsorption of DLZ on pyrite surface in some extent. FTIR-DRIR results prove that the infrared spectrum of pyrite interacts with DLZ and Cu²⁺ has no obvious change, which indicates the adsorption of DLZ on the pyrite surface is physical adsorption. Adding CaO brings about two absorption peaks (at 873.7 cm⁻¹ and 797.7 cm⁻¹), and shows that there are some Ca(OH)₂ and other calcium compounds which adhere to pyrite surface, and prevent adsorption of DLZ on pyrite surface, thus the flotation of pyrite is reduced.

Key words:pyrite; collector; adsorption capacity; flotation

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