



## 论文摘要

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## 十二叔胺系列捕收剂对一水硬铝石的浮选行为

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**摘要:** 研究十二叔胺系列捕收剂(DRN, DEN, DPN和DBN)对一水硬铝石的浮选行为。研究表明: 在4种叔胺中, DEN对一水硬铝石的捕收能力最强, 浮选回收率可达80%以上; 一水硬铝石中存在大量OH基, O—H键的断裂和OH基的电离是其带电的主要原因; 一水硬铝石的等电点约为4.8, 十二叔胺主要以静电引力吸附于矿物颗粒表面, 并能显著增大一水硬铝石的Zeta电位; 叔胺的 $pK_a$ 为9.7左右, 当 $4.8 < pH < pK_a$ 时, 叔胺具有较好的浮选性能; 增大捕收剂用量, 浮选效果增强; 叔胺分子中N原子上所连的不同取代基的给电子效应和空间位阻效应的综合效果使它们对一水硬铝石浮选能力存在差异。

**关键字:** 十二叔胺; 一水硬铝石; 静电作用; 电子效应; 空间效应

## Flotation of diaspore with a series of dodecyl tertiary amines

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**Abstract:** The flotation performances and mechanism of diaspore with a series of tertiary amines (DRN, DEN, DPN and DBN) were studied by micro-flotation, measurements of FT-IR spectra and Zeta potential, calculation of solution chemistry. The results indicate that DEN has the best collecting powder for diaspore with a maximum recovery above 80%. On the basis of FT-IR spectra measurements, plenty of OH groups are found on diaspore surface, and the fracture and ionization of O—H groups contribute to the charging mechanism of diaspore surface. According to the curves of Zeta potential, the isoelectric point of diaspore is about 4.8, dodecyl tertiary amines are attached on the surface of diaspore by electrostatic force, and the Zeta potential of diaspore increases a lot using tertiary amines as collector. The  $pK_a$  of DRN is about 9.7. DRN, DEN and DPN have better flotation performance for diaspore when  $4.8 < pH < pK_a$ ; and the more the dosage, the better the flotation effect. The differences of collecting power of four tertiary amines result from the diversity of the substituent effects coming from the groups bonding to the N atom in tertiary amine molecules.

**Key words:** dodecyl tertiary amine; diaspore; electro-static effect; inductive electronic effect; space-steric effect

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