

材料化学工程与纳米技术

腐殖酸钠抑制氧化铝熟料溶出二次反应机理初探

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摘要 在烧结法熟料溶出过程中添加腐殖酸钠,一定程度上能抑制二次反应的发生,当添加量为熟料的0.43%时,熟料中氧化铝和苛碱的溶出率比空白样分别高出3.87%和4.51%。通过对赤泥红外光谱测定和熟料溶出液SiO₂和Ca²⁺的浓度分析,初步探讨了腐殖酸钠抑制二次反应的机理。试验结果表明,腐殖酸钠的多基团大分子附着在硅酸二钙分子的表面上,使其不与溶液接触而避免二次反应的发生;同时,腐殖酸钠进入溶液解离出阴离子与Ca²⁺形成较稳定的沉淀,减少了溶液中游离Ca²⁺的数量,阻止水合铝硅酸钙的生成,从而降低铝酸钠的损失。

关键词

[腐殖酸钠](#) [熟料](#) [二次反应](#) [硅酸二钙](#) [烧结法](#)

分类号

Mechanism for humic acid sodium to inhibit secondary reaction in clinker extraction process

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Abstract

Humic acid sodium was used as an inhibitor to the secondary reaction in the process of clinker extraction. When the addition of humic acid sodium to clinker was up to about 0.43%, the extraction efficiency of alumina and caustic from clinker will be increased by 3.87% and 4.51%, respectively. Its inhibition mechanism was studied by the determination of infrared (NIR) spectra and the concentrations of SiO₂ and Ca²⁺ in the extracted solution. The results showed that the big molecules of humic acid sodium enwrapped dicalcium silicate surface, which prevented dicalcium silicate from contacting with the solution. At the same time, the anions dissociating from humic acid sodium could combine with Ca²⁺, which resulted in the concentration reduction of Ca²⁺ in the solution. Therefore, it was inhibited to form hydrated aluminosilicate silicate which caused the loss of sodium aluminate.

Key words

[humic acid sodium](#) [clinker](#) [secondary reaction](#) [dicalcium silicate](#) [sintering process](#)

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