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油溶性添加剂对铝酸钠溶液种分分解率和 $\text{Al}(\text{OH})_3$ 粒度的影响

陈 锋¹, 谢志辉¹, 张宝砚¹, 毕诗文², 尹 成³

(1. 东北大学 理学院, 沈阳 110004; 2. 东北大学 材料与冶金学院, 沈阳 110004; 3. 中国铝业股份有限公司 山西分公司, 河津 043300)

摘 要: 研究由羧酸盐类阴离子表面活性剂与聚氧乙烯型非离子表面活性剂复配的油溶性添加剂对铝酸钠溶液种分分解率和产物 $\text{Al}(\text{OH})_3$ 粒度的影响, 并对该添加剂影响铝酸钠溶液种分分解过程的相关机理进行探讨。结果表明, 当添加剂中羧酸盐类表面活性剂的含量为60%(质量分数)、添加量75 mg/L时, 相对空白试样, 添加剂可提高铝酸钠溶液种分分解率2.5%左右, 产物中粒径大于45 μm 的 $\text{Al}(\text{OH})_3$ 颗粒的含量增加约7%(质量分数), 且粒度分布主要集中在50-70 μm 区域; 对产物粒度分布进行数学拟合计算, 得出加入添加剂后单位质量 $\text{Al}(\text{OH})_3$ 颗粒的总表面积增加约2%, 表明在保证不增加粒径小于45 μm 的 $\text{Al}(\text{OH})_3$ 颗粒含量的前提下, 通过加入添加剂提高铝酸钠溶液种分分解率在理论上是可行的。

关键字: 表面活性剂; 铝酸钠溶液; 分解率; 粒度; 表面积

Effect of oil-soluble additive on precipitation ratio from sodium aluminate solution and granularity of $\text{Al}(\text{OH})_3$

CHEN Feng¹, XIE Zhi-hui¹, ZHANG Bao-yan¹, BI Shi-wen², YIN Cheng³

(1. School of Science, Northeastern University, Shenyang 110004, China; 2. School of Materials and Metallurgy, Northeastern University, Shenyang 110004, China; 3. Shanxi Aluminum Co Ltd, China Aluminum Co Ltd, Hejin 043300, China)

Abstract: The effect of oil-soluble additive composed of carboxylate anionic surfactant and polyoxyethylene nonionic surfactant in different proportions on the seed precipitation from sodium aluminate solution was studied, and the corresponding mechanism was investigated. The results show that when the content of anionic surfactant is 60% (mass fraction) and the additive concentration in sodium aluminate solution is 75 mg/L, the precipitation ratio is improved by about 2.5%, the content of $\text{Al}(\text{OH})_3$ with particle size above 45 μm increases by about 7% (mass fraction), and the granularity distribution of $\text{Al}(\text{OH})_3$ centralizes at 50-70 μm . The result of mathematics fit on the granularity distribution of $\text{Al}(\text{OH})_3$ indicates that the total surface area of $\text{Al}(\text{OH})_3$ increases by about 2%, which makes the precipitation ratio improve in theory under the condition that the content of $\text{Al}(\text{OH})_3$ with particle size below 45 μm does not increase.

Key words: surfactant; sodium aluminate solution; precipitation ratio; granularity; surface area

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地 址：湖南省长沙市岳麓山中南大学内 邮编： 410083

电 话： 0731-8876765, 8877197, 8830410 传真： 0731-8877197

电子邮箱： f-ysxb@mail.csu.edu.cn