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KOH亚熔盐法分解钛铁矿的动力学分析

刘玉民¹, 齐 涛², 张 懿²

(1. 河南师范大学 化学与环境科学学院, 新乡 453007;
2. 中国科学院 过程工程研究所, 北京 100080)

摘 要: 对钛铁矿在氢氧化钾亚熔盐体系中的分解动力学进行研究, 考察反应温度及矿粒粒径对钛铁矿分解率的影响。结果表明: 钛铁矿在氢氧化钾亚熔盐体系中的分解符合未反应收缩核模型, 受界面化学反应控制; 提高反应温度或减小矿粒粒径均能提高钛铁矿的分解率。在一定的操作条件下, 根据Arrhenius方程得到钛铁矿在氢氧化钾亚熔盐体系中的分解活化能, 且活化能随矿粒粒径的减小而减小; 当矿粒粒径为58~180 μm 时, 钛铁矿的分解活化能为54.78~46.82 kJ/mol。

关键字: 钛铁矿; 亚熔盐法; KOH; 分解

Kinetics analysis of decomposition of ilmenite by KOH sub-molten salt method

LIU Yu-min¹, QI Tao², ZHANG Yi²

(1. College of Chemistry and Environmental Science, Henan Normal University, Xinxiang 453007, China;
2. Institute of Process Engineering, Chinese Academy of Sciences, Beijing 100080, China)

Abstract: The decomposing kinetics of ilmenite in KOH sub-molten salt was investigated. The effects of factors, such as reaction temperature and particle size of the ore, on the decomposition rate of ilmenite were also studied. The results show that the decomposing process of ilmenite in KOH sub-molten salt is well interpreted with the unreacted shrinking core model under chemical reaction control. The decomposition rate of ilmenite increases with increasing the reaction temperature and decreasing the particle size. Under the specific operating conditions, the activation energy for the decomposition of ilmenite is calculated according to Arrhenius expression, and its values decrease with decreasing the particle size of the ore. When the particle size of the ore varies from 58 μm to 180 μm , the activation energy varies from 46.82 kJ/mol to 54.78 kJ/mol.

Key words: ilmenite; sub-molten salt method; KOH; decomposition

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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