中国有色金属学报
中国有色金属学报(英文版)
中国科学技术协会 主管
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论文摘要

中国有色金属学报
ZHONGGUO YOUSEJINSHUXUEBAO XUEBAO
第17卷 第7期 (总第100期) 2007年7月

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文章编号：1004-0609(2007)07-1207-06

高炉尘泥化学除锌

黄志华， 伍喜庆， 彭冠兰

(中南大学 资源加工与生物工程学院，长沙 410083)

摘 要：为了降低经物理分选后的高炉精泥中锌的含量，对高炉精泥进行化学浸出除锌研究，考察浸出剂、浸出时间、温度、液固比和搅拌速度等对浸出的影响，并进行理论分析。结果表明：硫酸对锌的浸出率最高，氯化铁次之，氨水最低；在合适的浸出条件下：液固比81:，温度20 ℃，硫酸浓度125 g/L，浸出时间35 min和搅拌速度150 r/min，锌浸出率为73.9%，高炉精泥中的锌含量从1.46%降低到0.38%。对硫酸浸出脱锌的动力学和反应机制的研究表明，浸出过程遵从$1-2\alpha/3-(1-\alpha)^{2/3}=kt$，浸出反应的活化能为8.89 kJ/mol，属于扩散控制过程。

关键字： 高炉尘泥；除锌；循环利用；动力学；浸出

Removal of zinc from blast furnace dust by chemical leaching

HUANG Zhi-hua, WU Xi-qing, PENG Guan-lan

（School of Resources Processing and Bioengineering, Central South University, Changsha 410083, China）

Abstract: Chemical leaching zinc from blast furnace dust concentrate (BFDC) treated by physical separation was investigated in order to reduce the content of zinc, and all common operating factors, such as leaching duration, temperature, ratio of liquid to solid and stirring rate, have tested. The results show that among the three leaching chemicals tested (sulfuric acid, ferric chloride and amine) sulfuric acid is the best one for leaching zinc. A zinc leaching rate of 73.9% is achieved and resultantly the content of zinc in the product is reduced from 1.46% to 0.38% under the following proper leaching conditions: ratio of liquid to solid 81:, room temperature (about 20 ℃), acid concentration of 125 g/L, leaching time 35 min and stirring rate 150 r/min. The kinetics and reaction mechanism of zinc acid leaching indicate that the leaching reaction conforms to the equation: 1−2α/3−(1−α)2/3=kt, the activation energy for the sulfuric acid leaching is 8.89 kJ/mol, and the leaching process is controlled by diffusion.

Key words: blast furnace dust; zinc removal; recycling; kinetics; leaching

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