

过程系统工程

回转窑过程回路设定值调整所致质量波动成分的分

莫鸿强, 杜启亮, 毛宗源

华南理工大学自动化科学与工程学院, 广东 广州 510641

收稿日期 2009-7-6 修回日期 2009-12-26 网络版发布日期 2010-4-12 接受日期

摘要

回转窑优化运行往往需要根据质量化验结果合理调整各回路设定值, 但其固有的非平稳特性及多种随机时变因素的影响极大地增加了调整效果量化评价的难度。论文给出了一种基于产品质量波动情况评价设定值调整行为合理性的方法。该方法根据质量反馈滞后的特点确定因设定值调整不当所引起的波动的时频特征, 基于Hilbert-Huang变换分析质量指标非平稳序列, 分离目标波动, 并计算其波动强度随时间变化的数值, 以估计设定值调整过程的快速性和平稳性。最后从波动频度与粉种切换频度之间关系等3方面验证了该方法的有效性。

关键词

[回转窑](#) [质量反馈](#) [Hilbert-Huang变换](#) [瞬时频率](#)

分类号

Separation of quality fluctuation resulting from set-point regulation for rotary kiln process

MO Hongqiang, DU Qiliang, MAO Zongyuan

Abstract

Proper set-point regulation based on quality assay is an important measure to optimize the operation of rotary kiln processes. However, due to the inherited non-stationarity of rotary kilns and the effects of various stochastic time-dependent variables, it is difficult to evaluate the performance of the set-point regulation. In this paper, a novel method is proposed to solve this problem. First, the time-frequency distribution characteristics of the quality fluctuation component resulting from set-point regulation were analyzed based on the large time-delay feature of the quality feedback within rotary kilns. Then the characteristics were used to separate the quality fluctuation component from the whole quality assay time-dependent serials with the Hilbert-Huang transformation. The intensity of the fluctuation component was estimated as a function of time. Finally, simulation results were provided to demonstrate the validity of the method.

Key words

[rotary kiln](#) [quality feedback](#) [Hilbert-Huang transformation](#) [instantaneous frequency](#)

DOI:

通讯作者 莫鸿强 hqiangmo@scut.edu.cn

扩展功能	
本文信息	
▶	Supporting info
▶	PDF(782KB)
▶	[HTML全文](0KB)
▶	参考文献
服务与反馈	
▶	把本文推荐给朋友
▶	加入我的书架
▶	加入引用管理器
▶	复制索引
▶	Email Alert
▶	文章反馈
▶	浏览反馈信息
相关信息	
▶	本刊中 包含 “
回转窑” 的相关文章	
▶	本文作者相关文章
•	莫鸿强
•	杜启亮
•	毛宗源