

过程系统工程

## 基于递推部分最小二乘自适应质量监控策略及其在橡胶混炼过程中的应用

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**摘要** 提出一种新的基于递推部分最小二乘 (RPLS) 算法的自适应在线质量监控策略。利用隐变量选择算法, 根据实时采集的现场数据, 在不增加计算和存储容量的基础上递推更新RPLS过程监测模型, 进而更新 $Q\alpha$  控制限, 从而使RPLS自适应质量监控系统具有强时变跟踪特性, 能够有效克服传统监测算法 $Q\alpha$ 无法反映系统时变性的缺点, 大大降低了监控系统的误报率和漏报率, 提高监控系统性能。并根据橡胶混炼过程特点, 将此方法运用于该时变间歇过程质量监控中, 取得了满意效果。

**关键词** [递推部分最小二乘](#); [统计质量监控](#); [橡胶混炼](#)

分类号

## RPLS based adaptive statistical quality monitoring of rubber mixing process

### Abstract

An adaptive recursive partial least squares (RPLS) monitoring scheme is proposed to improve the time-variant tracking power of the statistical quality monitoring (SQM) systems. When new samples are obtained, this new method updates the monitoring model and the  $Q$  statistic control limit ( $Q\alpha$ ) on the basis of the improved RPLS algorithms. Thus it could overcome the shortage of the traditional fixed SQM successfully. The theoretical findings were fully supported by the application performed on the rubber mixing process in a large-scale tire plant in east China. It was shown that the compounds quality is improved remarkably and the false alarm frequency was reduced significantly.

**Key words** [recursive partial least square](#) [statistical quality monitoring](#) [rubber mixing process](#)

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