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软测量技术及其在铝电解槽温度测量中的应用

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摘要: 软测量技术可以为一些无法直接测量的参数寻找一种测量方法. 从辅助变量选择、数据处理、软测量模型建立和模型修正等方面系统地介绍了软测量技术; 并针对铝电解槽温度高、腐蚀性强、温度难以直接测量的问题, 选择电解槽的输入电功率和下料速度作为辅助变量, 利用现代时间序列分析法建立了带受控项目的自回归数学模型, 从而计算出电解槽的温度估计值. 在160 kA点式下料预焙阳极铝电解槽进行实验, 结果证明了该方法的有效性.

关键字: 软测量技术; 数学模型; 铝电解槽; 现代时间序列法

Soft-measuring technique and its application for temperature measurement in electrolytic cell

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Abstract: Soft-measuring technique can be used to measure a parameter that cannot be measured directly. The soft-measuring technique is systemically described from the following aspects: auxiliary variable selection, data processing, soft-measuring model construction and model correction. Moreover, in order to solve the problem of measuring temperature of aluminum electrolytic cell, the importation electric power and blanking velocity are selected as auxiliary variable, then the temperature estimated value of the electrolytic cell is calculated. An autoregressive model with controlled item based on Modern Time Series Analysis method is established. The method is proved to be effective by the experiment in the 160 kA spot blanking premelting anode aluminum electrolytic cell.

Key words: soft-measuring technique; mathematical model; electrolytic cell; modern time series analysis method

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