工程与应用

支持向量机在中药浓缩浓度软测量中的应用

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摘要　　针对中药浓缩过程中浓缩液浓度估计问题，提出了支持向量机的软测量建模方法。分析了中药浓缩过程及工艺，选择6个过程变量作为辅助变量，用支持向量回归的方法建立软测量模型，并利用过程数据进行参数寻优和校验。利用优化后的模型对中药浓缩过程浓度进行了预测，通过数据验证了模型的学习性能和泛化性能。结果表明建立的软测量模型实现了对中药浓度较为精确的预测，使用支持向量机方法建模用于小样本学习，计算速度快，具有较强的泛化性。

关键词　　支持向量回归　中药　浓度　软测量

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Application of support vector machines in soft-sensor of Chinese traditional medicine concentration process

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Abstract

Aiming at the problem of the estimating of the concentrated-solution's concentration during Chinese traditional medicine concentration process，a soft sensor modeling method based on support vector machines is proposed.The concentration-process and technology of Chinese traditional medicine are analyzed，and six process-variables are chose as auxiliary ones.A soft sensor model is constructed by SVR method，and the parameters are optimized and checked making use of the process-data.The concentration during the Chinese-traditional-medicine concentration process，which is predicted by the optimized model，validates the study-capability and generalization-ability of the model through the data.It turns out that the soft sensor model can provide an accurate prediction to the concentration of Chinese traditional medicine，and the model which is constructed by support-vector-machines method has advantages of quick computation and better generalization ability if used to small samples-learning.

Key words　support vector regression　Chinese traditional medicine　concentration　soft-sensor

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