化工学报 2010 61 (2): 504-509 ISSN: 0438-1157 CN: 11-1946/TQ

材料化学工程与纳米技术

一种提高聚合物挤出流量在线测量精度的方法

许红，吴大鸣，周星，王克俭

北京化工大学机电学院

收稿日期 2009-3-26 修回日期 2009-10-20 网络版发布日期 2010-3-2 接受日期

摘要

针对聚合物挤出加工过程挤出流量间接测量的特点，提出了介于静态数字滤波与动态数字滤波之间的“转静态”数字滤波方法，将具有动态测量特点的直接测量变量转化为相对稳定的具有静态测量特点的间接测量变量。在此基础上，将限幅滤波和递推平均滤波应用于挤出流量在线测量的数据处理，以克服挤出过程中随机干扰和周期干扰对挤出流量测量精度的影响。通过实验选取最佳的滤波参数——滤波采样周期T及递推平均次数N，结果证明，“转静态”数字滤波输出值与挤出流量真值吻合度很好，符合对挤出流通量在线测量精度的要求。

关键词 聚合物挤出加工 转静态滤波 挤出流量在线测量 测量精度 数据采集处理

分类号

Method for improving on-line measurement accuracy of flow rate in polymer extrusion[

XU Hong，WU Daming，ZHOU Xing，WANG Kejian

Abstract

Considering the specific behavior of indirect measurement of flow rate in the polymer extrusion process，a quasi-static digital filtering method，intermediate between dynamic and static measurements，was proposed.By means of this method a direct measurement of the dynamic variables was transferred into an indirect measurement of static variables which demonstrated relative stability in comparison with dynamic variables.Based on this concept，the influences of stochastic and periodic disturbances in extrusion process on measurement accuracy of flow rate were eliminated effectively by using limit filtering and recursive-average filtering.The optimal filtering parameters，including sampling time T and recursive number N，were determined by experiment.Experimental results showed that the output value of quasi-static digital filtering fitted with the actual value very well.

Key words polymer extrusion process quasi-static filtering extrusion flow rate on-line measuring measurement accuracy data acquisition and processing

DOI:

通讯作者 许红 xuhong@mail.buct.edu.cn