OPTIMIZATION AND DEVELOPMENT OF CONTROLLERS BASED ON PID AND MPC FOR TEMPERATURE CONTROL IN CHEMICAL PROCESSES

Andressa Comerlatto*

Michel Brasil da Silva**

Resumo

With the increasing development of economy, the products requests also enhance, such as surfactants. These products are used to the production of dyestuffs, plastics, in the textile industry and they are important to environmental protection as dispersants in petro/chemical industries. Another example of a product increasingly used is the polystyrene, due to its properties as flexibility, low cost and ease of processing. However, for both processing, a good temperature control and process monitoring is necessary as well as the use of a high-performance controller. The proportional-integral-derivative (PID) control, is widely used in the industries, but due to nonlinear character, complex reaction kinetics, different conditions of reactors operations, its use not always accomplish the desired performance. In this context, appear studies to optimize the existing controllers, as the PID and the MPC (Model Predictive control), this one is limited due to high-cost. Some studies have been developing neural network-model predictive control algorithms, with the goal to improve the process control as well as to minimize production cost. The obtained results from the studies, when compared to the conventional controllers PID and MPC, show a higher performance. Some groups and structures combine the advantages of PID's simple structure and

the good controller performance of MPC, better start up during process, less variability and smoother controller moves.

Keywords: Model predictive control. Polystyrene. Surfarctant. Neural-network. Proportional-integral-derivative.

E-mails:
* a.andressa@msn.com
** micbrava@yahoo.com.br