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CHALISA PROYBUMRUNG : THESIS TITLE. (TEMPERATURE CONTROL OF THE REACTOR IN THE CLOXACILLIN SYNTHESIS PROCESS) THESIS ADVISOR : ASSOCIATE PROFESSOR PAISAN KITTISUPAKORN, Ph.D., THESIS COADVISOR : LAWAN SRATTHAPHUT, R.Ph., 92 pp. ISBN 974-03-1039 -7.

Cloxacillin synthesis process in a batch reactor involves highly exothermic reactions resulting in high heat released of reaction. In a normal operation, after raw materials are initially fed into the reactor, the temperature of the reactor is raised and maintained at a desired set point. However, presently as a conventional PID controller is used to control such temperature profile, it often gives poor control response of the reactor.

The thesis presents of the application of Generic model control (GMC) to control the temperature of a batch reactor in the cloxacillin synthesis process. Since the GMC is a model-based controller, it needs states and parameters of a system to determine control action. Therefore, an estimation technique is incorporated into the GMC control formulation to estimate unmeasurable state and unknown/uncertain parameters. In this thesis, Kalman Filter is used to estimate the rate constant of the reaction. Simulation results have shown that, in a nominal case, the performance of the GMC with the Kalman Filter is similar to the PID controller. But the GMC with the Kalman Filter is much more robust than the PID in the presence of plant/model mismatch in heat transfer coefficient, raw material feed rate and rate of reaction.