

SUMMARY

Theoretical and experimental investigations have been presented concerning with the dynamics and process control of a semibatch chemical reactor.

A jacketed glass reactor had been designed and built to carry out the reaction of acetic anhydride with water. Icc-85 microcomputer was used, which utilises an 8-bit word being responsible for the data acquisition, command and control.

The present well-mixed tank reactor was designed and operated under the kinetic reaction control, while for large scale reactor, the diffusion process is more predominant due to bad mixing that may occur. Good mixing is essential in large scale reactors to make the above assumption of kinetic control is valid.

The tendency model technique proved to be successful and satisfactory in predicting the kinetics parameters of reaction.

The moving model approach and partial simulation technique were used to solve the non-linear differential equations representing the mass and heat balance equations. Both methods proved gave accurate results.

Dynamic models for semibatch reactor were developed to predict the transient response to normal and abnormal (upsets) conditions using servo technique. The simulated and the experimental responses of the reactor were in good agreement.