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3.1.9 Dynamics of Reactor-Stripper Process3.2 Reactor-Column Process with Two Reactants; 3.2.1 Nonlinear Dynamic Model of Reactor and Column; 3.2.2 Control Structure for Reactor-Column Process; 3.2.3 Reactor-Column Process with Hot Reaction; 3.3 AutoRefrigerated Reactor Control; 3.3.1 Dynamic Model; 3.3.2 Simulation Results; 3.4 Reactor Temperature Control Using Feed Manipulation; 3.4.1 Introduction; 3.4.2 Revised Control Structure; 3.4.3 Results; 3.4.4 Valve Position Control; 3.5 Aspen Dynamics Simulation of CSTRs; 3.5.1 Setting up the Dynamic Simulation
3.5.2 Running the Simulation and Tuning Controllers3.5.3 Results with Several Heat Transfer Options; 3.5.4 Use of RGIBBS Reactor; 3.6 Conclusion; 4 CONTROL OF BATCH REACTORS; 4.1 Irreversible, Single Reactant; 4.1.1 Pure Batch Reactor; 4.1.2 Fed-Batch Reactor; 4.2 Batch Reactor with Two Reactants; 4.3 Batch Reactor with Consecutive Reactions; 4.4 Aspen Plus Simulation Using RBatch; 4.5 Ethanol Batch Fermentor; 4.6 Fed-Batch Hydrogenation Reactor; 4.7 Batch TML Reactor; 4.8 Fed-Batch Reactor with Multiple Reactions; 4.8.1 Equations; 4.8.2 Effect of Feed Trajectory on Conversion and Selectivity 4.8.3 Batch Optimization

Sommario/riassunto

Chemical Reactor Design and Control uses process simulators like Matlab®, Aspen Plus, and Aspen Dynamics to study the design of chemical reactors and their dynamic control. There are numerous books that focus on steady-state reactor design. There are no books that consider practical control systems for real industrial reactors. This unique reference addresses the simultaneous design and control of chemical reactors. After a discussion of reactor basics, it: Covers three types of classical reactors: continuous stirred tank (CSTR), batch, and tubular plug flow Emphasizes tempe