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Nota di contenuto	Chemical Engineering Dynamics; Preface; Organisation of the Book; Acknowledgements; Table of Contents; Nomenclature for Chapters 1 to 4; 1 Basic Concepts; 1.1 Modelling Fundamentals; 1.1.1 Chemical Engineering Modelling; 1.1.2 General Aspects of the Modelling Approach; 1.1.3 General Modelling Procedure; 1.2 Formulation of Dynamic Models; 1.2.1 Material Balance Equations; 1.2.2 Balancing Procedures; 1.2.2.1 Case A . Continuous Stirred-Tank Reactor; 1.2.2.2 Case B . Tubular Reactor; 1.2.2.3 Case C . Coffee Percolator; 1.2.3 Total Material Balances; 1.2.3.1 Case A . Tank Drainage 1.2.4 Component Balances1.2.4.1 Case A . Waste Holding Tank; 1.2.4.2 Case B . Extraction from a Solid by a Solvent; 1.2.5 Energy Balancing; 1.2.5.1 Case A . Continuous Heating in an Agitated Tank; 1.2.5.2 Case B . Heating in a Filling Tank; 1.2.5.3 Case C . Parallel Reaction in a Semi-Continuous Reactor with Large Temperature Changes; 1.2.6

Momentum Balances; 1.2.7 Dimensionless Model Equations; 1.2.7.1 Case A . Continuous Stirred-Tank Reactor (CSTR); 1.2.7.2 Case B . Gas-Liquid Mass Transfer to a Continuous Tank Reactor with Chemical Reaction; 1.3 Chemical Kinetics
1.3.1 Rate of Chemical Reaction1.3.2 Reaction Rate Constant; 1.3.3 Heats of Reaction; 1.3.4 Chemical Equilibrium and Temperature; 1.3.5 Yield, Conversion and Selectivity; 1.4 Microbial Growth Kinetics; 1.5 Mass Transfer Theory; 1.5.1 Stagewise and Differential Mass Transfer Contacting; 1.5.2 Phase Equilibria; 1.5.3 Interphase Mass Transfer; 2 Process Dynamics Fundamentals; 2.1 Signal and Process Dynamics; 2.1.1 Measurement and Process Response; 2.1.1.1 First-Order Response to an Input Step-Change Disturbance; 2.1.1.2 Case A . Concentration Response of a Continuous Flow, Stirred Tank
2.1.1.3 Case B . Concentration Response in a Continuous Stirred Tank with Chemical Reaction2.1.1.4 Case C . Response of a Temperature Measuring Element; 2.1.1.5 Case D . Measurement Lag for Concentration in a Batch Reactor; 2.1.2 Higher-order Responses; 2.1.2.1 Case A . Multiple Tanks in Series; 2.1.2.2 Case B . Response of a Second-Order Temperature Measuring Element; 2.1.3 Pure Time Delay; 2.1.4 Transfer Function Representation; 2.2 Time Constants; 2.2.1 Common Time Constants; 2.2.1.1 Flow Phenomena; 2.2.1.2 Diffusion and Dispersion; 2.2.1.3 Chemical Reaction; 2.2.1.4 Mass Transfer
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2.3.4.3 Adaptive Control

Sommario/riassunto

In this book, the reader is guided through the complex study of dynamic chemical engineering systems by the unique combination of a simplified presentation of the fundamental theory (Part 1) and direct hands-on computer experimentation with the provision of 85 accompanying computer-based simulation examples (Part 2) supplied on diskette.The ISIM digital simulation language is very simple to use and its powerful interactive nature enables the readers to create their own simulations, based on their own specific problems. This powerful dynamic ISIM software is ready to run on any DOS pers