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Nota di contenuto	Chemical Reactor Design, Optimization, and Scaleup; Contents; Preface to the Second Edition; Symbols; 1 Elementary Reactions in Ideal Reactors; 1.1 Material Balances; 1.1.1 Measures of Composition; 1.1.2 Measures of Reaction Rate; 1.2 Elementary Reactions; 1.2.1 Kinetic Theory of Gases; 1.2.2 Rate of Formation; 1.2.3 First-Order Reactions; 1.2.4 Second-Order Reactions with One Reactant; 1.2.5 Second-Order Reactions with Two Reactants; 1.2.6 Third-Order Reactions; 1.3 Reaction Order and Mechanism; 1.4 Ideal, Isothermal Reactors; 1.4.1 Ideal Batch Reactors; 1.4.2 Reactor Performance Measures 1.4.3 Piston Flow Reactors 1.4.4 Continuous Flow Stirred Tanks; 1.5 Mixing Times and Scaleup; 1.6 Dimensionless Variables and Numbers; 1.7 Batch Versus Flow and Tank Versus Tube; Suggested Further

Readings; Problems; 2 Multiple Reactions in Batch Reactors; 2.1 Multiple and Nonelementary Reactions; 2.1.1 Reaction Mechanisms; 2.1.2 Byproducts; 2.2 Component Reaction Rates for Multiple Reactions; 2.3 Multiple Reactions in Batch Reactors; 2.4 Numerical Solutions to Sets of First-Order ODEs; 2.5 Analytically Tractable Examples; 2.5.1 The nth-Order Reaction  
2.5.2 Consecutive First-Order Reactions, A B C . . . 2.5.3 Quasi-Steady Hypothesis; 2.5.4 Autocatalytic Reactions; 2.6 Variable-Volume Batch Reactors; 2.6.1 Systems with Constant Mass; 2.6.2 Fed-Batch Reactors; 2.7 Scaleup of Batch Reactions; 2.8 Stoichiometry and Reaction Coordinates; 2.8.1 Matrix Formulation of Reaction Rates; 2.8.2 Stoichiometry of Single Reactions; 2.8.3 Stoichiometry of Multiple Reactions; Suggested Further Readings; Problems; Appendix 2.1 Numerical Solution of Ordinary Differential Equations; 3 Isothermal Piston Flow Reactors; 3.1 Piston Flow with Constant Mass Flow  
3.1.1 Gas Phase Reactions 3.1.2 Liquid Phase Reactions; 3.2 Scaleup Relationships for Tubular Reactors; 3.2.1 Scaling Factors; 3.2.2 Scaling Factors for Tubular Reactors; 3.3 Scaleup Strategies for Tubular Reactors; 3.3.1 Scaling in Parallel and Partial Parallel; 3.3.2 Scaling in Series for Constant-Density Fluids; 3.3.3 Scaling in Series for Gas Flows; 3.3.4 Scaling with Geometric Similarity; 3.3.5 Scaling with Constant Pressure Drop; 3.4 Scaling Down; 3.5 Transpired-Wall Reactors; Suggested Further Readings; Problems; 4 Stirred Tanks and Reactor Combinations  
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5.1 Temperature Dependence of Reaction Rates

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## Sommario/riassunto

The classic reference, now expanded and updated, *Chemical Reactor Design, Optimization, and Scaleup* is the authoritative sourcebook on chemical reactors. This new Second Edition consolidates the latest information on current optimization and scaleup methodologies, numerical methods, and biochemical and polymer reactions. It provides the comprehensive tools and information to help readers design and specify chemical reactors confidently, with state-of-the-art skills. This authoritative guide: Covers the fundamentals and principles of chemical reactor design, along with adva

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