



# Chemical Reaction Engineering and Reactor Technology (Chemical Industries)

By Tapio O. Salmi, Jyri-Pekka Mikkola, Johan P. Warna

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The role of the chemical reactor is crucial for the industrial conversion of raw materials into products and numerous factors must be considered when selecting an appropriate and efficient chemical reactor. **Chemical Reaction Engineering and Reactor Technology** defines the qualitative aspects that affect the selection of an industrial chemical reactor and couples various reactor models to case-specific kinetic expressions for chemical processes.

Offering a systematic development of the chemical reaction engineering concept, this volume explores:

- Essential stoichiometric, kinetic, and thermodynamic terms needed in the analysis of chemical reactors
- Homogeneous and heterogeneous reactors
- Residence time distributions and non-ideal flow conditions in industrial reactors
- Solutions of algebraic and ordinary differential equation systems
- Gas- and liquid-phase diffusion coefficients and gas-film coefficients
- Correlations for gas-liquid systems
- Solubilities of gases in liquids
- Guidelines for laboratory reactors and the estimation of kinetic parameters

The authors pay special attention to the exact formulations and derivations of mass energy balances and their numerical solutions. Richly illustrated and containing exercises and solutions covering a number of processes, from oil refining to the development of specialty and fine chemicals, the text provides a clear understanding of chemical reactor analysis and design.



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#### About the Author

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