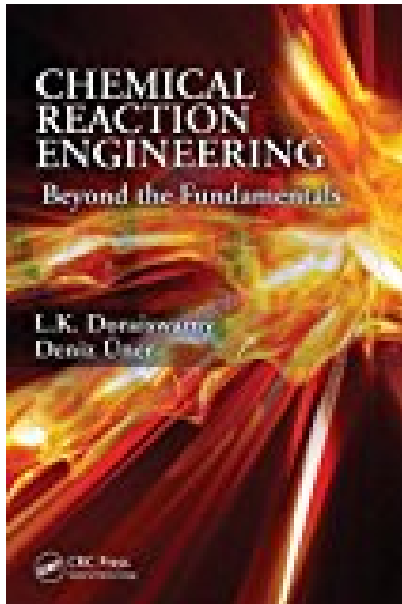


Chemical Reaction Engineering Beyond the Fundamentals



BOOK DETAILS

- Author : L.K. Doraiswamy
- Pages : 578 Pages
- Publisher : CRC Press
- Language : English
- ISBN : 143983122X

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BOOK SYNOPSIS

Filling a longstanding gap for graduate courses in the field, *Chemical Reaction Engineering: Beyond the Fundamentals* covers basic concepts as well as complexities of chemical reaction engineering, including novel techniques for process intensification. The book is divided into three parts: *Fundamentals Revisited*, *Building on Fundamentals*, and *Beyond the Fundamentals*. Part I: *Fundamentals Revisited* reviews the salient features of an undergraduate course, introducing concepts essential to reactor design, such as mixing, unsteady-state operations, multiple steady states, and complex reactions. Part II: *Building on Fundamentals* is devoted to "skill building," particularly in the area of catalysis and catalytic reactions. It covers chemical thermodynamics, emphasizing the thermodynamics of adsorption and complex reactions; the fundamentals of chemical kinetics, with special emphasis on microkinetic analysis; and heat and mass transfer effects in catalysis, including transport between phases, transfer across interfaces, and effects of external heat and mass transfer. It also contains a chapter that provides readers with tools for making accurate kinetic measurements and analyzing the data obtained. Part III: *Beyond the Fundamentals* presents material not commonly covered in textbooks, addressing aspects of reactors involving more than one phase. It discusses solid catalyzed fluid-phase reactions in fixed-bed and fluidized-bed reactors, gas-solid noncatalytic reactions, reactions involving at least one liquid phase (gas-liquid and liquid-liquid), and multiphase reactions. This section also describes membrane-assisted reactor engineering, combo reactors, homogeneous catalysis, and phase-transfer catalysis. The final chapter provides a perspective on future trends in reaction engineering.

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