DESCRIPTION

Laurence Belfiore’s unique treatment meshes two mainstream subject areas in chemical engineering: transport phenomena and chemical reactor design. Expressly intended as an extension of Bird, Stewart, and Lightfoot’s classic Transport Phenomena, and Froment and Bischoff’s Chemical Reactor Analysis and Design, Second Edition, Belfiore’s unprecedented text explores the synthesis of these two disciplines in a manner the upper undergraduate or graduate reader can readily grasp.

*Transport Phenomena for Chemical Reactor Design* approaches the design of chemical reactors from microscopic heat and mass transfer principles. It includes simultaneous consideration of kinetics and heat transfer, both critical to the performance of real chemical reactors. Complementary topics in transport phenomena and thermodynamics that provide support for chemical reactor analysis are covered, including:

- Fluid dynamics in the creeping and potential flow regimes around solid spheres and gas bubbles
- The corresponding mass transfer problems that employ velocity profiles, derived in the book’s fluid dynamics chapter, to calculate interphase heat and mass transfer coefficients
- Heat capacities of ideal gases via statistical thermodynamics to calculate Prandtl numbers
- Thermodynamic stability criteria for homogeneous mixtures that reveal that binary molecular diffusion coefficients must be positive
In addition to its comprehensive treatment, the text also contains 484 problems and ninety-six detailed solutions to assist in the exploration of the subject. Graduate and advanced undergraduate chemical engineering students, professors, and researchers will appreciate the vision, innovation, and practical application of Laurence Belfiore’s *Transport Phenomena for Chemical Reactor Design*.

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**ABOUT THE AUTHOR**

LAURENCE A. BELFIORE has been teaching and conducting research in the chemical engineering department at Colorado State University for eighteen years. He has published forty-two journal papers, five book chapters, and thirty-four proceedings, and presented eighty-eight symposia talks.

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**FEATURES**

- An extension of Bird, Stewart, and Lightfoot's classic Transport Phenomena book (Wiley)
- This unique treatment meshes two mainstream subject areas in chemical engineering...transport phenomena and chemical reactor design.
- Simultaneous consideration of both kinetics and heat transfer, critical to the performance of real chemical reactors.
- 484 problems and 96 solutions.

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