



Bioprocess Engineering: Kinetics, Sustainability, and Reactor Design

Shijie Liu

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Bioprocess Engineering: Kinetics, Sustainability, and Reactor Design, Second Edition, provides a comprehensive resource on bioprocess kinetics, bioprocess systems, sustainability, and reaction engineering. Author Dr. Shijie Liu reviews the relevant fundamentals of chemical kinetics, batch and continuous reactors, biochemistry, microbiology, molecular biology, reaction engineering, and bioprocess systems engineering, also introducing key principles that enable bioprocess engineers to engage in analysis, optimization, and design with consistent control over biological and chemical transformations.

The quantitative treatment of bioprocesses is the central theme in this book, with more advanced techniques and applications being covered in depth. This updated edition reflects advances that are transforming the field, ranging from genetic sequencing, to new techniques for producing proteins from recombinant DNA, and from green chemistry, to process stability and sustainability.

The book introduces techniques with broad applications, including the conversion of renewable biomass, the production of chemicals, materials, pharmaceuticals, biologics, and commodities, medical applications, such as tissue engineering and gene therapy, and solving critical environmental problems.

- Includes the mechanistic description of biotransformations and chemical transformations
- Provides quantitative descriptions of bioprocesses
- Contains extensive illustrative drawings, which make the understanding of the subject easy
- Includes bioprocess kinetics and reactor analysis
- Contains examples of the various process parameters, their significance, and their specific practical use
- Incorporates sustainability concepts into the various bioprocesses

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