

Ravindra Pogaku · Awang Bono
Christopher Chu *Editors*

Developments in Sustainable Chemical and Bioprocess Technology

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Preface

Sustainable Chemical and Bioprocess Technology is a field having numerous applications in the production of chemicals, fuels, materials, pharmaceuticals, and medicines at the genetic level. The field's novelty is in dealing with various topics of environmental engineering, chemical and bioprocesses, separation processes, advanced materials. The objective is to identify specific cases or environmental manipulations that result in improvements in yield and productivities of chemical and biotechnological processes.

To address cutting-edge topics in the key areas of chemical and bioprocess engineering, the content of the chapters of this book is divided into four main parts comprising of 47 chapters. Environmental Engineering ([Chaps. 1–16](#)); Chemical and Bioprocesses ([Chaps. 17–29](#)); Separation Processes ([Chaps. 30–36](#)); Advanced Materials ([Chaps. 37–47](#)).

The emphasis is laid on sustainability in chemical and bioprocess technology. The content related to process development, sustainability analysis in chemical and bioprocessing, industry case studies, supply case studies, and outlines of the latest technology of sustainability developments are reviewed. These topics include sustainability security and diversity of supply, costs and process economics, environmental and emissions legislation, technology development, public perceptions, market opportunities, energy conservation, and the role of alternative and renewable energy.

There is potential hub for chemical and biotechnology industries world over with its diverse flora and fauna. By introducing new and innovative methods and technologies in the chemical and bioprocessing of natural resources, one can expect to see a synergistic combination that promises greater sustainability.

Key Features

- Highlights the issues of sustainability development and technology related to environmental engineering, chemical and bioprocesses, separation processes, advanced materials
- Demonstrates engineering in action with numerous examples of chemical and bioprocesses

- Includes methods for identifying key enzymes in complex bioprocesses
- Contains a comprehensive review of chemical and biochemical engineering
- Discusses processes at the micro, macro, molecular, enzyme, and cell levels
- Explains concepts of stoichiometry, kinetics, and thermodynamics of separation processes
- Comprehensive overview of advanced materials
- Minimizes mathematical complexity
- Links the traditional processes to a sustainable environment models

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Part I

Environmental Engineering