

<<生物反应工程原理>>

图书基本信息

书名：<<生物反应工程原理>>

13位ISBN编号：9787030332981

10位ISBN编号：7030332989

出版时间：2012-1

出版时间：科学

作者：(丹麦)维拉森

页数：561

版权说明：本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问：<http://www.tushu007.com>

## <<生物反应工程原理>>

### 内容概要

本书从2003年开始在世界范围内（主要是欧美）被用作课程教材，足以证明其影响力。这是第3版，在以前版本的基础上进行了大幅修改。

本书的核心理念在于：设计生物过程首先要基于对生物系统的模拟，因此，需要引入生物科学里数学、定量的方法，以期和工程科学完美结合，以指导最佳生物过程的设计，相对于国内大多数生物反应工程教材，本书更注重基础、注重数学方法。这是特别值得借鉴的。

在基础科学部分，本书设计第2、3、4、5章，分别从生物分子、物料守恒、生物反应热力学和生化反应系统四方面介绍生物过程的科学实质、

第6、7、8章，结合前面四章内容，系统总结了酶、细胞、细胞群落三个生物反应过程。侧重于用数学方法描述酶催化、细胞（群落）转化过程，特别重视基础科学和工程科学的结合。

第9、10、11章介绍生物反应中的工程问题，主要包括发酵过程的设计、气液传质以及生物过程放大

本书理念先进，层次清楚，基础和工程结合紧密，特别值得引入国内教育领域。

<<生物反应工程原理>>

作者简介

作者：(丹麦)维拉林(John Villadsen) Jens Nielsen Gunnar Liden

# <<生物反应工程原理>>

## 书籍目录

### 1 What Is This Book About ?

#### 1.1 Note on Nomenclature

### 2 Chemicals from Metabolic Pathways

#### 2.1 The Biorefinery

##### 2.1.1 Ethanol Production

##### 2.1.2 Production of Platform Chemicals in the Biorefinery

#### 2.2 The Chemistry of Metabolic Pathways

##### 2.2.1 The Currencies Of Gibbs Free Energy and of Reducing

##### Power

##### 2.2.2 Glycolysis

##### 2.2.3 Fermentative Metabolism : Oxidation of NADH in Anaerobic

##### Processes

##### 2.2.4 The TCA Cycle : Provider of Building Blocks and

##### NADH / FADH ,

##### 2.2.5 Production of ATP by Oxidative Phosphorylation

##### 2.2.6 The Pentose Phosphate Pathway : A Multipurpose Metabolic

##### Network

##### 2.2.7 Summary of the Primary Metabolism of Glucose

#### 2.3 Examples of Industrial Production Of Chemicals by

##### Bioprocesses

##### 2.3.1 Amino Acids

##### 2.3.2 Antibiotics

##### 2.3.3 Secreted Proteins

#### 2.4 Design of Biotech Processes : Criteria for Commercial

##### Success

##### 2.4.1 Strain Design and Selection

##### 2.4.2 Criteria for Design and Optimization of a Fermentation

##### Process

##### 2.4.3 Strain Improvement

#### 2.5 The Prospects of the Biorefinery

##### Problems

##### References

### 3 Elemental and Redox Balances

#### 3.1 The Continuous Stirred Tank Reactor

##### 3.1.1 Mass Balances for all Ideal Steady-State Continuous Tank

##### Reactor

##### 3.2 Yield Coefficients

##### 3.3 Black Box Stoichiometries

##### 3.4 Degree of Reduction Balances

##### 3.4.1 Consistency Test of Experimental Data

##### 3.4.2 Redox Balances Used in the Design of Bioremediation

##### Processes

##### 3.5 Systematic Analysis of Black Box Stoichiometries

##### 3.6 Identification of Gross Measurement Errors

<<生物反应工程原理>>

Problems

References

4 Thermodynamics Of Bioreactions

4.1 Chemical Equilibrium and Thermodynamic State Functions

4.1.1 Changes in Free Energy and Enthalpy

4.1.2 Free Energy Changes in Bioreactions

4.1.3 Combustion : A Change in Reference State

4.2 Heat of Reaction

4.2.1 Nonequilibrium Thermodynamics

4.2.2 Free Energy Reclaimed by Oxidation in the Electron Transfer

Chain

4.2.3 Production of ATP Mediated by F<sub>0</sub>-F<sub>1</sub> ATP Synthase

Problems

References

5 Biochemical Reaction Networks

5.1 Basic Concepts

5.1.1 Metabolic Network with Diverging Branches

5.1.2 A Formal Matrix-Based Description of Metabolic

Networks

5.2 Growth Energetics

5.2.1 Consumption of ATP for Cellular Maintenance

5.2.2 Energetics of Anaerobic Processes

5.2.3 Energetics of Aerobic Processes

.....

6 Enzyme Kinetics and Metabolic Control Analysis

7 Growth Kinetics of Cell Cultures

8 Population Balance Equations

9 Design of Fermentation Processes

10 Gas-Liquid Mass Transfer

11 Scale-Up of Bioprocesses

Index

## 章节摘录

版权页：插图：Matrix algebra is necessary to understand, even on a superficial level, the concepts discussed in papers on Systems Biology, and we introduce matrix-based Metabolic Flux Analysis in Chap. 5. But the subject is introduced slowly after simple networks have been studied by methods that require very little beyond basic algebra. Similarly, at the end of Chap. 3, methods that are necessary to evaluate the quality of experimental data are discussed, but only after many examples where elemental and redox balances are used to analyze steady-state rate data and to derive the stoichiometry of bioreactions. When in Chap. 6 reactions catalyzed by immobilized enzymes are treated, one must apply some basic concepts from transport phenomena. Diffusion into the pellets is treated with the help of detailed examples. The objective is to give the reader an understanding of the topic which is on the par with that given in standard texts on Chemical Reaction Engineering. The book has more than 100 examples and notes. The Examples will help the reader to better understand the text while topics which extend the text, sometimes by pointing to applications in different areas, are treated in Notes. The teaching of the examples is further extended into the Problem sections of each chapter. Some of the examples and problems are simple illustrations of the text, while others are detailed quantitative studies relevant for building up a further understanding of bio-reactions, both for use in scientific studies and for design of equipment. The design examples often refer to the collaboration of the authors with major bio-tech companies - suitably reformulated if necessary. Hopefully these design examples demonstrate that Bio-reaction Engineering, by combining core subjects from Chemical Engineering and the Bio-Sciences, contributes to secure bioprocesses a prominent place in the process industry.

## <<生物反应工程原理>>

### 编辑推荐

《生物反应工程原理(原著第3版)(英文版)》是国外化学经典教材系列(影印版)。

<<生物反应工程原理>>

版权说明

本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问:<http://www.tushu007.com>