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-Hydroxy Aldehydes, Ketones or Carboxylic Acids; 3.17 Cyanohydrins, Hemithioacetals and Hemiaminals
3.18 Sulfoxides and Sulfones3.19 Halides; 3.20 Aromatics (Ring Functionalization); 3.21 Cyclic Compounds; 3.22 Carbohydrates; 3.23 Peroxides; 3.24 Isomers; 3.25 Examples of Retrosynthetic Biotransformations; 3.25.1 Example 1; 3.25.2 Example 2; 4 Optimization of Industrial Enzymes by Molecular Engineering; 4.1 Introduction; 4.2 Learning from Nature; 4.3 Enzyme Production Using Bacterial Expression Hosts; 4.4 Improvements to Enzymes by Molecular Engineering Techniques; 4.4.1 Rational Enzyme Design; 4.4.2 Directed Evolution; 4.4.3 Random Mutagenesis Methods
4.5 Identification of Improved Enzyme Variants4.6 Conclusions and Future Prospects; 5 Basics of Bioreaction Engineering; 5.1 Definitions; 5.1.1 Process Definitions; 5.1.2 Definitions of Unit Operations; 5.2 Biocatalyst Kinetics; 5.2.1 Types of Biocatalysts; 5.2.2 Enzyme Structure; 5.2.3 Kinetics; 5.3 Basic Reactor Types and their Modes of Operation; 5.3.1 Mass and Energy Balances; 5.4 Biocatalyst Recycling and Recovery; 5.4.1 Entrapment; 5.4.2 Cross-linking; 5.4.3 Covalent Binding; 5.4.4 Membrane Filtration; 5.5 Reaction Parameters; 5.6 Scale-up of Bioreactors
5.7 Recent Developments and Trends6 Processes; Oxireductases EC 1; Transferases EC 2; Hydrolases EC 3; Lyases EC 4; Isomerases EC 5; 7 Quantitative Analysis of Industrial Biotransformations; Index; Index of enzyme name; Index of strain; Index of company; Index of starting material; Index of product

Sommario/riassunto

The completely revised second edition of this user-friendly and application-oriented overview of one-step biotransformations of industrial importance. Based on extensive literature and patent research, this book is unique in arranging each process in a systematic way to allow for easy comparison. All the chapters have been rewritten, with all the processes updated and more than 30 new processes added. Each set of data is accompanied by key literature citations, supported by flow sheets where available, reduced to their significant elements. In addition, an extensive index classified by sub
