

## Industrial Enzymology | b106f05ccb157113ab475d05dad6bf63

Biophysical Chemistry of Proteins Industrial Enzymes for Biofuels Production Biotechnology and Biology of Trichoderma Industrial Enzymes Enzymes Fundamentals of Enzymology The Use of CRISPR/cas9, ZFNs, TALENs in Generating Site-Specific Genome Alterations Molecular and Cellular Enzymology Industrial Enzymology Handbook of Food Enzymology Practical Enzymology Trends in Enzymology: Industrial and clinical enzymology Advances in Enzymology and Related Areas of Molecular Biology Industrial Enzyme Applications Industrial Enzymology Industrial Enzymology Industrial and clinical Enzymology Enzymes in Industry Industrial Enzymology Library of Congress Subject Headings Challenges in Computational Enzymology Industrial Enzymology Biotechnology of Microbial Enzymes Industrial Enzymology Industrial and Clinical Enzymology Research Advancements in Pharmaceutical, Nutritional, and Industrial Enzymology Trends in Enzymology Lignocellulosic Biomass Production and Industrial Applications Enzyme Technology Industrial Enzymology Industrial Enzymology Trends in Enzymology Unique Sequence Signatures in Plant Lipolytic Enzymes: Emerging Research and Opportunities Enzymes Biotechnology Handbook Textile Processing with Enzymes ENZYMES: Catalysis, Kinetics and Mechanisms Industrial Enzymology Enzymes in Food Processing Immobilized Enzymes For Industrial Reactors Industrial Enzymology

With the increasing need to reduce pollution in textile production, the use of enzymes in the chemical processing of fibers and textiles is rapidly gaining recognition for its eco-friendly and non-toxic characteristics. Enzymes are a safe alternative in a wide range of textile processes that otherwise requires harsh chemicals, the disposal of which poses environmental problems. This book covers all of the relevant issues from basic biochemistry and enzymology to the industrial application of these biocatalysts. It begins with the fundamental aspects of enzymes determining catalytic properties, followed by a summary of fibrous and non-fibrous materials as substrates for enzymes. Chapters discuss catalysis and processing, with an overview of the function and application of enzymes used in textile processing, and addresses process engineering and industrial enzyme applications. The final part presents the practical aspects of handling enzymes, provide a detailed look at operational and storage stabilities, and consider the use of enzymes in effluent treatment.

It is over 10 years since the publication of the first edition of this title and not surprisingly the developments in the use of enzymes in industry since the first edition have been considerable and significant so prompting this heavily updated new edition. Over 20 contributors have provided expert coverage on the application of enzymes across a very diverse number of industries: these range from baking, brewing, fruit juice, wine and starch processing to leather, effluent treatment, diagnostics and protein processing. There are also very valuable chapters on legislation, safe handling, toxicological aspects and kinetics. Information is also provided on the suppliers, product data, common industrial uses as well as assays and units.

### Publisher Description

Discussing methods of enzyme purification, characterization, isolation, and identification, this book details the chemistry, behavior, and physicochemical properties of enzymes to control, enhance, or inhibit enzymatic activity for improved taste, texture, shelf-life, nutritional value, and process tolerance of foods and food products. The

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Leading experts in the enzymology field present herewith an overview of the use of enzymes in therapy, genetic engineering, pulp and paper, textile, detergent, food and animal feed. The book carries up to date information and presents a wider perspective scope wise in the field of enzymology. The book would be advantageous not only for Undergraduate, PG and PhD students but also to non-specialists who may acquaint themselves with this rapidly growing field. We feel extremely proud in recommending this book as ideal reading for any of the above students engaged in basic and applied research. Any library, industrial and academic platforms strongly suits this book as it is a very relevant in-demand title on key industrial enzymes. Academic fraternity, genetic engineers and biotechnologists would be greatly enriched with the current knowledge on key enzymes of industrial relevance. The book would be able to go well with other readers as well who are not familiar with the subject. Also the book offers a broad overview of the use of enzymes in industrial applications carrying the most advanced information and presents a simplistic overview about the key industrial enzymes which is otherwise a very complex process. This is itself remarkable as almost 40 different authors contributed to this book and still the content is flawless, easy to comprehend and written in a very simple language. The researchers involved in enzyme work should have this book in his or her library. But it will also be of great value to the marketing experts interested in the present use of enzymes and their future perspective in food and nonfood applications. All the researchers working with or willing to work with enzymes should have this book to ensure that their research projects run smoothly supplemented with the most current information on industrial enzymes.

Industrial Enzymology provides state-of-the-art explanations of the uses of enzymes, with an emphasis on their practical applications in 22 industries.

Biotechnology of Microbial Enzymes: Production, Biocatalysis and Industrial Applications provides a complete survey of the latest innovations on microbial enzymes, highlighting biotechnological advances in their production and purification along with information on successful applications as biocatalysts in several chemical and industrial processes under mild and green conditions. Applications of microbial enzymes in food, feed, and pharmaceutical industries are given particular emphasis. The application of recombinant DNA technology within industrial fermentation and the production of enzymes over the last 20 years have produced a host of useful chemical and biochemical substances. The power of these technologies results in novel transformations, better enzymes, a wide variety of applications, and the unprecedented development of biocatalysts through the ongoing integration of molecular biology methodology, all of which is covered insightfully and in-depth within the book. Features research on microbial enzymes from basic science through application in multiple industry sectors for a comprehensive approach Includes information on metabolic pathway engineering, metagenomic screening, microbial genomes, extremophiles, rational design, directed evolution, and more Provides a holistic approach to the research of microbial enzymes

Since the publication of the successful and popular second edition of Fundamentals of Enzymology in 1989 there has been a large increase in the knowledge of several aspects of enzymology, not least the rapid acceleration of structural characterization of enzymes and the development of the field of bioinformatics. This new edition places appropriate emphasis on the new knowledge and consolidates the strengths of the previous editions. As before, Fundamentals of Enzymology 3rd ed gives an all-round view of the field including enzyme purification and characterization, enzyme structure (including information on the web), enzyme kinetics, the mechanisms and control of enzyme action, enzyme folding, how enzymes act in vivo, enzyme synthesis and degradation, and also clinical and industrial applications of enzymology. Throughout the book, the integration of these themes is stressed.

Molecular and Cellular Enzymology addresses not only experienced enzymologists but also students, teachers and academic and industrial researchers who are confronted with enzymological problems during their fundamental or applied research. In this field there is an urgent need for training in order to meet the requirements of both research and industrial endeavours. This book consists of several levels. Practical aspects and elementary explanations are given for the benefit of non-specialists' and students' understanding. In order to facilitate the task of students, two typographies have been adopted. The main text corresponds to basic knowledge, whereas text in a smaller font provides more specialised information. Specialists will also find topics more deeply expounded with the principal bibliographic references cited. The bibliography, however, is not exhaustive; the choice includes general books and review articles as well as some specialised articles. In this book, for the first time, the different molecular and cellular aspects of enzymology are presented together. Until now, there has been no book available in which these different aspects are treated in the same volume. In addition, besides the theoretical developments, this book provides a wealth of practical information for experimentalists.

Immobilized Enzymes for Industrial Reactors aims to guide the engineer and scientist along the path toward the industrial application of immobilized enzymes. It is necessary to identify the hazards and pitfalls that will be encountered, not only in the initial research efforts, but also during the final engineering phases of a commercial program. Each contributing factor in an immobilized enzyme system will be scrutinized by the authors in an effort to accomplish the overall objectives. This book comprises 10 chapters, with the first being an introduction to and general history of immobilized enzymes. The next chapters go on to discuss basic enzymology; controlled-pore glasses for enzyme immobilization; carriers; immobilization by adsorption and inorganic bridge formation; immobilization by covalent attachment and by entrapment; characteristics of free vs. immobilized enzymes; immobilized coenzymes; design and operation of immobilized enzyme reactors; and applications of immobilized enzymes. This book will be of interest to practitioners in the fields of chemistry and engineering.

The book is structured in nine sections, each containing several chapters. The volume starts with an overview of analytical techniques and progresses through purification of proteins; protein modification and inactivation; protein size, shape, and structure; enzyme kinetics; protein-ligand interactions; industrial enzymology; and laboratory quality control. The book is targeted at all scientists interested in protein research.

Leading experts from all over the world present an overview of the use of enzymes in industry for: - the production of bulk products, such as glucose, or fructose - food processing and food analysis - laundry and automatic dishwashing detergents - the textile, pulp and paper and animal feed industries - clinical diagnosis and therapy - genetic engineering. The book also covers identification methods of new enzymes and the optimization of known ones, as well as the regulatory aspects for their use in industrial applications. Up to date and wide in scope, this is a chance for non-specialists to acquaint themselves with this rapidly growing field. 'The quality is so great that there is no hesitation in recommending it as ideal reading for any student requiring an introduction to enzymes. Enzymes in Industry - should command a place in any library, industrial or academic, where it will be frequently used.' The Genetic Engineer and Biotechnologist 'Enzymes in Industry' is an excellent introduction into the field of applied enzymology for the reader who is not familiar with the subject. offers a broad overview of the use of enzymes in industrial applications. It is up-to-date and remarkable easy to read, despite the fact that almost 50 different authors contributed. The scientist involved in enzyme work should have this book in his or her library. But it will also be of great value to the marketing expert interested in the present use of enzymes and their future in food and nonfood applications.' Angewandte Chemie 'This book should be available to all of those working with, or aspiring to work with, enzymes. In particular academics should use this volume as a source book to ensure that their 'new' projects will not 'reinvent the wheel'.' Journal of Chemical Technology and Biotechnology

This enzymology textbook for graduate and advanced undergraduate students covers the syllabi of most universities where this subject is regularly taught. It focuses on

the synchrony between the two broad mechanistic facets of enzymology: the chemical and the kinetic, and also highlights the synergy between enzyme structure and mechanism. Designed for self-study, it explains how to plan enzyme experiments and subsequently analyze the data collected. The book is divided into five major sections: 1] Introduction to enzymes, 2] Practical aspects, 3] Kinetic Mechanisms, 4] Chemical Mechanisms, and 5] Enzymology Frontiers. Individual concepts are treated as stand-alone chapters; readers can explore any single concept with minimal cross-referencing to the rest of the book. Further, complex approaches requiring specialized techniques and involved experimentation (beyond the reach of an average laboratory) are covered in theory with suitable references to guide readers. The book provides students, researchers and academics in the broad area of biology with a sound theoretical and practical knowledge of enzymes. It also caters to those who do not have a practicing enzymologist to teach them the subject.

This new volume of *Methods in Enzymology* continues the legacy of this premier serial with quality chapters authored by leaders in the field. This volume covers recent research and methods development for changing the DNA sequence within the genomes of cells and organisms. Focusing on enzymes that generate double-strand breaks in DNA, the chapters describe use of molecular tools to introduce or delete genetic information at specific sites in the genomes of animal, plant and bacterial cells. Continues the legacy of this premier serial with quality chapters authored by leaders in the field Covers research methods in biomineralization science Contains sections on such topics as genome editing, genome engineering, CRISPR, Cas9, TALEN and zinc finger nuclease

*Biotechnology and Biology of Trichoderma* serves as a comprehensive reference on the chemistry and biochemistry of one of the most important microbial agents, *Trichoderma*, and its use in an increased number of industrial bioprocesses for the synthesis of many biochemicals such as pharmaceuticals and biofuels. This book provides individuals working in the field of *Trichoderma*, especially biochemical engineers, biochemists and biotechnologists, important information on how these valuable fungi can contribute to the production of a wide range of products of commercial and ecological interest. Provides a detailed and comprehensive coverage of the chemistry, biochemistry and biotechnology of *Trichoderma*, fungi present in soil and plants Includes most important current and potential applications of *Trichoderma* in bioengineering, bioprocess technology including bioenergy & biofuels, biopharmaceuticals, secondary metabolites and protein engineering Includes the most recent research advancements made on *Trichoderma* applications in plant biotechnology and ecology and environment

Lipids are biomolecules that constitute a significant amount of biomass in the earth, and plant lipids are rapidly growing in interest due to their roles in improving food technology, medicine, nutrition, and biotechnology. With recent advances in protein chemistry, biochemistry, and enzymology promoting research on lipolytic enzymes, it is important for research to address the mechanisms of such enzymes and their diverse functions. *Unique Sequence Signatures in Plant Lipolytic Enzymes: Emerging Research and Opportunities* provides innovative insights into the biochemistry of plant lipases and phospholipases as well as their structures and catalytic mechanisms. The book explores the conserved domains and motifs of plant lipolytic enzymes by identifying the main residues involved in the catalysis in the enzymes and the phylogeny of important plant lipolytic enzymes, as well as calculating the evolutionary distance in those enzymes. Organized into six chapters, it is a vital reference source for researchers, chemists, biologists, academicians, practitioners, medical professionals, engineers, and graduate students.

Enzymes have interesting applications in our biological system and act as valuable biocatalysts. Their various functions allow enzymes to develop new drugs, detoxifications, and pharmaceutical chemistry. *Research Advancements in Pharmaceutical, Nutritional, and Industrial Enzymology* provides emerging research on biosynthesis, enzymatic treatments, and bioengineering of medicinal waste. While highlighting issues such as structural implications for drug development and food applications, this publication explores information on various applications of enzymes in pharmaceutical, nutritional, and industrial aspects. This book is a valuable resource for medical professionals, pharmacists, pharmaceutical companies, researchers, academics, and upper-level students seeking current information on developing scientific ideas for new drugs and other enzymatic advancements.

Enzymes: Novel Biotechnological Approaches for the Food Industry provides an in-depth background of the most up-to-date scientific research and information related to food biotechnology and offers a wide spectrum of biological applications. This book addresses novel biotechnological approaches for the use of enzymes in the food industry to help readers understand the potential uses of biological applications to advance research. This is an essential resource to researchers and both undergraduate and graduate students in the biotechnological industries. Provides fundamental and rigorous scientific information on enzymes Illustrates enzymes as tools to achieve value and quality to a product, either in vitro or in vivo Presents the most updated knowledge in the area of food biotechnology Demonstrates novel horizons and potential for the use of enzymes in industrial applications

Fundamentals of enzyme activity; Enzymes in the food industry; Food enzymes and the new technology; Enzymes in milk and cheese production; Enzymes in the meat industry; Enzymes in the production of beverages and fruit juices; Enzymes in the starch and sugar industries; Enzymes in the processing of fats and oils; Enzymes as diagnostic tools.

Industrial biotechnology is the practice of using cells to generate industrially useful products. An enzyme is a protein that catalyzes, or speeds up, a chemical reaction. Enzymes are the focal point of biotechnological processes, without them biotechnology as a subject would not exist. The main advantage of enzymes compared to most other catalysts is their stereo, region and chemo selectivity and specificity. Enzymes are responsible for many essential biochemical reactions in micro organisms, plants, animals, and human beings. Biotechnology processes may have potential in energy production, specifically in the substitution of renewable plant biomass for fossil feedstock. This will depend on the development of enzymes able to degrade cellulose in plant biomass and designing methods to recycle or dispose of spent biomass. With time, research, and improved protein engineering methods, many enzymes have been genetically modified to be more effective at the desired temperatures, pH, or under other manufacturing conditions typically inhibitory to enzyme activity (e.g. harsh chemicals), making them more suitable and efficient for industrial or home applications. Enzymes are used in the extraction of natural products, as catalysts in organic chemistry, in clinical analysis, in industrial processes, and so on. The application of enzymes is found in many different fields and it is one of the good sectors to venture. In coming few years it is estimated that world enzyme demand will average annual increases of 6.3 percent. This book basically deals with principles of industrial enzymology, basis of utilization of soluble and immobilized, enzymes in industrial processes, principles of immobilization of enzymes, enzymes in clinical analysis principles, practical aspects of large-scale protein purification, the applications of enzymes in industry, use of enzymes in the extraction of natural products, data on techniques of enzyme immobilization and bio affinity procedures etc. In this book you can find all the basic information required on the fundamental aspects of the enzymes, their chemistry, bio chemistry as well as detailed information of their applications a wide variety of industrial processes etc. The book is very useful for research scholars, technocrats, institutional libraries and entrepreneurs who want to enter into the field of manufacturing of enzymes.

A practice-oriented guide to assaying more than 100 of the most important enzymes, complete with the theoretical background and specific protocols for immediate use in the biochemical laboratory. Now expanded with a new section on metal ion determination.

Advances in Enzymology and Related Areas of Molecular Biology is a seminal series in the field of biochemistry, offering researchers access to authoritative reviews of the latest discoveries in all areas of enzymology and molecular biology. These landmark volumes date back to 1941, providing an unrivaled view of the historical development of enzymology. The series offers researchers the latest understanding of enzymes, their mechanisms, reactions and evolution, roles in complex biological process, and their application in both the laboratory and industry. Each volume in the series features contributions by leading pioneers and investigators in the field from

around the world. All articles are carefully edited to ensure thoroughness, quality, and readability. With its wide range of topics and long historical pedigree, *Advances in Enzymology and Related Areas of Molecular Biology* can be used not only by students and researchers in molecular biology, biochemistry, and enzymology, but also by any scientist interested in the discovery of an enzyme, its properties, and its applications.

*Lignocellulosic Biomass Production and Industrial Applications* describes the utilization of lignocellulosic biomass for various applications. Although there have been numerous reports on lignocellulosic biomass for biofuel application, there have been very few other applications reported for lignocellulosic biomass-based chemicals and polymers. Therefore, this book covers all of the possible lignocellulosic biomass applications. Besides describing the different types of biofuel production, such as bioethanol, biobutanol, biodiesel and biogas from lignocellulosic biomass, it also presents various other lignocellulosic biomass biorefinery applications for the production of chemicals, polymers, paper and bioplastics. In addition, there are chapters on valorization of lignocellulosic materials, alkali treatment to improve the physical, mechanical and chemical properties of lignocellulosic natural fibers, and a discussion of the major benefits, limitations and future prospects of the use of lignocellulosic biomass.

*Industrial Enzymes for Biofuels Production: Recent Updates and Future Trends* focuses on resolving existing bottlenecks in enzymes mediated biomass to biofuels production processes through updating recent scientific knowledge and technology developments. The book provides low cost sustainable approaches to lower the cost of enzymes production following different approaches. It is specifically focused on industrial aspects of enzymes used in biofuels production processes by presenting in-depth study of existing issues related to practical viability and long-term sustainability. The book covers detailed discussions on market scenario of industrial enzymes used in biofuels production processes and compares them on both lab and industrial scale. Users will find this to be a great resource that also helps them develop low cost green technologies for enzyme development in biofuels production. Includes recent updates in research and the technologies of industrial enzymes used in biofuels production process Describes various developed low-cost technologies for enzyme production Explores different, sustainable approaches currently being used

This reference is a "must-read": It explains how an effective and economically viable enzymatic process in industry is developed and presents numerous successful examples which underline the efficiency of biocatalysis.

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