Industrial Application Of Enzymes On Carbohydrate Based Materials

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Production,

Biocatalysis and Industrial Applications Academic Press Biocatalysis has become an essential tool in the chemical industry and is the core of industrial biotechnology, also known as white biotechnology, making use of biocatalysts in terms of enzymes or whole cells in chemical processes as an alternative to chemical catalysts. This shift can be seen in the many areas of daily life where biocatalysts—with their environmentally friendly properties—are currently employed. Drivers are the big societal challenges resulting from concerns about the global climate change and the need for an assured energy supply. Modern biocatalysis relies to a large extent on the tremendous advances in the so-called omics techniques and the structural elucidation of biomolecules, which have led to synthetic biology and metabolic engineering as new research fields with high application potential for the rational design of enzymes and microbial production strains. In this book, renowned scientists discuss the actual developments in these research fields together with a variety of application-oriented topics. *Immobilized*

Enzymes For Industrial Reactors Amer Chemical Society Industrial Enzyme ApplicationsJohn Wiley & Sons

Novel Enzyme Technology for Food Applications CRC Press

BIOPROSPECTING OF PLANT BIODIVERSITY FOR INDUSTRIAL MOLECULES A comprehensive collection of recent translational research on bioresource utilization and ecological sustainability Bioprospecting of Plant Biodiversity for Industrial Molecules provides an up-to-date overview of the ongoing search for biodiverse organic compounds for use in pharmaceuticals, bioceuticals, agriculture, and other commercial applications. Bringing together work from a panel of international contributors, this comprehensive monograph covers natural compounds of plants, endophyte enzymes and their applications in industry, plant bioprospecting in cosmetics, marine bioprospecting of seaweeds, and more. Providing global perspectives on bioprospecting of plant biodiversity, the authors present research on enzymes, mineral micro-nutrients, biopesticides, algal biomass, and other bioactive molecules. In-depth chapters assess the

health impacts and ecological sustainability of the various biomolecules and identify existing and possible applications ranging from ecological restoration to production of essential oils and cosmetics. Other topics include, bio-energy crops as alternative fuel resources, the role of plants in phytoremediation of industrial waste, and the industrial applications of endophyte enzymes. This comprehensive resource: Includes a through introduction to plant biodiversity and bioprospecting Will further the knowledge of application of different plants and improve research investigation techniques. Summarizes novel approaches for researchers in food science, microbiology, biochemistry, and biotechnology Bioprospecting of Plant Biodiversity for Industrial Molecules is an indispensable compendium of biological research for scientists, researchers, graduate and postgraduate students, and academics in the areas of microbiology, food biotechnology, industrial microbiology, plant biotechnology, and microbial biotechnology.

Basics and Biotechnological Applications Academic Press

The aim of food processing is to produce food that is palatable and

tastes good, extend its shelf-life, increase the variety, and maintain the nutritional and healthcare quality of food. To achieve favorable processing conditions and for the safety of the food to be consumed, use of food grade microbial enzymes or microbes (being the natural biocatalysts) is imperative. This book discusses the uses of enzymes in conventional and non-conventional food and beverage processing as well as in dairy processing, brewing, bakery and wine making. Apart from conventional uses, the development of bioprocessing tools and techniques have significantly expanded the potential for extensive application of enzymes such as in production of bioactive peptides, oligosaccharides and lipids, flavor and colorants. Some of these developments include extended use of the biocatalysts (as immobilized/encapsulated enzymes), microbes (both natural and genetically modified) as sources for bulk enzymes, solid state fermentation technology for enzyme production. Extremophiles and marine microorganisms are another source of food grade enzymes. The book throws

light on potential applications of microbial enzymes to expand the base of food processing industries.

Industrial Enzyme Applications

CRC Press

A comprehensive, accessible, up-to-date catalog of enzymes andtheir uses in modern manufacturing. Enzymes have long been used by industrial product makers as majorcatalysts to transform raw materials into end products. Nowavailable in English for the first time, Industrial Enzymes andTheir Applications is the only authoritative catalog of enzymeswith in-depth coverage of their varied uses, the classes in whichthey are grouped, and which chemical reagents they have replaced oncurrent mass production lines. The first section surveys general enzyme characteristics anddiscusses their microbiological origin, including pH andtemperature dependence of the activity and stability of eachenzyme. The next section then examines the most importantindustrial enzymes in use today--includingcarbohydrate-hydrolyz-ing enzymes, proteases, estercleavage-fat-hydrolyzing enzymes, and immobilized enzymes. The lastsection is devoted to

specific applications of technical enzymes insuch areas as food processing, beverage production, animalnutritio n, leather, and textiles. Industrial Enzymes and Their Applications offers instant access toa wealth of key enzyme data--an invaluable, wide-ranging resourcefor industrial chemists, biochemists, biochemical engineers, andstudents. *Industrial Enzymes* Elsevier This volume discusses recent advancements to the age old practice of using microbial enzymes in the preparation of food. Written by leading experts in the field, it discusses novel enzymes and their applications in the industrial preparation of food to improve taste and texture, while reducing cost and increasing consistency. This book will be of interest to both researchers and students working in food technology. *Enzymes from Extreme Environments* Elsevier 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.

Production and Applications

Elsevier 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 **Enzymes in Industry** John Wiley & Sons Recent years

have seen a rapid increase in the use of enzymes as food processing tools, as an understanding of their means of control has improved. Since publication of the first edition of this book many new products have been commercially produced and the corresponding number of published papers has swollen. This second edition has been fully revised and updated to cover changes in the last five years. It continues to provide food technologists, chemists, biochemists and microbiologists with an authoritative, practical and detailed review of the subject. *Industrial Biocatalysis* John Wiley & Sons Industrial Biorefineries and White Biotechnology provides a comprehensive look at the increasing focus on developing the processes and technologies needed for the conversion of biomass to liquid and gaseous fuels and chemicals, in particular, the development of low-cost technologies. During the last 3-4 years, there have been scientific and technological developments in the area; this book represents the most updated information and technological perspective on the topic. Provides information on the most advanced and innovative pretreatment

processes and technologies for biomass Covers information on lignocellulosic and algal biomass to work on the principles of biorefinery Provides information on integration of processes for the pretreatment of biomass Designed as a textbook for both graduate students and researchers

Trends, Scope and Relevance

IGI Global Advances in Food and Nutrition Research, Volume 81 provides updated knowledge on nutrients in foods and how to avoid deficiencies, paying special attention to the essential nutrients that should be present in the diet to reduce disease risk and optimize health. The series provides the latest advances on the identification and characterization of emerging bioactive compounds with putative health benefits, as well as up-to-date information on food science, including raw materials, production, processing, distribution, and consumption. Contains contributions that have been carefully selected based on their vast experience and expertise on the subject Includes updated, in-depth, and critical discussions of available information, giving the reader a unique opportunity to

learn Encompasses a broad view of the topics at hand Green Bio-processes Industrial Enzyme Applications “Microbial Enzymes: Roles and applications in industry” offers an essential update on the field of microbial biotechnology, and presents the latest information on a range of microbial enzymes such as fructosyltransferase, laccases, amylases, lipase, and cholesterol oxidase, as well as their potential applications in various industries. Production and optimisation technologies for several industrially relevant microbial enzymes are also addressed. In recent years, genetic engineering has opened up new possibilities for redesigning microbial enzymes that are useful in multiple industries, an aspect that the book explores. In addition, it demonstrates how some of the emerging issues in the fields of agriculture, environment and human health can be resolved with the aid of green technologies based on microbial enzymes. The topics covered here will not only provide a better understanding of the commercial applications of microbial enzymes, but also outline futuristic

approaches to use microbial enzymes as driver of industrial sustainability. Lastly, the book is intended to provide readers with an overview of recent applications of microbial enzymes in various industrial sectors, and to pique researchers' interest in the development of novel microbial enzyme technologies to meet the changing needs of industry.

Industrial Biorefineries and White Biotechnology Springer Science & Business Media

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.

Industrial Application of Enzymes on Carbohydrate-based Material

Springer Nature

The food industry is constantly seeking advanced technologies to meet consumer demand for nutritionally balanced food products. Enzymes are a useful biotechnological processing tool whose action can be controlled in the food matrix to produce higher quality products. Written by an international team of contributors, Novel enzyme technology for food applications reviews the latest advanced methods to develop specific enzymes and their applications. Part one discusses fundamental aspects of industrial enzyme technology. Chapters cover the discovery, improvement and production of enzymes as well as consumer attitudes towards the technology. Chapters in Part two discuss enzyme technology for specific food applications such as textural improvement, protein-based fat replacers, flavour enhancers, and health-functional carbohydrates . Novel enzyme technology for food applications is

a standard reference for all those in industry and academia concerned with improving food products with this advanced technology. Reviews the latest advanced methods to develop specific enzymes Discusses ways of producing higher quality food products Explores the improvement and production of enzymes *Fungi* John Wiley & Sons The discovery of enzymes as biocatalysts has led to various biotechnological developments. The capability of enzymes to catalyse various chemical reactions both in vivo and in vitro has led them to applications in various industries, such as food, feed, pharmaceutical, diagnostics, detergent, textile, paper, leather, and fine chemical industries. Microbial Fermentation and Enzyme Technology mainly focuses on production and application of enzymes in various industries. Further, it also discusses recent developments in enzyme engineering particularly those involved in creating and improving product formations through enzyme and fermentation technology. Salient features: Includes current research and developments in the area of

microbial aspects in different fields like food, chemicals, pharmaceutical, bioprocess, etc. Discusses various enzymes that are used in refinement of environmental pollutions and its application in different industrial sectors Focuses on production and application of enzymes in various industries Highlights recent developments in enzyme engineering with respect to its application in textile, pharmaceutical, nanobiotechnology, bioremediation and many other related fields.

Enzymes in Industrial Food Processing

CRC Press 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 *Biomass, Biofuels, Biochemicals* Springer 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 recommendin g 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 Biotechnologis t '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 Biology and Applications Academic Press

Microbial Extremozymes: Novel Sources and Industrial Applications is a unique resource of practical research information on the latest novel sources and technologies regarding extremozymes in bioremediation, waste management, valorization of industrial by-products, biotransformation of natural polymers, nutrition, food safety and diagnosis of disease. The book's broad knowledge and varying applications are useful to the food industry, dairy industry, fruit and vegetable processing, and baking and beverages industries, as well as the pharmaceutical and biomedical industries. This is a concise, all-encompassing resource for a range of scientists needing knowledge of extremozymes to enhance and research. Furthermore, it provides an updated knowledge of microbial enzymes isolated from extreme environments (temperatures, etc.) and their biotechnological applications. It will be useful to researchers, scientists and students in enzyme research. In addition, users from the dairy and baking industries will benefit from the presented content. Explores recent scientific research on extremophiles and

extremozymes technologies that help innovate novel ideas Provides innovative technologies for enzyme production from extremophilic microbes Includes cutting-edge research for applications in various industries where extreme temperature conditions exist Presents novel microorganisms and their enzymes from extreme environments (Thermophilic, Psychrophilic, Acidophilic, Alkaliphilic, Anaerobic, Halophilic, Barophilic, Metallotolerant, Radioresistant, etc.) Actinobacteria Academic Press Agro-industrial Wastes as Feedstock for Enzyme Production: Apply and Exploit the Emerging and Valuable Use Options of Waste Biomass explores the current state-of-the-art bioprocesses in enzyme production using agro-industrial wastes with respect to their generation, current methods of disposal, the problems faced in terms of waste and regulation, and potential value-added protocols for these wastes. It surveys areas ripe for further inquiry as well as future trends in the field. Under each section, the individual chapters present up-to-date and in-depth information on bioprospecting of agro-industrial wastes to

obtain enzymes of economic importance. This book covers research gaps, including valorization of fruit and vegetable by-product—a key contribution toward sustainability that makes the utmost use of agricultural produce while employing low-energy and cost-efficient bioprocesses. Written by experts in the field of enzyme technology, the book provides valuable information for academic researchers, graduate students, and industry scientists working in industrial-food microbiology, biotechnology, bioprocess technology, post-harvest technology, agriculture, waste management, and the food industry. Addresses key opportunities and challenges in the emerging field of enzyme technology, with an emphasis on energy and bio-based industrial applications Explores the current state of the art bioprocesses in enzyme production using fruit and vegetable wastes with respect to their generation, current methods of disposal, and problems faced in terms of waste and regulation Presents in-depth information on bioprospecting of fruit and vegetable to obtain enzymes of economic

importance Delves into environmental concerns and economic considerations related to fruit and vegetable processing by-products Enzymes in Food Processing Springer Science & Business Media 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

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