

Oleochemical Manufacture And Applications

A-Z of Biorefinery: A Comprehensive View provides a comprehensive book that highlights and illustrates important topics relating to biorefineries, including associated theory, current and future research trends, available techniques and future challenges. This book will benefit a wide range of audiences, including students, engineers, scientists, practitioners, and those who are keen to explore more on biorefinery. Sections cover the availability of current technologies, constraints, market trends, recent system developments, and the concepts that enable modern biorefineries to utilize all kinds of biomass. This book is an essential resource for students, scientists, engineers and practitioners working in industry and academia. Covers the most important topics relating to biorefineries Provides related definitions, theories, overviews of methods, applications and important references Offers perspectives and concise reviews for each section Includes complete design case studies with tutorials

Industrial Applications of Renewable Plastics: Environmental, Technological, and Economic Advances provides practical information to help engineers and materials scientists deploy renewable plastics in the plastics market. It explores the uses, possibilities, and problems of renewable plastics and composites to assist in material selection and rejection. The designer's main problems are examined, along with basic reminders that deal with structures and processing methods that can help those who are generally familiar with metals understand the unique properties of plastic materials. The book offers a candid overview of main issues, including conservation of fossil resources, geopolitical considerations, greenhouse effects, competition with food crops, deforestation, pollution, and disposal of renewable plastics. In addition, an overview of some tools related to sustainability (Life cycle assessments, CO2 emissions, carbon footprint, and more) is provided. The book is an essential resource for engineers and materials scientists involved in material selection, design, manufacturing, molding, fabrication, and other links in the supply chain of plastics. The material contained is of great relevance to many major industries, including automotive and transport, packaging, aeronautics, shipbuilding, industrial and military equipment, electrical and electronics, energy, and more. Provides key, enabling information for engineers and materials scientists looking to increase the use of renewable plastic materials in their work Presents practical guidance to assist in materials selection, processing methods, and applications development, particularly for designers more familiar with other materials, such as metals Includes a candid discussion of the pros and cons of using renewable plastics, considering the technical, economic, legal, and environmental aspects

The outlook of organic synthesis has changed many times during its tractable history. The initial focus on the synthesis of substances typical of living matter, exemplified by the first examples of organic chemistry through the synthesis of urea from inorganic substances by Liebig, was accepted as the birth of organic chemistry, and thus also of organic synthesis. Although the early developments in organic synthesis closely followed the pursuit of molecules typical in nature, towards the end of the 19th century, societal pressures placed higher demands on chemical methods appropriate for the emerging age of industrialization. This led to vast amounts of information being generated through the discovery of synthetic reactions, spectroscopic techniques and reaction mechanisms. The basic organic functional group transformations were discovered and improved during the early part of this century. Reaction mechanisms were elucidated at a growing pace, and extremely powerful spectroscopic tools, such as infrared, nuclear magnetic resonance and mass spectrometry were introduced as everyday tools for a practising organic chemist. By the 1950s, many practitioners were ready to agree that almost every molecule could be synthesized. Some difficult stereochemical problems were exceptions; for example Woodward concluded that erythromycin was a "hopelessly complex target". This frustration led to a hectic phase of development of new and increasingly more ingenious protecting group strategies and functional group transformations, and also saw the emergence of asymmetric synthesis.

Lubricants are essential in engineering, however more sustainable formulations are needed to avoid adverse effects on the ecosystem. Bio-based lubricant formulations present a promising solution. **Biolubricants: Science and technology** is a comprehensive, interdisciplinary and timely review of this important subject. Initial chapters address the principles of lubrication, before systematically reviewing fossil and bio-based feedstock resources for biodegradable lubricants. Further chapters describe catalytic, (bio) chemical functionalisation processes for transformation of feedstocks into commercial products, product development, relevant legislation, life cycle assessment, major product groups and specific performance criteria in all major applications. Final chapters consider markets for biolubricants, issues to consider when selecting and using a lubricant, lubricant disposal and future trends. With its distinguished authors, **Biolubricants: Science and technology** is a comprehensive reference for an industrial audience of oil formulators and lubrication engineers, as well as researchers and academics with an interest in the subject. It provides an essential overview of scientific and technological developments enabling the cost-effective improvement of biolubricants, something that is crucial for the green future of the lubricant industry. A comprehensive, interdisciplinary and timely review of bio-based lubricant formulations Addresses the principles of lubrication Reviews fossil and bio-based feedstock resources for biodegradable lubricants

As a spectroscopic method, Nuclear Magnetic Resonance (NMR) has seen spectacular growth over the past two decades, both as a technique and in its applications. Today the applications of NMR span a wide range of scientific disciplines, from physics to biology to medicine. Each volume of Nuclear Magnetic Resonance comprises a combination of annual and biennial reports which together provide comprehensive of the literature on this topic. This Specialist Periodical Report reflects the growing volume of published work involving NMR techniques and applications, in particular NMR of natural macromolecules which is covered in two reports: "NMR of Proteins and Acids" and "NMR of Carbohydrates, Lipids and Membranes". For those wanting to become rapidly acquainted with specific areas of NMR, this title provides unrivalled scope of coverage. Seasoned practitioners of NMR will find this an invaluable source of current methods and applications. Specialist Periodical Reports provide systematic and detailed review coverage in major areas of chemical research. Compiled by teams of leading authorities in the relevant subject areas, the series creates a unique service for the active research chemist, with regular, in-depth accounts of progress in particular fields of chemistry. Subject coverage within different volumes of a given title is similar and publication is on an annual or biennial basis.

Educating professionals and students about the chemistry, formulation technology, and related regulatory aspects of cosmetics and perfume **Cosmetics and perfume** comprise a multibillion-dollar global industry. **Kirk-Othmer Chemical Technology of Cosmetics** provides authoritative information on the substances and processes involved, including key product groups, ingredients,

formulation technology, packaging, and regulatory topics in twenty-two articles. This resource makes sense of a vast group of consumer products designed to improve the health, cleanliness, and physical appearance of the human exterior. It identifies natural and synthetic ingredients and gives details on formulation of the product so that the cosmetic is safe, easy to use, and performs as described. Particular attention is paid to the technologies that have been developed to produce them, including emulsification, stick technology, powder blending, and aerosol technology. Packaging is also addressed, as it must be attractive to the consumer, be environmentally friendly, and keep the product safe as well. Regulatory information reinforces the safety aspect. Based on Wiley's renowned Kirk-Othmer Encyclopedia of Chemical Technology, this book presents new and carefully updated articles, and features the same breadth and quality of coverage and clarity of presentation found in the original. This comprehensive guide is a valuable resource for chemists, R&D professionals, dermatologists, patent attorneys, regulatory agencies, and other professionals in the field of personal care products. It is also a must-have reference for students who plan to enter the field.

This textbook introduces the industrial production and processing of natural resources. It is divided into six major topics (fats and oils, carbohydrates, lignin, terpenoids, other natural products, biorefinery), which are divided into a total of 20 chapters. Each chapter is self-contained and therefore a compact learning unit, which can be worked on by students in self-study or presented by lecturers. Clear illustrations, flow diagrams, apparatus drawings and photos facilitate the understanding of the subject matter. All chapters end with a succinct summary, the "Take Home Messages". Each chapter is supplemented by ten short test questions, which can be solved quickly after working through the chapter; the answers are at the end of the book. All chapters contain bibliographical references that focus on essential textbooks and reference works. As a prior knowledge, only basic knowledge of chemistry is required.

The Malaysian Oleochemical Industry must also produce downstream products to avoid the pitfalls of the commodity type market. Economic feasibility and technological skills are also important determinants in "creating" up-market products of high-value applications. The Industry must therefore offer clear quality and cost advantages in order to be candidates for the required and cost advantages in order to be candidates for the required technology transfer. Once the technology has been transferred, it is success in the market place which will determine the fate of the industry. To prepare for the future the Industry must ensure that adequate training is given to ensure that experienced personnel are available in sufficient numbers. [Author's abstract].

Fatty Acids: Chemistry, Synthesis and Applications is a comprehensive source of information about a wide range of industrially important fatty acids. This practical resource provides key insights into the chemistry, synthesis, industrial applications, derivatives, and analysis of fatty acids, and the chemical modifications that transform them for use in products from biodiesel fuels to pharmaceuticals. Written by a team of industry experts, Fatty Acids includes detailed descriptions of fatty acid crystallization, enzymatic synthesis, and microbial production. This book focuses heavily on the chemistry of trans fatty acids, with extensive explanations of their synthesis and measurement. Further, the book addresses advances in the analytical methodology, including mass spectrometry, of fatty acids as well as their derivatives. This book serves as a reference manual to a new generation of lipid scientists and researchers; a useful resource for oleochemical industries; and a valuable teaching aid for undergraduate and graduate students who are interested in fields related to the chemistry of oils, fats, and food. Includes recent developments in the synthesis of fatty acid derivatives, as renewable raw materials for the chemical industry Presents efficient synthetic methods for the dietary trans fatty acids in multi-gram scale allowing scientists and researchers to study dietary effects of individual trans fatty acids on human health Addresses uses of fats and fatty acids in foods and nutrition Identifies the roles of fatty acids and derivatives in cosmetic technology

This book covers a wide range of food and oleochemical applications of palm and coconut oils. The presentations were part of the World Conference on Palm and Coconut Oils for the 21st Century held in Bali and reflect the changes in the oleochemical industry during the past decade.

This book provides a comprehensive overview of the basic and advanced metabolic engineering technologies used to generate natural metabolites and industrially important biomolecules. Metabolic engineering has the potential to produce large quantities of valuable biomolecules in a renewable and sustainable manner by extending or modifying biosynthetic pathways in a wide range of organisms. It has been successfully used to produce chemicals, drugs, enzymes, amino acids, antibiotics, biofuels, and industrially important pharmaceuticals. The book comprehensively reviews the various metabolites detection, extraction and biosensors and the metabolic engineering of microbial strains for the production of industrially useful enzymes, proteins, organic acids, vitamins and antibiotics, therapeutics, chemicals, and biofuels. It also discusses various genetic engineering and synthetic biology tools for metabolic engineering. In closing, the book discusses ethical, patenting and regulatory issues in the metabolic engineering of microbes. This book is a valuable source not only for beginners in metabolic engineering, but also students, researchers, biotechnology and metabolic engineering based company.

Most modern surfactants are readily biodegradable and exhibit low toxicity in the aquatic environment, the two criteria for green surfactants. However the majority are synthesised from petroleum, so over the past decade the detergent industry has turned its attention to developing greener routes to create these surfactants via renewable building blocks. Surfactants from Renewable Resources presents the latest research and commercial applications in the emerging field of sustainable surfactant chemistry, with emphasis on production technology, surface chemical properties, biodegradability, ecotoxicity, market trends, economic viability and life-cycle analysis. Reviewing traditional sources for renewable surfactants as well as recent advances, this text focuses on techniques with potential for large scale application. Topics covered include: Renewable hydrophobes from natural fatty acids and forest industry by-products Renewable hydrophiles from carbohydrates, amino acids and lactic acid New ways of making renewable building blocks; ethylene from renewable resources and complex mixtures from waste biomass Biosurfactants Surface active polymers This book is a valuable resource for industrial researchers in companies that produce and use surfactants, as well as academic researchers in surface and polymer chemistry, sustainable chemistry and chemical engineering.

Chemical engineering applications have been a source of challenging optimization problems in terms of economics and technology. The goal of this book is to enable the reader

to get instant information on fundamentals and advancements in chemical engineering. This book addresses ongoing evolutions of chemical engineering and provides overview to the state of the art advancements. Molecular perspective is increasingly important in the refinement of kinetic and thermodynamic modeling. As a result, much of the material was revised on industrial problems and their sophisticated solutions from known scientists around the world. These issues were divided into two sections, fundamental advances and catalysis and reaction engineering. A distinct feature of this text continues to be the emphasis on molecular chemistry, reaction engineering and modeling to achieve rational and robust industrial design. Our perspective is that this background must be made available to undergraduate, graduate and professionals in an integrated manner.

Biodiesel: A Realistic Fuel Alternative for Diesel Engines describes the production and characterization of biodiesel. The book also presents current experimental research work in the field, including techniques to reduce biodiesel's high viscosity. Researchers in renewable energy, as well as fuel engineers, will discover a myriad of new ideas and promising possibilities.

As the field of tribology has evolved, the lubrication industry is also progressing at an extraordinary rate. Updating the author's bestselling publication, **Synthetic Lubricants and High-Performance Functional Fluids**, this book features the contributions of over 60 specialists, ten new chapters, and a new title to reflect the evolving nature of the field. This volume gives a detailed account into how renewables can be transformed into value-added products via homogeneous catalysis, especially via transition metal homogeneous catalysis. The most important catalytic reactions of oleochemicals, isoprenoids, carbohydrates, lignin, proteins and carbon dioxide are described. Special emphasis is placed on carbon-carbon linkage reactions (hydroformylations, dimerisations, telomerisations, metathesis, polymerisations etc.), hydrogenations, oxidations and other important homogeneous reactions (such as isomerisations, hydrosilylations etc.). Also, tandem reactions including isomerising hydroformylations are presented. Wherever possible, the authors have included mechanistic, kinetic, and technical aspects. The reader is therefore given a total overview of the status quo of homogeneous catalysis directed to the most important renewables.

Food and Industrial Bioproducts and Bioprocessing describes the engineering aspects of bioprocessing, including advanced food processing techniques and bioproduct development. The main focus of the book is on food applications, while numerous industrial applications are highlighted as well. The editors and authors, all experts in various bioprocessing fields, cover the latest developments in the industry and provide perspective on new and potential products and processes. Challenges and opportunities facing the bioproduct manufacturing industry are also discussed. Coverage is far-reaching and includes: current and future biomass sources and bioprocesses; oilseed processing and refining; starch and protein processing; non-thermal food processing; fermentation; extraction techniques; enzymatic conversions; nanotechnology; microencapsulation and emulsion techniques; bioproducts from fungi and algae; biopolymers; and biodegradable/edible packaging. Researchers and product developers in food science, agriculture, engineering, bioprocessing and bioproduct development will find **Food and Industrial Bioproducts and Bioprocessing** an invaluable resource.

A compilation of 58 carefully selected, topical articles from the **Ullmann's Encyclopedia of Industrial Chemistry**, this three-volume handbook provides a wealth of information on economically important basic foodstuffs, raw materials, additives, and processed foods, including a section on animal feed. It brings together the chemical and physical characteristics, production processes and production figures, main uses, toxicology and safety information in one single resource. More than 40 % of the content has been added or updated since publication of the 7th edition of the **Encyclopedia** in 2011 and is available here in print for the first time. The result is a "best of Ullmann's", bringing the vast knowledge to the desks of professionals in the food and feed industries.

"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.

Glycerol: The Renewable Platform Chemical provides a valuable overview of the glycerol market, including industrial applications and sustainable production of glycerol. Replacing previous works on the subject, this useful resource describes glycerol, also known as glycerine, and its chemical derivatives, especially the new bioglycerol-derived products. The monograph also discusses how the industrial use of glycerol as raw material for producing commodity chemicals depends on broader scope and lower cost of the catalytic process used to convert glycerol of varying purity grades into valued monomers. New chapters on glycerol polymers, the use of glycerol as antifreeze, and its sustainable production offer relevant information for researchers and professionals from academics and industry alike. The book features new processes, such as low cost and biocompatible glycerol polymers as a major alternative to the conventional polymers, with the first practical applications now emerging in the biomedical and patient care markets. The book offers both a source of inspiration for new projects and a reliable source of information on how glycerol is replacing petrochemicals in many real world applications. Features completely unique information and insight from leading expert Mario Pagliaro, including recent developments in the field, gathered from over a decade of intense R&D activities. Includes new chapters on the glycerol market, glycerol polymers, the use of glycerol in the cement and construction industries, its use as antifreeze, and its sustainable production. Contains reliable, accessible information appropriate for research chemists and chemical engineers in the chemical, oleochemicals, biodiesel, biotechnology and cement industries as well as in academia.

Volume 2 of *Advances in Carbon Management Technologies* has 21 chapters. It presents the introductory chapter again, for framing the challenges that confront the proposed solutions discussed in this volume. Section 4 presents various ways biomass and biomass wastes can be manipulated to provide a low-carbon footprint of the generation of power, heat and co-products, and of recovery and reuse of biomass wastes for beneficial purposes. Section 5 provides potential carbon management solutions in urban and manufacturing environments. This section also provides state-of-the-art of battery technologies for the transportation sector. The chapters in section 6 deal with electricity and the grid, and how decarbonization can be practiced in the electricity sector. The overall topic of advances in carbon management is too broad to be covered in a book of this size. It was not intended to cover every possible aspect that is relevant to the topic. Attempts were made, however, to highlight the most important issues of decarbonization from technological viewpoints. Over the years carbon intensity of products and processes has decreased, but the proportion of energy derived from fossil fuels has been stubbornly stuck at about 80%. This has occurred despite very rapid development of renewable fuels, because at the same time the use of fossil fuels has also increased. Thus, the challenges are truly daunting. It is hoped that the technology choices provided here will show the myriad ways that solutions will evolve. While policy decisions are the driving forces for technology development, the book was not designed to cover policy solutions.

Algae Based Polymers, Blends, and Composites: Chemistry, Biotechnology and Material Sciences offers considerable detail on the origin of algae, extraction of useful metabolites and major compounds from algal bio-mass, and the production and future prospects of sustainable polymers derived from algae, blends of algae, and algae based composites. Characterization methods and processing techniques for algae-based polymers and composites are discussed in detail, enabling researchers to apply the latest techniques to their own work. The conversion of bio-mass into high value chemicals, energy, and materials has ample financial and ecological importance, particularly in the era of declining petroleum reserves and global warming. Algae are an important source of biomass since they flourish rapidly and can be cultivated almost everywhere. At present the majority of naturally produced algal biomass is an unused resource and normally is left to decompose. Similarly, the use of this enormous underexploited biomass is mainly limited to food consumption and as bio-fertilizer. However, there is an opportunity here for materials scientists to explore its potential as a feedstock for the production of sustainable materials. Provides detailed information on the extraction of useful compounds from algal biomass Highlights the development of a range of polymers, blends, and composites Includes coverage of characterization and processing techniques, enabling research scientists and engineers to apply the information to their own research and development Discusses potential applications and future prospects of algae-based biopolymers, giving the latest insight into the future of these sustainable materials

Major tree crops contribute substantially to the economy of many developing countries on the Asian, African and Latin American continents. For example, coffee is the main revenue earner for Kenya. This book provides a comprehensive review of the agronomy, botany, taxonomy, genetics, chemistry, economics, and future global prospects of a range of crops that have great food, industrial and economic value such as cocoa, coffee, cashew, oil palm and natural rubber. Discusses the major tree crops of great economic value to the developing world The author is an eminent scientist who has won numerous awards for his work in this area

In recent years bioprocessing has increased in popularity and importance, however, bioprocessing still poses various important techno-economic and environmental challenges, such as product yields, excessive energy consumption for separations in highly watery systems, batch operation or the downstream processing bottlenecks in the production of biopharmaceutical products. Many of those challenges can be addressed by application of different process intensification technologies discussed in the present book. The first book dedicated entirely to this area, *Intensification of Biobased Processes* provides a comprehensive overview of modern process intensification technologies used in bioprocessing. The book focusses on four different categories of biobased products: bio-fuels and platform chemicals; cosmeceuticals; food products; and polymers and advanced materials. It will cover various intensification aspects of the processes concerned, including (bio)reactor intensification; intensification of separation, recovery and formulation operations; and process integration. This is an invaluable source of information for researchers and industrialists working in chemical engineering, biotechnology and process engineering.

Oleochemical Manufacture and Applications presents an overview of oleochemicals at the research and professional levels, with an emphasis on industrial production and applications. Approximately half of the chapters consider general matters, while the other half deal with applications. Authors are drawn from industrial and academic laboratories around the world. The book is an invaluable reference for chemists and technologists working on the production and use of oleochemicals, analytical chemists, quality assurance personnel, and lipid chemists in academic research laboratories.

Oleochemical Manufacture and Applications CRC Press

Renewable Bioresources: scope and modification for non-food applications is the first text to consider the broad concept of renewable materials from the socio-economic aspects through to the chemical production and technical aspects of treating different raw products. The text sets the context of the renewables debate with key opening chapters on green chemistry, and the current situation of US and EU policy regarding sustainability and industrial waste. The quantitative and technical scope and production of renewable resources is then discussed with material looking at integral valorisation, the primary production of raw materials, downstream processing, and the identification of renewable crop materials. The latter part of the book concludes with a discussion on the uses for renewable materials such as carbohydrates, woods, fibres, biopolymers, lipids and proteins in different industrial applications, including a key chapter on the high value-added industries. Covers the broad concept of renewable resources from different points of view.

Takes readers through the identification, production, processing and end-applications for renewable raw materials. Considers and compares EU and US renewable resources and sustainability objectives. Devotes one chapter to green chemistry and sustainability, focussing on the green industrial processes. This is an essential book for upper level undergraduates and Masters students taking modules on Renewable Resources, Green Chemistry, Sustainable Development, Environmental Science, Agricultural Science and Environmental Technology. It will also benefit industry professionals and product developers who are looking at improved economic and environmental means of utilising

renewable materials.

This book serves as a rich source of information on the production, processing, characterization and utilization of palm oil and its components. It also includes several topics related to oil palm genomics, tissue culture and genetic engineering of oil palm. Physical, chemical and polymorphic properties of palm oil and its components as well as the measurement and maintenance of palm oil quality are included and may be of interest to researchers and food manufacturers. General uses of palm oil/kernel oil and their fractions in food, nutritional and oleochemical products are discussed as well as the potential use of palm oil as an alternative to trans fats. Some attention is also given to palm biomass, bioenergy, biofuels, waste management, and sustainability. Presents several chapters related to oil palm genetics, including oil palm genomics, tissue culture and genetic engineering. Includes contributions from more than 80 well-known scientists and researchers in the field. In addition to chapters on food uses of palm oil, the book contains nonfood applications such as use as a feedstock for wood-based products or for bioenergy. Covers key aspects important to the sustainable development of palm oil. Understanding the biochemistry of food is basic to all other research and development in the fields of food science, technology, and nutrition, and the past decade has seen accelerated progress in these areas. Advances in Food Biochemistry provides a unified exploration of foods from a biochemical perspective. Featuring illustrations to elucidate m Surfactants play a critical role in Tribology controlling friction, wear, and lubricant properties such as emulsification, demulsification, bioresistance, oxidation resistance, rust prevention and corrosion resistance. This is a critical topic for new materials and devices particularly those built at the nanoscale. This newest volume will address tribological properties of cutting fluids, lubricant performance related to steel surfaces, biolubricants, and novel materials and ways to reduce friction and wear. Scientists from industrial research and development (R&D) organizations and academic research teams in Asia, Europe, the Middle East and North America will participate in the work.

Biodiesel production is a rapidly advancing field worldwide, with biodiesel fuel increasingly being used in compression ignition (diesel) engines. Biodiesel has been extensively studied and utilised in developed countries, and it is increasingly being introduced in developing countries, especially in regions with high potential for sustainable biodiesel production. Initial sections systematically review feedstock resources and vegetable oil formulations, including the economics of vegetable oil conversion to diesel fuel, with additional coverage of emerging energy crops for biodiesel production. Further sections review the transesterification process, including chemical (catalysis) and biochemical (biocatalysis) processes, with extended coverage of industrial process technology and control methods, and standards for biodiesel fuel quality assurance. Final chapters cover the sustainability, performance and environmental issues of biodiesel production, as well as routes to improve glycerol by-product usage and the development of next-generation products. Biodiesel science and technology: From soil to oil provides a comprehensive reference to fuel engineers, researchers and academics on the technological developments involved in improving biodiesel quality and production capacity that are crucial to the future of the industry. Evaluates biodiesel as a renewable energy source and documents global biodiesel development The outlook for biodiesel science and technology is presented exploring the challenges faced by the global diesel industry Reviews feedstock resources and vegetable oil formation including emerging crops and the agronomic potential of underexploited oil crops

In response to the global increase in the use of biofuels as substitute transportation fuels, advanced chemical, biochemical and thermochemical biofuels production routes are fast being developed. Research and development in this field is aimed at improving the quality and environmental impact of biofuels production, as well as the overall efficiency and output of biofuels production plants. The range of biofuels has also increased to supplement bioethanol and biodiesel production, with market developments leading to the increased production and utilisation of such biofuels as biosyngas, biohydrogen and biobutanol, among others. Handbook of biofuels production provides a comprehensive and systematic reference on the range of biomass conversion processes and technology. Part one reviews the key issues in the biofuels production chain, including feedstocks, sustainability assessment and policy development. Part two reviews chemical and biochemical conversion and in turn Part three reviews thermal and thermo-chemical conversion, with both sections detailing the wide range of processes and technologies applicable to the production of first, second and third generation biofuels. Finally, Part four reviews developments in the integration of biofuels production, including biorefineries and by-product valorisation, as well as the utilisation of biofuels in diesel engines. With its distinguished international team of contributors, Handbook of biofuels production is a standard reference for biofuels production engineers, industrial chemists and biochemists, plant scientists, academics and researchers in this area. A comprehensive and systematic reference on the range of biomass conversion processes and technologies Addresses the key issues in the biofuels production chain, including feedstocks, sustainability assessment and policy development Reviews chemical and bio-chemical conversion techniques as well as thermal and thermo-chemical conversion, detailing the range of processes and technologies applicable to biofuels production

Biopolymers represent a carbon emission solution: they are green and eco-friendly with a variety of uses in biomedical engineering, the automotive industry, the packaging and paper industries, and for the development of new building materials. This book describes the various raw materials of biopolymers and their chemical and physical properties, the polymerization process, and the chemical structure and properties of biopolymers. Furthermore, this book identifies the drawbacks of biopolymers and how to overcome them through modification methods to enhance the compatibility, flexibility, physicochemical properties, thermal stability, impact response, and rigidity.

This book paints a wide canvas of the immense global economic potential of ten most important cash generating crops spread over Asia, Africa and Latin America, namely, Arecanut, Cashew Nut, Coconut, Cinchona, Cocoa, Coffee, Tea, Oil Palm, Rubber and Wattle. It provides a cross-sectoral, multi-scale assessment of the status of these crops, from seed to dining table, an invaluable treatise on the subject. Structured to be an invaluable tool for the inquisitive researcher, an ardent student, and, an insightful policy maker.

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

First published in 1945, Bailey's has become the standard reference on the food chemistry and processing technology related to edible oils and the nonedible byproducts derived from oils. This Sixth Edition features new coverage of edible fats and oils and is enhanced by a second volume on oils and oilseeds. This Sixth Edition consists of six volumes: five volumes on edible oils and fats, with still one volume (as in the fifth edition) devoted to nonedible products from oils and fats. Some brand new topics in the sixth edition include: fungal and algal oils, conjugated linoleic acid, coco butter, phytosterols, and plant biotechnology as related to oil production. Now with 75 accessible chapters, each volume contains a self-contained index for that particular volume.

Our dietary intake comprises three macronutrients (protein, carbohydrate and lipid) and a large but unknown number of micronutrients (vitamins, minerals, antioxidants, etc). Good health rests, in part, on an adequate and balanced supply of these components. This book is concerned with the major sources of lipids and the micronutrients that they contain. The volume provides a source of concentrated but accessible information on the composition, properties and uses of the vegetable oils commonly found within the food industry. It includes the modifications of these oils that are commercially available by means of partial hydrogenation, fractionation and seed breeding. The major food uses are linked, wherever possible, to the composition and properties of the oils. This is a book for food scientists and technologists, chemists and technologists working in oils and fats processing, analytical chemists and quality assurance personnel.

Food Microbiology and Biotechnology: Safe and Sustainable Food Production explores the most important advances in food microbiology and biotechnology, with special emphasis on the challenges that the industry faces in the era of sustainable development and food security problems. Chapters cover broad research areas that offer original and novel highlights in microbiology and biotechnology and other related sciences. The authors discuss food bioprocesses, fermentation, food microbiology, functional foods, nutraceuticals, extraction of natural products, nano- and micro-technology, innovative processes/bioprocesses for utilization of by-products, alternative processes requiring less energy or water, among other topics. The volume relates some of the current developments in food microbiology that address the relationship between the production, processing, service and consumption of foods and beverages with the bacteriology, mycology, virology, parasitology, and immunology. Demonstrating the potential and actual developments across the innovative advances in food microbiology and biotechnology, this volume will be of great interest to students, teachers, and researchers in the areas of biotechnology and food microbiology.

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