Chemistry And Technology Of Polyols For Polyurethanes 2nd Edition Volume 1

This volume describes in detail the mechanisms of the diisocyanates and polyols polyaddition process as well as its kinetic and process aspects important for obtaining linear polyurethanes. General kinetics of the process and its experimental verification, using GPC chromatography as well as NMR spectroscopy and MALDI-ToF spectrometry, are presented. Accompanied by over 400 references, the author presents synthesis methods, physicochemical properties of linear polyurethanes (analyzed with DCS, TG, DMTA, Rtg, AFM microscopy methods) as semiproducts for foams, elastomers, lacquers and coatings. Research results concerning free surface energy of the polyurethane coatings are also presented. Special attention is given to the latest polyurethane applications, such as ecological waterborne dispersions, biodegradation resistant elastomers and coatings used as medical implants and binders for ceramic powder materials. Moreover, the book contains information on urethane-isocyanate prepolymers applications, which are potential semifinished products for elastomers, foams, coatings, adhesives and interpenetrating polymer network composites.

While polymer technology forms one of the largest areas of application of microwave technology, and the methods and procedures used therein are among the most developed, there is still a relative lack of published information on the subject. Microwave-Enhanced Polymer Chemistry and Technology describes novel approaches to polymer processing using microwave technologies. Coverage includes background and scientific data, analysis of

processes and product properties in comparison with existing technology, applications that are being used in various approaches, and the status of current research. Features of microwave irradiation, i.e., solvent-free reactions, low waste, energy efficiency, high yield, short reaction time, and possible use of alternative solvents, can play an important role in the development of green chemistry methods.

MDI and TDI are polymer building blocks with a wide range of applications in industry. Both are used in large quantities and can be found in a wide variety of industries and applications. As their use will often involve large numbers of workers they are also subject to stringent health and safety regulations. This book covers all the important topics concerning MDI and TDI and provides comprehensive coverage on the health and environmental science associated with these. Considering the risk management of both substances this is the first book to offer comprehensive discussion of health and environmental issues and includes * insights from academic, regulatory, and industrial experts * numerous photographs, spectra, tables, and graphs * additional information on physical properties and analysis * Considers the risk management of these two diisocyanates Addressing their use throughout industry this title presents an essential source of information for occupational physicians, industrial hygiene professionals, polyurethane producers, environmental scientists, chemical analysts and regulators.

This review book focuses on the structure-property relationships of polyurethane nanocomposite foams in comparison with those of conventional polyurethane composite foams. The thermal insulation properties of polyurethane foam nanocomposites are discussed along with other traits such as their morphology, mechanical and thermomechanical properties,

thermal degradation and flammability, energy absorption and saving capability, recycling and recovery behavior. In turn, the book discusses potential applications of PU nanocomposite foams and outlines the main problems that remain to be solved with regard to this important topic.

The replacement of polyols synthesized from petrochemical by polyols originating from natural products, notably from vegetable oils and animal fats, has been the subject of research projects for a number of decades. Very recently, however, the polymers industry has intensified its efforts to include the “green products”, such as biobased polyols, in applications already available in the market. Examples of such applications include polyurethane foams, elastomers and epoxides. This book describes the extraction of the natural constituents of several fruits and plants as well as their chemical conversion to polyols. In addition to the chemistry involved in the process, particular emphasis is attributed to their applications.

A practical handbook rather than merely a chemistry reference, Szycher's Handbook of Polyurethanes, Second Edition offers an easy-to-follow compilation of crucial new information on polyurethane technology, which is irreplaceable in a wide range of applications. This new edition of a bestseller is an invaluable reference for technologists, marketers, suppliers, and academicians who require cutting-edge, commercially valuable data on the most advanced uses for polyurethane, one of the most important and complex specialty polymers. internationally recognized expert Dr. Michael Szycher updates his bestselling industry "bible" With seven entirely new chapters and five that are revised and updated, this book summarizes vital contents from U.S. patent literature—one of the most comprehensive sources of up-to-date technical information. These patents illustrate the most useful technology discovered by

corporations, universities, and independent inventors. Because of the wealth of information they contain, this handbook features many full-text patents, which are carefully selected to best illustrate the complex principles involved in polyurethane chemistry and technology. Features of this landmark reference include: Hundreds of practical formulations Discussion of the polyurethane history, key terms, and commercial importance An in-depth survey of patent literature Useful stoichiometric calculations The latest "green" chemistry applications A complete assessment of medical-grade polyurethane technology Not biased toward any one supplier’s expertise, this special reference uses a simplified language and layout and provides extensive study questions after each chapter. It presents rich technical and historical descriptions of all major polyurethanes and updated sections on medical and biological applications. These features help readers better understand developmental, chemical, application, and commercial aspects of the subject.

Polyurethane and Related Foams: Chemistry and Technology is an in-depth examination of the current preparation, processing, and applications of polyurethanes (PURs) and other polymer foams. Drawing attention to novel raw materials, alternative blowing agents, and new processing methods, the book accentuates recent innovations that meet increasingly stringent environmental and fire safety regulations as well as higher quality products. Written by Dr. Kaneyoshi Ashida, a renowned pioneer of polyisocyanurate (PIR) foams, the book details the fundamental chemistry and material properties for each category of foams. The author presents mechanisms for chemical modification and foaming reactions, emphasizing the relationship between molecular design and enhanced physical properties. The latter half of the book focuses on polyurethane foams, the largest segment of the polyisocyanate-based foam

industry. It contains a fully updated description of the chemistry, raw materials, manufacturing, formulations, analyses, and testing involved in producing a wide variety of progressive applications, including building materials. This book chronicles the scientific and technological evolution of preparation and processing methods for polyisocyanate-based foams. Polyurethane and Related Foams: Chemistry and Technology offers a clear and concise guide to the technologies, methods, and best practices that help the foam industry meet higher quality, health, and environmental standards.

This book provides the most up-to-date and comprehensive coverage of the structures and properties of polysaccharides, methods for their characterization, de novo synthesis, and modification, as well as advances in structure/function correlations. Many of these topics are summarized for the first time. A brief survey of polysaccharide structures is given highlighting the most significant advances in analytical and spectroscopic technology (NMR, MS, etc.). A chapter is devoted to glycan properties, including conformational aspects, rheological and compatibility characteristics, etc. There is a comprehensive overview of the de novo synthesis of carbohydrate polymers, the transformation of glycans into novel types of polymers, and the preparation of linear and branched polysaccharide analogues and conjugates with synthetic polymers via chemical and enzymatic approaches. The book also details the factors controlling the uniformity of substitutions in homogeneous and heterogeneous derivatization processes and the elucidation of the substitution patterns of partially modified polysaccharides, through combined spectroscopic and statistical methods. One of the important developments in the glycan field is based on the increasing demand for greater control of the functional properties of these biopolymers. The book provides a very extensive account of various types of

modifications, including selective and non-selective chemical techniques, biological methods that facilitate alterations or specific functional groups and properties through the application of synthetic or degradative enzymes, and mutational or recombinant DNA techniques. The coverage extends to the control of glycan integrity and molecular weight through chemical enzymatic, physical or other methods. Electrochemical modification techniques are also discussed. A particularly up-to-date and comprehensive review is given of polysaccharide structure/property relations. Here, the effects of primary structural parameters (composition, molecular size, branching, polyelectrolyte character and non-carbohydrate substituents) are discussed, as are factors which affect glycan solubility, viscosity and gel-forming capacity. Also included are the phenomena resulting from the interactions of polysaccharides with solvents, salts, polyols, surfactants, synthetic and biological polymers. The impact of glycan structural parameters on various biological activities, such as immunological, anticoagulant, and antitumour properties, is surveyed. The book features a foreword by Dr. R.H. Marchessault, and contains almost 2,000 references to the state-of-the-art in the field, as well as an extensive subject index, over 40 tables, and 130 schemes and illustrations. It provides a wealth of valuable information for specialists in polysaccharides, biochemists, biotechnologists, enzymologists, microbiologists, organic chemists, polymer scientists, and others whose work involves these biopolymers.

Flexible and viscoelastic polyurethane foams have enormous potential as viable business ventures and have replaced many traditional materials used in everyday life. This book describes the chemistry of flexible and viscoelastic

polyurethane foams as well as calculations and formulating methodology for quality production. The author presents detailed information on foam manufacturing, based on over 45 years of hands-on industry experience.
Polyurethane Polymers: Composites and Nanocomposites concentrates on the composites and nanocomposites of polyurethane based materials. Polyurethane composites are a very important class of materials widely used in the biomedical and industrial field that offer numerous potential applications in many areas. This book discusses current research and identifies future research needs in the area. Provides an elaborate coverage of the chemistry of polyurethane, its synthesis, and properties Includes available characterization techniques Relates types of polyurethanes to their potential properties Discusses composites, nanocomposites options, and PU recycling
This book presents the reports on the developments in the field of urethane. It includes information on polyurethane automotive carpet composites, pentane blown polyurethane foams, and applications of polyols derived from renewable resources in polyurethanes and liquid crystalline polyurethanes.
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

History and future expectation of starch use; Economics and future of the starch industry; Genetics and physiology os starch development; Ennzymes in the hydrolysis and synthesis of starch; Starch oligosaccharides: linear, branched, and cyclic; Molecular structure of starch; Organization of starch granules; Fractionation of starch; Gelatinization of starch nad mechanical properties of starch pastes; Starch derivates: production and uses; Chemicals from starch; Corn and sorghum starches: production; Tapioca, arrowrrot, and sago starches: production; Potato starch: production and uses; Wheat starch: production, modification, and uses; Rice starch: production, properties, and uses; Acid-modified starch: production and uses; Starch in the paper industry; Applications of starches in foods; Starch and dextrins in prepared adhesives; Glucose - and fructose-containing sweeteners from starch; Industrial microcospy of starches; Photomicrographs of starches.

The Handbook of Composites From Renewable Materials comprises a set of 8 individual volumes that brings an interdisciplinary perspective to accomplish a more detailed understanding of the interplay between the synthesis, structure, characterization, processing, applications and performance of these advanced

materials. The handbook covers a multitude of natural polymers/ reinforcement/ fillers and biodegradable materials. Together, the 8 volumes total at least 5000 pages and offers a unique publication. Volume 1 is solely focused on the Structure and Chemistry of renewable materials. Some of the important topics include but not limited to: carbon fibers from sustainable resources; polylactic acid composites and composite foams based on natural fibres; composites materials from other than cellulosic resources; microcrystalline cellulose and related polymer composites; tannin-based foam; renewable feedstock vanillin derived polymer and composites; silk biocomposites; bio-derived adhesives and matrix polymers; biomass based formaldehyde-free bio-resin ; isolation and characterization of water soluble polysaccharide; bio-based fillers; keratin based materials in biotechnology; structure of proteins adsorbed onto bioactive glasses for sustainable composite; effect of filler properties on the antioxidant response of starch composites; composite of chitosan and its derivate; magnetic biochar from discarded agricultural biomass; biodegradable polymers for protein and peptide conjugation; polyurethanes and polyurethane composites from bio-based / recycled components.

The book gives a systematic introduction to green chemistry principles and technologies in inorganic and organic chemistry, polymer sciences and

pharmaceutical industry. It also discusses the use of biomass and marine resources for synthesis as well as renewable energy utilization and the concepts and evaluation of recycling economy and eco-industrial parks.

This book, cohesively written by an expert author with supreme breadth and depth of perspective on polyurethanes, provides a comprehensive overview of all aspects of the science and technology on one of the most commonly produced plastics. Covers the applications, manufacture, and markets for polyurethanes, and discusses analytical methods, reaction mechanisms, morphology, and synthetic routes Provides an up-to-date view of the current markets and trend analysis based on patent activity and updates chapters to include new research Includes two new chapters on PU recycling and PU hybrids, covering the opportunities and challenges in both

Volume 2 of the updated and extended 3rd edition of this work focuses on the chemistry and technology of rigid polyurethanes. Recent developments in obtaining polyols from renewable resources and the field of rigid polyurethanes have been included. This book is of interest to chemists and engineers in industry and academia as well as anyone working with polyols for the manufacture of PUs.

This first volume of the updated and extended 3rd edition of this work covers the basic chemistry and technology of oligo-polyol fabrication, the characteristics of the various

oligo-polyol families and the effects of their structure on the properties of the resulting PU. This book is of interest to chemists and engineers in industry and academia as well as anyone working with polyols for the manufacture of PUs.

Offering a unique perspective summarizing research on this timely important topic around the globe, this book provides comprehensive coverage of how molecular biomass can be transformed into sustainable polymers. It critically discusses and compares a few classes of biomass - oxygen-rich, hydrocarbon-rich, hydrocarbon and non-hydrocarbon (including carbon dioxide) as well as natural polymers - and equally includes products that are already commercialized. A must-have for both newcomers to the field as well as established researchers in both academia and industry.

Polyurethanes are one of the most dynamic groups of polymers, they find use in nearly every aspect of modern life, in applications such as furniture, bedding, seating and instrument panels for cars, shoe soles, thermoinsulation, carpet backings, packaging, adhesives, sealants, binders and as coatings. In 2004 10.6 million tons of polyurethanes were produced, in 2014 the world production was close to 20 million tons. In the last decade (2005-2015) important, worldwide developments in the area of polyols for polyurethanes were carried out, especially for polyols from renewable resources, described in detail in this second edition of the book. The main raw materials used for the production of PU are polyols and isocyanates. The first of these is the subject of this two volume handbook. Volume 1 is dedicated to polyols for elastic PU

(flexible foams, elastomers and so on). Volume 2 is dedicated to polyols for rigid PU (rigid foams, wood substitute, packaging, flotation materials and so on). The book considers the raw materials used to build the PU polymeric architecture. It covers the chemistry and technology of oligo-polyol fabrication, the characteristics of the various oligo-polyol families and the effects of the oligo-polyol structure on the properties of the resulting PU. It presents the details of oligo-polyol synthesis, and explains the chemical and physico-chemical subtleties of oligo-polyol fabrication. This book links data and information concerning the chemistry and technology of oligo-polyols for PU, providing a comprehensive overview of: Basic PU chemistry Key oligo-polyol characteristics Synthesis of the main oligo-polyol families, including: polyether polyols, filled polyether polyols, polyester polyols, polybutadiene polyols, acrylic polyols, polysiloxane polyols, aminic polyols Polyols from renewable resources Flame retardant polyols Chemical recovery of polyols Relationships between polyol structure and PU properties This book will be of interest to all specialists working with polyols for the manufacture of PU and to all researchers that would like to know more about polyol chemistry.

In the chapter polyurethanes of practical use like poly(esterurethanes), poly(ether-urethanes), and poly(urethaneurea) are described. They belong to block copolymers in which chemically connected hard and soft blocks (segments) are present. Those macromolecules are characterized by the presence of polar urethane groups in the main backbone next to ester, ether, urea, and other groups. Cross-linked Pus are

developed as advanced coatings or membranes, polymers with shape memory properties, materials resistant to biodegradation for medical application, or materials with non-elastic optical properties for electronics.

Polyurethanes are formed by reacting a polyol (an alcohol with more than two reactive hydroxyl groups per molecule) with a diisocyanate or a polymeric isocyanate in the presence of suitable catalysts and additives. Because a variety of diisocyanates and a wide range of polyols can be used to produce polyurethane, a broad spectrum of materials can be produced to meet the needs of specific applications. During World War II, a widespread use of polyurethanes was first seen, when they were used as a replacement for rubber, which at that time was expensive and hard to obtain. During the war, other applications were developed, largely involving coatings of different kinds, from airplane finishes to resistant clothing. Subsequent decades saw many further developments and today we are surrounded by polyurethane applications in every aspect of our everyday lives. While polyurethane is a product that most people are not overly familiar with, as it is generally "hidden" behind covers or surfaces made of other materials, it would be hard to imagine life without polyurethanes.

Handbook of Thermoset Plastics, Fourth Edition provides complete coverage of the chemical processes, manufacturing techniques and design properties of each polymer, along with its applications. This new edition has been expanded to include the latest developments in the field, with new chapters on radiation curing, biological adhesives,

vitrimers, and 3D printing. This detailed handbook considers the practical implications of using thermoset plastics and the relationships between processing, properties and applications, as well as analyzing the strengths and weakness of different methods and applications. The aim of the book is to help the reader to make the right decision and take the correct action on the basis of informed analysis – avoiding the pitfalls the authors' experience has uncovered. In industry, the book supports engineers, scientists, manufacturers and R&D professionals working with plastics. The information included will also be of interest to researchers and advanced students in plastics engineering, polymer chemistry, adhesives and coatings. Offers a systematic approach, guiding the reader through chemistry, processing methods, properties and applications of thermosetting polymers Includes thorough updates that discuss current practice and the new developments on biopolymers, nanotechnology, 3D printing, radiation curing and biological adhesives Uses case studies to demonstrate how particular properties make different polymers suitable for different applications Covers end-use and safety considerations

This brief outlines the most recent advances in the production of polyols and polyurethanes from renewable resources, mainly vegetable oils, lignocellulosic biomass, starch, and protein. The typical processes for the production of polyols from each of the above mentioned feedstocks are introduced and the properties of the resultant polyols and polyurethanes are also discussed.

A comprehensive account of the physical / mechanical behaviour of polyurethanes (PU ?s) elastomers, films and blends of variable crystallinity. Aspects covered include the elasticity and inelasticity of amorphous to crystalline PUs, in relation to their sensitivity to chemical and physical structure. A study is made of how aspects of the constitutive responses of PUs vary with composition: the polyaddition procedure, the hard segment, soft segment and chain extender (diols and diamines) are varied systematically in a large number of systems of model and novel crosslinked andthermoplastic PUs. Results will be related to: microstructural changes, on the basis of evidence from x-ray scattering (SAXS and WAXS), and also dynamic mechanical analyses (DMA), differential scanning calorimetry (DSC) and IR dichroism. Inelastic effects will be investigated also by including quantitative correlations between the magnitude of the Mullins effect and the fractional energy dissipation by hysteresis under cyclic straining, giving common relations approached by all the materials studied. A major structural feature explored is the relationship between the nature of the hard segment (crystallising or not) and that of the soft segments. Crystallinity has been sometimes observed in the commercial PUs hard phase but this is usually limited to only a few percent for most hard segment structures when solidified from the melt. One particular diisocyanate, 4,4’-dibenzyl diisocyanate (DBDI) that, in the presence of suitable chain extenders (diols or diamines), gives rise to significant degrees of crystallinity [i-iii] and this is included in the present work. Understanding the reaction pathways involved, in resolving the subtle morphological evolution at the nanometre level, and capturing mathematically the complex, large-deformation nonlinear viscoelastic mechanical behaviour are assumed to bring new important insights in the world basic research in polyurethanes and towards applied industrial research in this area.

Catalysis is an area of chemical sciences which has fascinated a wide range of academicians, researchers, chemical technologists and industries throughout the world. Progress in this field has been made owing to the thrust provided by this research and commercial interest. The field of catalysis is interdisciplinary by its nature, as it requires knowledge of organic synthesis, coordination and organometallic chemistry, reaction kinetics and mechanisms, stereochemical concepts and materials science. Fundamentals and Prospects of Catalysis highlights many important topics and sub-disciplines in catalysis by presenting 7 chapters on different but varied catalytic processes. This volume presents the following topics:· Organocatalytic Asymmetric Synthesis of Spiroacetals and Bridged Acetals· Design and Development of Bimetallic Enantioselective Salen Co Catalysts for The Hydrolytic Kinetic Resolution of Terminal Epoxides· Recent Trend in Asymmetric Heterogeneous Flow Catalysis· Ball Milling: A Green Tool in Synthetic Organic Chemistry· Recent Advances in the Developments of Enantioselective Electrophilic Fluorination Reactions via Organocatalysis· Green and Sustainable Biocatalytic Routes to Prepare Biobased Polyols as Precursors for Polyurethanes with Comparison of Existing Biobased Polyol Technology· Polymers Used as Catalysts

This book considers the raw materials used to build the polyurethane polymeric architecture. It covers the chemistry and technology of oligo-polyol fabrication, the characteristics of the various oligo-polyol families and the effects of the oligo-polyol structure on the properties of the resulting polyurethane. It presents the details of oligo-polyol synthesis, and explains the chemical and physico-chemical subtleties of oligo-polyol fabrication. This book will be of interest to all specialists working with polyols for the manufacture of polyurethanes and to all researchers that would like to know more about polyol chemistry.

Chemistry and Technology of Isocyanates is a comprehensive book on isocyanate chemistry and technology. It highlights the industrial applications of diisocyanates in the manufacture of flexible and rigid foams, elastomers, coatings and adhesives; discusses ionomers used in water-based coatings, polymer networks and biomedical polymers; and reviews current and future environmental issues, including toxicity and safe handling of isocyanates, recycling of isocyanate derived polymers and monomers derived from natural products.

Chemistry and Technology of Polyols for PolyurethanesiSmithers Rapra Publishing

Modern techniques to produce nanoparticles, nanomaterials, and nanocomposites are based on approaches that frequently involve high costs, inefficiencies, and negative environmental impacts. As such, there has been a real drive to develop and apply approaches that are more efficient and benign. The Handbook of Greener Synthesis of Nanomaterials and Compounds provides a comprehensive review of developments in this field, combining foundational green and nano-chemistry with the key information researchers need to assess, select and apply the most appropriate green synthesis approaches to their own work. Volume 2: Synthesis at the Macroscale and Nanoscale explores synthesis at different scales. Beginning with a selection of chapters discussing a range of macroscale topics, the book goes on to explore such important areas as metal nanoparticle synthesis, biogenic synthesis, and synthesis of enzymes. Further chapters explore the role of Metal Organic Frameworks in greener synthesis, synthesis from renewable sources, and impacts of nanomaterials synthesized by greener methods. Discusses the synthesis of widely different groups of chemical compounds and distinct materials Reviews synthesis at both the macro and nanoscales, including information on metal-organic frameworks, carbon dots and ionic liquids Provides examples of applications to support

learning and guide implementation of theory in practice

Sugar replacement in food and beverage manufacture no longer has just an economic benefit. The use of ingredients to improve the nutritional status of a food product is now one of the major driving forces in new product development. It is therefore important, as options for sugar replacement continue to increase, that expert knowledge and information in this area is readily available. Sweeteners and Sugar Alternatives in Food Technology provides the information required for sweetening and functional solutions, enabling manufacturers to produce processed foods that not only taste and perform as well as sugar-based products, but also offer consumer benefits such as calorie reduction, dental health benefits, digestive health benefits and improvements in long term disease risk through strategies such as dietary glycaemic control. Part I of this comprehensive book addresses these health and nutritional considerations. Part II covers non-nutritive, high-intensity sweeteners, providing insights into blending opportunities for qualitative and quantitative sweetness improvement as well as exhaustive application opportunities. Part III deals with reduced calorie bulk sweeteners, which offer bulk with fewer calories than sugar, and includes both the commercially successful polyols as well as tagatose, an emerging functional bulk sweetener. Part IV looks at the less well-established sweeteners that do not conform in all respects to what may be considered to be standard sweetening properties. Finally, Part V examines bulking agents and multifunctional ingredients. Summary tables at the end of each section provide valuable, concentrated data on each of the sweeteners covered. The book is directed at food scientists and technologists as well as ingredients suppliers.

This ninth international conference has seen contributions over the years from academia,

processors, materials suppliers and end users. Addressing the key issues for this ever expanding and highly competitive market, which has grown this conference into the well established event that it is today. The conference was dedicated to the critical role of blowing agents in foamed plastics and rubber. Foamed materials are being enhanced to replace dense solid polymers, reducing weight and costs. Chemical and environmental legislation is constantly changing and the foam industry is adapting to meet demands. The proceedings include papers from industry leaders such as BASF AG, Solvay, 3M Europe, Zotefoams plc and Trexel GmbH and will appeal to those involved in the formulation and application of blowing agents and techniques to produce expanded or foamed polymer substrates.

Your personal Ullmann's: Chemical and physical characteristics, production processes and production figures, main applications, toxicology and safety information are all to be found here in one single resource - bringing the vast knowledge of the Ullmann's Encyclopedia to the desks of industrial chemists and chemical engineers. The ULLMANN'S perspective on polymers and plastics brings reliable information on more than 1500 compounds and products straight to your desktop Carefully selected "best of" compilation of 61 topical articles from the Encyclopedia of Industrial Chemistry on economically important polymers provide a wealth of chemical, physical and economic data on more than 1000 different polymers and hundreds of modifications Contains a wealth of information on the production and use of all industrially relevant polymers and plastics, including organic and inorganic polymers, fibers, foams and resins Extensively updated: more than 30% of the content has been added or updated since the launch of

the 7th edition of the Ullmann's encyclopedia in 2011 and is now available in print for the first time 4 Volumes

Sweeteners: Nutritional Aspects, Applications, and Production Technology explores all essential aspects of sugar-based, natural non-sugar-based, and artificial sweeteners. The book begins with an overview presenting general effects, safety, and nutrition. Next, the contributors discuss sweeteners from a wide range of scientific and lifestyle perspectives. Topics include: The chemistry and functional properties of monosaccharides, oligosaccharides, polysaccharides, and sugar polyols Analytical methodologies for determining low-calorie nonnutritive sweeteners Honey, syrups, and their physicochemical aspects and applications Sweeteners such as "sykin" and raisin, prune, apple, and grape juice concentrate Quality control, production, handling, storage, safety, legislation, and risk assessment of sweeteners The impact of sweeteners and sugar alternatives on nutrition and health Environmental and health concerns from the use of genetically modified (GM) herbicide-tolerant sugar beets and GM high fructose corn syrup Inulin and oligofructose as soluble dietary fibers derived from chicory root As manufacturers strive to produce healthier and safer products with better taste, new avenues of inquiry are opening up with respect to both the sources and the processing of sweeteners. This volume provides a solid starting point for researchers and product developers in the food and beverage industry.

This volume incorporates 13 contributions from renowned experts from the relevant

research fields that are related biodegradable and biobased polymers and their environmental and biomedical applications. Specifically, the book highlights: Developments in polyhydroxyalkanoates applications in agriculture, biodegradable packaging material and biomedical field like drug delivery systems, implants, tissue engineering and scaffolds The synthesis and elaboration of cellulose microfibrils from sisal fibres for high performance engineering applications in various sectors such as the automotive and aerospace industries, or for building and construction The different classes and chemical modifications of tannins Electro-activity and applications of Jatropha latex and seed The synthesis, properties and applications of poly(lactic acid) The synthesis, processing and properties of poly(butylene succinate), its copolymers, composites and nanocomposites The different routes for preparation polymers from vegetable oil and the effects of reinforcement and nano-reinforcement on the physical properties of such biobased polymers The different types of modified drug delivery systems together with the concept of the drug delivery matrix for controlled release of drugs and for antitumor drugs The use of nanocellulose as sustainable adsorbents for the removal of water pollutants mainly heavy metal ions, organic molecules, dyes, oil and CO2 The main extraction techniques, structure, properties and different chemical modifications of lignins Proteins and nucleic acids based biopolymers The role of tamarind seed polysaccharide-based multiple-unit systems in sustained drug release The “greening” of industry processes, i.e. making them more sustainable, is a popular

and often lucrative trend which has emerged over recent years. The 3rd volume of Green Chemical Processing considers sustainable chemistry in the context of corporate interests. The American Chemical Society's 12 Principles of Green Chemistry are woven throughout this text as well as the series to which this book belongs.