

Handbook Of Biopolymers And Biodegradable Plastics Properties Processing And Applications Plastics Design Library

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. This 3rd volume of the Handbook is solely focused on the Physico-Chemical and Mechanical Characterization of renewable materials. Some of the important topics include but not limited to: structural and biodegradation characterization of supramolecular PCL/HAP nano-composites; different characterization of solid bio-fillers based agricultural waste material; poly (ethylene-terephthalate) reinforced with hemp fibers; poly (lactic acid) thermoplastic composites from renewable materials; chitosan –based composite materials: fabrication and characterization; the use of flax fiber reinforced polymer (FFRP) composites in the externally reinforced structures for seismic retrofitting monitored by transient thermography and optical techniques; recycling and reuse of fiber reinforced polymer wastes in concrete composite materials; analysis of damage in hybrid composites subjected to ballistic impacts; biofiber reinforced acrylated epoxidized soybean oil (AESO) biocomposites; biopolyamides and high performance natural fiber-reinforced biocomposites; impact of recycling on the mechanical and thermo-mechanical properties of wood fiber based HDPE and PLA composites; lignocellulosic fibers composites: an overview; biodiesel derived raw glycerol to value added products; thermo-mechanical characterization of sustainable structural composites; novel pH sensitive composite hydrogel based on functionalized starch/clay for the controlled release of amoxicillin; preparation and characterization of biobased thermoset polymers from renewable resources; influence of natural fillers size and shape into mechanical and barrier properties of biocomposites; composite of biodegradable polymer blends of PCL/PLLA and coconut fiber - the effects of ionizing radiation; packaging composite materials from renewable resources; physicochemical properties of ash based geopolymer concrete; a biopolymer derived from castor oil polyurethane; natural polymer based biomaterials; physical and mechanical properties of polymer membranes from renewable resources

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. This 8th volume of the Handbook is solely focused on the Nanocomposites: Advanced Applications. Some of the important topics include but not limited to: virgin and recycled polymers applied to advanced nanocomposites; biodegradable polymer-carbon nanotube composites for water and wastewater treatment; eco-friendly nanocomposites of chitosan with natural

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extracts, antimicrobial agents and nanometals; controllable generation of renewable nanofibrils from green materials and their application in nanocomposites; nanocellulose and nanocellulose composites; poly (lactic acid) biopolymer composites and nanocomposites for biomedical and biopackaging applications; impact of nanotechnology in water treatment: carbon nanotube and graphene; nanomaterials in energy generation; sustainable green nanocomposites from bacterial bioplastics for food packaging applications; PLA-nanocomposites: a promising material for future from renewable resources; bio-composites from renewable resources: preparation and applications of chitosan-clay nanocomposites; nano materials: an advanced and versatile nano additive for kraft and paper industries; composites and nanocomposites based on polylactic acid obtaining; cellulose-containing scaffolds fabricated by electrospinning: applications in tissue engineering and drug delivery; biopolymer-based nanocomposites for environmental applications; calcium phosphate nanocomposites for biomedical and dental applications: recent developments; chitosan-metal nanocomposites: synthesis, characterization and applications; multi-carboxyl functionalized nano-cellulose/nano-bentonite composite for the effective removal and recovery of metal ions; biomimetic gelatin nanocomposite as a scaffold for bone tissue repair; natural starches-blended ionotropically-gelled microparticles/beads for sustained drug release and ferrogels: smart materials for biomedical and remediation applications.

Plastic Waste and Recycling: Environmental Impact, Societal Issues, Prevention, and Solutions begins with an introduction to the different types of plastic materials, their uses, and the concepts of reduce, reuse and recycle before examining plastic types, chemistry and degradation patterns that are organized by non-degradable plastic, degradable and biodegradable plastics, biopolymers and bioplastics. Other sections cover current challenges relating to plastic waste, explain the sources of waste and their routes into the environment, and provide systematic coverage of plastic waste treatment methods, including mechanical processing, monomerization, blast furnace feedstocks, gasification, thermal recycling, and conversion to fuel. This is an essential guide for anyone involved in plastic waste or recycling, including researchers and advanced students across plastics engineering, polymer science, polymer chemistry, environmental science, and sustainable materials.

Hollow Glass Microspheres for Plastics, Elastomers, and Adhesives Compounds brings together, for the first time, all of the practical and theoretical aspects of glass bubble manufacturing, including its properties, processing, and applications, as well as regulatory, environmental, and health and safety aspects. The book enables the reader to evaluate the applicability of glass bubbles to various applications involving polymers in thermoplastics, elastomers, liquid thermosets, and adhesives. It is an indispensable guide for material selection and improving sustainability of products. Related data sets and case studies complement the book, making it a reference book for plastics processors, product designers, and engineers working with plastics and elastomers, and anyone who wants to improve functionality and performance, make their products lighter, longer lasting, and stronger, all while reducing costs and material needs. Provides best practices for plastics and rubber processing with glass bubbles Synthesizes all of the practical and theoretical aspects of glass bubble manufacturing, including its properties, applications, and more Describes different end-use applications and how glass bubbles influence various properties, including

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mechanical, structural, thermal, and optical properties in these applications A one-stop reference book that also covers the regulatory and environmental aspects of this important additive

This book offers concise information on the properties of polymeric materials, particularly those most relevant to physical chemistry and chemical physics. Extensive updates and revisions to each chapter include eleven new chapters on novel polymeric structures, reinforcing phases in polymers, and experiments on single polymer chains. The study of complex materials is highly interdisciplinary, and new findings are scattered among a large selection of scientific and engineering journals. This book brings together data from experts in the different disciplines contributing to the rapidly growing area of polymers and complex materials. Polymers are one of the most fascinating materials of the present era finding their applications in almost every aspects of life. Polymers are either directly available in nature or are chemically synthesized and used depending upon the targeted applications. Advances in polymer science and the introduction of new polymers have resulted in the significant development of polymers with unique properties. Different kinds of polymers have been and will be one of the key in several applications in many of the advanced pharmaceutical research being carried out over the globe. This 4-partset of books contains precisely referenced chapters, emphasizing different kinds of polymers with basic fundamentals and practicality for application in diverse pharmaceutical technologies. The volumes aim at explaining basics of polymers based materials from different resources and their chemistry along with practical applications which present a future direction in the pharmaceutical industry. Each volume offer deep insight into the subject being treated. Volume 1: Structure and Chemistry Volume 2: Processing and Applications Volume 3: Biodegradable Polymers Volume 4: Bioactive and Compatible Synthetic/Hybrid Polymers

While the prevalence of plastics and elastomers in medical devices is now quite well known, there is less information available covering the use of medical devices and the applications of polymers beyond medical devices, such as in hydrogels, biopolymers and silicones beyond enhancement applications, and few books in which these are combined into a single reference. This book is a comprehensive reference source, bringing together a number of key medical polymer topics in one place for a broad audience of engineers and scientists, especially those currently developing new medical devices or seeking more information about current and future applications. In addition to a broad range of applications, the book also covers clinical outcomes and complications arising from the use of the polymers in the body, giving engineers a vital insight into the real world implications of the devices they're creating. Regulatory issues are also covered in detail. The book also presents the latest developments on the use of polymers in medicine and development of nano-scale devices. Gathers discussions of a large number of applications of polymers in medicine in one place Provides an insight into both the legal and clinical implications of device design Relevant to industry, academic and medical professionals Presents the latest developments in the field, including medical devices on a nano-scale Biopolymers for Food Design, Volume 20 in the Handbook of Bioengineering series, describes how biopolymers have made a major impact in the food industry, from food design, to food control and safety. Biopolymers can be used in the development of novel nutritional alternatives, to replace difficult to obtain food products, or for foods inaccessible or inappropriate for a particular

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population (i.e. allergic to specific components). In addition, some polymers can be used as functional ingredients, and can also represent efficient scaffolds for food ingredients with therapeutic values. This valuable reference is ideal for those looking for new solutions for the food industry. Presents common biopolymers and their applications in food bioengineering, from food design, to control and safety Identifies how the use of certain biopolymers can result in faster production time and reduced costs Includes cutting-edge technologies used in research for food design and other food-related applications Discusses the use of biopolymers in food packaging, shelf-life extension, and the creation of novel food products

Biopolymers have the potential to cut carbon emissions and reduce carbon dioxide in the atmosphere. The carbon dioxide released when they degrade can be reabsorbed by plants, which makes them close to carbon neutral. Biopolymers are biodegradable and some are compostable, too. This book presents key topics on biopolymers, including their synthesis, characterization, and physiochemical properties, and discusses their applications in key areas such as biomedicine, agriculture, and environmental engineering. It will serve as an in-depth reference for the biopolymer industry--material suppliers and processors, producers, and fabricators--and engineers and scientists who are designing biopolymers or evaluating options for switching from traditional plastics to biopolymers.

Biopolymers and Biodegradable Plastics are a hot issue across the Plastics industry, and for many of the industry sectors that use plastic, from packaging to medical devices and from the construction industry to the automotive sector. This book brings together a number of key biopolymer and biodegradable plastics topics in one place for a broad audience of engineers and scientists, especially those designing with biopolymers and biodegradable plastics, or evaluating the options for switching from traditional plastics to biopolymers. Topics covered include preparation, fabrication, applications and recycling (including biodegradability and compostability). Applications in key areas such as films, coatings controlled release and tissue engineering are discussed. Dr Ebnesajjad provides readers with an in-depth reference for the plastics industry – material suppliers and processors, bio-polymer producers, bio-polymer processors and fabricators – and for industry sectors utilizing biopolymers – automotive, packaging, construction, wind turbine manufacturers, film manufacturers, adhesive and coating industries, medical device manufacturers, biomedical engineers, and the recycling industry. Essential information and practical guidance for engineers and scientists working with bioplastics, or evaluating a migration to bioplastics. Includes key published material on biopolymers, updated specifically for this Handbook, and new material including coverage of PLA and Tissue Engineering Scaffolds. Coverage of materials and applications together in one handbook enables engineers and scientists to make informed design decisions.

"Applied Plastics Engineering Handbook: Processing, Materials, and Applications, Second Edition, "covers both the polymer basics that are helpful to bring readers quickly up-to-speed if they are not familiar with a particular area of plastics processing and the recent developments that enable practitioners to discover which options best fit their requirements. New chapters added specifically cover polyamides, polyimides, and polyesters. Hot topics such as 3-D printing and smart plastics are also included, giving plastics engineers the information they need to take these embryonic technologies and deploy them in their own work. With

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the increasing demands for lightness and fuel economy in the automotive industry (not least due to CAFE standards), plastics will soon be used even further in vehicles. A new chapter has been added to cover the technology trends in this area, and the book has been substantially updated to reflect advancements in technology, regulations, and the commercialization of plastics in various areas. Recycling of plastics has been thoroughly revised to reflect ongoing developments in sustainability of plastics. Extrusion processing is constantly progressing, as have the elastomeric materials, fillers, and additives which are available. Throughout the book, the focus is on the engineering aspects of producing and using plastics. The properties of plastics are explained, along with techniques for testing, measuring, enhancing, and analyzing them. Practical introductions to both core topics and new developments make this work equally valuable for newly qualified plastics engineers seeking the practical rules-of-thumb they don't teach you in school and experienced practitioners evaluating new technologies or getting up-to-speed in a new field. Presents an authoritative source of practical advice for engineers, providing guidance from experts that will lead to cost savings and process improvements Ideal introduction for both new engineers and experienced practitioners entering a new field or evaluating a new technology Updated to include the latest technology, including 3D Printing, smart polymers, and thorough coverage of biopolymers and biodegradable plastics"

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 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

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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.

This second edition provides a comprehensive discussion of contemporary materials used in biomedical research and development. The pedagogical writing style and structure provides students with an understanding of the fundamental concepts necessary to pursue research and industrial work in this growing area of biomedical science, including characteristics of biomaterials, biological processes, biocompatibility, and applications of materials in implants and medical instruments. Written by leading researchers in the field, this volume highlights important topics associated with biomedical engineering, medicine and surgery. The revised text contains updates that reflect recent technological advances in biomedical materials. It contains information on new characterization methods and applications for biomedical materials and incorporates suggestions that were offered by readers and educators using the first edition over the years. This textbook takes the reader to the forefront of biomedical materials development, providing graduate students with a taste of how the field is changing, while also serving as a useful reference to physicians and engineers.

Covers the latest research in green chemistry principles for new, environmentally friendly processes in the fields of engineering, science and technology.

Multidrug-resistant bacteria play a significant role in public health by destroying the potency of existing antibiotics. Meanwhile, cancer remains one of the most common health problems that impact society, resulting in many deaths worldwide. Novel strategies are required to combat antimicrobial resistance and create efficient anticancer drugs that could revolutionize treatment. Nanomedicine is one such innovation that plays a significant role in developing alternative and more effective treatment strategies for antimicrobial resistance and cancer theranostics. The Handbook of Research on Nano-Strategies for Combatting Antimicrobial Resistance and Cancer is an essential scholarly resource that examines (1) how to overcome the existing, traditional approaches to combat antimicrobial resistance and cancer; (2) how to apply multiple mechanisms to target the cancer cells and microbes; and (3) how the nanomaterials can be used as carriers. Featuring a range of topics such as bacteriophage, nanomedicine, and oncology, this book is ideal for molecular biologists, microbiologists, nanotechnologists, academicians, chemists, pharmacists, oncologists, researchers, healthcare professionals, and students.

"The Handbook of Bioplastics & Biocomposites Engineering Applications brings together scientists, from academia and industries, to report on current research and applications, in the bioplastics and biocomposites arena, that integrates pure and applied sciences such as chemistry, engineering and materials science. The Handbook focuses on five main categories of applications: Packaging, Civil Engineering, Biomedical, Automotive, General Engineering"--

This new Handbook provides engineers and scientists with the information and practical guidance needed to successfully design and manufacture products using biopolymers and biodegradable plastics. Biopolymers and biodegradable plastics are a hot issue

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across the plastics industry, and for many of the industry sectors that use plastic: from packaging to medical devices and from the construction industry to the automotive sector. This book brings together in one place a number of key biopolymer and biodegradable plastics topics-in chapters previously published as well as updated and new chapters-for a broad audience of engineers of and scientists, especially those designing with biopolymers and biodegradable plastics or evaluating the options for switching from traditional plastics to biopolymers. Topics covered include preparation, fabrication, applications and recycling (including biodegradability and compostability). Applications in key areas such as films, coatings, controlled release, and tissue engineering are discussed.

Biopolymers Reuse, Recycling and Disposal is the first book covering all aspects of biopolymer waste management and post-usage scenarios, embracing existing technologies, applications, and the behavior of biopolymers in various waste streams. The book investigates the benefits and weaknesses, social, economic and environmental impacts, and regulatory aspects of each technology. It covers different types of recycling and degradation, as well as life cycle analysis, all supported by case studies, literature references, and detailed information about global patents. Patents in particular—comprising 80% of published technical literature in this emerging field, widely scattered, and often available in Japanese only—are a key source of information. Dr. Niaounakis draws on disciplines such as polymer science, management, biology and microbiology, organic chemistry, environmental chemistry, and patent law to produce a reference guide for engineers, scientists and other professionals involved in the development and production of biopolymers, waste management, and recycling. This information is also valuable for regulators, patent attorneys and academics working in this field. Explores techniques and technologies involved in managing biopolymers in the waste stream, including recycling and upcycling Provides waste management and recycling professionals the knowledge they need to plan for the exponential growth in biopolymer waste Helps engineers and product designers fully consider the end-of-life aspects of their environmentally sustainable 'green' products and solutions

Biopolymers and biodegradable plastics are finding new applications in various sectors, from packaging, to medical, automotive and many more. As synthetic plastics are increasingly replaced by their bioplastic equivalents, engineers are facing new challenges including processing, costs, environmental sustainability and - ultimately - developing successful products.

Biopolymers: Processing and Products, the second book of a trilogy dedicated to biopolymers, gives a detailed insight into all aspects of processing, seamlessly linking the science of biopolymers to the latest trends in the development of new products. Processes covered in the book include blending, compounding, treatment, and shaping, as well as the formation of biocomposites. Biopolymer coatings and adhesives are also investigated. This book unique in its coverage contains information retrieved mainly from patents, which form the bulk of the book. The coverage of processing will help engineers and designers to improve output and efficiency of every stage of the product development process, and will form an indispensable tool in selecting the right biopolymer and processing technique for any given application, covering medical, automotive, food packaging and more. It will assist also engineers, material scientists and researchers to improve existing biopolymer processes and deliver better products at

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lower cost. Multi-disciplinary approach and critical presentation of all available processing techniques and new products of biopolymers Contains information not to be found in any other book Self-contained chapters

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. This 5th volume Handbook is solely focused on Biodegradable Materials. Some of the important topics include but not limited to: Rice husk and its composites; biodegradable composites based on thermoplastic starch and talc nanoparticles; recent progress in biocomposites of biodegradable polymer; microbial polyesters: production and market; biodegradable and bio absorbable materials for osteosynthesis applications; biodegradable polymers in tissue engineering; composites based on hydroxyapatite and biodegradable polylactide; biodegradable composites; development of membranes from bio-based materials and their applications; green biodegradable composites based on natural fibers; fully biodegradable all-cellulose composites; natural fiber composites with bio-derivative and/or degradable polymers; synthetic biodegradable polymers for bone tissue engineering; polysaccharides as green biodegradable platforms for building-up electroactive composite materials; biodegradable polymer blends and composites from seaweeds; biocomposites scaffolds derived from renewable resources for bone tissue repair ; pectin-based composites; recent advances in conductive composites based on biodegradable polymers for regenerative medicine applications; biosynthesis of PHAs and their biomedical applications; biodegradable soy protein isolate/poly (vinyl alcohol) packaging films and biodegradability of bio-based polymeric materials in natural environment.

This book presents recent advances in the development of biomaterials for industrial applications, and discusses the potential for substituting environmentally hazardous substances with environmentally friendly and degradable components. Focusing on both the material development and production technologies, it reviews different materials, as well as new production technologies and application areas. It also highlights the importance of incorporating organic materials into different composites to enable consumption of otherwise waste materials. Further it addresses biopolymers for the food industry, e.g. edible films and coatings in food production and biodegradable materials; the automotive industry; bio fuels, such as biodiesel based on organic constituents; and green composites in marine applications. Environmental protection aspects related to the protection of cultural heritage, and new nanoparticles, such as nano zerovalent iron, are also reviewed. Aimed at young research ers, professionals, chemical engineers and marine engineers, the book is the result of the joint efforts of different academic and research institutions participating in the WIMB Tempus project, 543898-TEMPUS-1-2013-1-ES-TEMPUS-JPHES, "Development of Sustainable Interrelations between Education, Research and Innovation at WBC Universities in Nanotechnologies and Advanced Materials where Innovation Means Business", co-funded by the European Union Tempus Program.

The first part of this volume focuses on biosynthesis, metabolism, biodegradation, functions, properties and applications of

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miscellaneous polymers, such as hemozoin, thymine-containing styrene polymers, polythioesters, polyphosphate, polyhydroxymethionine, polyketides, and natural polyacetals. The second part then goes on to treat the biodegradation of a wide range of synthetic polymers, e.g. substituted cellulose nylon polycarbonate polyvinyl alcohol polyurethanes polystyrenes polyethylene polyanhydrides

June 28-29, 2018 Berlin, Germany Key Topics : Natural Polymers, Advanced Biopolymers, Bioplastics, Bioinformatics, Biopolymer Applications, Biopolymers as Materials, Green Composites in Biopolymers, Biopolymers for Tissue Engineering and Regenerative Medicine, Biodegradable polymers, Biopolymers in Biomedical Applications, Biopolymers in Biofibers & Microbial Cellulose, Recycling & Waste management of Biopolymers, Future & Scope of Biopolymers, Biopolymer Companies & Market, Materials play a key role in our search for solutions to many pressing issues. They underpin industries, are critical for developing new consumer goods, are essential components for medical diagnosis, offer hope for the treatment of currently incurable diseases, and help solve environmental problems. This is a guide to materials for the future

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. This 6th volume Handbook is solely focused on Polymeric Composites. Some of the important topics include but not limited to: Keratin as renewable material for developing polymer composites; natural and synthetic matrices; hydrogels in tissue engineering; smart hydrogels: application in bioethanol production; principle renewable biopolymers; application of hydrogel biocomposites for multiple drug delivery; nontoxic holographic materials; bioplasticizer - epoxidized vegetable oils-based poly (lactic acid) blends and nanocomposites; preparation, characterization and adsorption properties of poly (DMAEA) – cross-linked starch gel copolymer in waste water treatments; study of chitosan crosslinking hydrogels for absorption of antifungal drugs using molecular modelling; pharmaceutical delivery systems composed of chitosan; eco-friendly polymers for food packaging; influence of surface modification on the thermal stability and percentage of crystallinity of natural abaca fiber; influence of the use of natural fibers in composite materials assessed on a life cycle perspective; plant polysaccharides-blended ionotropically-gelled alginate multiple-unit systems for sustained drug release; vegetable oil based polymer composites; applications of chitosan derivatives in wastewater treatment; novel lignin-based materials as a products for various applications; biopolymers from renewable resources and thermoplastic starch matrix as polymer units of multi-component polymer systems for advanced applications; chitosan composites: preparation and applications in removing water pollutants and

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recent advancements in biopolymer composites for addressing environmental issues.

Annotation An essential reference for engineers, scientists and product designers that already work with polymers and plastics who wish to convert to a sustainable plastic. It covers the properties, synthesis and polymerisation of PLA and processing techniques involved in fabricating parts from this polymer.

This reference guide brings together a wide range of essential data on the effect of long term thermal exposure on plastics and elastomers, enabling engineers to make optimal material choices and design decisions. The data is supported by explanations of how to make use of the data in real-world engineering contexts. High heat environments are common in automotive, oil and gas, household appliances, coatings, space and aeronautics and many more end uses. As a result, thermal stability data are critically important to engineers designing parts particularly that replace metals, work that is common today as they look for ways to reduce weight. The data tables in this book enable engineers and scientists to select the right materials for a given product or application across a wide range of sectors. Several polymer classes are covered, including polyolefins, polyamides, polyesters, elastomers, fluoropolymers, biodegradable plastics and more, saving readers the need to contact suppliers. The book also includes introductory sections to provide background on plastic/polymer chemistry and formulation and plastic testing methods, providing the knowledge required to make best use of the data. Essential data and practical guidance for engineers and scientists working with plastics for use in high temperature environments Includes introductory chapters on polymer chemistry and its effect on thermal stability, providing the underpinning knowledge required to utilize the data Covers a wide range of commercial polymer classes, saving readers the need to contact suppliers

The book gives detailed insights into the application of nanomaterials in food packaging, covering recent innovations as well as future perspectives. The chapters provide a comprehensive review on the types of nanomaterials used in food packaging and their processing and characterization. In addition, the book discusses the use of nanoparticles in the development of active and functional food packaging and the related environmental and toxicological aspects.

This unique volume covers the results of the world-wide efforts to implement natural polymers as engineering plastics and the use of their inherent properties. The processing opportunities and the applications of the natural materials as reinforcement of polymer composites are discussed, including the structural, morphological and thermal characterization as well as the mechanical behavior of the obtained materials. Also covered is the preparation of biodegradable homopolymers, blends and composites, which involves chemical reactions, regardless of the type of the starting material. This first systematic scientific reference in the area of micro- and nanostructured biopolymer systems discusses in two volumes the morphology, structure, dynamics, properties and applications of all important biopolymers, as well as their

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blends, composites, interpenetrating networks and gels. Selected leading researchers from industry, academia, government and private research institutions around the globe comprehensively review recent accomplishments in the field. They examine the current state of the art, new challenges, and opportunities, discussing all the synthetic routes to the generation of both micro- and nano-morphologies, as well as the synthesis, characterization and application of porous biopolymers. An outstanding resource for anyone involved in the field of eco-friendly biomaterials for advanced technologies.

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Handbook of Biodegradable Polymers, the seventh volume in the Drug Delivery and Targeting book series, provides a source manual for synthetic procedures, properties and applications of bioerodible polymers. The authors describe widely available materials such as polyactides, collagen and gelatin, as well as polymers of emerging importance, such as the genetically-engineered and elastin-based polymers which are either proprietary or in early stages of development. Section 1 addresses synthetic absorbable polymers, and Section 2 profiles natural, semi-synthetic and biosynthetic polymers. Section 3 discusses the surface characterization of degradable polymers, the modeling of biodegradation and non-medical polymers. This book is ideal for researchers from academia and industry as well as chemists,

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pharmacists and physicians who deal with biopolymers, drug delivery and targeting, bioengineering and implantable devices.

The 21st century offers vast challenges for researchers all around the globe, especially regarding the effective use of sustainable polymers and their materials for different applications. With this focus, sustainable polymers are now rising as one of the most feasible alternatives to traditional synthetic polymers/materials for a variety of industrial uses. This book is an archival reference for researchers and students working in the field of sustainable polymers and their applications in industry. It focuses on the processing and applications of diverse sustainable polymers procured from different biorenewable resources that have been rarely reported so far in a single book.

This handbook focuses on biopolymers for both environmental and biomedical applications. It shows recent advances in technology in all areas from chemical synthesis or biosynthesis to end use applications. These areas have not been covered in a single book before and they include biopolymers for chemical and biotechnological modifications, material structures, characterization, processing, properties, and applications. After the introduction which summarizes the importance of biopolymer in the market, the book covers almost all the topics related to polysaccharides, biofibers, bioplastics, biocomposites, natural rubber, gums, bacterial and blood compatible polymers, and applications of biopolymers in various fields.

"This book provides contemporary information that brings together current knowledge and practices in the value-chain of mango fruit from production through consumption"--

Essential to anyone working in the field, this reference focuses on latest advancements in tissue construction, repair and regeneration focusing on developments in gene and drug therapy, the evolution of tissue-engineered products, and new technologies for the design of functional tissues and organ systems.

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