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Biobased Materials For Polyurethane Dispersions ***2022-09-24***

MYLA HIGGINS

Developments in Surface Contamination and Cleaning - Vol 2 John Wiley & Sons Bio-Based Flame Retardants for Polymeric Materials provides a comprehensive overview of flame retardants derived directly and indirectly from plant sources, drawing on cutting-edge research and covering preparation methods, testing and evaluation techniques, enhanced properties, and end applications. Chapters introduce bio-based materials in the context of additives for flame retardancy, explaining fundamentals and testing methods and analyzing synthetic approaches and the potential advantages of pursuing a bio-based approach. This is followed by detailed coverage of bio-based retardants, with each chapter covering a specific source and guiding the reader systematically through preparation techniques, evaluation methods, properties and applications. Throughout the book, the latest progress in the field is critically reviewed, and there is a continual emphasis on novel approaches to achieve enhanced properties and performant materials. This is an essential guide for all those with an interest in innovative, sustainable flame retardant additives for polymeric materials, including researchers, scientists, advanced students, and more. - Explains innovative techniques for the preparation of bio-based flame retardant mechanisms, analyzing properties, performance and applications - Offers in-depth coverage of a range of sources, including cellulose, lignin, cardanol, chitosan, eugenol, vanillin, furan, alginate and vegetable oils - Presents the latest advances in the field, serving as a novel resource to advanced students, researchers and R&D professionals in academia and industry

Performance of Bio-based Building Materials Newnes
Biopolymeric Nanomaterials: Fundamentals and Applications outlines the fundamental design concepts and emerging applications of biopolymeric nanomaterials. The book also provides information on emerging applications of biopolymeric nanomaterials, including in biomedicine, manufacturing and water purification, as well as assessing their physical, chemical and biological properties. This is an important reference source for materials scientists, engineers and biomedical scientists who are seeking to increase their understanding of how polymeric nanomaterials are being used for a range of biomedical and industrial applications. Biopolymeric nanomaterials refer to biocompatible nanomaterials, consisting of biopolymers, such as protein (silk, collagen, gelatin, ß-casein, zein, and albumin), protein-mimicked polypeptides and polysaccharides (chitosan, alginate, pullulan, starch, and heparin). Biopolymeric nanomaterials may be used as i) delivery systems for bioactive compounds in food application, (ii) for delivery of therapeutic molecules (drugs and genes), or for (iii) tissue engineering. Provides information on the design concepts and synthesis of biopolymeric nanomaterials in biomedical and industrial applications Highlights the major properties and processing methods for biopolymeric nanomaterials Assesses the major challenges of producing biopolymeric nanomaterials on an industrial scale
Advanced Applications of Biobased Materials Wiley-VCH
Polyurethane Polymers: Blends and Interpenetrating Networks deals with almost all aspects of blends and IPNs formed by polyurethane, including the thermal, mechanical, morphological, and viscoelastic properties of each blend presented in the book. In addition, major applications related to these blends and IPNs are mentioned. - Provides an elaborate coverage of the chemistry of polyurethane, including its synthesis and properties - Includes available characterization techniques - Relates types of polyurethanes to their potential properties - Discusses blends options
Biopolymeric Nanomaterials Royal Society of Chemistry
Recycling of Polyethylene Terephthalate Bottles provides an overview of PET chemistry, highlighting the main degradation, depolymerization processes and pathways of PET, along with the applications of recycled monomers derived from PET waste. The latest methodologies of recycling and feedstock recovery are covered, providing critical foundational information. In addition, the book discusses a range of established methods of polymer recycling, with an emphasis on real world industrial case studies and the latest academic research. Users will find in-depth lifecycle and cost analysis of each waste management method, comparing the suitability and feasibility of each to support the decision -making process. Polyethylene Terephthalate (PET) is the most recycled plastic in the world, but still represents a significant amount of landfill waste. This book presents an update on new regulations, providing recommendations for new opportunities in this area, including new processing methods and applications for recycled PET. - Features a comprehensive introduction to the waste management of PET bottles, from regulatory concerns, to the range of different methods of materials recovery - Enables

practitioners to choose the most efficient and effective waste management process - Includes detailed lifecycle and cost analysis information - Compares traditional thermal recycling methods with more recently developed monomer recovery and chemical recycling methods

Advanced Polymeric Materials Walter de Gruyter GmbH & Co KG

This book presents an overview of various types of lignin and their unique structures and properties, as well as utilizations of crude or modified technical lignin for high-value bioproducts such as lignin-based PF resins/adhesives, epoxy resins, PF foams, PU foams, rubber reinforcement and carbon fibers and as dispersants in drilling fluids in the oil and gas industry. It subsequently discusses various thermal/chemical modification techniques (pyrolysis, direct liquefaction and de-polymerization) for converting lignin into oils and chemical feedstocks, and the utilization of crude lignin, lignin-derived oils or depolymerized lignins (DLs) of reduced molecular weights and improved reactivity to produce lignin-based PF resins/adhesives, PF/PU foams and epoxy resins. The book will interest and benefit a broad readership (graduate students, academic researchers, industrial researchers and practitioners) in various fields of science and technology (chemical engineering, biotechnology, chemistry, material science, forestry, etc.). Chunbao (Charles) Xu, PhD, is currently a Professor of Chemical Engineering and NSERC/FPInnovations Industrial Research Chair in Forest Biorefinery at the University of Western Ontario, Canada. Fatemeh Ferdosian, PhD, is currently a postdoctoral fellow at the University of Waterloo, Canada.

Advanced Coating Materials Springer Nature

The field of bio-based plastics has developed significantly in the last 10 years and there is increasing pressure on industries to shift existing materials production from petrochemicals to renewables. Bio-based Plastics presents an up-to-date overview of the basic and applied aspects of bioplastics, focusing primarily on thermoplastic polymers for material use. Emphasizing materials currently in use or with significant potential for future applications, this book looks at the most important biopolymer classes such as polysaccharides, lignin, proteins and polyhydroxyalkanoates as raw materials for bio-based plastics, as well as materials derived from bio-based monomers like lipids, poly(lactic acid), polyesters, polyamides and polyolefines. Detailed consideration is also given to the market and availability of renewable raw materials, the importance of bio-based content and the aspect of biodegradability. Topics covered include: Starch Cellulose and cellulose acetate Materials based on chitin and chitosan Lignin matrix composites from natural resources Polyhydroxyalkanoates Poly(lactic acid) Polyesters, Polyamides and Polyolefins from biomass derived monomers Protein-based plastics Bio-based Plastics is a valuable resource for academic and industrial researchers who are interested in new materials, renewable resources, sustainability and polymerization technology. It will also prove useful for advanced students interested in the development of bio-based products and materials, green and sustainable chemistry, polymer chemistry and materials science. For more information on the Wiley Series in Renewable Resources, visit

www.wiley.com/go/rrs
Renewable Resources for Surface Coatings, Inks and Adhesives Woodhead Publishing
Advanced Applications of Biobased Materials: Food, Biomedical, and Environmental Applications brings together cutting-edge developments in the preparation and application of biobased materials. This book begins by providing an overview of biobased materials, their classification, and their physical and chemical modifications. This is followed by a section covering the latest techniques in fabrication, processing, and characterization. Subsequent chapters are grouped by application area, offering insights into advanced and emerging utilizations of biobased materials in food, biomedical, environmental, and other industrial applications. The final part of the book highlights other key considerations, including life cycle assessment, circular economy, sustainability, and future potential. - Presents processing methods, characterization techniques, and the latest advances in biobased materials - Focuses on advanced and emerging applications of biobased materials in three key areas – food, biomedicine and the environment - Considers sustainability issues relating to biobased materials, including environmental impact, lifecycle assessment and the circular economy
Novel Biomaterials for Regenerative Medicine Springer Science & Business Media
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.
Szycher's Handbook of Polyurethanes, Second Edition Springer
This book focuses on starch polymers including starch genetics, biotechnological and chemical modification, nanostructures, processing, characterization, properties and applications. This books topic is in a cutting edge and emerging technology area of biomaterials, nanomaterials and renewable materials, and will involve international experts in diverse fields from genetic engineering to applications. - Focuses on cutting edge applications of starch polymers, including starch genetics and Rheology - Contains working examples and provides real problems and solutions in the area of biomaterials, nanomaterials, and renewable materials - Provides systematic and in-depth coverage and critical assessment of all starch properties and applications from top scientists in the industry

Conversion of Lignin into Bio-Based Chemicals and Materials John Wiley & Sons
The growing interest in replacing petroleum-based products by inexpensive, renewable, natural materials will have a significant impact on sustainability, environment, and the polymer industry. This book provides scientists a useful framework to help take advantage of the latest research conducted in this rapidly advancing field enabling them to develop and commercialize their own products quickly and more successfully.
Sustainability of Polymeric Materials Royal Society of Chemistry
An up-to-date and two volume overview of recent developments in the field of chemocatalytic and enzymatic processes for the transformation of renewable material into essential chemicals and fuels. Experts from both academia and industry discuss catalytic processes currently under development as well as those already in commercial use for the production of bio-fuels and bio-based commodity chemicals. As such, they cover drop-in commodity chemicals and fuels, as well as bio-based monomers and polymers, such as acrylic acid, glycols, polyesters and polyolefins. In addition, they also describe reactions applied to waste and biomass valorization and integrated biorefining strategies. With its comprehensive coverage of the topic, this is an indispensable reference for chemists working in the field of catalysis, industrial chemistry, sustainable chemistry, and polymer synthesis.
Starch Polymers William Andrew
Polymers have achieved an enviable position as the class of materials having the highest volume of production, exceeding that of both metals and ceramics. The meteoric rise in the production and utilization of polymers has been due to advances in polymer synthesis which allow the creation of specific and well-defined molecular structures, to new knowledge concerning the relationships between polymer structure and properties, and to an improved understanding of how processing can be used as a tool to develop morphological features which result in desired properties. Polymers have truly become 'engineered materials' in every sense of the term. Polymer scientists and engineers are forever seeking to modify and improve the properties of synthetic polymeric systems for use in specific applications. Towards this end they have often looked to nature for advice on how to design molecules for specific needs. An excellent illustration of this is the use of noncovalent bonding (ionic, hydrogen, and van der Waals) in lipids, proteins, and nucleic acids, where these noncovalent bonds, acting both intra and intermolecularly, precisely control the structure and thus the function of the entire system. The utilization of ionic bonding, in particular in man-made polymers has attracted widespread interest in recent years, since ionic interactions exert a similar strong influence on the structure and properties of these synthetic systems.
Bio-based Flame-Retardant Technology for Polymeric Materials Elsevier
This volume provides in-depth knowledge and recent research on polymers and nanostructured materials from synthesis to advanced applications. Leading researchers from industry, academia, government, and private research institutions across the globe have contributed to this volume, covering new research on

nanocomposites, polymer technology, and electrochemistry.

Polyurethane Chemistry Elsevier

This book covers the synthesis of useful products and intermediates from plant oils, which is a critically important area given current challenge of depleting fossil fuel reserves.

Advanced Elastomers Royal Society of Chemistry

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.

Bio-based Polyols and Polyurethanes Elsevier

"This book is about Polyurethane Chemistry: Renewable Polyols and Isocyanates"--

Biobased and Environmentally Benign Coatings Springer

With daily signals, Nature is communicating us that its unconscious wicked exploitation is no more sustainable. Our socio-economic system focuses on production increasing without considering the consequences. We are intoxicating ourselves on a daily bases just to allow the system to perpetuate itself. The time to switch into more natural solutions is come and the scientific community is ready to offer more natural product with comparable performance then the market products we are used to deal with. This book collects a broad set of scientific examples in which research groups from all over the world, aim to replace fossil fuel-based solutions with biomass derived materials. In here, some of the most innovative developments in the field of bio-materials are reported considering topics which goes from

biomass valorization to the synthesis of high preforming bio-based materials.
Bio-Based Plastics BoD – Books on Demand
This book will provide a comprehensive overview on the green approach to the research and industrialization of plastic materials. An effort will be made to offer to the reader a critical perspective concerning both oil-based plastics and novel bio-based and waste-derived polymer formulations. A special focus on bio-innovation in the area of organic materials will also be delivered.
Green Materials from Plant Oils John Wiley & Sons
Performance of Bio-based Building Materials provides guidance on the use of bio-based building materials (BBBM) with respect to their performance. The book focuses on BBBM currently present on the European market. The state-of-the-art is presented regarding material properties, recommended uses, performance expectancies, testing methodology, and related standards. Chapters cover both 'old and traditional' BBBM since quite a few of them are experiencing a comeback on the market. Promising developments that could become commercial in the near future are presented as well. The book will be a valuable reference resource for those working in the bio-based materials research community, architects and agencies dealing with sustainable construction, and graduate students in civil engineering. - Takes a unique approach to bio-based materials and presents a broad overview of the topics on relevant areas necessary for application and promotion in construction - Contains a general description, notable properties related to performance, and applications - Presents standards that are structured according to performance types
Chemicals and Fuels from Bio-Based Building Blocks BoD – Books on Demand
Aqueous polymer dispersions are environmentally friendly and therefore they have replaced in many applications polymers dissolved in organic solvents. This substitution process is still ongoing. This book discusses the world of aqueous polymer dispersions from the viewpoint of how they are applied. For a better understanding it starts with a general description of the synthesis of polymer dispersions and their characterization. The following chapters are dedicated to a wide variety of applications, including history, modern processes, and typical formulations and performance. The selection and the usage of a polymer dispersion are not uniform around the world because of historical and regional differences of the technical developments and marketing demands. Leading scientists from industry contributed to this book ensuring that practical issues are emphasized.