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Ning Lin, and Alain Dufresne

Polysaccharide-Based Nanocrystals

Chemistry and Applications



Chemical Industry Press

Polysaccharide Based Nanocrystals Chemistry And Applications

Valentin Popa



Polysaccharide Based Nanocrystals Chemistry And Applications:

Polysaccharide-Based Nanocrystals Jin Huang, Peter R. Chang, Ning Lin, Alain Dufresne, 2015-03-09 Polysaccharide nanocrystals an emerging green nanoingredient nanomaterial with high crystallinity obtained by acid hydrolysis of biomass based polysaccharides are of scientific and economic significance owing to their abundance biodegradation potential and fascinating functional performance This versatile class of materials can be used in nanocomposites such as rubber or polyester and in functional materials such as drug carriers bio inspired mechanically adaptive materials or membranes to name but a few This book encompasses the extraction structure properties surface modification theory and mechanism of diverse functional systems derived from polysaccharide nanocrystals This highly sought after trendy book is currently the only monograph devoted to the most current knowledge pertaining to this exciting subject area It is ideal for researchers and stakeholders who wish to broaden and deepen their knowledge in the fast moving and rapidly expanding R D field of polymeric materials

Polysaccharide-based Nanocrystals Peter R. Chang, Ning Lin, Alain Dufresne, 2014 Polysaccharide nanocrystals can be derived from the renewable resources cellulose chitin or starch which makes them ideal candidates for Green Materials Science This versatile material class can be used in nanocomposites such as rubber or polyester and in functional materials such as drug carriers bio inspired mechanically adaptive materials or membranes Moreover polysaccharide based nanomaterials are environmentally friendly due to their intrinsic biodegradability With its interdisciplinary approach the book gives a thorough introduction to extraction structure properties surfac

Handbook of Composites from Renewable Materials, Physico-Chemical and Mechanical Characterization Vijay Kumar Thakur, Manju Kumari Thakur, Michael R. Kessler, 2017-01-26 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

Sustainability of Biomass through Bio-based Chemistry Valentin Popa, 2021-03-21 The process of photosynthesis is a potential source of energy and bioproducts Renewable sources of polymeric materials offer an answer to maintaining sustainable development of economically and ecologically attractive technology The innovations in the development of materials from biopolymers preservation of fossil based raw materials complete biological degradability reduction in the volume of garbage and compostability in the natural cycle climate protection through reduction of carbon dioxide released and the application possibilities of agricultural resources for the production of bio green materials are some of the reasons why such materials are attracting public interest FEATURES Discusses waste from urban areas forestry and agricultural processes specifically grown crops such as trees starch crops sugar crops hydrocarbon plants and oils and finally aquatic plants such as water seaweeds and algae which can be used as raw materials for sustainable development Presents recent advances in the development of some specifically chemical components of biomasses for a sustainable future Focuses on lignocellulose as a source of bio based products Draws upon expertise from various countries Describes how upgraded and integrated biomass processing may reduce the risks associated with the COVID 19 pandemic Valentin I Popa is professor emeritus of Wood Chemistry and Biotechnology at Gheorghe Asachi Technical University of Iasi Romania

Functional Starch and Applications in Food Zhengyu Jin, 2018-09-19 This book discusses functional starch and its applications in food focusing on starches with possible health benefits or novel applications Covering slowly digested starch resistant starch porous starch starch microemulsions microcrystalline starch and noncrystallization starch and their applications this book provides a valuable reference for graduate students and research professionals in the food and chemical industries

Polysaccharides Bhasha Sharma, M. Enamul Hoque, 2023-12-14 Polysaccharides offer unique and valuable functional properties persisting in technological importance and poised to grow more critical due to sustainability demands and emerging applications in medical and life sciences This book presents comprehensive information about carbohydrate polymers providing readers with an enhanced appreciation of carbohydrate structure and function a new enzyme library and extraction strategies that will help to advance a number of exciting domains

of research including genomics proteomics chemical synthesis materials science and engineering Key Features Details the source production structures properties and current and potential applications of polysaccharides Discusses general strategies of isolation separation and characterization of polysaccharides Describes botanical algal animal and microbial sources of polysaccharides Demonstrates the importance of carbohydrates in new lead generation Highlights the range of possibilities for polysaccharides to make real world impact Biopolymer-Based Metal Nanoparticle Chemistry for Sustainable Applications Mahmoud Nasrollahzadeh, 2021-03-05 Biopolymers are becoming an increasingly important area of research as traditional chemical feedstocks run low and concerns about environmental impacts increase One area of particular interest is their use for more sustainable development of metal nanoparticles Biopolymer Based Metal Nanoparticle Chemistry for Sustainability Applications Volume 2 reviews key uses of biopolymers and biopolymer based metal nanoparticles for a range of key sustainability focused applications After providing contextual examples of applications across the fields of food science biomedicine and biochemistry the book goes on to explore further sustainability focused applications of Biopolymer Based Metal Nanoparticles in such important areas as catalysis environmental science biosensing and energy Provides an overview of biopolymer based metal nanoparticles for a wide range of applications Provides technological details on the synthesis of natural polymer based metal nanoparticles Explores the role of biopolymer based metal nanoparticles for more sustainable catalytic processes **Food, Medical, and Environmental Applications of Polysaccharides** Kunal Pal, Indranil Banerjee, Preetam Sarkar, Arindam Bit, Doman Kim, Arfat Anis, Samarendra Maji, 2020-12-03 Food Medical and Environmental Applications of Polysaccharides provides a detailed resource for those interested in the design and preparation of polysaccharides for state of the art applications The book begins with an introductory section covering sources chemistry architectures bioactivity and chemical modifications of polysaccharides Subsequent parts of the book are organized by field with chapters focusing on specific applications across food medicine and the environment This is an extremely valuable book for researchers scientists and advanced students in biopolymers polymer science polymer chemistry biomaterials materials science biotechnology biomedical engineering cosmetics medicine food science and environmental science This important class of biopolymer can offer attractive properties and modification potential enabling its use in groundbreaking areas across food medical and environmental fields The book will be of interest to scientists R D professionals designers and engineers who utilize polysaccharide based materials Presents comprehensive information of the polymeric structures and properties that can be developed from polysaccharides Offers systematic coverage of classification synthesis and characterization enabling targeted design and preparation of polysaccharides for specific applications Explores advanced methods for novel applications across food medicine and the environment

Bioinspired and Biomimetic Polymer Systems for Drug and Gene Delivery Zhongwei Gu, 2015-03-09 Here front line researchers in the booming field of nanobiotechnology describe the most promising approaches for bioinspired drug

delivery encompassing small molecule delivery delivery of therapeutic proteins and gene delivery The carriers surveyed include polymeric proteinaceous and lipid systems on the nanoscale with a focus on their adaptability for different cargoes and target tissues Thanks to the broad coverage of carriers as well as cargoes discussed every researcher in the field will find valuable information here Green Micro- and Nanocomposites Sabu Thomas, Abitha V. K., Hanna J Maria, 2023-10-20

Green materials derived from renewable resources are increasingly being advocated for sustainable development due to rising environmental consciousness waste management difficulties depleting fossil resources and rising oil prices to name a few Renewable green resources such as starch and cellulose polymers natural fibers vegetable oils wood bark cotton wool and silk have been utilized for food furniture and clothing for thousands of years They have only recently undergone a revival as one of the most cost effective alternatives to synthetic polymers in a variety of industrial applications including building and construction automotive packaging films and paper coating as well as biomedical uses The primary drawbacks of synthetic polymers such as the release of toxic gases and vapors during incineration and the difficulty in disposing of them have prompted extensive research on new green polymeric materials with special focus on the use of biopolymers derived from renewable resources for green composite applications This book gives a true reflection of the vast area of research in green composites as it has contributions from internationally recognized experts in the field of green polymer materials representing a wide range of disciplines backgrounds and expertise

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'open' and designed for group or class activities. CHAPTER 1. CASE STUDY: THE KANDY CYCLE SHOP. 1 ▷ Why do you ...
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