

Biopolymers And Biotech Admixtures For Eco Efficient Construction Materials Woodhead Publishing Series In Civil And Structural Engineering

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Biopolymers And Biotech Admixtures For and bacteria and assess their suitability as an admixture biotechnology for cement-based materials. The research activities will enhance the long-term durability of cement-based materials and promote ...
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Experimental Study of Biomimetic Antifreeze Polymers for Improved Durability of Cementitious Binders
Combinatorial library A set of organic or inorganic compounds, plasmids, microorganisms, vectors or biopolymers, e.g. polynucleotides ... See for example Nature Biotechnology (1997), 15, pages 29-34: ...

CPC Definition - Subclass C40B The use of materials for applications not provided for elsewhere, e.g. sealing materials, drilling fluids. The use of materials in general having specific properties, not provided for elsewhere, e.g.

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This book provides an updated state-of-the-art review on biopolymers and their influence and use as admixtures in the development of eco-efficient construction materials. Provides essential knowledge for researchers and producers working on the development of biopolymer-modified construction materials Discusses the various types of biopolymers currently available, their different production techniques, their use as bio-admixtures in concretes and mortars and applications in other areas of civil engineering such as soil stability, wood preservation, adhesives and coatings All contributions are made from leading researchers, who have intensive involvement in the design and use of biopolymers in construction materials

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Biopolymers and Their Industrial Applications: From Plant, Animal, and Marine Sources to Functional Products is a detailed guide to the use of biopolymers for advanced applications across a range of key industries. In terms of processing and cost, bio-based polymers are becoming increasingly viable for an ever-broadening range of novel industrial applications. The book begins with an overview of biopolymers, explaining resources, demands, sustainability, life cycle assessment (LCA) modeling and simulation, and classifications. Further in-depth chapters explore the latest techniques and methodologies for isolation and physicochemical characterization, materials selection, and processing for blends and composites. Chapters 6 to 14 each focus on the preparation and applications of biopolymers in a specific industrial area, including food science and nutraceuticals, medicine and pharmaceuticals, textiles, cosmeceutical, packaging, adhesives and automotive, 3D printing, super capacitor and energy storage devices, and environmental applications. The final chapter compares and analyzes biopolymers alongside synthetic polymers, also offering valuable insight into social, economic, and environmental aspects. This is an essential resource for those seeking to understand, research, or utilize biopolymers in industrial applications. This includes researchers, scientists, and advanced students working in biopolymers, polymer science, polymer chemistry, biomaterials, materials science, nanotechnology, composites, and biotechnology. This is a highly valuable book for scientists, R&D professionals, designers, and engineers across multiple industries and disciplines, who are looking to utilize biopolymers for components and products. Introduces a broad range of industrial application areas, including food, medicine, textiles, cosmetics, packaging, automotive, 3D printing, energy, and more Offers an industry-oriented approach, addressing challenges and explaining the preparation and application of biopolymers for functional products and parts Considers important factors such as resources, classification, sustainability, and life cycle assessment (LCA) modeling and simulation Compares and analyzes biopolymers alongside synthetic polymers, also offering valuable insight into social, economic, and environmental aspects

Advanced Processing, Properties, and Applications of Starch and Other Bio-based Polymers presents the latest cutting-edge research into the processing and applications of bio-based polymers, for novel industrial applications across areas including biomedical and electronics. The book is divided into three sections, covering processing and manufacture, properties, and applications. Throughout the book, key aspects of sustainability are considered, including improved utilization of available natural resources, sustainable design possibilities, cleaner production processes, and waste management. Focuses on starch-based polymers, examining the latest advances in processing and applications with this valuable category of biopolymer Highlights industrial sustainability considerations at all steps of the process, including when sourcing materials, designing and producing products, and dealing with waste Supports the processing and development of starch and other bio-based polymers with enhanced functionality for advanced applications

Bio-based Materials and Biotechnologies for Eco-efficient Construction fills a gap in the published literature, discussing bio-based materials and biotechnologies that are crucial for a more sustainable construction industry. With comprehensive coverage and contributions from leading experts in the field, the book includes sections on Bio-based materials and biotechnologies for infrastructure applications, Bio-based materials and biotechnologies for building energy efficiency, and other applications, such as using biotechnology to reduce indoor air pollution, for water treatment, and in soil decontamination. The book will be an essential reference resource for academic researchers, civil engineers, contractors working in construction works, postgraduate students and other professionals. Focuses on sustainability and green concepts in construction Discusses recent trends on bio-based materials and biotechnologies for eco-efficient construction Covers many important aspects, including infrastructure applications, energy efficiency for building construction, and air, water and soil related problems

Discover a comprehensive and current overview of microbial bioprospecting written by leading voices in the field In *Bioprospecting of Microorganism-Based Industrial Molecules*, distinguished researchers and authors Sudhir P. Singh and Santosh Kumar Upadhyay deliver global perspectives of bioprospecting of biodiversity. The book covers diverse aspects of bioprospecting of microorganisms demonstrating biomass value of nutraceutical, pharmaceutical, biomedical, and bioenergetic importance. The authors present an amalgamation of translational research on bioresource utilization and ecological sustainability that will further the reader's knowledge of the applications of different microbial diversity and reveal new avenues of research investigation. Readers will also benefit from: A thorough introduction to microbial biodiversity and bioprospecting An exploration of anti-ageing and skin lightening microbial products and microbial production of anti-cancerous biomolecules A treatment of UV protective compounds from algal biodiversity and polysaccharides from marine microalgal sources Discussions of microbial sources of insect toxic proteins and the role of microbes in bio-surfactants production Perfect for academics, scientists, researchers, graduate and post-graduate students working and studying in the areas of microbiology, food biotechnology, industrial microbiology, plant biotechnology, and microbial biotechnology, *Bioprospecting of Microorganism-Based Industrial Molecules* is an indispensable guide for anyone looking for a comprehensive overview of the subject.

This book presents the first comprehensive text on construction biomaterials and bioprocesses. It details aspects of construction biotechnology, a new interdisciplinary area involving applications of environmental and industrial microbiology and biotechnology in geotechnical and civil engineering. It also critically reviews all existing and potential construction biotechnology processes. It discusses a number of topics including the biotechnological production of new construction materials such as self-healing concrete, construction biocomposites, construction bioplastics, and biotechnological admixtures to cement. It also addresses construction-related processes like biocementation, bioclogging, soil surface fixation and biosealing, microbial cements and grouts, the biocoating of construction material surfaces, the microbiology and biosafety of the construction environment, the prevention of biocorrosion as well as biodeterioration and biofouling in civil engineering. Biomediated precipitation of calcium, magnesium, and iron compounds as carbonates, phosphates, sulphides, and silicate minerals in soil for its clogging and strengthening are considered from geotechnical, chemical, and microbiological points of view. It offers an overview of the basic microbiology that will enable civil engineers to perform the construction biogeochemical processes. Design principles and considerations for different field implementations are discussed from a practical point of view. The book can be used as a textbook for graduate and senior undergraduate students in biotechnology, civil engineering and environmental engineering as well as a reference book for researchers and practitioners working in this new interdisciplinary area.

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 performing bio-based materials.

Dynamics of Advanced Sustainable Nanomaterials and Their Related Nanocomposites at the Bio-Nano Interface highlights the most recent research findings (conducted over the last 5-6 years) on the dynamics of nanomaterials, including their multifaceted, advanced applications as sustainable materials. In addition, special attributes of these materials are discussed from a mechanistic and application point-of-view, including their sustainability and interfacial interactions at the bio-nano interface and different applications. This book presents an important reference resource on advanced sustainable nanomaterials for chemical, nano-, and materials technologists who are looking to learn more about advanced nanocomposites with sustainable attributes. Finally, the book examines the emerging market for sustainable materials and their advanced applications, with a particular focus on the bio-nano interface and their future outlook. Features detailed information on the fundamentals of bio-nano interfacial interactions in sustainable nanomaterials Includes advanced applications of these materials that will help the end user select the appropriate materials for their desired application Features extensive information on the dynamics of these materials, helping the end user extend their work into new applications

A Thermo-Economic Approach to Energy From Waste provides readers with the tools to analyze the effectiveness of biomass waste conversion into value-added products and how thermochemical conversion methods can be commercialized with minimum environmental impact. The book provides a comprehensive overview of biomass conversion technologies through pyrolysis, including the types of reactors available, reactor mechanisms, and the upgradation of bio-oil. Case studies are provided on waste disposal in selected favelas (slums) of Rio de Janeiro, including data on subnormal clusters and analyses of solid waste in the 37 slums of Catumbi. Step-by-step guidance is provided on how to use a life cycle assessment (LCA) approach to analyze the potential impact of various waste-to-energy conversion technologies, and a brief overview of the common applications of LCA in other geographical locations is presented, including United States, Europe, China, and Brazil. Finally, waste-to-value-added functional catalysts for the transesterification process in biodiesel production are discussed alongside various other novel technologies for biodiesel production, process simulation, and techno-economic analysis of biodiesel production. Bringing together research and real-world case studies from an LCA perspective, the book provides an ideal reference for researchers and practitioners interested in waste-to-energy conversion, LCA, and the sustainable production of bioenergy. Presents an overview of the technologies for the production of biofuels from waste via pyrolysis and gasification Provides a guide to the utilization of LCA to assess the economic and environmental impact of value-added products Describes real-world case studies on the implementation of LCA in waste-to-energy scenarios

Advanced Green Materials: Fabrication, Characterization and Applications of Biopolymers and Biocomposites looks at their extraction, purification, modification, and processing for various industrial, biomedical, pharmaceutical, and construction applications. The book comprehensively summarizes recent technical research accomplishments in natural materials and discusses various aspects of natural materials from a chemistry/engineering point of view. The book is unique with contributions from experts working on hybrid biopolymers and bio- composites, bioactive and biodegradable materials, bio-inert polymers and composites, natural polymer and composites, and metallic natural materials. The book will be a useful reference for scientists, academicians, research scholars, and biotechnologists. Advanced biocomposite materials continue to become increasingly popular and important for a broad range of different science and engineering applications. In the race to exploit the unique mechanical, thermal, and electrical properties of these materials, researchers must also address new challenges to predict, understand, and manage the potentially adverse effects they could have on the environment and human lives. The book describes recent developments and applications of biopolymers and biocomposites for applications in various industrial fields. Chapters include original research and the latest reviews in similar fields. Biopolymers and biocomposites occupy an exceptional position in the exciting new world of novel biomaterials. Considering their sustainability, non-toxic properties, and their ability to have tailored properties and functions, they should be considered as a smart candidate in the advancement of biomaterials technology. Covers all types of biopolymers and advanced industrial applications, from packaging to biomedical therapeutics Discusses the shift from research to industrial large-scale application of biopolymers and biocomposites Emphasizes new strategic trends, such as bio-based and biodegradable additives for bioplastics, PHAs, new lignin-based biopolymers, and new polymers based on terpenes and biosensor applications

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