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Handbook of Biopolymers

Springer

Handbook of Biopolymers

Sabu Thomas • Ajitha AR •
Cintil Jose Chirayil • Bejoy Thomas
Editors

Handbook of Biopolymers

With 376 Figures and 55 Tables

Springer

Preface

Biopolymers constitute some of the most diverse groups of organic molecules, which recently become an area of great research interest for their applications toward many dimensions of human life. Topics covered in this book include biopolymers from renewable sources, marine prokaryotes, soy protein and humus oils, biopolymer recycling, chemical modifications, and specific properties. Applications in key areas such as material, biomedical, sensing, packaging, biotechnology, and tissue engineering are discussed in detail. This handbook will be a very valuable reference material for graduate and postgraduate students, academic researchers, professionals, research scholars, scientists, and for anyone who has a flavor for doing biomaterial research. It provides universal perspectives for an emerging field where classical polymer science blends with molecular biology with highlights on recent advances.

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Volume 1

Material Applications of Gelatin

C. S. Julie Chandra, Sreesha Sasi, and T. K. Bindu Sharmila

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Abstract

Gelatin, a well-known biocompatible polymer, is a derivative of collagen obtained by the heat denaturation of collagen. The properties of gelatin vary depending on the sources and extraction techniques. Gelatin is remarkably known for its special gel-forming ability, which makes it a suitable material for exploring the fundamental functional features in colloid studies. Gelatin is widely explored by the scientific community because of its unique characteristics and is highly demanded by various industries such as food, pharmaceutical, cosmetic, photographic, etc. This chapter focuses on the various sources, extraction, and properties of gelatin and provide an insight into gelatin in recent applications.

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Nanocellulose from Cladophora

Applications

P. V. Sandhya, M. Nishaf Naseeha Farsana, and K. S. Femina

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Abstract

Cellulose is a unique biopolymer having distinctive structure and exceptional qualities beneficial for numerous industrial, environmental, medicinal, and pharmaceutical applications. Cladophora nanocellulose, extracted from *Cladophora* green algae, has unmatched advantages over those celluloses derived from other plant sources. Unique features of Cladophora-derived cellulose include excellent crystallinity (>95%), low moisture adsorption capacity, better solution processability, high porosity in the mesoporous range, and larger specific surface area. Due to its rich surface functionality, it can be easily modified by simple chemical reactions. Numerous Cladophora nanocellulose derivatives and composites have been reported, and their applications have been explored in diverse fields, including biomedical, environmental remediation, energy storage, batteries, etc. The pore size's tenability could be applied as an immunosorbent, hemodialysis, and

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Thermal Properties of Biopolymers

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Amrutha S. R., Rejimon P. K., Suja N. R., and Alson Mart

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Abstract

In the context of sustainable development, the use of polymers of natural origin has gained a lot of significance. Degradability, nontoxicity, a wealth of natural resources available as raw materials, and renewable nature are the main characteristics that are prioritized when employing biopolymers. These polymers have a wide range of applications, including medication administration, tissue engineering, tumor ablation, biomedicine, and food packaging. Their weak thermal and mechanical stability, however, is a drawback. The four most studied biopolymers, cellulose, starch, chitosan, and polylactic acid, have all been the subject of thermal investigations, which have been attempted to be analyzed in this chapter.

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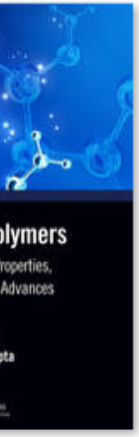

Book

Specialty Polymers

Fundamentals, Properties, Applications and Advances

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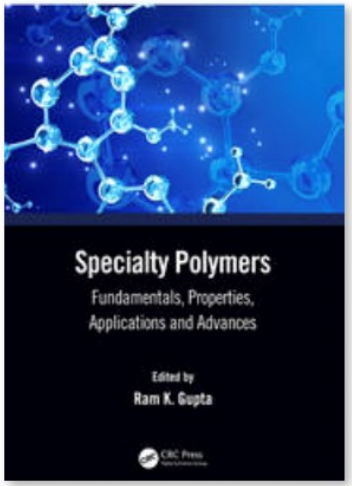
ehensive volume provides current, state-of-the-art information on specialty polymers that can be
ny advanced applications. The book covers the fundamentals of specialty polymers, synthetic



Chapter

Polymers in Display Devices

By Neena George, Ajalesh B. Nair, Pushpan K. Simi, Rani Joseph

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