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3.3.2 Cyclodextrin-Linked Chitosan; 3.3.3 Crown Ether Bound Chitosan; 3.3.4 Thiol-Containing Chitosan; 3.3.5 Carbohydrate Branched Chitosans; 3.3.6 Carboxymethylated Chitosans; 3.3.7 Alkylated Chitosans; 3.3.8 Quaternized Chitosan Derivatives; 3.3.9 Chitosan Hydrogels; 3.4 Biomedical Applications of Chitosan Derivatives; 3.4.1 Tissue Engineering; 3.4.2 Wound Healing; 3.4.3 Drug Delivery; 3.5 Conclusion; References; CHAPTER 4: Biomimetic Lessons for Processing Chitin-Based Composites; 4.1 Introduction; 4.2 Physicochemical Properties of Chitin; 4.2.1 Chitin Hierarchical Structure 4.2.2 Chitin Crystallinity 4.2.3 Liquid Crystal Behavior of Chitin; 4.2.4 Chitin and Proteins; 4.3 Biomimetic Lessons from Natural Chitin Nanocomposites; 4.3.1 Chitin Synthesis in Mollusk and Crustacean Hard Tissue; 4.3.2 Jumbo Squid Beak; 4.4 Bioinspired Lessons for Processing Chitin Nanocomposites; 4.4.1 Chitin Nanocomposite Processing; 4.4.2 Chitin Nanocomposites in Biomedical Engineering; 4.4.3 Inorganic Chitin-Based Nanocomposites; 4.5 Conclusions; Acknowledgments; References; CHAPTER 5: Morphological and Thermal Investigations of Chitin-Based Nanocomposites 5.1 Morphological Investigations of Chitin-Based Nanocomposites 5.1.1 Optical Microscopy; 5.1.2 Scanning Electron Microscopy and Transmittance Electron Microscopy; 5.1.3 Atomic Force Microscopy; 5.2 Thermal Investigations of Chitin-Based Nanocomposites; 5.2.1 Differential Scanning Calorimetry; 5.2.2 Dynamic Thermal Mechanical Analysis; 5.2.3 Thermogravimetric Analysis; 5.2.4 Thermomechanical Analysis; References; CHAPTER 6: Mechanical Properties of Chitin-Based Nanocomposites; 6.1 Introduction; 6.2 Mechanical Properties of Chitin/Chitosan Nanocomposites 6.2.1 Chitosan-Hydroxyapatite Nanocomposites

Sommario/riassunto

"The book is an attempt to introduce various biopolymers and bionanocomposites to a student of material sciences. Going beyond mere introduction, the book delves deep into the characteristics of various biopolymers and bionanocomposites and discusses, the nuances of their preparation with a view to help researchers to find out newer and novel applications. Chapter 2 of the book, for instance, describes the preparation of Chitin Nanofibers and their Composites and goes even to the basics like isolation of CNFs from different sources. Chapter 3 is on Chemical Modification of Chitosan and its Biomedical Application. While, Biometric lessons for processing chitin based composites are provided in Chapter 4, the next chapter deals with Morphological and Thermal Investigations of Chitin-based Nanocomposites. Mechanical properties of chitin-based nanocomposites are discussed in Chapter 6 and Preparation and Applications of Chitin Nanofibers/Nanowhiskers is the topic of Chapter 7. Thus, Chapters 2 to 7 are allotted to Chitin and related topics"--
