

1. Record Nr.	UNINA9910818814003321
Titolo	Biopolymer nanocomposites : processing, properties, and applications / / edited by Alain Dufresne, Sabu Thomas, Laly A. Pothan
Pubbl/distr/stampa	Hoboken, NJ, : John Wiley and Sons, Inc., c2013
ISBN	1-118-60990-5 1-118-60995-6 1-118-60987-5
Edizione	[1st ed.]
Descrizione fisica	1 online resource (698 p.)
Collana	Wiley Series on Polymer Engineering and Technology
Classificazione	TEC009010
Altri autori (Persone)	DufresneAlain <1962-> ThomasSabu PothanLaly A
Disciplina	572
Soggetti	Biopolymers Nanocomposites (Materials)
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Cover; Title page; Copyright page; Contents; Foreword; Contributors; CHAPTER 1: Bionanocomposites: State of the Art, Challenges, and Opportunities; 1.1 Introduction; 1.2 Nanocrystalline Cellulose; References; CHAPTER 2: Preparation of Chitin Nanofibers and Their Composites; 2.1 Introduction; 2.2 Isolation of Chitin Nanofibers from Different Sources; 2.2.1 Processing of Chitin Nanofibers from Crab Shells; 2.2.2 Chitin Nanofibers from Prawn Shells; 2.2.3 Facile Preparation of Chitin Nanofibers from Dry Chitin 2.3 Characterization of Chitin Nanofibers Obtained from Crab, Prawn, and Dry Chitin Powder2.4 Preparation of Chitin Nanofibers from Edible Mushrooms; 2.5 Preparation of Chitin Nanofiber Nanocomposites; 2.6 Acetylation of Chitin Nanofibers; 2.6.1 Study of Degree of Substitution; 2.6.2 SEM Images of Substituted Chitin Nanofibers; 2.6.3 Acetylated Chitin Nanofiber Composites; 2.7 Conclusion; References; CHAPTER 3: Chemical Modification of Chitosan and Its Biomedical Application; 3.1 Introduction; 3.2 Structure of Chitosan; 3.3 Chemical Modifications of Chitosan; 3.3.1 Chitosan-Grafted Copolymers 3.3.2 Cyclodextrin-Linked Chitosan3.3.3 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"--
