

1. Record Nr.	UNINA9911008940703321
Autore	Kodali Deepa
Titolo	Biocarbon Polymer Composites
Pubbl/distr/stampa	Sharjah : , : Bentham Science Publishers, , 2023 ©2023
ISBN	9789815196689 9815196685
Edizione	[1st ed.]
Descrizione fisica	1 online resource (168 pages)
Altri autori (Persone)	RangariVijaya
Disciplina	662.88
Soggetti	Carbon composites Polymers
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Cover -- Title -- Copyright -- End User License Agreement -- Contents -- Preface -- Acknowledgement -- List of Contributors -- Synergistic Effect of Bio-Nanocarbon Embedded Polymer Nanocomposite and its Applications -- Vandana Molahalli1,2, Jasmine Joseph1,2, Kiran Bijapur1,2, Aman Sharma1,2, Gowri Soman1,2 and Gurumurthy Hegde1,2,* -- 1. INTRODUCTION -- 2. BIOCARBON FOR SUSTAINABLE ENVIRONMENT -- 3. BIOCARBON FOR SUPERCAPACITORS -- 4. BIOCARBON FOR MEDICAL APPLICATIONS -- 5. THERMAL CONDUCTIVITY STUDY OF BIOCARBON -- 6. BIOCARBON NANOMATERIALS IN SOLAR CELLS -- 7. POLYMER NANOCOMPOSITE -- 8. SYNTHESIS OF POLYMER NANOCOMPOSITE -- 8.1. In-situ Chemical Polymerization -- 8.2. Solution Method -- 8.3. Melt Extrusion -- 8.4. Sol-gel Method -- 8.5. Melt Blending -- 8.6. Hand Layup Method -- 9. RECENT ADVANCEMENTS IN THE CARBON BASED POLYMER NANOCOMPOSITE -- 10. SYNERGISTIC EFFECT OF BIO-NANOCARBON AND POLYMERS -- 10.1. Biocarbon Reinforced Thermoset Polymers -- 10.2. Epoxy Resin -- 10.3. Biocarbon-filled Polyurethane (PU) and Polyester Resin -- 10.4. Polylactic Acid (PLA) -- 11. CONDUCTING POLYMERS -- 12. APPLICATIONS OF BIOCARBON-BASED POLYMER NANOCOMPOSITE -- CONCLUSION -- ACKNOWLEDGEMENT -- REFERENCES -- Biochar-thermoplastic Polymer Composites: Recent

Advances and Perspectives -- Giulio Malucelli^{1,2,*} -- 1. INTRODUCTION -- 2. SYNTHESIS OF BIOCHAR (BC) -- 3. BIOCHAR-THERMOPLASTIC POLYMER COMPOSITES -- 3.1. Biochar in Polyolefins -- 3.2. Biochar in Polyamides -- 3.3. Biochar in Polyesters -- 3.4. Biochar in other Thermoplastic Matrices -- 4. CARBONACEOUS FILLERS VS. BIOCHAR IN THE DESIGN OF POLYMER COMPOSITES -- CONCLUSION AND FUTURE PERSPECTIVES -- ACKNOWLEDGEMENTS -- REFERENCES -- Animal-Based Biochar Reinforced Polymer Composites -- Radhika Mandala^{1,2,*}, B. Anjaneya Prasad¹ and Suresh Akella³ -- 1. INTRODUCTION -- 2. OVERVIEW OF CARBON. 2.1. Sources of Biocarbon -- 2.2. Synthesis of Animal-based Biocarbon -- 3. POLYMER COMPOSITE FABRICATION -- 4. THERMAL AND MECHANICAL PROPERTIES OF POLYMER COMPOSITES -- 4.1. Mechanical Properties -- 4.2. Thermal Properties -- CONCLUSION -- REFERENCES -- Harnessing Agro-based Biomass for Sustainable Thermal Energy Storage with Biochar Polymer Nanocomposites -- Venkateswara Rao Kode^{1,*} -- 1. INTRODUCTION -- 2. COMPOSITION -- 2.1. Almonds -- 2.2. Walnuts -- 3. BIOCHAR -- 3.1. Synthesis -- 3.2. Pyrolysis -- 3.3. Gasification -- 3.4. Hydrothermal Carbonization -- 4. BIOCHAR-ENCAPSULATED POLYMER NANOCOMPOSITES: -- 4.1. Synthesis of Phase Change Materials -- 4.2. Characterization -- 5. THERMAL PROPERTIES -- CONCLUSION -- REFERENCES -- The Application of Biocarbon Polymer Nanocomposites as Filaments in the FDM Process - A Short Review -- Singaravel Balasubramaniyan^{1,*}, Niranjan Thiruchinapalli² and Rutika Umesh Kankrej¹ -- 1. INTRODUCTION -- 2. LITERATURE REVIEW -- 3. DISCUSSION -- CONCLUSION -- REFERENCES -- Tensile Characteristics of FDM 3D Printed PBAT/PLA/Carbonaceous Biocomposites -- Gustavo F. Souza¹, Rene R. Oliveira², Janetty J.P. Barros^{1,3}, Fernando L. Almeida⁴ and Esperidiana A.B. Moura^{1,*} -- 1. INTRODUCTION -- 2. MATERIALS AND METHODS -- 2.1. Materials -- 2.2. Rice Husk ash (RHA) Preparation -- 2.3. Composite Preparation -- 2.4. Filament Preparation -- 2.5. FDM 3D Printing -- 2.6. Characterization Methods -- 2.6.1. Thermogravimetric Analyses (TGA) -- 2.6.2. Fourier Transform Infrared Spectroscopy (FTIR) -- 2.6.3. Scanning Electron Microscopy (SEM) -- 2.6.4. Mechanical Testing -- 3. RESULTS AND DISCUSSION -- 3.1. TGA -- 3.2. FTIR Analyses -- 3.3. SEM Analyses -- 3.4. Mechanical Tests -- CONCLUSION -- FUNDING SOURCES -- ACKNOWLEDGEMENT -- REFERENCES -- Biochar-Based Polymer Composites: A Pathway to Enhanced Electrical Conductivity. Mahesh K. Pallikonda^{1,*} and Joao A. Antonangelo² -- 1. INTRODUCTION -- 2. MECHANISMS OF ELECTRICAL CONDUCTIVITY IN POLYMER COMPOSITES -- 3. FACTORS INFLUENCING THE ELECTRICAL CONDUCTIVITY IN POLYMER COMPOSITES -- 3.1. Pyrolysis Temperature -- 3.2. Degree of Graphitization -- 3.3. Precursor Material -- 3.4. Different Concentrations of Filler Material -- CONCLUSION -- REFERENCES -- Coconut Shell Derived Carbon Reinforced Polymer Composite Films for Packaging Applications -- Gautam Chandrasekhar¹ and Vijaya Rangari^{1,*} -- 1. INTRODUCTION -- 1.1. Overview of Plant-derived Carbon-based Materials -- 1.2. Biochar Carbon-reinforced Polymer Composites -- 2. MATERIALS AND METHODS -- 2.1. Materials -- 2.2. Synthesis of Carbon by Pyrolysis -- 2.3. Characterization of the Synthesized Carbon -- 2.3.1. X-ray Diffraction (XRD) -- 2.3.2. Raman Spectroscopy -- 2.3.3. Scanning Electron Microscopy (SEM) -- 2.4. Blown Film Extrusion -- 2.5. Analysis of Films -- 2.5.1. Thermogravimetric Analysis -- 2.5.2. Differential Scanning Calorimetry -- 2.5.3. Tensile Test -- 3. RESULTS -- 3.1. Scanning Electron Microscopy of CSPC -- 3.2. X-ray Diffraction -- 3.3.

Raman Spectroscopy -- 3.4. Thermogravimetric Analysis -- 3.5. Differential Scanning Calorimetry -- 3.6. Tensile Test -- 3.7. Fracture Surface Analysis of LDPE/CSPC Films using SEM -- CONCLUSION -- FUNDING SOURCES -- REFERENCES -- Carbon Based Polymer Composites in Water Treatment and Filtration -- Sabina Yeasmin^{1,*} and Soma Bose¹ -- 1. INTRODUCTION -- 2. BIOCHAR IN WATER TREATMENT -- 3. POLYMER NANOCOMPOSITES IN WATER FILTRATION -- CONCLUSION -- REFERENCES -- Subject Index.

Sommario/riassunto

This book explores cutting-edge biocarbon polymer composites. The book brings together nine edited chapters that explore the development, properties, and applications of these eco-friendly materials, highlighting their potential to transform industries and reduce the environmental impact of traditional polymers. Spanning a range of critical topics, this book begins with an introduction to biocarbon and polymer materials, providing a solid foundation. It then progresses into the latest research on biocarbon sources, processing techniques, and characterization methods. Subsequent chapters cover the mechanical, thermal, and electrical properties of biocarbon polymer composites, along with their applications in diverse industries such as automotive, construction, and packaging. Contributors highlight real-world case studies and examples to showcase the practical relevance of these materials. Readers will gain a comprehensive understanding of the science and technology behind biocarbon polymer composites, enabling them to make informed decisions in materials selection and development. In an era of increasing environmental consciousness, this book emphasizes the eco-friendly nature of biocarbon composites, offering sustainable alternatives to traditional plastics. Additionally, this book bridges the information gaps between different disciplines and it is intended for a wide range of readers, from materials scientists and engineers to environmentalists and industry policymakers.

Readership: Researchers and scientists in materials science and engineering; Professionals in industries seeking sustainable alternatives to traditional plastics; Environmentalists and policymakers interested in promoting eco-friendly materials; Academics and students studying materials science, polymer chemistry, and sustainable technologies; Innovators and entrepreneurs looking to capitalize on emerging materials trends.
