1. Record Nr. UNINA9911019765403321

Autore	Deshmukh Kalim
Titolo	MXene Reinforced Polymer Composites : Fabrication, Characterization and Applications
Pubbl/distr/stampa	Newark : , : John Wiley & Sons, Incorporated, , 2024 ©2024
ISBN	9781119901273 1119901278 9781119901266 111990126X 9781119901280 1119901286
Edizione	[1st ed.]
Descrizione fisica	1 online resource (569 pages)
Altri autori (Persone)	PandeyaMayanka HussainChaudhery Mustansar
Disciplina	620.192
Soggetti	MXenes Polymeric composites
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Cover -- Title Page -- Copyright Page -- Contents -- Preface -- Chapter 1 Two-Dimensional MXenes: Fundamentals, Characteristics, Synthesis Methods, Processing, Compositions, Structure, and Applications -- 1.1 Introduction -- 1.2 Fundamentals -- 1.2.1 Crystallographic Structure -- 1.2.2 Electronic Structure -- 1.2.3 Magnetic Structure -- 1.3 General Characteristics of the MXenes -- 1.3.1 Physical Properties -- 1.3.2 Chemical Properties -- 1.4 Synthesis Methods -- 1.4.1 Wet Chemical Etching -- 1.4.2 Urea Glass Route -- 1.4.3 Chemical Vapor Deposition -- 1.4.4 Molten Salt Etching -- 1.4.5 Hydrothermal Synthesis -- 1.4.6 Electrochemical Synthesis at Room Temperature -- 1.5 Applications -- 1.5.1 Nitrogen Reduction Reaction (NRR) -- 1.5.2 Oxygen Evolution Reaction (OER)/Oxygen Reduction Reaction (ORR) -- 1.5.3 Hydrogen Evolution Reaction (HER) -- 1.5.4 Energy Storages -- 1.5.4.1 Battery -- 1.5.4.2 Supercapacitor -- 1.5.4.3 Electromagnetic Interference Shielding -- 1.5.5 Biomedical Applications

Catalysis -- 11.4.2.2 Electrocatalysis -- 11.4.2.3 Photocatalysis -- 11.4.3 Water Remediation -- 11.5 Future Directions -- 11.5.1 Bioimaging -- 11.5.1.1 Magnetic Resonance Imaging (MRI) -- 11.5.1.2 Photoacoustic (PA) Imaging -- 11.5.2 Computed Tomography (CT) -- 11.5.3 Bone Regeneration -- 11.6 Conclusion -- Acknowledgement -- References -- Chapter 12 MXene-Reinforced Polymer Composites as Flexible Wearable Sensors -- 12.1 Introduction -- 12.2 Performance Parameter for Flexible Pressure and Strain Sensor -- 12.2.1 Sensitivity -- 12.2.2 Stretchability -- 12.2.3 Hysteresis -- 12.2.4 Durability and Range -- 12.3 Design of MXenes/Polymer Composites as Flexible Pressure Sensors -- 12.4 Design of MXenes/Polymer Composites as Flexible Strain Sensors.
12.5 Design of MXenes/Biopolymer Composites as a Flexible Pressure Sensor.

Sommario/riassunto

This book explores the integration of MXenes, a class of two-dimensional materials, into polymer composites, focusing on their synthesis, fabrication methods, properties, and applications. Edited by a team of international experts, it provides a comprehensive overview of the fundamental properties of MXenes, including their electronic, magnetic, and thermal characteristics. The book discusses various synthesis methods such as chemical exfoliation and delamination, and delves into surface modification strategies to enhance their properties. It also covers the application of MXene-polymer composites in energy storage, biomedical fields, electronic devices, and electromagnetic interference shielding. The intended audience includes researchers, engineers, and professionals in materials science and polymer engineering fields, aiming to understand the latest advancements in MXene technology and their practical applications.