

1. Record Nr.	UNINA9910632498103321
Autore	Ooi Poh Choon
Titolo	Enhanced Carbon-Based Materials and Their Applications
Pubbl/distr/stampa	Newark : , : John Wiley & Sons, Incorporated, , 2023 ©2023
ISBN	3-527-82968-7 3-527-82967-9
Descrizione fisica	1 online resource (313 pages)
Altri autori (Persone)	XieMengying DeeChang Fu
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Cover -- Title Page -- Copyright -- Contents -- Preface -- Chapter 1 Enhanced CarbonBased Materials and Their Applications -- 1.1 Overview -- 1.2 Glance of CarbonBased Materials -- 1.3 Applications -- 1.4 Outline of This Book -- References -- Chapter 2 CarbonBased Nanomaterials: Synthesis and Characterizations -- 2.1 Introduction -- 2.1.1 Carbon -- 2.1.2 Allotropes of Carbon -- 2.2 Synthesis of Carbon Based Nanostructures -- 2.2.1 Chemical Vapor Deposition Technique -- 2.2.1.1 Thermal Chemical Vapor Deposition -- 2.2.1.2 Plasma Enhanced Chemical Vapor Deposition -- 2.2.2 Ion Irradiation Technique -- 2.3 Characterization -- 2.3.1 Raman Spectroscopic Characterization of Carbon Nanostructure Materials -- 2.3.2 Electron Microscopy -- 2.3.2.1 Scanning Electron Microscopy -- 2.3.2.2 Transmission Electron Microscopy -- 2.3.2.3 In Situ Transmission Electron Microscopy -- 2.4 Summary -- References -- Chapter 3 Functional CarbonBased Nanomaterials and Sensor Applications -- 3.1 Introduction to LowDimensional CarbonBased Nanomaterials -- 3.2 Modification of LowDimensional CarbonBased Nanomaterials -- 3.3 PlasmaBased Synthesis of HeteroatomDoped Graphene -- 3.3.1 In Situ PlasmaAssisted Growth and Doping -- 3.3.2 PostGrowth Plasma Treatment -- 3.3.3 Properties of HeteroatomDoped Graphene -- 3.4 Doping Modulation in Graphene for Optoelectronic Applications -- 3.5

Imperfections in Graphene for Strain-Pressure Sensing Applications --
3.6 Structural Defect in Graphene for GasSensing Applications --
References -- Chapter 4 Fabrication Techniques of Resistive Switching
CarbonBased Memories -- 4.1 Introduction - Emerging CarbonBased
Memory Technologies -- 4.2 MemristorBased Memory -- 4.3 Substrate
Options -- 4.4 Effect of Electrode Materials -- 4.5 Fabrication Methods
of Metal/Insulator/Metal Structure -- 4.5.1 Spin Coating -- 4.5.2 Spray
Coating.
4.5.3 Dip Coating -- 4.5.4 Inkjet Printing -- 4.5.5 Plasma
Polymerization (PP) Deposition -- 4.6 Conclusion -- References --
Chapter 5 CarbonousBased Optoelectronic Devices -- 5.1 Introduction
-- 5.2 GrapheneBased Optoelectronics -- 5.3 Carbonous Materials in
Photovoltaics -- 5.4 Carbonous Materials in DyeSensitized Solar Cells
-- 5.5 Carbonous Materials in Perovskite Solar Cells (PSCs) --
References -- Chapter 6 Thermoelectric Energy Harvesters and
Applications -- 6.1 Introduction -- 6.2 Thermoelectric Effect and
Properties -- 6.2.1 Seebeck Effect -- 6.2.2 Peltier Effect -- 6.2.3
Thomson Effect -- 6.2.3.1 FigureofMerit and Power Factor -- 6.3
Thermoelectric Power and Efficiency -- 6.3.1 Simplified One
Dimensional Decoupled Model -- 6.3.2 ThreeDimensional Coupled
Multiphysics Model -- 6.4 Thermoelectric Materials -- 6.4.1 Inorganic
Thermoelectric Materials -- 6.4.2 Organic Thermoelectric Materials --
6.4.3 Hybrid Organic-Inorganic Thermoelectric Materials -- 6.5
Application of Organic Thermoelectric Generators -- 6.6
Summary/Future Perspective -- References -- Chapter 7 Carbon
Enhanced Piezoelectric Materials and Applications -- 7.1 Introduction
-- 7.2 CarbonEnhanced Piezoelectric Materials -- 7.2.1 Inorganic
Piezoelectric Materials -- 7.2.2 Organic Piezoelectric Materials --
7.2.2.1 Carbon Nanotubes -- 7.2.2.2 Graphene and GrapheneBased
Materials -- 7.2.2.3 Quantum Dots -- 7.3 Fabrication Methods -- 7.4
Applications -- 7.4.1 Energy Harvesters -- 7.4.2 Biomechanical Sensor
-- 7.4.3 Other Applications -- 7.5 Conclusion -- Acknowledgment --
References -- Chapter 8 Actuators Based On the CarbonEnhanced
Materials -- 8.1 Introduction -- 8.2 Actuation on the Molecular Scale
-- 8.3 Carbon Nanomaterials -- 8.3.1 Graphene and Related Materials
-- 8.3.2 Carbon Nanotubes -- 8.3.3 Fullerenes -- 8.4 CarbonBased
Actuation.
8.4.1 Carbon NanotubeBased Actuators -- 8.4.2 Graphene and
Graphene Oxide Actuators -- 8.4.3 FullereneBased Actuators -- 8.5
Challenges and Prospectives of Actuators Based on Carbon
Nanostructures -- References -- Chapter 9 Display Based on Carbon
Enhanced Materials -- 9.1 Introduction -- 9.2 Display Based on CDs --
9.2.1 Synthesis of CDs -- 9.2.2 Optical Properties of CDs in Display --
9.2.3 CDs in LEDs Display Applications -- 9.2.3.1 Photoluminescent
LEDs -- 9.2.3.2 Electroluminescent LEDs -- 9.3 Display Based on
Carbon Nanotubes -- 9.3.1 CNTs Emission Material in Display -- 9.3.2
CNTs as Alignment and Polarized Material in LCDs -- 9.3.3 CNT-TFT in
LCD and OLED -- 9.3.4 Transparent Electrode and Touch Panel in the
Display -- 9.4 Display Based on Graphene and Graphene Oxide --
9.4.1 Graphene and Graphene Oxide as LiquidCrystal Materials --
9.4.2 Graphene Transparent Electrode in the Display -- 9.5 Summary
and Outlook -- References -- Chapter 10 Enhanced CarbonBased
Materials and Their Applications -- References -- Index -- EULA.
