1. Record Nr. UNINA9910813718603321

Titolo	Solar cell nanotechnology / / edited by Atul Tiwari, Rabah Boukherroub, and Maheshwar Sharon ; cover design by Russell Richardson
Pubbl/distr/stampa	Hoboken, New Jersey : , : John Wiley and Sons, , 2014 ©2014
ISBN	1-118-84572-2 1-118-84604-4 1-118-84578-1
Descrizione fisica	1 online resource (540 p.)
Classificazione	TEC021000
Altri autori (Persone)	TiwariAtul BoukherroubRabah SharonMaheshwar RichardsonRussell
Disciplina	621.31/244
Soggetti	Solar cells - Materials Photovoltaic cells - Materials Nanostructured materials Solar cells - Design and construction Photovoltaic cells - Design and construction
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end og each chapters and index.
Nota di contenuto	Cover; Title Page; Copyright Page; Contents; Preface; Part 1 Current Developments; 1 Design Considerations for Efficient and Stable Polymer Solar Cells; 1.1 Introduction; 1.1.1 Background; 1.1.2 Theory; 1.1.2.1 Photovoltaic Processes in Donor-Acceptor (D-A) System; 1.1.2.2 Equivalent Circuit Diagram of a PV Cell under Illumination; 1.1.2.3 Parameters Governing Performance of Solar Cells; 1.2 Role of Interfacial Layer for Efficient BHJ Solar Cells; 1.2.1 Role of Interfacial Layer on Voc; 1.2.2 Influence on Active Layer Vertical Morphology Based on underneath Interfacial Layer 1.2.3 Light Trapping Strategies and Plasmonic Effects for Efficient Light Harvesting 1.2.4 Morphology Control of Active Layer and ETL by Processing; 1.3 Selection of Interfacial Layer for Stable and Longer

Lifetime; 1.3.1 Stability of Active Layer Materials; 1.3.2 Stability of Metal Electrodes; 1.3.3 Stability of Transparent Electrode; 1.3.4 Stability by Electron Transport Layers (ETLs); 1.3.5 Stability by Hole Transport Layers (HTLs); 1.4 Materials Used as Interfacial Layer; 1.4.1 Conventional Solar Cell Devices; 1.4.1.1 Cathode and Electron Transport Layers
1.4.1.2 Anode and Hole Transport Layers 1.4.2 Inverted Device Structure; 1.4.2.1 Cathode and Electron Transport Layers; 1.4.2.2 Anode and Hole Transport Layers; 1.5 Conclusion and Outlook; Acknowledgement; References; 2 Carbazole-Based Organic Dyes for Dye-Sensitized Solar Cells: Role of Carbazole as Donor, Auxiliary Donor and -linker; 2.1 Introduction; 2.2 Carbazole as a Donor for Dye-Sensitized Solar Cells; 2.2.1 Carbazole as Donor via C3-Position; 2.2.2 Carbazole as Donor and Linked through N9-position; 2.3 Carbazole as a -Linker; 2.3.1 Carbazole as a Bridge via C2, C7 Positions
2.3.2 Carbazole as a Linker via C3, C6 Positions 2.4 Carbazole as Auxiliary Donor for DSSC; 2.4.1 Carbazole as Auxiliary Donor via C2-position; 2.4.2 Carbazole as Auxiliary Donor via C3-Position; 2.4.3 Carbazole as Auxiliary Donor via N9-Position; 2.4.4 Carbazole as Auxiliary Donor via C3, C6-positions; 2.5 Carbazole as Donor as Well as Linker for DSSC; 2.6 Conclusion and Outlook; Acknowledgements; References; 3 Colloidal Synthesis of CuInS2 and CuInSe2 Nanocrystals for Photovoltaic Applications; 3.1 Introduction; 3.2 Synthesis of CuInS2 and CuInSe2 Nanocrystals
3.2.1 Ligand Shell and Colloidal Stability 3.2.2 Adjusting the Reactivity of the Precursors; 3.2.3 Shape Control; 3.2.4 Crystallographic Structure; 3.2.5 Composition; 3.3 Application of Colloidal CuInS2 and CuInSe2 Nanoparticles in Solar Energy Conversion; 3.3.1 All-Inorganic Solar Cells; 3.3.2 Organic-Inorganic Hybrid Solar Cells; 3.3.3 Nanocrystal Sensitized Solar Cells; 3.4 Conclusion and Outlook; References; 4 Two Dimensional Layered Semiconductors: Emerging Materials for Solar Photovoltaics; 4.1 Introduction; 4.2 Material Synthesis; 4.2.1 Chemical Exfoliation
4.2.2 CVD Synthesis of 2D Layered Semiconductors MoS2 and WS2

Sommario/riassunto

"Focusing on the cutting-edge technologies available in the field of photovoltaics, Solar Cell Nanotechnology explores the latest research and development activities related to organic, inorganic, and hybrid materials being used in solar cell manufacturing. Several chapters are dedicated to explaining the fundamentals of photovoltaics and nanomaterials utilized in the manufacturing of solar cells. Other essential subjects, such as microcontact printing, plasmonic light trapping, outdoor and indoor efficiency, luminescent solar concentrators, and photon management in photovoltaics, are comprehensively reviewed. Written for a broad audience, this is an essential book for engineers, nanotechnologists, and materials scientists"--