

1. Record Nr.	UNINA9910830287103321
Autore	Facchetti Antonio
Titolo	Transparent electronics [[electronic resource] ] : from synthesis to applications // Antonio Facchetti, Tobin J. Marks
Pubbl/distr/stampa	Chichester, West Sussex, U.K. ; ; Hoboken, N.J., : Wiley, 2010
ISBN	1-282-55143-4 9786612551437 0-470-71060-8 0-470-71059-4
Descrizione fisica	1 online resource (476 p.)
Altri autori (Persone)	MarksTobin J
Disciplina	621.381
Soggetti	Transparent electronics Transparent semiconductors
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 and index.
Nota di contenuto	Transparent Electronics: From Synthesis to Applications; Contents; Preface; List of Contributors; 1 Combining Optical Transparency with Electrical Conductivity: Challenges and Prospects; 1.1 Introduction; 1.2 Electronic Properties of Conventional TCO Hosts; 1.3 Carrier Generation in Conventional TCO Hosts; 1.3.1 Substitutional Doping; 1.3.2 Oxygen Reduction; 1.4 Magnetically Mediated TCO; 1.5 Multicomponent TCO Hosts; 1.6 Electronic Properties of Light Metal Oxides; 1.7 Carrier Delocalization in Complex Oxides; 1.7.1 Multicomponent Oxides with Layered Structures 1.7.2 Nanoporous Calcium Aluminate1.8 An Outlook: Toward an Ideal TCO; Acknowledgements; References; 2 Transparent Oxide Semiconductors: Fundamentals and Recent Progress; 2.1 Introduction; 2.2 Electronic Structure in Oxides: Carrier Transport Paths in Semiconductors; 2.3 Materials Design of p-Type TOSs; 2.4 Layered Oxichalcogenides: Improved p-Type Conduction and Room-Temperature Stable Excitons; 2.4.1 Improved Hole Transport in p-Type TOSs; 2.4.2 Epitaxial Film Fabrication: Reactive Solid-Phase Epitaxy (R-SPE); 2.4.3 Carrier Transport, Light Emission and Excitonic Properties 2.4.4 Two-Dimensional Electronic Structure in LnCuOCh2.5

Nanoporous Crystal, C12A7: New Functions Created by Subnanometer Cages and Clathrated Anions; 2.5.1 Crystal Structure of C12A7; 2.5.2 Electronic Structure of Clathrated Ions; 2.5.3 C12A7:H : Reversible Insulator-Conductor Conversion by UV Irradiation and Thermal Heating; 2.5.4 C12A7:e : Room-Temperature Stable Inorganic Electrode; 2.5.5 Embedded Quantum Dots in C12A7; 2.5.6 Device Application: Field Emission of Clathrated Electrons; 2.6 TAOSs and their TFT Applications; 2.6.1 TAOSs in Amorphous Semiconductors 2.6.2 Material Design for Transparent TAOSs with Large Electron Mobility 2.6.3 Electron-Transport Properties; 2.6.4 TAOS-TFTs; 2.7 Perspective; References; 3 p-Type Wide-Band-Gap Semiconductors for Transparent Electronics; 3.1 Introduction; 3.2 Applications; 3.2.1 p-Channel TTFT; 3.2.2 p-n Junctions; 3.2.3 p++ Contacts; 3.2.4 Solar Cells; 3.2.5 Passive Applications; 3.3 Challenges Associated with p-Type Wide-Gap Semiconductors; 3.3.1 Band Structure and Dopability; 3.3.2 Transport; 3.3.3 Optical Properties; 3.4 Materials; 3.4.1 Oxides 3.4.2 Chalcogenides, Chalcogenide Fluorides and Chalcogenide Oxides 3.4.3 Organic Semiconductors; 3.4.4 Nanomaterials; 3.4.5 Materials Synthesis; 3.5 Outlook and Prospects; References; 4 Lead Oxides: Synthesis and Applications; 4.1 Introduction; 4.2 Overview of Synthetic Methods and Approaches; 4.3 Synthesis of Lead Oxides; 4.3.1 Synthesis of PbO; 4.3.2 Synthesis of PbO<sub>2</sub>; 4.3.3 Synthesis of Pb<sub>2</sub>O<sub>3</sub>; 4.3.4 Synthesis of Pb<sub>3</sub>O<sub>4</sub>; 4.3.5 Other Minor Lead Oxides; 4.4 Applications of Lead Oxides; 4.5 Summary; Acknowledgement; References

5 Deposition and Performance Challenges of Transparent Conductive Oxides on Plastic Substrates

---

Sommario/riassunto

The challenge for producing "invisible" electronic circuitry and opto-electronic devices is that the transistor materials must be transparent to visible light yet have good carrier mobilities. This requires a special class of materials having "contra-indicated properties" because from the band structure point of view, the combination of transparency and conductivity is contradictory. Structured to strike a balance between introductory and advanced topics, this monograph juxtaposes fundamental science and technology / application issues, and essential materials characteristics versus device a

---