1. Record Nr. UNINA9910141808603321

Autore	Kar Pradip
Titolo	Doping in conjugated polymers [[electronic resource] /] / Pradip Kar
Pubbl/distr/stampa	Hoboken, New Jersey, : John Wiley and Sons, Inc., 2013
ISBN	1-118-81661-7 1-118-81663-3 1-118-81676-5
Descrizione fisica	1 online resource (176 p.)
Collana	Polymer Science and Plastics Engineering
Classificazione	TEC009010
Disciplina	660/.2977
Soggetti	Conjugated polymers Conducting polymers Semiconductor doping
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	"Published simultaneously in Canada"--Title page verso.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Cover; Title page; Copyright Page; Contents; Acknowledgement; Preface; 1 Introduction to Doping in Conjugated Polymer; 1.1 Introduction; 1.2 Molecular Orbital Structure of Conjugated Polymer; 1.3 Possibility of Electronic Conduction in Conjugated Polymer; 1.4 Necessity of Doping in Conjugated Polymer; 1.5 Concept of Doping in Conjugated Polymer; 1.5.1 Concept of Secondary Doping in Doped Conjugated Polymer; 1.5.2 Concept of Co-doping in Conjugated Polymer; 1.6 Doping as Probable Solution; 2 Classification of Dopants for the Conjugated Polymer; 2.1 Introduction 2.2 Classification of Dopant According to Electron Transfer2.2.1 p-Type Dopant; 2.2.2 n-Type Dopant; 2.3 Classification of Dopant According to Chemical Nature; 2.3.1 Inorganic Dopant; 2.3.2 Organic Dopant; 2.3.3 Polymeric Dopant; 2.4 Classification of Dopant According to Doping Mechanism; 2.4.1 Ionic Dopant or Redox Dopant; 2.4.2 Non-redox Dopant or Neutral Dopant; 2.4.3 Self-dopant; 2.4.4 Induced Dopant; 3 Doping Techniques for the Conjugated Polymer; 3.1 Introduction; 3.2 Electrochemical Doping; 3.2.1 Electrochemical Doping during Polymerization 3.2.2 Electrochemical Doping after Polymerization3.3 Chemical Doping; 3.3.1 Gaseous Doping; 3.3.2 Solution Doping; 3.4 In-situ doping; 3.5

Radiation-Induced Doping or Photo Doping; 3.6 Charge Injection Doping; 4 Role of Dopant on the Conduction of Conjugated Polymer; 4.1 Introduction; 4.2 Charge Defects within Doped Conjugated Polymer; 4.2.1 Soliton; 4.2.2 Polaron; 4.2.3 Bipolaron; 4.3 Charge Transport within the Doped Conjugated Polymer; 4.3.1 Electronic Parameter Responsible for Charge Transport; 4.3.2 Charge Transport Mechanism; 4.4 Migration of Dopant Counter Ions
4.4.1 Electrical Potential Difference and Redox-Potential Gradient4.4.2 Dopant Concentration Gradient or Doping Level; 5 Influence of Properties of Conjugated Polymer on Doping; 5.1 Introduction; 5.2 Conducting Property; 5.3 Spectroscopic Property; 5.3.1 UV-VIS Spectroscopy (Optical Property); 5.3.2 FTIR Spectroscopy; 5.3.3 NMR Spectroscopy; 5.3.4 Other Spectroscopy; 5.4 Electrochemical Property; 5.4.1 Cyclic Voltammetry; 5.4.2 Electrochemical Impedance Spectroscopy; 5.5 Thermal Property; 5.6 Structural Property; 5.6.1 Crystal Structure; 5.6.2 Morphological Structure
6 Some Special Classes of Dopants for Conjugated Polymer6.1 Introduction; 6.2 Iodine and Other Halogens; 6.2.1 Principle; 6.2.2 Doping Technique; 6.2.3 Property; 6.3 Halide Doping; 6.3.1 Principle; 6.3.2 Doping Technique; 6.3.3 Property; 6.4 Protonic Acid Doping; 6.4.1 Principle; 6.4.2 Doping Technique; 6.4.3 Property; 6.5 Covalent Doping; 7 Influence of Dopant on the Applications of Conjugated Polymer; 7.1 Introduction; 7.2 Sensors; 7.2.1 Chemical Sensors; 7.2.2 Biosensors; 7.3 Actuators; 7.4 Field Effect Transistor; 7.5 Rechargeable Batteries; 7.6 Electrochromic Devices
7.7 Optoelectronic Devices

Sommario/riassunto

This book responds to the growing interest in conjugated polymer-dopant interaction across disciplines. The first book dedicated to the subject, it offers an A to Z overview, detailing doping interaction, dopant types, doping techniques, influence of dopant on applications, and more. It explains how the performances of these polymers are influenced by the nature of dopants and their level of distribution within the polymer, showing how the electrochemical, mechanical, and optical properties of the doped conjugated polymers can be tailored by various means. Doping at the nano scale is also exam