

1. Record Nr.	UNINA9910831100203321
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Titolo	Handbook of oligo- and polythiophenes // Denis Fichou
Pubbl/distr/stampa	Weinheim, [Germany] : , : Wiley-VCH, , 1999 ©1999
ISBN	1-282-01020-4 9786612010200 3-527-61171-1 3-527-61170-3
Descrizione fisica	1 online resource (560 p.)
Altri autori (Persone)	FichouDenis
Disciplina	547.594 547.7
Soggetti	Thiophenes Polythiophenes
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 of each chapters and index.
Nota di contenuto	Handbook of Oligo- and Polythiophenes; Contents; 1 The Chemistry of Conducting Polythiophenes: from Synthesis to Self-Assembly to Intelligent Materials; 1.1 Introduction; 1.2 Chemical Synthesis of Unsubstituted Polythiophene (PT); 1.3 Chemcial Synthesis of Polyalkylthiophenes (PATs); 1.3.1 Straight Alkyl Side Chains; 1.3.1.1 Chemical Synthesis of PATs; 1.3.1.1.1 Metal Catalyed Cross-coupling Polymerizations; 1.3.1.1.2 FeCl3 Method for the Polymerization of PATs; 1.3.1.2 Comparison of the Above Methods; 1.3.1.3 Regioregular PATs; 1.3.1.3.1 Regioregular HH-TT and TT-HH PATs 1.3.1.4 Regioregular, Head-to-Tail Coupled PATs1.3.1.4.1 The McCullough Method; 1.3.1.4.2 The Rieke Method; 1.3.1.4.3 The Mechanism and Catalyst Choice; 1.3.1.4.4 NMR Characterization of HT-PAT; 1.3.1.4.5 IR and UV-Vis; 1.3.1.4.6 Self-Assembly, X-ray, and Electrical Conductivity in HT-PATs; 1.3.1.4.7 Other Methods; 1.3.1.4.8 Random Copolymers of Alkyl Thiophenes; 1.3.1.4.9 Head-to-Tail Coupled, Random Copolymers of Alkyl Thiophenes; 1.3.1.5 Branched Alkyl PATs; 1.3.1.6 PTs with Phenyl Sidechains

1.4 Chemical Synthesis of Heteroatomic Functionalized Substituents on PTs: Recognition Sites for Self-Assembly and Chemical Sensing
 1.4.1 Chemical Synthesis of Alkoxy Polythiophenes; 1.4.2 Chemical Prepared Alkoxy PTs as Conducting Polymer Sensors; 1.4.3 Chiral Substituents on PT; 1.4.4 Carboxylic Acid Derivatives: Self-Assembly and Sensors; 1.4.5 Other Derivatives of PT; 1.5 Fused Rings Systems; 1.6 Conclusion; References; 2 Electronic Properties of Polythiophenes; 2.1 General Aspects of Conducting Polymers; 2.2 Structure and Conformation of Polythiophenes
 2.2.1 Morphology and Crystal Structure
 2.2.2 Conformational Features; 2.3 Electronic Processes of Polythiophenes; 2.3.1 Charge Excitations in Polythiophenes; 2.3.2 Charge Transport in Polythiophenes; 2.3.3 Carrier Recombination: Photoluminescence and Electroluminescence; 2.3.4 Spectroscopic Studies of the Charged States; 2.3.4.1 Charge Storage Configurations in Solids and their Anisotropic Properties; 2.3.4.2 Properties in Solutions; 2.4 Concluding Remarks and Future Outlook; Acknowledgments; References; 3 The Synthesis of Oligothiophenes; 3.1 Introduction; 3.2 Synthesis of Oligothiophenes
 3.2.1 Unsubstituted Oligothiophenes
 3.2.1.1 Arene/arene-Coupling Methods by Oxidative Couplings; 3.2.1.2 Transition Metal Catalyzed Coupling Methods; 3.2.1.3 Ring Closure Reactions from Acyclic Precursors; 3.2.1.4 Physical Properties of -Oligothiophenes and Isomers; 3.2.2 Substituted Oligothiophenes; 3.2.2.1 β,β -Substituted Oligothiophenes; 3.2.2.2 γ -Substituted Oligothiophenes; 3.2.2.3 δ -Substituted Oligothiophenes; 3.2.2.4 Functionalized Oligothiophenes; 3.2.2.5 Amphiphilic Oligothiophenes; 3.2.2.6 Transition Metal Complexes of Oligothiophenes; 3.3 Conclusion; Acknowledgement
 References

Sommario/riassunto

This first concise handbook on this important new class of organic conducting materials gives a broad survey over this emerging field of research. The physical background is covered as well as the synthesis, electronic and nonlinear optical properties and applications of these advanced materials. This information will be of high value for graduate students, researchers and practitioners working in the interdisciplinary field of materials science, polymer and organic chemistry and applied physics.
