1. Record Nr. UNINA9911019987203321

Autore	Manners Ian <1961->
Titolo	Synthetic metal-containing polymers / / Ian Manners
Pubbl/distr/stampa	Weinheim ; ; Cambridge, : Wiley-VCH, c2004
ISBN	9786610520237 9781280520235 128052023X 9783527605088 3527605088 9783527601684 3527601686
Descrizione fisica	1 online resource (291 p.)
Disciplina	547.7 620.192
Soggetti	Copolymers - Analysis Metal-filled plastics - Analysis Metallic composites Polymeric composites Polymerization - Analysis
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibiographical references and index.
Nota di contenuto	Synthetic Metal-Containing Polymers; Preface; Contents; Abbreviations; 1 Introduction; 1.1 Metal-Containing Polymers; 1.2 Fundamental Characteristics of Polymeric Materials; 1.2.1 Polymer Molecular Weights; 1.2.2 Amorphous, Crystalline, and Liquid-Crystalline Polymers: Thermal Transitions; 1.2.3 Polymers versus Oligomers: Why are High Molecular Weights Desirable?; 1.2.4 Polymer Solubility; 1.2.5 Block Copolymers; 1.2.6 Dendrimers and Hyperbranched Polymers; 1.2.7 Electrically Conducting Polymers; 1.3 Motivations for the Incorporation of Metals into Polymer Structures 1.3.1 Conformational, Mechanical, and Morphological Characteristics1. 3.2 Precursors to Ceramics; 1.3.3 Magnetic, Redox, Electronic, and Optical Properties; 1.3.4 Catalysis and Bioactivity; 1.3.5 Supramolecular

Chemistry and the Development of Hierarchical Structures; 1.4 Historical Development of Metal-Based Polymer Science; 1.5 Synthetic Routes to Metal-Containing Polymers; 1.5.1 The Synthesis of Side-Chain Metal-Containing Polymers; 1.5.2 Main-Chain Metal-Containing Polymers; 1.5.2.1 Why are Transition Metals in the Polymer Main Chain Desirable?
1.5.2.2 The Synthesis of Main-Chain Metal-Containing Polymers1. 5.2.2.1 Addition Polymerization; 1.5.2.2.2 Polycondensations; 1.5.2.2.3 Ring-Opening Polymerization (ROP); 1.6 References; 2 Side-Chain Metal-Containing Polymers; 2.1 Introduction; 2.2 Side-Chain Polymetallocene Homopolymers and Block Copolymers; 2.2.1 Organic Polymers with Metallocene Side Groups; 2.2.1.1 Poly(vinylferrocene); 2.2.1.2 Other Organic Polymers with Metallocene-Containing Side Groups; 2.2.2 Inorganic Polymers with Metallocene Side Groups; 2.2.2.1 Polyphosphazenes with Ferrocene- or Ruthenocene-Containing Side Groups
2.2.2.2 Polysilanes, Polysiloxanes, and Polycarbosilanes with Metallocene Side Groups2.3 Other Side-Chain Metallopolymers; 2.3.1 Polymers with -Coordinated Metals; 2.3.2 Polymers with Pendant Polypyridyl Complexes; 2.3.3 Polymers with Other Pendant Metal-Containing Units, Including the Area of Polymer-Supported Catalysts; 2.3.4 Block Copolymers with Pendant Metal-Containing Groups; 2.3.4.1 Approaches using Ring-Opening Metathesis Polymerization (ROMP); 2.3.4.2 Coordination to Pyridyl Substituents in Preformed Blocks; 2.3.4.3 Coordination to Other Substituents in Preformed Blocks
2.4 References3 Main-Chain Polymetallocenes with Short Spacer Groups; 3.1 Introduction; 3.2 Polymetallocenylenes and Polymetallocenes with Short Spacers Obtained by Condensation Routes; 3.2.1 Polymetallocenylenes; 3.2.2 Other Polymetallocenes with Short Spacers Obtained by Polycondensation Routes; 3.3 Ring-Opening Polymerization (ROP) of Strained Metallocenophanes; 3.3.1 Thermal ROP of Silicon-Bridged [1]Ferrocenophanes; 3.3.2 Thermal ROP of Other Strained Metallocenophanes; 3.3.3 Living Anionic ROP of Strained Metallocenophanes
3.3.4 Transition Metal-Catalyzed ROP of Strained Metallocenophanes

Sommario/riassunto

The development of the field of synthetic metal-containing polymers - where metal atoms form an integral part of the main chain or side group structure of a polymer - aims to create new materials which combine the processability of organic polymers with the physical or chemical characteristics associated with the metallic element or complex. This book covers the major developments in the synthesis, properties, and applications of synthetic metal-containing macromolecules, and includes chapters on the preparation and characterization of metal-containing polymers, metallocene-based polymers, rig