

1. Record Nr.	UNINA9910133583703321
Titolo	Hyperbranched polymers [[electronic resource]] : synthesis, properties, and applications // edited by Deyue Yan, Chao Gao, Holger Frey
Pubbl/distr/stampa	Hoboken, N.J., : Wiley, 2011
ISBN	0-470-93476-X 1-283-02554-X 9786613025548 0-470-92899-9 0-470-92900-6
Descrizione fisica	1 online resource (482 p.)
Collana	Wiley series on polymer engineering and technology
Altri autori (Persone)	YanDeyue GaoChao FreyHolger
Disciplina	668.9
Soggetti	Dendrimers Polymers
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	CONTENTS; Preface; Contributors; 1. Promising Dendritic Materials: An Introduction to HyperbranchedPolymers; 1.1 Importance of Branching; 1.2 Polymer Architecture; 1.3 Dendritic Polymers; 1.4 Hyperbranched Polymers; 1.4.1 Concept and History; 1.4.2 Structure and Properties; 1.4.3 Synthesis Philosophy; 1.4.4 Applications; 1.5 Conclusions; 1.6 References; 2. Polycondensation of AB x Monomers; 2.1 Introduction; 2.2 Statistical Consideration; 2.2.1 Polymerization Behavior; 2.2.2 Degree of Branching; 2.3 Polymerization of AB x -Type Monomers; 2.3.1 C-C Coupling Reactions 2.3.1.1 Metal-Catalyzed Cross Couplings 2.3.1.2 Diels-Alder Reactions; 2.3.1.3 Nucleophilic Substitution by Activated Methylenes; 2.3.1.4 Electrophilic Acylations; 2.3.2 C-O Coupling Reactions; 2.3.2.1 Nucleophilic Substitution Reactions by Phenoxides orAlkoxides; 2.3.2.2 Esterification of Carboxylic Acid Derivatives; 2.3.2.3 Ring-Opening Reaction of Epoxides; 2.3.3 C-N Coupling Reactions; 2.3.3.1 Condensation of Amines and Carboxylic AcidDerivatives; 2.3.3.2

Nucleophilic Addition of Amines; 2.3.3.3 Other C-N Coupling Reactions; 2.3.4 Si-C or Si-O Coupling Reactions
2.3.4.1 Hydrosilylation Reactions 2.3.4.2 Condensation Reactions; 2.3.4.3 Other Si-Containing Reactions; 2.3.5 Other Coupling Reactions; 2.3.5.1 C-O or C-N Coupling Reactions of Isocyanates; 2.3.5.2 C-S Coupling Reactions; 2.4 References; 3. Synthesis of Hyperbranched Polymers via Polymerization of Functionally Symmetric Monomer Pairs; 3.1 Introduction; 3.2 Theoretical Treatment of $A_2 + B_3$ Polymerization; 3.3 Polymerization of Symmetrical Monomer Pairs; 3.3.1 Polycondensation of A_2 and B_3 Monomers; 3.3.1.1 Polyamides; 3.3.1.2 Polyimides; 3.3.1.3 Polyethers; 3.3.1.4 Polyesters 3.3.1.5 Polycarbonates 3.3.1.6 Polyurethanes; 3.3.2 Proton-Transfer Polymerization of A_2 and B_3 Monomers; 3.3.3 The Michael Addition Polymerization of A_2 and B_3 Monomers; 3.4 Conclusions; 3.5 References; 4. Synthesis of Hyperbranched Polymers via Polymerization of Asymmetric Monomer Pairs; 4.1 Introduction; 4.2 General Description of Polymerization of Asymmetric Monomer Pairs; 4.3 Hyperbranched Polymers Prepared by Polymerization of Asymmetric Monomer Pairs; 4.3.1 Poly(Sulfoneamine); 4.3.2 Poly(Ester Amine); 4.3.3 Poly(Amidoamine); 4.3.4 Multihydroxyl Hyperbranched Poly(Amine Ester)s 4.3.5 Poly(Ester Amide)s 4.3.6 Polyesters; 4.3.7 Poly(Urea-Urethane)s; 4.3.8 Other Polymers; 4.3.9 Highly Branched Copolymers; 4.4 Conclusions; 4.5 References; 5. Self-Condensing Vinyl Polymerization; 5.1 Introduction; 5.2 Self-Condensing Vinyl Polymerization; 5.2.1 General Principles; 5.2.2 Various Mechanisms of SCVP; 5.2.3 Kinetics and MWD; 5.2.4 Degree of Branching; 5.2.5 Comparison with Experimental Data; 5.3 Self-Condensing Vinyl Copolymerization (SCVCP); 5.3.1 Experimental Data; 5.3.2 Kinetics and MWD; 5.3.3 Degree of Branching; 5.3.4 Comparison with Experimental Data 5.4 Self-Condensing Processes in Presence of Initiators

Sommario/riassunto

A much-needed overview of the state of the art of hyperbranched polymers. The last two decades have seen a surge of interest in hyperbranched polymers due to their ease of synthesis on a large scale and their promising applications in diverse fields, from medicine to nanotechnology. Written by leading scientists in academia and industry, this book provides for the first time a comprehensive overview of the topic, bringing together in one complete volume a wealth of information previously available only in articles scattered across the literature. Drawing on their work at the
