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| Nota di contenuto       | Polymer Brushes; Contents; Preface; List of Contributors; Polymer Brushes: On the Way to Tailor-Made Surfaces; 1 Growth of Polymer Molecules at Surfaces: Introductory Remarks; 2 Coatings: From First Principles to High-Tech Applications; 3 Surface-Coating Techniques; 4 Surface-Attached Polymers; 5 Polymer Brushes: General Features; 6 Theory of Polymer Brushes; 7 Synthesis of Polymer Brushes; 8 Polymer Brushes as Functional Materials; 9 Microstructured Polymer Brushes; 10 Surface-Initiated Polymerization: The Overall Picture; Part I Synthesis; 1 Recent Advances in Polymer Brush Synthesis<br>1.1 Introduction<br>1.2 "Grafting To" Synthesis Technique<br>1.3 "Grafting From" Synthesis Technique<br>2 Polymer Brushes by Atom Transfer |

Radical Polymerization; 2.1 Introduction; 2.2 Polymer Brushes on Flat Surfaces; 2.2.1 Controlled ATRP from Flat Surfaces; 2.2.2 Block Copolymer Brushes on Flat Surfaces; 2.2.3 Stimuli-Responsive Ultrathin Films from "Grafting To" Approach; 2.3 Polymer Brushes from Particles; 2.3.1 Spherical Brushes from Inorganic Colloids; 2.3.2 Multilayered Core-Shell Colloids; 2.3.3 Imaging of Individual Spherical Brushes; 2.3.4 Modification of Carbon Black Fillers

2.4 Molecular Brushes 2.4.1 Synthesis of Molecular Brushes from Linear Polymeric Macroinitiators; 2.4.2 Molecular Brushes from Dendritic Macroinitiators; 3 Polymer Brushes by Atom Transfer Radical Polymerization Initiated from Macroinitiator Synthesized on the Surface; 3.1 Introduction; 3.2 Experimental; 3.3 Results and Discussion; 3.3.1 Synthesis of Macroinitiator for ATRP; 3.3.2 ATRP from Macroinitiator; 4 Synthesis of Polypeptide Brushes; 4.1 Introduction; 4.2 Preparation of Peptide Brushes by "Grafting To"; 4.3 Preparation of Peptide Brushes by Grafting From Polymerization

4.3.1 Mechanisms of NCA Polymerization 4.3.2 Amine-Initiated Grafting From Polymerizations in Solution; 4.3.3 Other Techniques for Amine-Initiated Grafting From Polymerizations; 4.4 Preparation of Peptide Brushes by Living Grafting From Polymerization; 4.4.1 Copolymerization Approach; 4.4.2 Alloc-Amide Approach; 5 Bottle Brush Brushes: Ring-Opening Polymerization of Lactide from Poly(hydroxyethyl methacrylate) Surfaces; 5.1 Introduction; 5.2 Synthesis of PHEMA-g-PLA; 5.3 Conclusions and Implications for Future Studies; 5.4 Experimental Section; 5.4.1 Materials

5.4.2 Preparation of Monomer Solution and Substrates 5.4.3 Ring-Opening Polymerization from PHEMA Surface; 5.4.4 Analytical Methods; 6 Preparation of Well-Defined Organic-Inorganic Hybrid Nanostructures using Living Cationic Surface-Initiated Polymerization from Silica Nanoparticles; 6.1 Introduction; 6.2 Experimental Section; 6.2.1 Materials; 6.2.2 Characterization; 6.2.3 Synthesis of Immobilized Macroinitiators; 6.3 Results and Discussion; 6.3.1 Living Cationic Surface-Initiated Polymerization of IB from Silica Nanoparticles in the Presence of Sacrificial Free Initiator

6.3.2 Living Cationic Surface-Initiated Polymerization of IB from Silica Macroinitiators

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#### Sommario/riassunto

Materials scientists, polymer chemists, surface physicists and materials engineers will find this book a complete and detailed treatise on the field of polymer brushes, their synthesis, characterization and manifold applications. In a first section, the various synthetic pathways and different surface materials are introduced and explained, followed by a second section covering important aspects of characterization and analysis in both flat surfaces and particles. These specific surface initiated polymerization (SIP) systems such as linear polymers, homopolymers, block copolymers, and hyperbra

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