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Page"; "Contents"; "Preface: Polymer Structures on Polymer Substrates"; "Acknowledgements"; "1 Functional Polymer Structures"; "1.1 Polymer Systems: Inertness Versus Functionality"; "1.2 Polymer Brushes"; "1.2.1 Formation of Polymer Brushes on Surfaces"; "1.2.2 Responsive Polymer Brushes"; "1.2.3 Polyelectrolyte Brushes"; "1.2.4 Biofunctional Brushes"; "1.2.5 Patterned Polymer Brushes"; "References"; "2 Polymer-on-Polymer Structures Based on Radiation Grafting"; "2.1 Introduction"; "2.2 Impact of Radiation on Polymers"; "2.2.1 Non-ionizing Versus Ionizing Radiation"; "2.2.2 Differences and Similarities of Photons and Particle Beams"; "2.2.3 Implications for Shadow Masks"; "2.3 Radiation Grafting Using Photons"; "2.3.1 Visible Light and UV Radiation"; "Lasers as Light Sources"; "2.3.2 Structures Via Extreme UV Lithography"; "EUV Interference Exposures"; "Growth of Polymer Brushes"; "Structure Formation"; "2.3.3 Photons in the keV Range"; "2.3.4 Gamma Radiation"; "2.4 Radiation Grafting Using Electrons"; "2.4.1 Structures Via Electron Beam Lithography"; "2.4.2 Absorption Mask Techniques Using Low-Energy Electron Beams"; "2.4.3 High-Energy Electrons"; "2.5 Radiation Grafting Using Particle Beams"; "2.5.1 Plasma Activation"; "2.5.2 Accelerated Ions"; "2.5.3 Swift Heavy Ions"; "2.6 Conclusions"; "References"; "3 Initiator Immobilization Strategies for Structured Brushes"; "3.1 General Initiator Patterning Strategies"; "3.2 Patterning Strategies for Atom Transfer Radical Polymerization"; "3.2.1 Initiator Immobilization and Patterning on Silicon Substrates"; "3.2.2 Polymers with Functional Groups for Initiator Immobilization"; "3.2.3 Initiator Immobilization on Inert Polymer Substrates"; "3.3 Patterning Strategies for Reversible Addition Fragmentation Transfer Polymerization"; "3.3.1 Site-Selective Polymerization Using a Light-Sensitive Initiator (Photoiniferter)"; "3.3.2 Selective Polymerization Using Substrates Containing a Light-Sensitive Initiator"; "3.4 Patterning Strategies Using Benzophenone Chemistry"; "3.5 Conclusions"; "References"; "4 Functional Polymer-on-Polymer Structures"; "4.1 Grafting Functional Monomers Versus Post-Polymerization Modification"; "4.2 Responsive Structures"; "4.2.1 Responsiveness to Changes in pH"; "4.2.2 Responsiveness to Temperature Changes"; "4.2.3 Magneto-responsiveness"; "4.2.4 Responsiveness Based on Counterion Exchange"; "4.2.5 Light Responsiveness"; "4.3 Biofunctional Structures"; "4.4 Conclusions"; "References"; "5 Characterization Challenges of Micro- and Nanografted Polymer Systems"; "5.1 Introduction"; "5.2 Spectroscopic Methods"; "5.2.1 Infrared Spectroscopy"; "5.2.2 Ultraviolet/Visual Spectroscopy"; "5.2.3 Fluorescence Spectroscopy"

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## Sommario/riassunto

Polymers have proven to be very suitable materials for topographic structuring, in particular in nanoreplication processes. Micro- and Nanografting strategies address the possibility for the formation of chemical patterns and structures on or in polymeric substrates using relatively simple processes. Polymer Micro- and Nanografting focuses on grafting techniques characterization and applications for the particular combination of polymer layers on polymer substrates. The authors, leaders in this area of research, provide a comprehensive survey on polymer-on-polymer grafting, covering the latest

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