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Nota di contenuto	Optimization of Polymer Nanocomposite Properties; Contents; Preface; List of Contributors; 1: Polymer Nanocomposites: Synthesis, Microstructure, and Properties; 1.1 Introduction; 1.2 Means of Synthesis and Microstructure; 1.3 Importance of Thermogravimetric Analysis and X-Ray Diffraction for Filler and Nanocomposite Microstructure Characterization; 1.4 Polar and Nonpolar Polymer Systems; 1.5 Advances in Filler Surface Modifications; 1.6 Prediction of Composite Properties; References; 2: Morphology Development in Thermoset Nanocomposites; 2.1 Introduction; 2.2 Epoxy Nanocomposite Systems 2.3 Effects of Processing and Aging2.4 Other Thermoset Nanocomposite Systems; 2.5 Recent Advances in Thermoset Nanocomposites; 2.5.1 Epoxy-HBP Nanostructured Systems; 2.5.2 Ternary Nanostructured Systems and Multiscale Composites; 2.5.3 Novel Characterization Methods; 2.5.4 Modeling Thermoset Nanocomposite Systems; 2.6 Summary; References; 3: Morphology and Interface Development in Rubber-Clay Nanocomposites; 3.1 Introduction; 3.2 Melt Compounding; 3.2.1 Mechanism and Influencing

Factors; 3.2.1.1 The Organic Modification; 3.2.1.2 The Features of Rubber and Compatibilizers or Coupling Agents
3.2.1.3 Melt-Compounding Conditions3.2.2 Evolution of Morphology and Interface during Vulcanization of RCNs; 3.2.2.1 Changes in the Local Microstructure of Clay Particles; 3.2.2.2 Change in the Spatial Distribution of Clay Particles; 3.3 Latex Compounding; 3.3.1 Mechanism and Influencing Factors; 3.3.2 Interface Enhancement; References; 4: Morphology Development in Polyolefin Nanocomposites; 4.1 Introduction; 4.2 Intercalation, Exfoliation, and Dispersion of MMT; 4.2.1 Manufacturing Processes; 4.2.2 Dispersion (Exfoliation) State of Nanoclays; 4.2.3 Exfoliation Process of Nanoclays
4.2.4 Control of Exfoliation/Dispersion of Nanoclays4.2.4.1 Raw Materials; 4.2.4.2 Mixing Methods; 4.2.4.3 Mixing Conditions; 4.2.5 Morphology of Base Polymers; 4.3 Crystallization and Crystalline Structure of Matrix Polymers; 4.3.1 Crystallization; 4.3.1.1 Quiescent Crystallization; 4.3.1.2 Flow-Induced Crystallization; 4.3.2 Crystalline Structure; 4.3.2.1 Quiescent Crystallization; 4.3.2.2 Flow-Induced Crystallization; 4.4 Morphology Development in Processing; 4.4.1 Injection Molding; 4.4.1.1 Conventional Injection Molding; 4.4.1.2 Dynamic Packing Injection Molding; 4.4.2 Sheet Extrusion
4.4.3 Film Extrusion Casting4.5 Conclusions; References; 5: Rheological Behavior of Polymer Nanocomposites; 5.1 Introduction; 5.2 Rheological Behavior of Polymer Nanocomposites in Solution State; 5.3 Rheological Behavior of Polymer Nanocomposites in Melt State; 5.4 Conclusions; References; 6: Mechanical Property Enhancement of Polymer Nanocomposites; 6.1 Introduction; 6.2 Material Stiffness; 6.2.1 Experimental Investigations; 6.2.2 Analytical Modeling; 6.3 Ultimate Mechanical Properties; 6.3.1 Experimental Investigations; 6.3.2 Analytical Modeling; 6.3.2.1 Yield Stress
6.3.2.2 Properties at Break

Sommario/riassunto

A one-stop resource for researchers and developers alike, this book covers a plethora of nanocomposite properties and their enhancement mechanisms.With contributors from industry as well as academia, each chapter elucidates in detail the mechanisms to achieve a certain functionality of the polymer nanocomposite, such as improved biodegradability, increased chemical resistance and tribological performance. Special emphasis is laid on the interdependence of the factors that affect the nanocomposite properties such that readers obtain the information necessary to synthesize the polymer materi

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