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Nota di contenuto	Cover; Title page; Copyright page; Contents; Preface; List of Contributors; 1: Epoxy-Vermiculite Nanocomposites; 1.1 Introduction; 1.2 Experimental; 1.2.1 Materials; 1.2.2 H2O2 Treatment; 1.2.3 Milling and De-agglomeration; 1.2.4 Delamination; 1.2.5 Cation Exchange Capacity; 1.2.6 Ion Exchange and Nanocomposite Preparation; 1.2.7 Characterization of the Fillers and Composite Films; 1.3 Results and Discussion; 1.4 Conclusions; Acknowledgment; References; 2: Polymer Nanocomposites with UV-Cured Epoxies; 2.1 Introduction; 2.2 Photopolymerization of Epoxides 2.3 Limits in Curing Epoxy Composites by UV Irradiation 2.4 Top-Down UV-Cured Epoxy Nanocomposites; 2.5 Bottom-Up UV-Cured Epoxy Nanocomposites; 2.6 Conclusions; References; 3: Influence of Organic Modification and Polyurethane Structure on Clay Dispersion in Polyurethane-Clay Nanocomposites; 3.1 Polymer Nanocomposites: An Introduction; 3.2 Polyurethane-Clay Nanocomposites; 3.2.1 Polyurethane Products and Chemistry; 3.2.2 Polyurethane Clay Composites; 3.3 Influence of Organic Modification of Clay and Structure of PU on PU/Clay Nanocomposites Structure; 3.3.1 Reactive and Nonreactive Modifiers

3.3.2 Effect of Nature of Modifier on Clay Dispersion in PU 3.3.3 Effect of Nature of Modifier on Properties of PU Nanocomposites; 3.4 Conclusions; References; 4: Thermal Properties of Formaldehyde-Based Thermoset Nanocomposites; 4.1 Introduction; 4.2 Theoretical Background of Thermal Kinetics; 4.2.1 Conventional Kinetics of Thermal Cure and Degradation; 4.2.2 Theory of Temperature-Modulated DSC (TMDSC); 4.2.3 Theory of Temperature-Modulated TG (MTG); 4.3 Thermal Properties of Nanocomposites; 4.3.1 Cure Kinetics of MF Resin/Clay/Cellulose Nanocomposites 4.3.2 Cure Kinetics of PF Resin/Clay/Cellulose Nanocomposites 4.3.3 Thermal Degradation Kinetics of PF Resin/MWCNT/Cellulose Nanocomposites; 4.3.4 Dynamic Mechanical Analysis of PF Resin/MWCNT/Cellulose Nanocomposites; 4.4 Mechanical Properties of the Nanocomposites; 4.5 Summary; Acknowledgment; References; 5: Mechanical Performance of Thermoset Clay Nanocomposites; 5.1 Introduction; 5.2 Viscoelasticity Analysis: Dynamical Mechanical Thermal Analysis (DMTA); 5.3 Rigidity - Young's Modulus; 5.4 Strain at Break; 5.5 Stress at Break - Fracture Toughness; 5.6 Conclusion; References
6: Unsaturated Polyester Resin Clay Hybrid Nanocomposites 6.1 Introduction; 6.2 Reinforced Unsaturated Polyester Composites; 6.3 Clay Minerals; 6.3.1 Layered Structure; 6.3.2 General Characteristics; 6.3.3 Surface Modification; 6.3.4 Processing and Characterization; 6.4 Mechanical and Thermal Properties of Clay-UP Nanocomposites; 6.5 Flame Retardance; 6.6 Bio-Derived Unsaturated Polyester-Clay Nanocomposites; References; 7: Hyperbranched Polymers as Clay Surface Modifications for Nanocomposites; 7.1 Introduction; 7.2 Hyperbranched Polymers for Antimicrobial Surface 7.3 Hyperbranched Polymers on Adsorbents for Cr(VI) Water Treatment

Sommario/riassunto

The book discusses proven and promising methods to achieve a compatibilization between the organic and inorganic phases in thermoset polymers such as polyurethanes, phenolic resins, polyesters and epoxies. Of particular importance to the polymer engineer are the chapters dealing with compatibilization agents such as maleic anhydride elastomers, hydroxyl or carboxylic acid functionalized copolymers or metallocenes that catalyze the reactive processing. This title is essential reading for materials scientists, polymer chemists, chemical industry, and chemical engineers.
