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Control; 2.3.2 Preparing Exfoliated/Intercalated Nanocomposites; 2.4 Latex Compounding; 2.4.1 Manufacturing Factors Control; 2.4.2 The Effect of Rubber Type; 2.5 Summary; Acknowledgments; References; 3 Reinforcement of Silicone Rubbers by Sol-Gel In Situ Generated Filler Particles; 3.1 Introduction; 3.2 Synthetic Aspects; 3.2.1 General Considerations; 3.2.2 Adopted Protocols 3.3 Properties of the Hybrid Materials 3.3.1 State of Dispersion; 3.3.2 Stress-Strain Curves; 3.3.3 Low Strain Dynamic Properties; 3.3.4 Mullins Effect; 3.3.5 Characterization of the Polymer-Filler Interface; 3.3.6 Thermal Properties; 3.4 Conclusions; References; 4 Interface Modification and Characterization; 4.1 Introduction; 4.1.1 Particle Size; 4.1.2 Surface Activity; 4.2 Rubber Nanocomposites Without Interface Modification; 4.2.1 Hardness and 300% Tensile Modulus; 4.2.2 Tensile Strength; 4.2.3 Tensile Strain; 4.2.4 Tear Strength; 4.2.5 Rebound Resilience; 4.2.6 Processing Properties 4.2.7 Advantages 4.2.8 Disadvantages; 4.3 Interface Modification by Nonreactive Routes; 4.4 Interface Modification by Reactive Routes; 4.5 Characterization of Interface Modification; 4.5.1 Direct Methods for Interface Characterization; 4.5.2 Indirect Methods for Interface Characterization; 4.6 Conclusion; List of Abbreviations; Acknowledgments; References; 5 Natural Rubber Green Nanocomposites; 5.1 Introduction; 5.2 Preparation of Polysaccharide Nanocrystals; 5.3 Processing of Polysaccharide Nanocrystal-Reinforced Rubber Nanocomposites; 5.4 Morphological Investigation; 5.5 Swelling Behavior 5.5.1 Toluene Swelling Behavior 5.5.2 Water Swelling Behavior; 5.5.3 Influence of the Chemical Modification of the Filler; 5.6 Dynamic Mechanical Analysis; 5.7 Tensile Tests; 5.8 Successive Tensile Tests; 5.9 Barrier Properties; 5.10 Conclusions; References; 6 Carbon Nanotube Reinforced Rubber Composites; 6.1 Introduction; 6.2 Functionalized Carbon Nanotubes; 6.3 Elastomeric Nanocomposites; 6.3.1 Natural Rubber; 6.3.2 Styrene-Butadiene Rubber; 6.3.3 Polyurethane Rubber; 6.3.4 Silicone Rubber; 6.4 Outlook; References; 7 Rubber/Clay Nanocomposites: Preparation, Properties and Applications 7.1 Introduction

Sommario/riassunto

Rubber Nanocomposites: Preparation, Properties and Applications focuses on the preparation, characterization and properties of natural and synthetic rubber nanocomposites. The book carefully debates the preparation of unmodified and modified nanofillers, various manufacturing techniques of rubber nanocomposites, structure, morphology and properties of nanocomposites. The text reviews the processing; characterization and properties of 0-, 1D and 2D nanofiller reinforced rubber nanocomposites. It examines the polymer/filler interaction, i.e., the compatibility between matrix and filler u
