

1. Record Nr.	UNINA9910139510303321
Titolo	Rubber nanocomposites [[electronic resource] ] : preparation, properties, and applications // editors: Sabu Thomas, Ranimol Stephen
Pubbl/distr/stampa	Hoboken, NJ, : Wiley, c2010
ISBN	1-282-68982-7 9786612689826 0-470-82347-X 1-61583-460-5 0-470-82346-1
Descrizione fisica	1 online resource (729 p.)
Altri autori (Persone)	ThomasSabu StephenRanimol
Disciplina	620.194 678.72 678/.72
Soggetti	Rubber Nanocomposites (Materials) Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	RUBBER NANOCOMPOSITES: PREPARATION, PROPERTIES, AND APPLICATIONS; Contents; List of Contributors; Preface; Editor Biographies; 1 Nanocomposites: State of the Art, New Challenges and Opportunities; 1.1 Introduction; 1.2 Various Nanofillers; 1.2.1 Layered Silicates; 1.2.2 Nanotubes; 1.2.3 Spherical Particles; 1.2.4 Polyhedral Oligomeric Silsesquioxanes; 1.2.5 Bionanofillers; 1.3 Rubber Nanocomposites; 1.4 Future Outlook, Challenges and Opportunities; References; 2 Manufacturing Techniques of Rubber Nanocomposites; 2.1 Introduction; 2.1.1 Conventional Manufacturing Techniques 2.1.2 Rubber Nanocomposites2.1.3 Reinforcing Agent; 2.2 Melt Compounding; 2.2.1 Manufacturing Factors Control; 2.2.2 Filler Surface Modification; 2.3 Solution Blending; 2.3.1 Manufacturing Factors 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

---