

1. Record Nr.	UNINA9910829975103321
Titolo	Rubber-clay nanocomposites : science, technology, and applications / / edited by Maurizio Galimberti
Pubbl/distr/stampa	Hoboken, New Jersey : , : John Wiley & Sons, , [2011] ©2011
ISBN	1-283-26814-0 9786613268143 1-118-09287-2 1-118-09286-4 1-118-09288-0
Descrizione fisica	1 online resource (627 p.)
Classificazione	TEC009010
Disciplina	620.1/94 620.194
Soggetti	Nanocomposites (Materials) Rubber
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	SECTION I. CLAYS FOR NANOCOMPOSITES. -- 1. Clays and clay minerals. -- 1.1 What's in a name. -- 1.2 Multiscale organization of clay minerals. -- 1.3 Intimate organization of the layer. -- 1.4 Most relevant physic-chemical properties of clay minerals. -- 1.5 Availability of natural clays and synthetic clay minerals. -- 1.6 Clays and (modified) clay minerals as fillers. -- 1.7 References. -- 2. Organophilic Clay Minerals. -- 2.1 Organoohilicity-Lipophilicity and the Hydrophilic Balance (HLB). -- 2.2 From clays to organoclays in polymer technology. -- 2.3 Methods of organoclays synthesis. -- 2.4 Other types of clay modifications (for clay-based nanomaterials). -- 2.5 Fine-tuning of organoclays structure properties. -- 2.6 Some introductory reflections on organo-clay polymer nanocomposites. -- 2.7 References. -- 3. Industrial treatments and modification of clay minerals. -- 3.1 Bentonite: from mine to plant -- 3.2 Processing of bentonite. -- 3.3 Purification of clay. -- 3.4 Reaction of clay with organic substance. -- 3.5 Particle size modification. -- 3.6

References. -- 4. Alkylammonium Chains on Layered Clay Mineral Surfaces. -- 4.1 Structure and dynamics. -- 4.2 Thermal properties. -- 4.3 Layer separation and miscibility with polymers. -- 4.4 Mechanical properties of clay minerals. -- 4.5 References. -- 5. Chemistry of Rubber/Organoclay Nanocomposites. -- 5.1 Introduction. -- 5.2 Organic Cation decomposition in Salts, Organoclays and Polymer Nanocomposites. -- 5.3 Mechanism of thermal decomposition of Organoclays. -- 5.4 Role of organic Cations in Organoclays as rubber vulcanization activators. -- 5.5 References --

SECTION II. PREPARATION AND CHARACTERIZATION OF RUBBER-CLAY NANOCOMPOSITES. -- 6. Processing Methods for the Preparation of Rubber-Clay Nanocomposites. -- 6.1 Introduction. -- 6.2 Latex compounding method. -- 6.3 Melt compounding. -- 6.4 Solution intercalation and in-situ polymerization intercalation. -- 6.5 Summary and prospects. -- 6.6 References. -- 7. Morphology of rubber clay nanocomposites. -- 7.1 Introduction. -- 7.2 Background for the review of RCN. -- 7.3 Rubber clay nanocomposites with pristine clays. -- 7.4 Rubber clay nanocomposites with clays modified with primary alkenylamines. -- 7.5 Rubber clay nanocomposites with clays modified with an ammonium cation having three methyls and one long alkenyl substituents. -- 7.6 Rubber clay nanocomposites with montmorillonite modified with two substituents larger than methyl. -- 7.7 Rubber clay nanocomposites with montmorillonite modified with an ammonium cation containing a polar group. -- 7.8 Rubber clay nanocomposites with montmorillonite modified with an ammonium cation containing two long chain alkenyl substituents. -- 7.9 Proposed mechanisms for the formation of rubber clay nanocomposites. -- 7.10 References. -- 8. Rheology of rubber clay nanocomposites. -- 8.1 Introduction. -- 8.2 Rheological Behavior of Rubber/Clay Nanocomposites. -- 8.3 General remarks on rheology of Rubber/Clay Nanocomposites. -- 8.4 Overview of rheological theories of Polymer/Clay Nanocomposites. -- 8.5 Conclusion and outlook. -- 8.6 References. -- 9. Vulcanization Characteristics and C --

13.1 Introduction. -- 13.2 Preparation methods and clay dispersion. -- 13.3 Cure characteristics. -- 13.4 Properties. -- 13.5 Outlook. -- 13.6 References. -- 14. Rubber Clay Nanocomposites based on Butyl and Halobutyl Rubbers. -- 14.1 Introduction. -- 14.2 Types of Clays useful in Butyl Rubber-Clay Nanocomposites. -- 14.3 Compatibilizer Systems for Butyl Rubber-Clay Nanocomposites. -- 14.4 Methods of Preparation of Butyl Rubber-Clay Nanocomposites. -- 14.5 Properties and Applications of Butyl Rubber-Clay Nanocomposites. -- 14.6 Conclusions. -- 14.7 References. -- 15. Rubber Clay Nanocomposites, based on olefinic rubber (EPM, EPDM). -- 15.1 Introduction. -- 15.2 Types of Clay minerals useful in EPM, EPDM clay Nanocomposites. -- 15.3 Compatibilizer Systems for Olefinic rubber Clay Nonocomposites. -- 15.4 Preparation of EPDM Clay Nanocomposites by an in situ intercalation method. -- 15.5 Characteristics of EPDM clay nanocomposites. -- 15.6 Preparation and characteristics of EPM clay nanocomposites. -- 15.7 Conclusion. -- 16. Rubber Clay Nanocomposites, based on thermoplastic elastomers. -- 16.1 Introduction. -- 16.2 Selection of Materials. -- 16.3 Experimental. -- 16.4 Numerical. -- 16.5 Discussion of Results. -- 16.6 Summary and Conclusions. -- 16.7 Nomenclature. -- 16.8 References --

SECTION IV. APPLICATIONS OF RUBBER: CLAY NANOCOMPOSITES. -- 17. Automotive Applications of Rubber Clay Nanocomposites. -- 17.1 Introduction. -- 17.2 Automotive application of rubber. -- 17.3 Prime requirement of different elastomeric auto components from application point of view. -- 17.4 Elastomeric nanocomposites and rubber

industry. -- 17.5 Superiority of clay: clay minerals in comparison to other nano fillers. -- 17.6 Organomodified clay: clay minerals. -- 17.7 Scope of application of elastomeric nanocomposites in automotive industry. -- 17.8 Disadvantages of use of organoclay elastomeric nanocomposites in automotive industry. -- 17.9 Conclusion. -- 17.10 List of abbreviations. -- 17.11 References. -- 18 Non automotive applications of rubber- clay nanocomposites. -- 18.1 Water based nanocomposites. -- 18.2 Applications.

Sommario/riassunto

"This book comprehensively reviews rubber-clay nanocomposites in a handbook format for R&D professionals. Along with valuable details on synthesis, processing, and mechanics, the book includes applications of rubber-clay nanocomposites in automotive tires and as polymer fillers. In addition, it helps scientists understand processing methods for nanocomposites preparation and nanostructure characterization. This book helps promote common knowledge and interpretation of the important aspects of rubber-clay nanocomposites, clarifying the main results achieved in the field of rubbers and crosslinked rubbers - not covered by the more general books on polymer-clay nanocomposites"

--
