Record Nr. UNINA9910788469003321 Nanocomposite coatings and nanocomposite materials / / edited by A. **Titolo** Ochsner, W. Ahmed, N. Ali Pubbl/distr/stampa Stafa-Zuerich;; Enfield, New Hampshire:,: Trans Tech Publications,, [2009] ©2009 **ISBN** 3-03813-322-1 1-61344-685-3 Descrizione fisica 1 online resource (398 p.) Materials science foundations, , 1422-3597;; volumes 54-55 Collana 620.5 Disciplina Soggetti Nanostructured materials Composite materials Coatings Thin films 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. Nota di contenuto Nanocomposite Coatings and Nanocomposite Materials; Preface; Table of Contents; Table of Contents; CHAPTER 1 Nanostructured, Nanocomposite Tribological Coatings; 1. Inroduction; 2. Classification of Nanostructured, Nanocomposite Tribological Coatings: 3. Background of Nanostructured Super-Hard Coatings; 4. New Directions for Nanostructured Super-Tough Coatings; 5. Other Possible Properties of Nanostructured Coatings; 6. New Processes for Industrial Applications of Multifunctional Tribological Coatings; 7. Case Studies: Preparation - Microstructure - Properties of Nanostructured Coatings 8. Concluding Remarks. References. CHAPTER 2 Nanocharacterisation of

Nanocomposite Materials; 1. Introduction; 2. Morphological Characterization of Nanocomposite Materials; 3. Chemical Analysis of Nanocomposite Materials; 4. Summary. References; CHAPTER 3 Hierarchical Nanocomposites; 1. Introduction; 2. Nanocomposites; 3. Hierarchical Nanocomposites; 4. Multiscale Hierarchical Nanocomposites; 5. Nanoresin-Based Multiscale Hierarchical Compound Nanocomposites; 6. Conclusions; References; CHAPTER 4 Fumed Silica Reinforced Nanocomposites; 1. Introduction; 2. Fumed Silica

3. Thermoplastic Polymeric Matrices4, Thermoset Polymeric Matrices: 5. Biocomposites; References; CHAPTER 5 Hard and Tough Nanocomposite Coatings: Design, Synthesis and Characterization; 1. Introduction. 2. Classification.; 3. Design Methodology for Nanocomposite Coatings; 4. How to Enhance Coating Hardness and Toughness; 5. Deposition Techniques; 6. Microstructures of Hard and Tough Nanocomposite Coatings; 7. Characterization of Coating Hardness and Toughness: 8. Concluding Remarks: References CHAPTER 6 Plasma Enhanced Magnetron Sputter (PEMS) Deposition of Thick Nanocomposite Coatings for Erosion Protection 1. Introduction, 2. Erosion of Materials.; 3. Plasma Enhanced Magnetron Sputter Deposition; 4. Parametric Study of Nanocomposite Coatings Using the PEMS Process; 5. Discussion; 6. Concluding Remarks and Future Outlook: References: CHAPTER 7 Synthesis of Nanowires: 1. Introduction; 2. Solution-Based Methods; 3. Vapor-Based Methods; 4. Direct Oxidization; 5. Hybrid Nanowires; 6. Conclusions and Future Outlook: References CHAPTER 8 Synthesis and Applications of Inorganic-Organic Hybrid Nanostructured Materials1.Introduction. 2.Zeolite-Like Inorganic-Organic Hybrids.; 3. Ship-in-a-Bottle Zeolites; 4. Mesoporous Silica

Nanostructured Materials1.Introduction. 2.Zeolite-Like Inorganic-Organic Hybrid Nanostructured Materials1.Introduction. 2.Zeolite-Like Inorganic-Organic Hybrids.; 3. Ship-in-a-Bottle Zeolites; 4. Mesoporous Silica with an Organic Surface; 5. Multi-Layered Nanoparticles; 6. Conclusions. References; CHAPTER 9 Nanolayers and Nanostructured Films; 1. Introduction; 2. Metallic Nanolayers; 3. Ceramics Nanolayers; References

Sommario/riassunto

Nanocomposite materials are formed by mixing two or more dissimilar materials at the nanoscale in order to control and develop new and improved structures and properties. The properties of nanocomposites depend not only upon the individual components used but also upon the morphology and the interfacial characteristics. Nanocomposite coatings and materials are among the most exciting and fastest-growing areas of research; with new materials being continually developed which often exhibit novel properties that are absent in the constituent materials. Nanocomposite materials and coatings theref