

1. Record Nr.	UNINA9910437801803321
Titolo	New frontiers of nanoparticles and nanocomposite materials : novel principles and techniques // Andreas Ochsner, Ali Shokuhfar, editors
Pubbl/distr/stampa	Berlin ; ; New York, : Springer, c2013
ISBN	3-642-14697-X
Edizione	[1st ed. 2013.]
Descrizione fisica	1 online resource (368 p.)
Collana	Advanced structured materials ; ; v. 4
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Disciplina	620.11
Soggetti	Nanoparticles Nanocomposites (Materials) Nanotechnology - Technological innovations
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	Nanoparticles -- Review Article Hollow Nanoparticles -- Diffusion in Hollow and Solid Nanoparticles: Simulation Studies -- Inorganic-organic hybrid nanoparticles for medical applications -- The mathematical modeling of the processes of the nanopowders production and their sintering -- Mechanochemical aspects of nanoparticles synthesis -- Shift of lines in phase diagrams for nanograined materials -- Transport processes of nanoparticles in gases and liquids -- Nanocomposites -- Hierarchical Nanocomposites -- Nanocomposite materials -- Smart Functional Nanocomposite Coatings -- Ceramic nanocomposite materials: synthesize, Characterisation and application -- Mechanics of Cellulose Nanocrystals and Their Polymer Composites -- Core/ Shell Nanocomposite Structures: Types, Synthesis Conditions, Properties and Applications on the simulation of thermal and electrical transport in nanotube and nanowire composites -- Nanostructured Materials and Nanomachining.
Sommario/riassunto	In the heart of so-called nanotechnology one can engineer the finest building blocks of atoms and molecules to achieve outstanding properties and quality of material and create so- called nanostructured materials or nanomaterials. Nanomaterials include atomic clusters, layered films, filamentary structures, and bulk nanomaterials. More

precisely nanomaterials are materials with at least one dimension in the range of 1–100 nanometers. They consist of atoms or clusters of single or mixed elements, all packed together to form a nanoparticle or at a larger scale, a bulk nanomaterial and in a special case a nanocomposite. The development of nanomaterials opens the possibility for new materials with outstanding properties compared to classical engineering materials. These materials can find applications in different fields such as medical treatment or structural mechanics. This monograph focuses on two major groups of nanomaterials, i.e. nanoparticles and nanocomposites. Nanoparticles, for example in the form of hollow particles, allow for new possibilities in drug delivery. Different aspects of nanoparticles ranging from manufacturing to modeling and simulation are covered. 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 on the individual components used but also on the morphology and the interfacial characteristics. Nanocomposite coatings and materials are one of the most exciting and fastest growing areas of research and novel properties being continuously developed which are previously unknown in the constituent materials. Thus, the second part of this monograph gives an overview on the latest developments in the area of composites and coatings based on nanomaterials.
