

1. Record Nr.	UNINA9910829958203321
Titolo	Environmental and human health impacts of nanotechnology [[electronic resource] /] / edited by Jamie R. Lead, Emma Smith
Pubbl/distr/stampa	Chichester, West Sussex, U.K. ; ; Hoboken, N.J., : Wiley, c2009
ISBN	1-282-27892-4 9786612278921 1-4443-0750-9 1-4443-0749-5
Descrizione fisica	1 online resource (461 p.)
Altri autori (Persone)	LeadJamie R SmithEmma (Emma L.)
Disciplina	620.5 620/.5
Soggetti	Nanoparticles - Environmental aspects Nanoparticles - Toxicology Nanostructured materials - Environmental aspects Nanostructured materials - Health aspects Nanotechnology - Environmental aspects Nanotechnology - Health aspects
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	Environmental and Human Health Impacts of Nanotechnology; Contents; Preface; Biographies; Contributors; 1: Overview of Nanoscience in the Environment; 1.1 Introduction; 1.2 History; 1.3 Definitions; 1.4 Investment and International Efforts; 1.5 Development: Four Anticipated Generations; 1.6 Applications of Nanotechnology; 1.7 Potential Benefits of Nanotechnology; 1.7.1 Environmental; 1.7.2 Human Health; 1.8 Potential Adverse Effects of Nanomaterials; 1.8.1 Environmental; 1.8.2 Human Health; 1.9 Classification; 1.9.1 Chemistry; 1.9.2 Origin; 1.9.3 Size; 1.9.4 State 1.10 Sources of Nanomaterials in the Environment1.11 Properties of Nanomaterials; 1.12 Nanomaterial Structure-Toxicity Relationship; 1.13 Environmental Fate and Behaviour of Nanomaterials; 1.13.1 Fate in Air;

1.13.2 Fate in Water; 1.13.3 Fate in Soil; 1.14 Potential for Human Exposure; 1.15 Detection and Characterization of Nanomaterials; 1.16 Issues to be Addressed; 1.16.1 Nomenclature; 1.16.2 Future Development and Risk; 1.16.3 Dosimetry; 1.16.4 Methods of Detection and Characterization; 1.16.5 Environmental Fate of Nanomaterials and their (Eco)Toxicology; 1.17 Conclusion; 1.18 References

2: Nanomaterials: Properties, Preparation and Applications

2.1 Overview; 2.2 Introduction; 2.3 Nanoparticle Architecture; 2.3.1 Nanoparticle Surface; 2.3.2 Charge Stabilisation; 2.3.3 Steric Stabilisation; 2.4 Particle Properties; 2.4.1 Surface Plasmon Resonance; 2.4.2 Catalysis; 2.4.3 Quantum Confinement; 2.4.4 Mechanical Performance; 2.4.5 Magnetic Properties; 2.4.6 Interfacial Properties; 2.4.7 Other Properties; 2.5 Nanoparticle Preparation; 2.5.1 The Challenges of Nanoparticle Synthesis: Scale Up; 2.5.2 Reactivity; 2.5.3 Dispersability; 2.5.4 Cost; 2.5.5 Methods: Natural Sources

2.5.6 Top Down; 2.5.7 Bottom Up; 2.5.8 Metal Nanoparticles; 2.5.9 Carbon; 2.5.10 Graphene; 2.5.11 Carbon Black; 2.5.12 Inorganic Compounds; 2.5.13 Polymers; 2.6 Applications of Nanoparticles and Nanotechnology; 2.6.1 The Past; 2.6.2 The Present and Near Future; 2.7 Implication for Environmental Issues; 2.8 Conclusions; 2.9 References;

3: Size/Shape-Property Relationships of Non-Carbonaceous Inorganic Nanoparticles and their Environmental Implications; 3.1 Introduction; 3.2 Inorganic Nanoparticle Anatomy; 3.3 Redox Chemistry of Nanoparticles

3.3.1 Photoredox Chemistry in Semiconductor Nanoparticles; 3.3.2 Redox Chemistry in Other Nanoparticle Systems; 3.4 Size Effects in Nanoparticle Sorption Processes; 3.5 Nanoparticle Fate: Dissolution and Solid State Cation Movement; 3.5.1 Basic Energetic and Kinetic Considerations of Nanoparticle Dissolution; 3.5.2 Effects of Nanoparticle Morphology; 3.5.3 Effects of Nanoparticle Coatings and External Substances; 3.5.4 Case Study: The Dissolution of Lead Sulfide Nanoparticles; 3.5.5 Solid State Cation Movement in Nanoparticles

3.6 Effect of Nanoparticle Aggregation on Physical and Chemical Properties

Sommario/riassunto

An increased understanding of the environmental and human health impacts of engineered nanoparticles is essential for the responsible development of nanotechnology and appropriate evidence-based policy and guidelines for risk assessment. Presenting the latest advances in the field from a variety of scientific disciplines, this book offers a comprehensive overview of this challenging, inter-disciplinary research area. Topics covered include: The properties, preparation and applications of nanomaterials; Characterization and analysis of manufactured nanoparticles; The fate and behavior