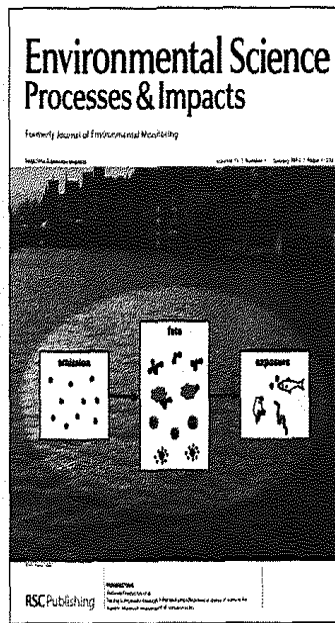


Cover
 See Robert B. Reed *et al.*, pp. 204–213.
 Image reproduced by permission of Mats Bjorklund (<http://www.magipics.com.au>) from *Environ. Sci.: Processes Impacts*, 2013, **15**, 204.



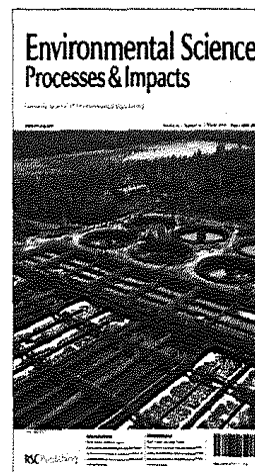
Inside cover
 See Antonia Praetorius *et al.*, pp. 161–168.
 Image reproduced by permission of Antonia Praetorius from *Environ. Sci.: Processes Impacts*, 2013, **15**, 161.

EDITORIALS

17

What's in a name?

Editorial Board Chair Frank Wania discusses the recent name change of the journal to *Environmental Science: Processes & Impacts*.



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Anthropogenic nanoparticles in the environment

Omowunmi A. Sadik

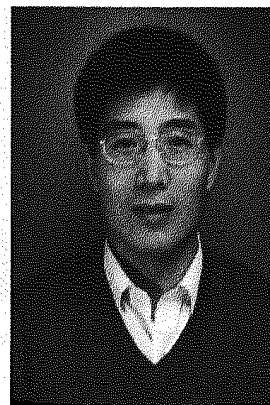
Wunmi Sadik introduces this themed issue on anthropogenic nanoparticles in the environment.



21

News from China

An occasional series featuring work from China that may be valuable to the environmental sciences community – summarised by our Associate Editor, Liang-Hong Guo.



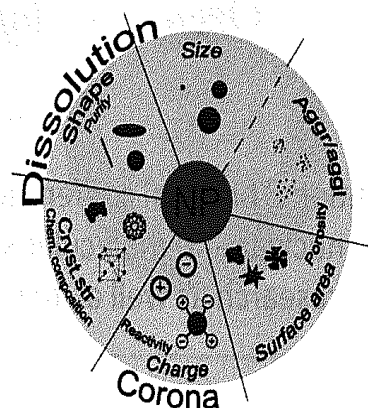
CRITICAL REVIEWS

23

How physico-chemical characteristics of nanoparticles cause their toxicity: complex and unresolved interrelations

Katrien Luyts, Dorota Napierska, Ben Nemery and Peter H. M. Hoet*

The unique properties of nanoparticles (NPs) not only determine their utility for (bio-medical) applications, but also their toxicity. Here, we try to link different critical physico-chemical characteristics separately with toxicity observed in both *in vitro* and *in vivo* models.



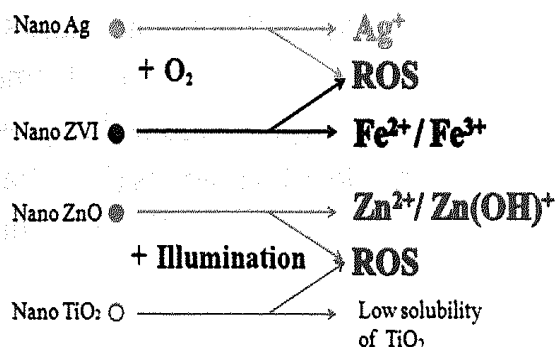
39

Impact of metallic and metal oxide nanoparticles on wastewater treatment and anaerobic digestion

Yu Yang, Chiqian Zhang and Zhiqiang Hu*

This review discusses the fate and potential effects of metallic and metal oxide nanoparticles on waste/wastewater treatment and anaerobic digestion.

ROS Generation and Dissolution of Metallic NPs

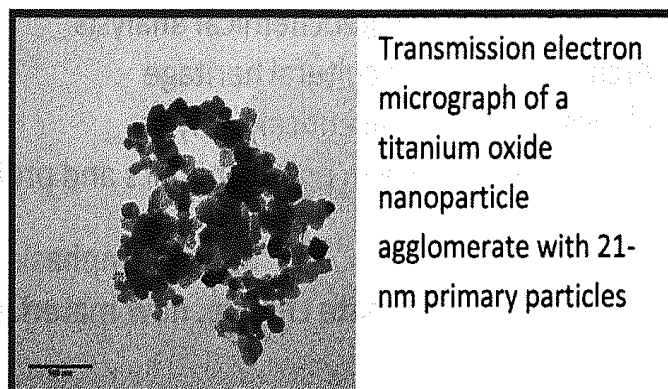


49

Occupational health risk to nanoparticulate exposure

Patrick T. O'Shaughnessy*

Current issues related to nanoparticle exposures in production facilities are reviewed with an emphasis on toxicology and measurement methods.



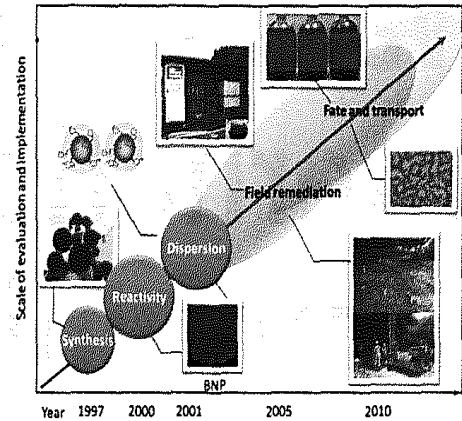
Transmission electron micrograph of a titanium oxide nanoparticle agglomerate with 21-nm primary particles

63

Iron nanoparticles for environmental clean-up: recent developments and future outlook

Weile Yan,* Hsing-Lung Lien, Bruce E. Koel and Wei-xian Zhang

Developmental milestones of nZVI technology over the past 15 years.

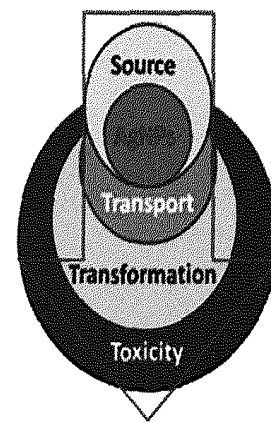


78

Silver nanoparticles in the environment

Su-juan Yu, Yong-guang Yin and Jing-fu Liu*

A critical review of the state-of-knowledge about AgNPs, involving history, analysis, source, fate and transport, and potential risks of AgNPs.

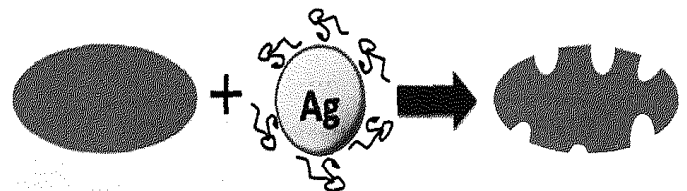


93

Antimicrobial nanotechnology: its potential for the effective management of microbial drug resistance and implications for research needs in microbial nanotoxicology

Deborah M. Aruguete,* Bojeong Kim,* Michael F. Hochella Jr., Yanjun Ma, Yingwen Cheng, Andy Hoegh, Jie Liu and Amy Pruden

The implications of antimicrobial nanotechnology for microbial drug resistance and associated research needs are discussed.

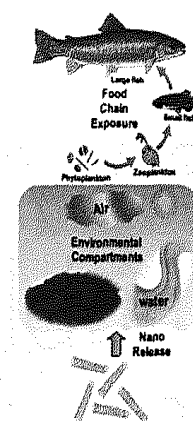


103

Biological accumulation of engineered nanomaterials: a review of current knowledge

Wen-Che Hou,* Paul Westerhoff and Jonathan D. Posner*

Engineered nanomaterials may be released into the environment and taken up by local biota and move up the food chain.

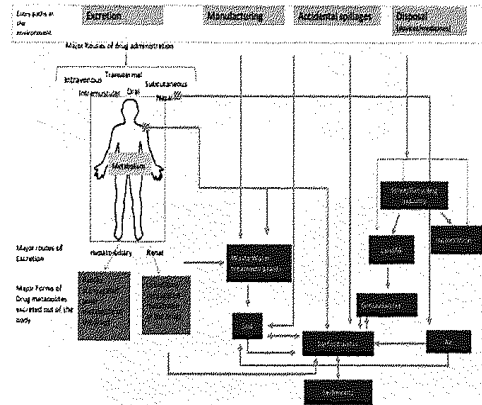


123

Potential environmental implications of nano-enabled medical applications: critical review

Indrani Mahapatra, J. Clark, Peter J. Dobson, Richard Owen and Jamie R. Lead*

This review paper presents a framework to understand environmental issues relating to nanomedicines and our ability to control such issues.

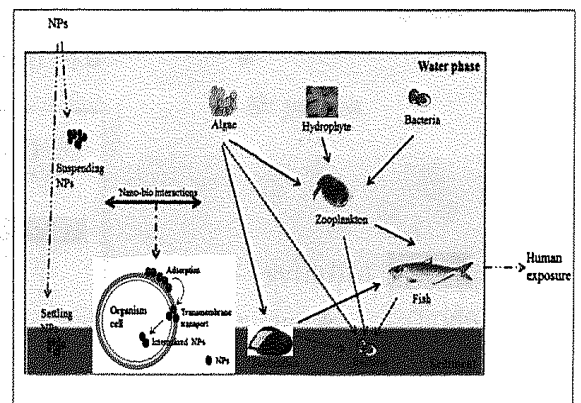


145

The biophysicochemical interactions at the interfaces between nanoparticles and aquatic organisms: adsorption and internalization

Si Ma and Daohui Lin*

Adsorption and internalization represent the nano-bio interactions that determine the ecological risk of NPs toward aquatic organisms.



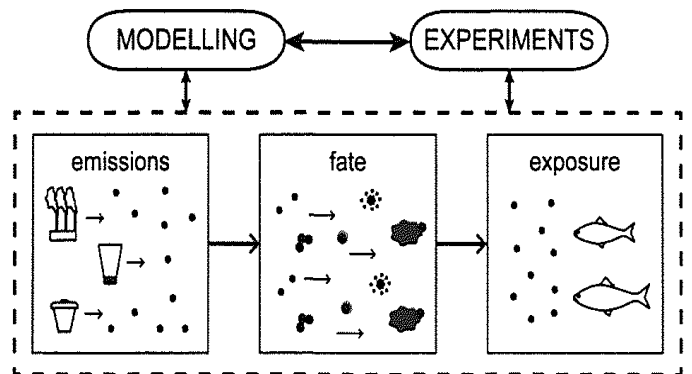
PERSPECTIVES

161

Facing complexity through informed simplifications: a research agenda for aquatic exposure assessment of nanoparticles

Antonia Praetorius,* Rickard Arvidsson, Sverker Molander and Martin Scheringer

Aquatic environmental exposure assessments of nanoparticles need a research agenda of informed simplifications and a linking of modelling and experiments.

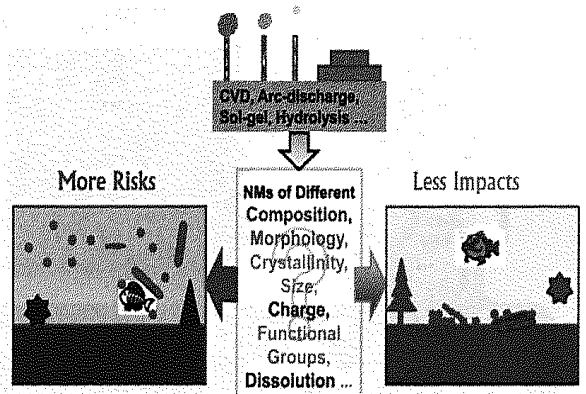


169

Effects of dominant material properties on the stability and transport of TiO₂ nanoparticles and carbon nanotubes in aquatic environments: from synthesis to fate

Xuyang Liu,* Gexin Chen, Arturo A. Keller and Chunming Su*

We investigate the synthesis processes of nanomaterials and focus on the influence of physicochemical properties on the environmental stability and transport.

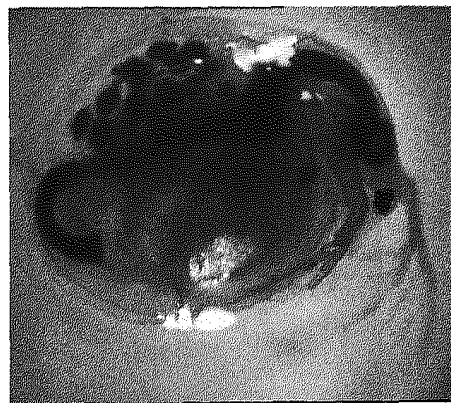


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Operationalization and application of "early warning signs" to screen nanomaterials for harmful properties

Steffen Foss Hansen,* Kåre Nolde Nielsen, Nina Knudsen, Khara D. Grieger and Anders Baun

The freshwater crustacean *Daphnia magna* is one of the commonly used test organisms for studying toxicity and bioaccumulation of nano particles.



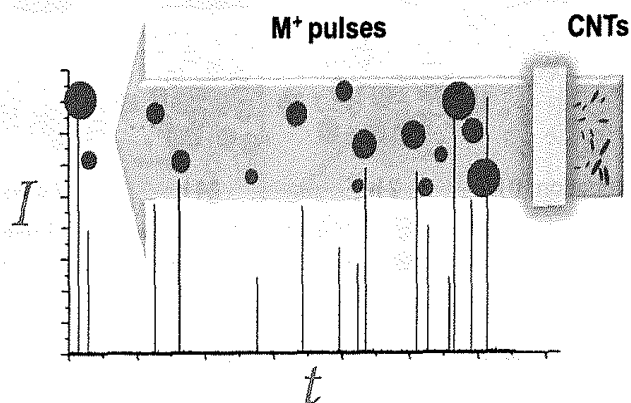
PAPERS

204

Detection of single walled carbon nanotubes by monitoring embedded metals

Robert B. Reed, David G. Goodwin, Kristofer L. Marsh, Sonja S. Capracotta, Christopher P. Higgins, D. Howard Fairbrother and James F. Ranville*

First use of single particle inductively coupled plasma mass spectrometry for detection of carbon nanotubes in a simulated release scenario.

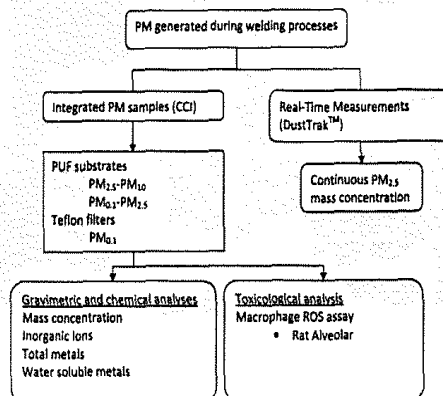


214

Physicochemical and toxicological characteristics of welding fume derived particles generated from real time welding processes

Cali Chang,* Philip Demokritou,* Martin Shafer and David Christiani

Welding fume particles have been well studied in the past; however, most studies have examined welding fumes generated from machine models rather than actual exposures.

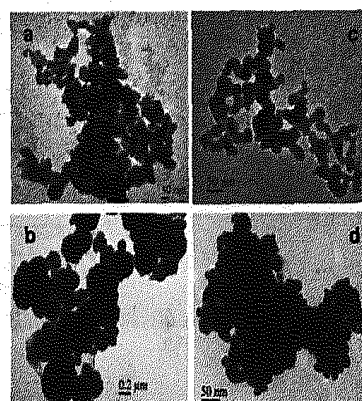


225

Comparative evaluation of impact of Zn and ZnO nanoparticles on brine shrimp (*Artemia salina*) larvae: effects of particle size and solubility on toxicity

Mehmet Ates, James Daniels, Zikri Arslan,* Ibrahim O. Farah and Hilsamar Félix Rivera

Brine shrimp (*Artemia salina*) larvae were exposed to different sizes of zinc (Zn) and zinc oxide (ZnO) nanoparticles (NPs) to evaluate their toxicity in marine aquatic ecosystems.



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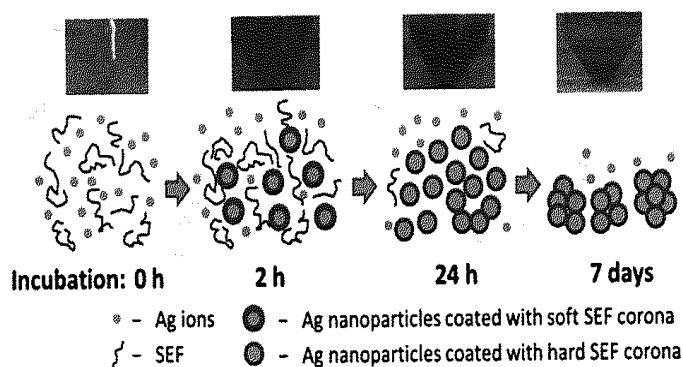


A comparative assessment of PM_{2.5} exposures in light-rail, subway, freeway, and surface street environments in Los Angeles and estimated lung cancer risk

Winnie Kam, Ralph J. Delfino, James J. Schauer and C. Sioutas*

PM_{2.5} exposure assessment of metals, elemental, and PAH species for commuters of five different microenvironments in Los Angeles.

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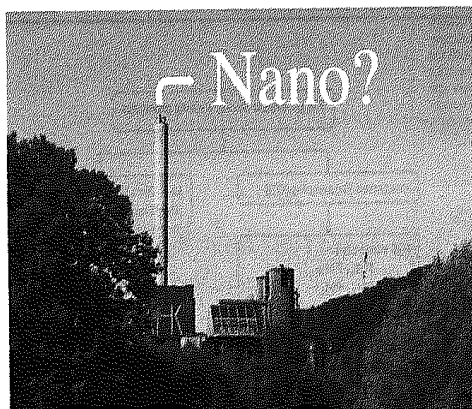


Extracellular conversion of silver ions into silver nanoparticles by protozoan *Tetrahymena thermophila*

Katre Juganson, Monika Mortimer,* Angela Ivask, Kaja Kasemets and Anne Kahru

Reduction of environmental silver ions by the soluble extracellular fraction (SEF) of *Tetrahymena thermophila* through formation of Ag nanoparticles.

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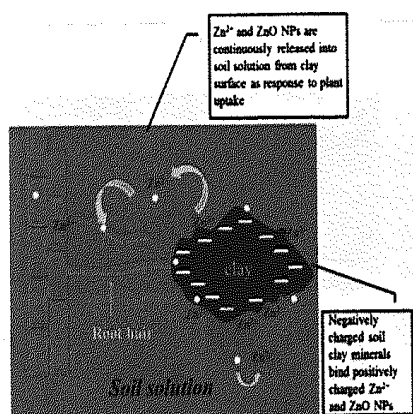


Modeling the flows of engineered nanomaterials during waste handling

Nicole C. Mueller, Jelena Buha, Jing Wang, Andrea Ulrich and Bernd Nowack*

The flows of nano-TiO₂, nano-ZnO, nano-Ag and CNT are modeled in the waste incineration-landfill system for Switzerland.

260



ZnO nanoparticle fate in soil and zinc bioaccumulation in corn plants (*Zea mays*) influenced by alginate

Lijuan Zhao, Jose Angel Hernandez-Viezcas, Jose R. Peralta-Videoa, Susmita Bandyopadhyay, Bo Peng, Berenice Munoz, Arturo A. Keller and Jorge L. Gardea-Torresdey*

Nanoparticles (NPs) can interact with naturally occurring inorganic and organic substances in soils, which may change their transport behavior in soil and plants.

267

Sorption of trace organics and engineered nanomaterials onto wetland plant material

Fariya Sharif,* Paul Westerhoff and Pierre Herckes

This article demonstrates the removal of emerging pollutants (trace organics and engineered nanomaterials) in microcosms with decaying wetland plant material.

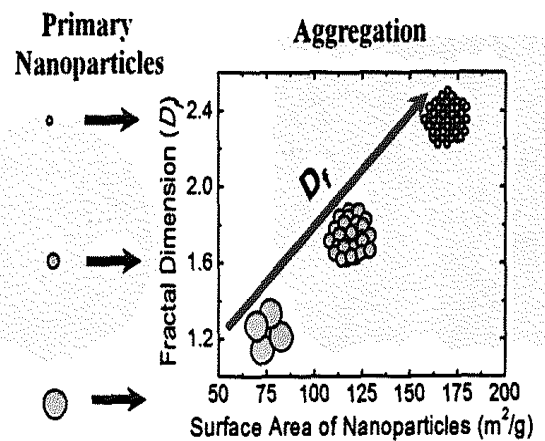


275

Aggregate morphology of nano-TiO₂: role of primary particle size, solution chemistry, and organic matter

Indranil Chowdhury, Sharon L. Walker and Steven E. Mylon*

Primary size of nanoparticles can significantly influence the morphology of nanoparticle aggregate with smaller size forming the more compact and strong aggregate.

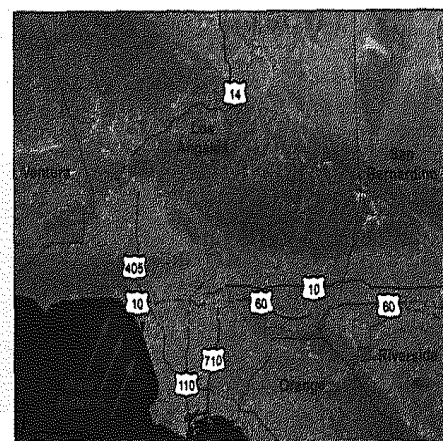


283

Seasonal and spatial variability in chemical composition and mass closure of ambient ultrafine particles in the megacity of Los Angeles

Nancy Daher, Sina Hasheminassab, Martin M. Shafer, James J. Schauer and Constantinos Sioutas*

Emerging toxicological research has shown that ultrafine particles (UFP, $d_p < 0.1-0.2 \mu m$) may be more potent than coarse or fine particulate matter.

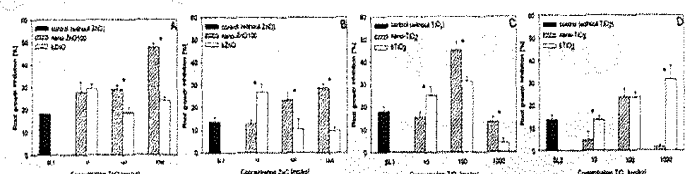


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The influence of ZnO and TiO₂ nanoparticles on the toxicity of sewage sludges

Izabela Joško and Patryk Oleszczuk*

More and more often sewage sludges become the place of deposition of nanoparticles (NPs), the use of which in consumer products is increasing.



307

Sorption of phenanthrene on single-walled carbon nanotubes modified by DOM: effects of DOM molecular weight and contact time

Hongwen Sun,* Qi Song, Pei Luo, Wenling Wu and Jizhou Wu

The impacts on the sorption of phenanthrene onto single-walled carbon nanotubes by loading of dissolved organic matter fractions with different molecular weights were studied.

