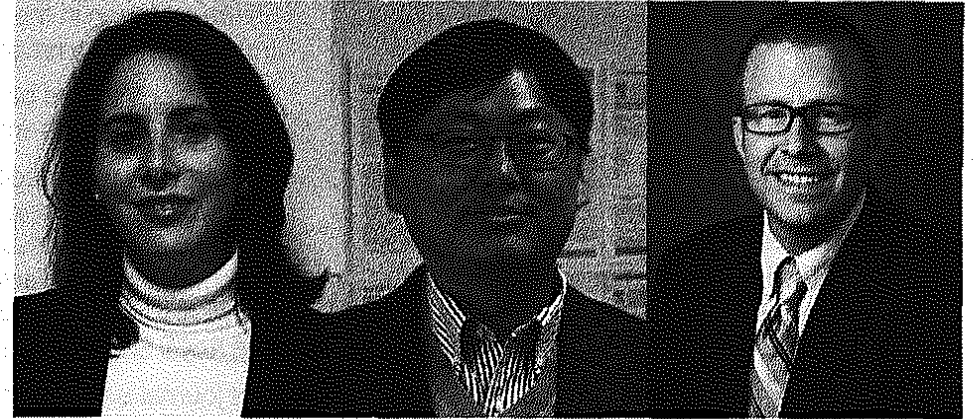


1169

Emerging investigators: challenges and opportunities for research independence and innovation

Juana Maria Delgado-Saborit, Hee-Deung Park and David M. Cwierny

Juana Maria Delgado-Saborit, Hee-Deung Park and David Cwierny introduce the 2014 *Environmental Science: Processes & Impacts* emerging investigators issue.



1171

Emerging investigators: profiles of the contributors

Environmental Science: Processes & Impacts profiles the contributors to the Emerging Investigators 2014 issue.

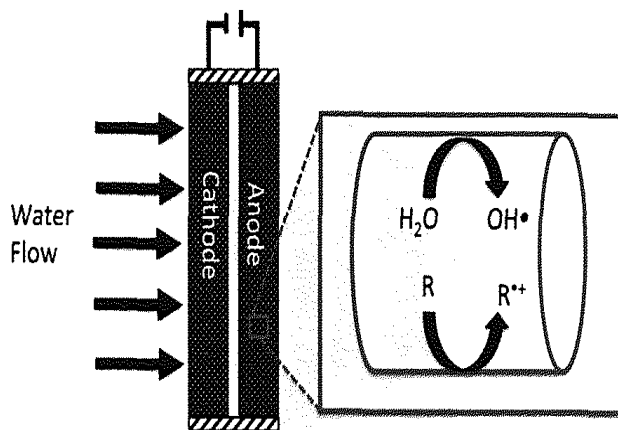


1187

Critical review of electrochemical advanced oxidation processes for water treatment applications

Brian P. Chaplin*

A critical review of the literature focused on electrochemical advanced oxidation processes for water treatment.

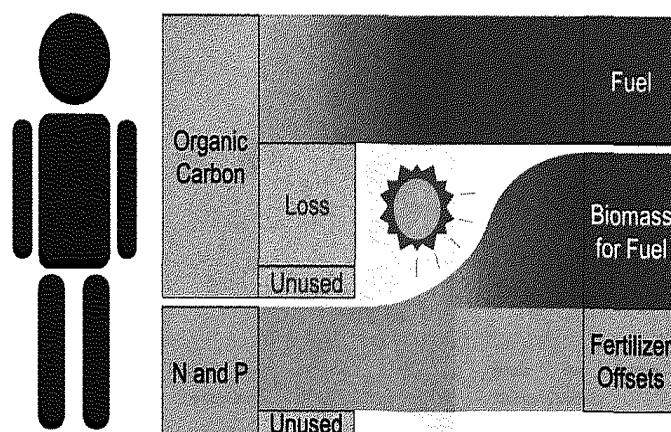


1204

Energy positive domestic wastewater treatment: the roles of anaerobic and phototrophic technologies

B. D. Shoener, I. M. Bradley, R. D. Cusick and J. S. Guest*

Utilizing both anaerobic and phototrophic biotechnologies for domestic wastewater treatment could enable energy positive sanitation.

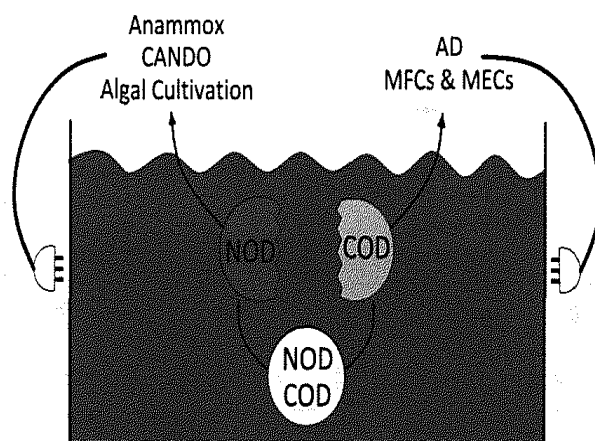


1223

Towards energy neutral wastewater treatment: methodology and state of the art

Han Gao, Yaniv D. Scherson and George F. Wells*

An optimal way to maximize energy recovery from wastewater treatment is to separate carbon and nutrient (particular N) removal processes.

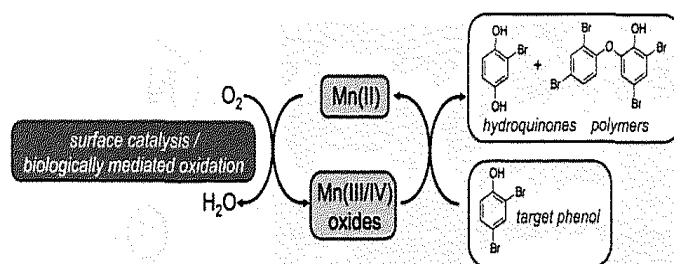


1247

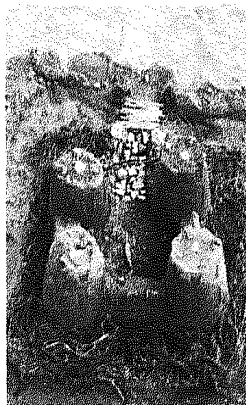
A critical review of the reactivity of manganese oxides with organic contaminants

Christina K. Remucal* and Matthew Ginder-Vogel

This critical review assesses the oxidation rates and transformation mechanisms of organic contaminants in the presence of manganese(III/IV) oxides.



1267

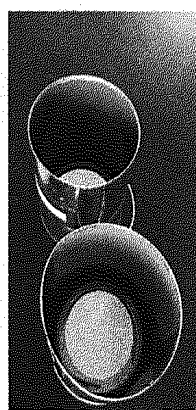


Association of nuisance filamentous algae *Cladophora* spp. with *E. coli* and *Salmonella* in public beach waters: impacts of UV protection on bacterial survival

Aubrey Beckinghausen, Alexia Martinez, David Blersch and Berat Z. Haznedaroglu*

This study presents evidence of nuisance algae commonly found in public beach waters providing UV protection to *E. coli* and *Salmonella*.

1275

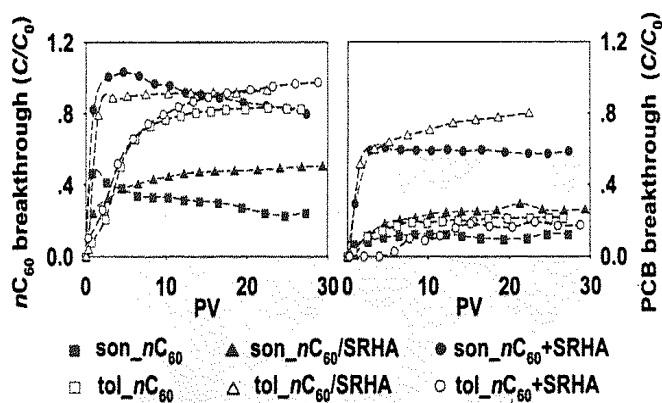


Use of dust fall filters as passive samplers for metal concentrations in air for communities near contaminated mine tailings

P. I. Beamer,* A. J. Sugeng, M. D. Kelly, N. Lothrop, W. Klimecki, S. T. Wilkinson and M. Loh

This study evaluates these dust fall filters as a simple low cost technique for measuring residential exposures near mining sites.

1282

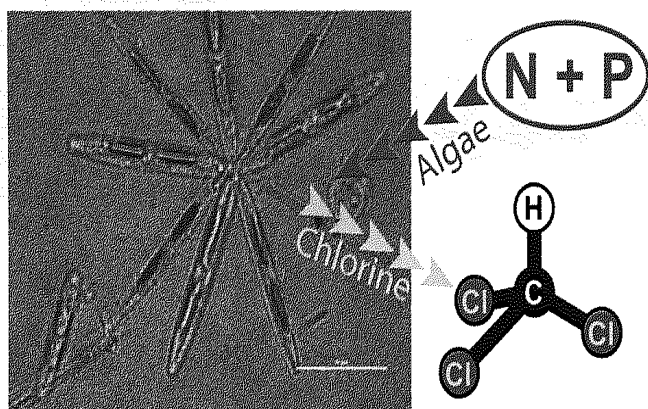


Effects of the preparation method and humic-acid modification on the mobility and contaminant-mobilizing capability of fullerene nanoparticles (*nC₆₀*)

Lilin Wang, Lei Hou, Ximeng Wang and Wei Chen*

Specific routes *via* which *nC₆₀* aggregates are formed and humic-acid modification significantly affect *nC₆₀*'s mobility and contaminant-mobilizing capabilities.

1290



Assessing trichloromethane formation and control in algal-stimulated waters amended with nitrogen and phosphorus

C. A. Mash, B. A. Winston, D. A. Meints II, A. D. Pifer, J. T. Scott, W. Zhang and J. L. Fairey*

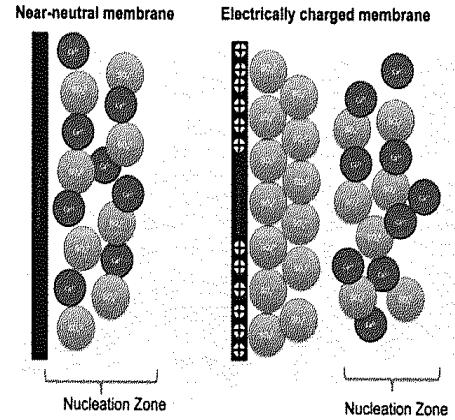
Nutrient-driven algal growth can serve as a source of trichloromethane precursors, but more importantly, exerts a demand for chlorine dioxide and alum, decreasing the effectiveness of common trichloromethane precursor removal processes.

1300

Electrochemical mineral scale prevention and removal on electrically conducting carbon nanotube – polyamide reverse osmosis membranes

Wenyan Duan, Alexander Dudchenko, Elizabeth Mende, Celeste Flyer, Xiaobo Zhu and David Jassby*

Electrically charged carbon nanotube composite reverse osmosis membranes have been demonstrated to prevent CaSO₄ scaling during brackish water desalination.

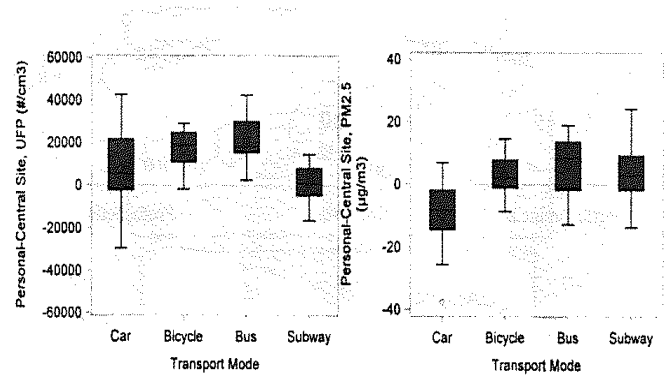


1309

Personal exposure to particulate matter in commuters using different transport modes (bus, bicycle, car and subway) in an assigned route in downtown Santiago, Chile

Liliana Suárez, Stephanie Mesías, Verónica Iglesias, Claudio Silva, Dante D. Cáceres and Pablo Ruiz-Rudolph*

Commuters' exposure to PM_{2.5} and ultrafine particles above background levels was observed in Santiago, Chile, which varied with transport mode.

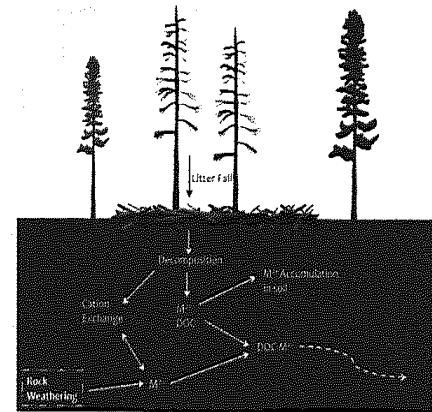


1318

Changes in metal mobility associated with bark beetle-induced tree mortality

Kristin M. Mikkelson, Lindsay A. Bearup, Alexis K. Navarre-Sitchler, John E. McCray and Jonathan O. Sharp*

Large-scale tree mortality has the potential to alter subsurface metal mobility and accumulation as demonstrated by laboratory column studies and complimentary field sampling.

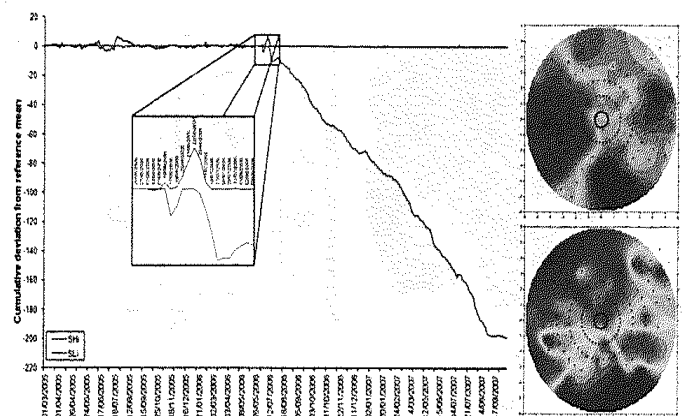


1328

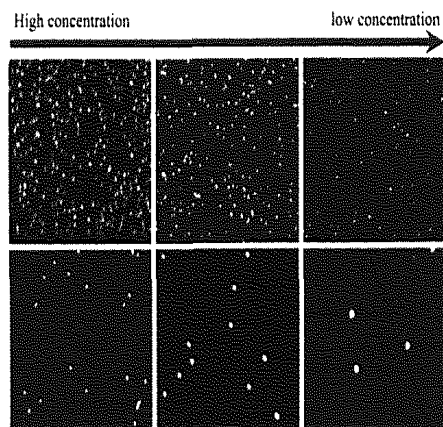
Intervention assessments in the control of PM₁₀ emissions from an urban waste transfer station

B. M. Barratt* and G. W. Fuller

A case study presenting novel analysis techniques for evaluating particulate air pollution mitigation measures at an industrial site in London.



1338

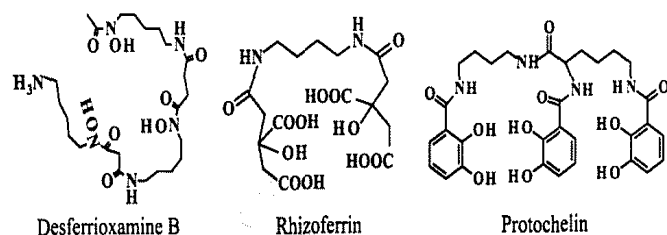


Quantitative measurement of the nanoparticle size and number concentration from liquid suspensions by atomic force microscopy

M. Baalousha,* A. Prasad and J. R. Lead

A validated fully quantitative approach to measure the nanoparticle number concentration and number size distribution.

1348

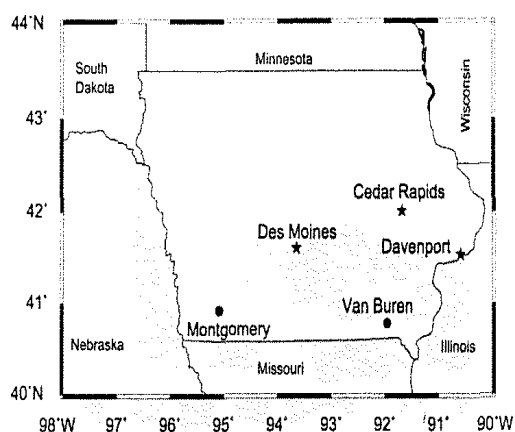


Siderophore-promoted dissolution of chromium from hydroxide minerals

Owen W. Duckworth,* Martin M. Akafia, Megan Y. Andrews and John R. Bargar

Biomolecules have significant impacts on the fate and transport of contaminant metals in soils and natural waters.

1360

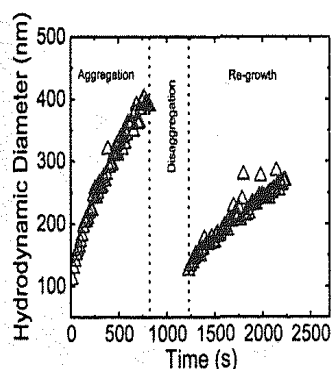


Composition and sources of fine particulate matter across urban and rural sites in the Midwestern United States

Shuvashish Kundu and Elizabeth A. Stone*

The composition and sources of fine particulate matter (PM_{2.5}) were investigated in rural and urban locations in Iowa, located in the agricultural and industrial Midwestern United States, from April 2009 to December 2012.

1371



Disaggregation of heteroaggregates composed of multiwalled carbon nanotubes and hematite nanoparticles

Khanh An Huynh and Kai Loon Chen*

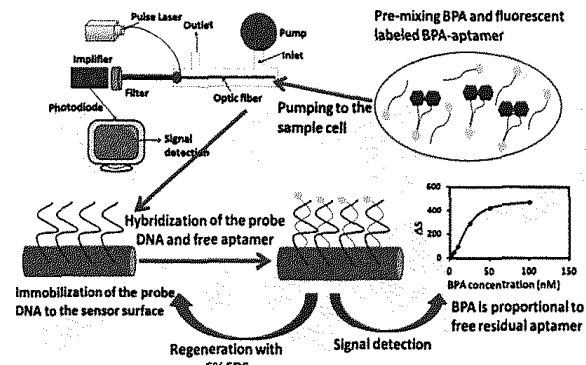
The degree of disaggregation of heteroaggregates composed of multiwalled carbon nanotubes and hematite nanoparticles is dependent on solution chemistry.

1379

A portable optic fiber aptasensor for sensitive, specific and rapid detection of bisphenol-A in water samples

Nimet Yildirim, Feng Long, Miao He, Han-Chang Shi and April Z. Gu*

Bisphenol A (BPA) is a known endocrine disruptor and one of the most serious environmental contaminants, often present at low levels in various water sources.

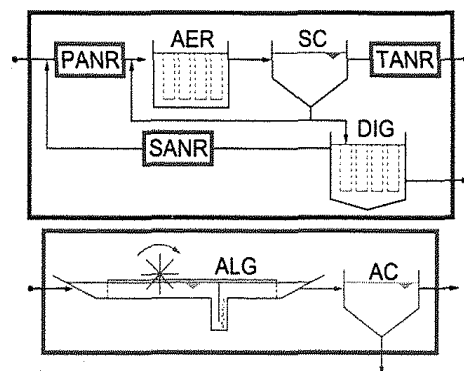


1387

Integrating algaculture into small wastewater treatment plants: process flow options and life cycle impacts

Muriel M. Steele, Annick Anctil and David A. Ladner*

Algaculture has the potential to be a sustainable option for nutrient removal at wastewater treatment plants.



REGULAR RESEARCH ARTICLES

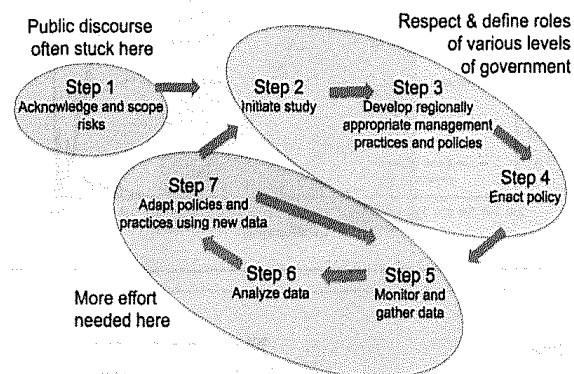
CRITICAL REVIEWS

1400

Evolving shale gas management: water resource risks, impacts, and lessons learned

Brian G. Rahm* and Susan J. Riha

This critical review assesses our current scientific understanding of a variety of water resource risks associated with shale gas development.



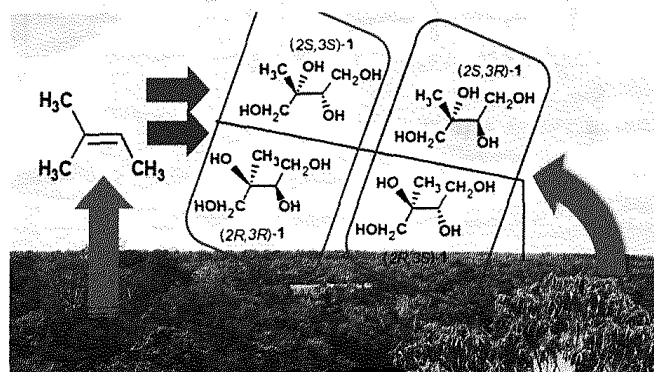
PAPERS

1413

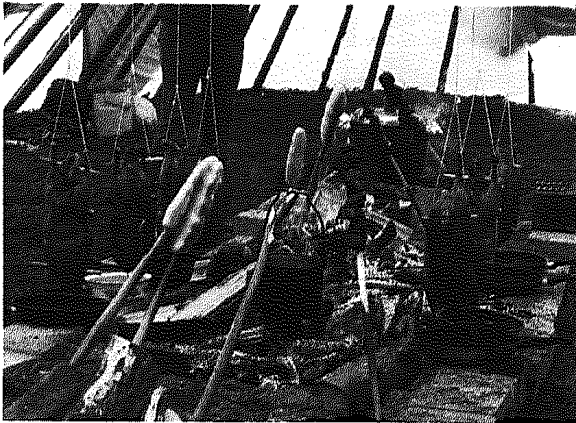
Primary and secondary organics in the tropical Amazonian rainforest aerosols: chiral analysis of 2-methyltetraols

N. J. D. González,* A.-K. Borg-Karlson, P. Artaxo, A. Guenther, R. Krejci, B. Nozière* and K. Noone

This work presents the application of a new method to facilitate the distinction between biologically produced (primary) and atmospherically produced (secondary) organic compounds in ambient aerosols based on their chirality.



1422

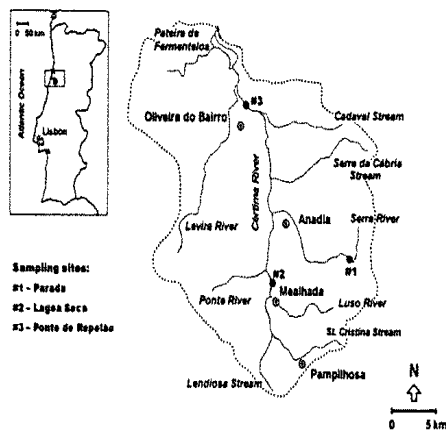


An examination of traditional foods and cigarette smoking as cadmium sources among the nine First Nations of *Eeyou Istchee*, northern Quebec, Canada

Nadia A. Charania,* Leonard J. S. Tsuji, Ian D. Martin, Eric N. Liberda, Suzanne Coté, Pierre Ayotte, Eric Dewailly and Evert Nieboer

Blood cadmium concentrations, dietary patterns, and personal information for nine Cree First Nations communities of northern Quebec (Canada) are used to investigate sources of the toxic metal cadmium.

1434

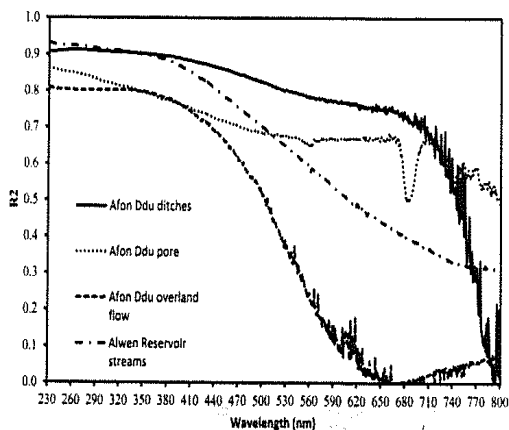


Assessment of river water quality using an integrated physicochemical, biological and ecotoxicological approach

Dalila Serpa, Jan Jacob Keizer, Joana Cassidy, Ana Cuco, Vera Silva, Fernando Gonçalves, Mário Cerqueira and Nelson Abrantes*

An integrated evaluation scheme combining standard Water Framework Directive (WFD) quality elements and an ecotoxicological approach was used to assess water quality in the Cértima River basin.

1445

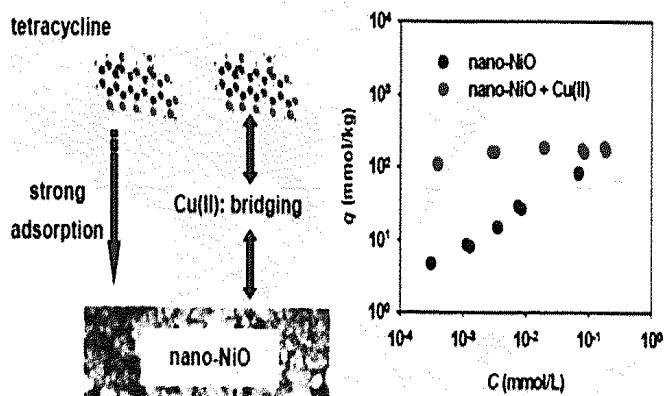


UV-visible absorbance spectroscopy as a proxy for peatland dissolved organic carbon (DOC) quantity and quality: considerations on wavelength and absorbance degradation

Mike Peacock,* Chris D. Evans, Nathalie Fenner, Chris Freeman, Rachel Gough, Timothy G. Jones and Inma Lebron

Wavelengths <270 nm are useful DOC proxies. The E4 : E6 ratio is a useful metric to compare DOC between peatlands. There was no loss of DOC in stored samples for 3 months.

1462



Adsorption of tetracycline to nano-NiO: the effect of co-existing Cu(II) ions and environmental implications

Lin Duan, Lingfang Li, Zhu Xu and Wei Chen*

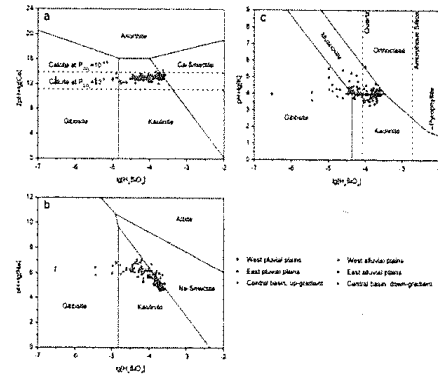
Nano-NiO exhibits strong adsorption affinity for tetracycline, particularly in the presence of Cu(II); such strong adsorptive interactions may significantly alter the toxicity of nanomaterials and bioavailability of contaminants.

1469

Geochemical evolution of groundwater salinity at basin scale: a case study from Datong basin, northern China

Ya Wu and Yanxin Wang*

The geochemical evolution of groundwater salinity and stages of water-rock/sediment interactions at basin scale were interpreted using integrated methods.

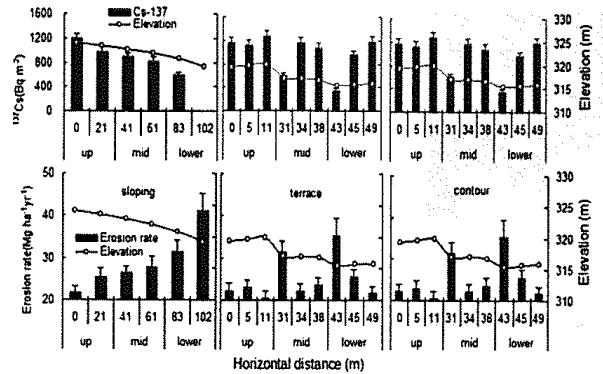


1480

Effectiveness assessment of soil conservation measures in reducing soil erosion in Baiquan County of Northeastern China by using ¹³⁷Cs techniques

Qing-wen Zhang and Yong Li*

The sediment budget calculated using ¹³⁷Cs inventories showed that soil erosion can be controlled by changing tillage practices from the slope farmland cultivation to the terrace or contour cultivation.

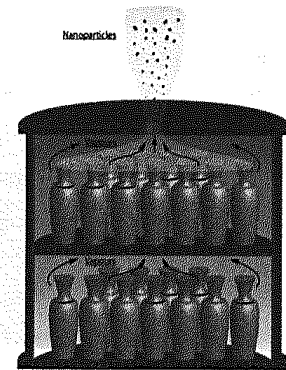


1489

Nanoparticle emissions from traditional pottery manufacturing

Aristeidis Voliotis, Spyros Bezzantakos, Maria Giamarelou, Marco Valenti, Prashant Kumar and George Biskos*

Traditional manufacturing of pottery tableware and ornamental ware involves firing of the ceramics; a process that leads to high concentrations of airborne nanoparticles that are harmful to human health. This paper reports systematic measurements of the size distributions and the elemental composition of nanoparticles emitted during the two firing stages of ceramics.

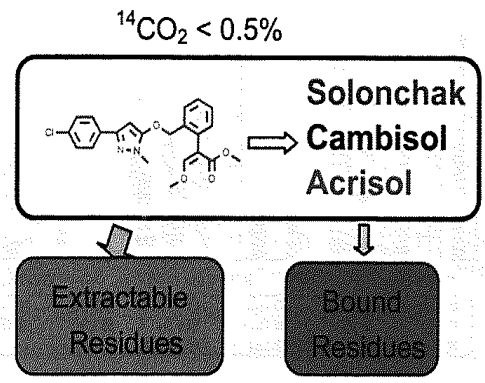


1495

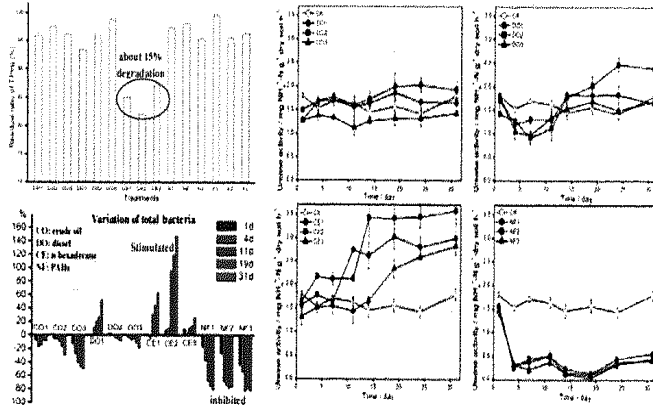
Fate of a novel strobilurin fungicide pyraoxystrobin in flooded soil

Tilong Yang, Chao Xu, Xunyue Liu, Xia Chen, Jianbo Zhang and Xingcheng Ding*

The mineralization and degradation of pyraoxystrobin was negligible and a large proportion of pyraoxystrobin can persist in flooded soil.



1501

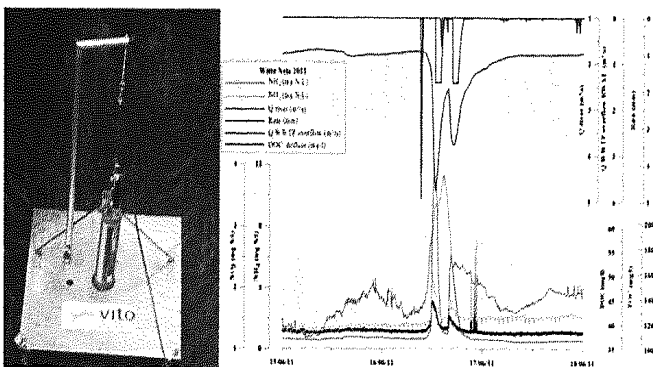


Ecological and enzymatic responses to petroleum contamination

Binbin Wu, Tian Lan, Diannan Lu* and Zheng Liu*

The micro-ecology of soil contaminated with different PHCs was monitored via quantification of relevant genes and enzymatic activities.

1510

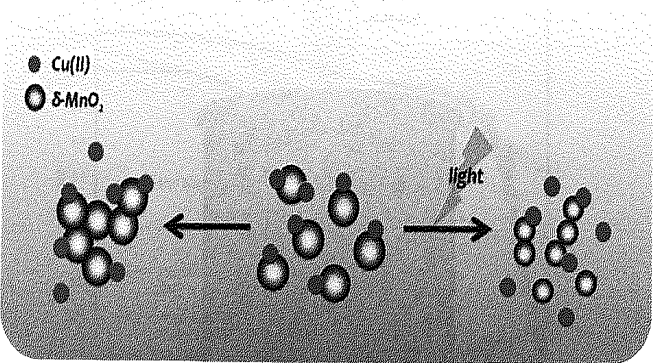


Use of online water quality monitoring for assessing the effects of WWTP overflows in rivers

Wesley Boënné,* Nele Desmet, Stijn Van Looy and Piet Seuntjens

This study highlights on-line monitoring technology for assessing the impacts of WWTP overflows on the chemical quality of the river water.

1519

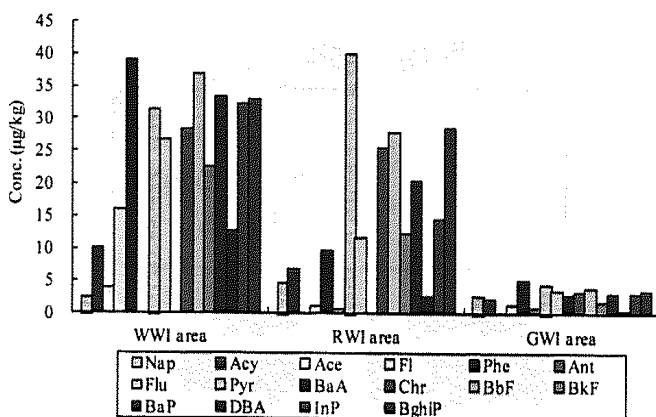


Sorption behavior of heavy metals on poorly crystalline manganese oxides: roles of water conditions and light

Eun-Ju Kim, Jungwon Kim, Sung-Chan Choi and Yoon-Seok Chang*

This study investigated Cu(II) uptake and release in a poorly crystalline δ -MnO₂ system based on mechanisms of aggregation and photoinduced dissolution.

1526



Distribution and transport of PAHs in soil profiles of different water irrigation areas in Beijing, China

Aifang Jin, Jiangtao He,* Sunuan Chen and Guoxin Huang

The vertical distribution characteristics of 16 PAHs in the soil profiles (0–5.5 m) of different water irrigation areas in Beijing were analyzed and compared.