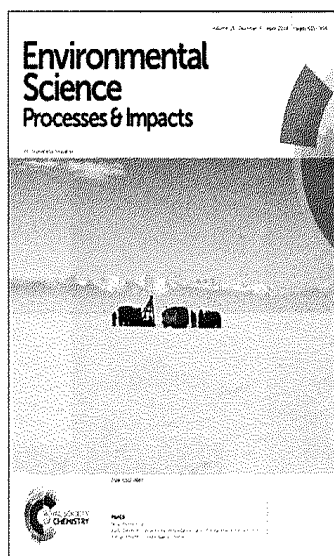


Cover
See Collin P. Ward *et al.*,
pp. 721–731.
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See Natascha T. Torres *et al.*,
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2014, 16, 879.

THEMED ISSUE ARTICLES

EDITORIAL

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Themed issue on aquatic photochemistry

Kristopher McNeill*

Guest editor Kris McNeill introduces this themed issue on Aquatic Photochemistry.



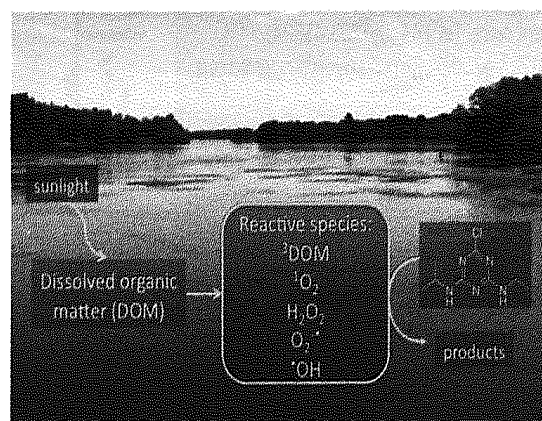
CRITICAL REVIEWS

628

The role of indirect photochemical degradation in the environmental fate of pesticides: a review

Christina K. Remucal

This critical review assesses the role of dissolved organic matter-sensitized indirect photolysis in the environmental fate of pesticides.

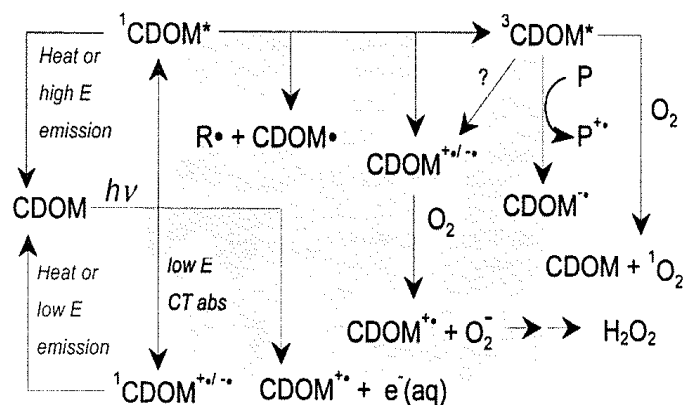


654

The importance of charge-transfer interactions in determining chromophoric dissolved organic matter (CDOM) optical and photochemical properties

Charles M. Sharpless* and Neil V. Blough*

A critical review presenting the case for an electronic interaction model as the basis for CDOM optical and photochemical properties.

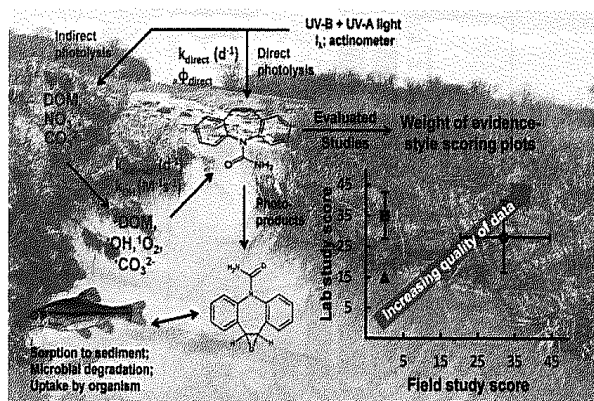


672

A critical assessment of the photodegradation of pharmaceuticals in aquatic environments: defining our current understanding and identifying knowledge gaps

Jonathan K. Challis, Mark L. Hanson, Ken J. Friesen and Charles S. Wong*

A standardized scoring rubric provided critical assessment—positive and negative—of the state of knowledge of aquatic photochemistry of pharmaceuticals.

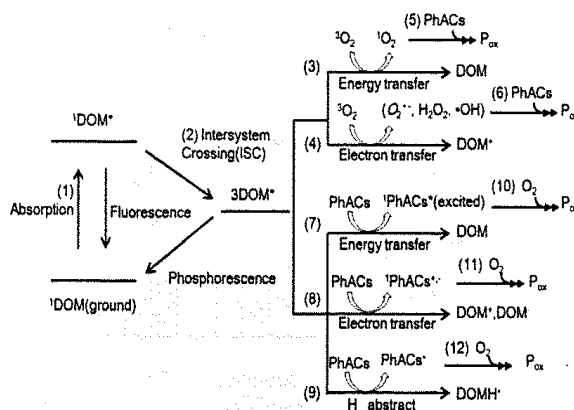


697

Photo-transformation of pharmaceutically active compounds in the aqueous environment: a review

Shuwen Yan and Weihua Song*

This review summarizes the last 10 years (2003–2013) of studies on the solar or solar-simulated photodegradation of pharmaceutically active compounds (PhACs) in aqueous environments.



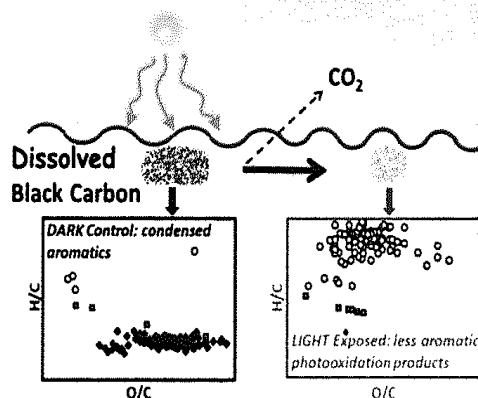
PAPERS

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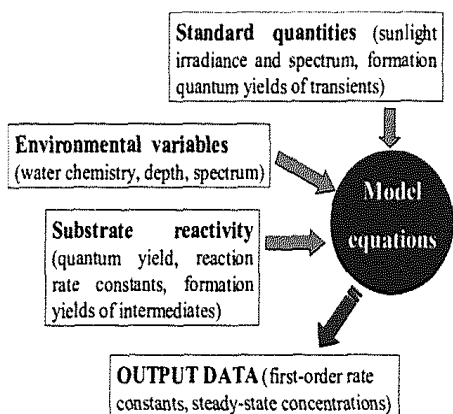
Insights into the complete and partial photooxidation of black carbon in surface waters

Collin P. Ward, Rachel L. Sleighter, Patrick G. Hatcher and Rose M. Cory*

Dissolved black carbon is more susceptible to photooxidation than particulate black carbon, and partial photooxidation of dissolved black carbon is a more important degradation pathway than complete photooxidation.



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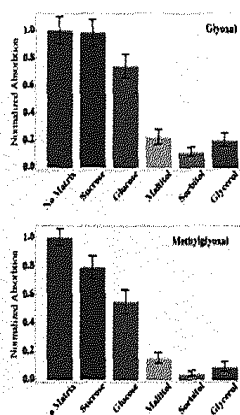


APEX (Aqueous Photochemistry of Environmentally occurring Xenobiotics): a free software tool to predict the kinetics of photochemical processes in surface waters

Marco Bodrato and Davide Vione*

The APEX software predicts the photochemical transformation kinetics of xenobiotics in surface waters as a function of photoreactivity parameters, water chemistry and water depth.

741

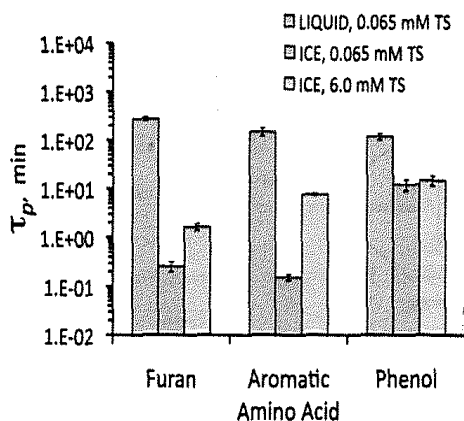


Organic matrix effects on the formation of light-absorbing compounds from α -dicarbonyls in aqueous salt solution

Greg T. Drozd and V. Faye McNeill*

Aqueous-phase reactions of organic compounds are of general importance in environmental systems.

748

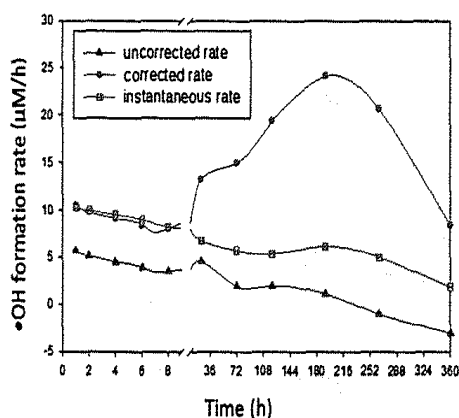


Degradation of organic pollutants in/on snow and ice by singlet molecular oxygen (1O_2) and an organic triplet excited state

Jonathan P. Bower and Cort Anastasio*

Lifetimes of pollutants are reduced on ice due to enhanced 1O_2 and the excited state triplet of the organic sensitizer.

757



Estimating hydroxyl radical photochemical formation rates in natural waters during long-term laboratory irradiation experiments

Luni Sun, Hongmei Chen, Hussain A. Abdulla and Kenneth Mopper*

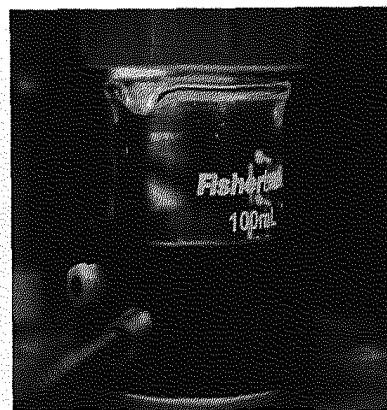
This study showed that hydroxyl radical ($\cdot OH$) production during long-term irradiation experiments is most accurately measured using instantaneous rates.

764

Photometric hydroxyl radical scavenging analysis of standard natural organic matter isolates

J. E. Donham, E. J. Rosenfeldt and K. R. Wigginton*

Hydroxyl radical ($\cdot\text{OH}$) scavenging reaction rate constants of standard natural organic matter (NOM) isolates ($k_{\text{OH,NOM}}$) were measured with a rapid background scavenging method.

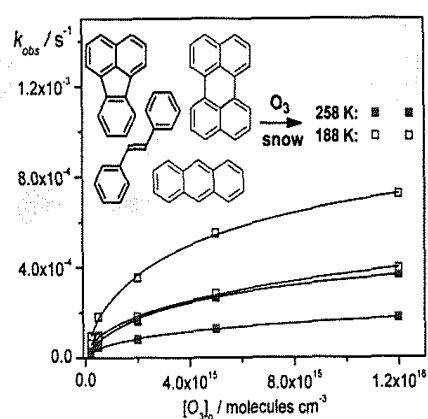


770

Kinetics of heterogeneous reactions of ozone with representative PAHs and an alkene at the air-ice interface at 258 and 188 K

D. Ray, H. Lišková and P. Klán*

The ozonation rates of representative PAHs and alkenes at the air-ice interface were shown to increase with decreasing temperature.

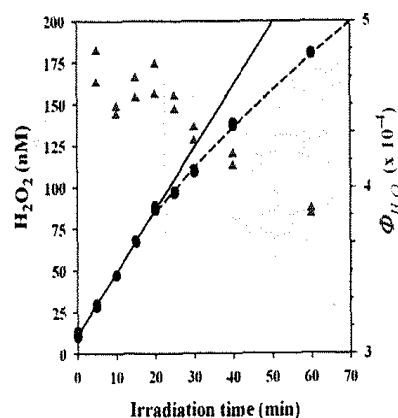


777

Wavelength and temperature-dependent apparent quantum yields for photochemical formation of hydrogen peroxide in seawater

David J. Kieber,* Gary W. Miller, Patrick J. Neale and Kenneth Mopper

Wavelength, temperature and light-dose dependent hydrogen peroxide photoproduction quantum yields were determined in subtropical, temperate and polar marine waters.

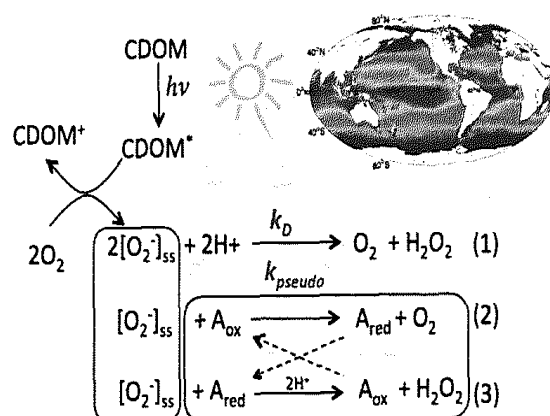


792

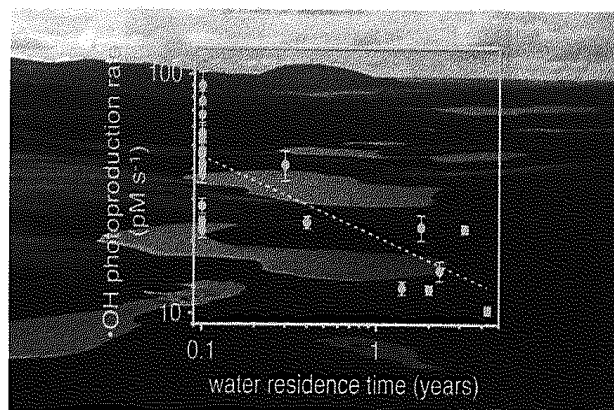
Blending remote sensing data products to estimate photochemical production of hydrogen peroxide and superoxide in the surface ocean

Leanne C. Powers and William L. Miller*

A novel combination of remote sensing products is used to estimate photochemical production rates of hydrogen peroxide and superoxide in the global surface ocean.



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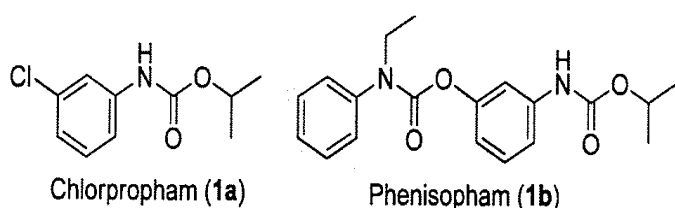


Evidence for dissolved organic matter as the primary source and sink of photochemically produced hydroxyl radical in arctic surface waters

Sarah E. Page, J. Robert Logan, Rose M. Cory* and Kristopher McNeill*

Photochemical hydroxyl radical formation decreases with increasing water residence time in a system of lakes connected by streams in the Arctic.

823

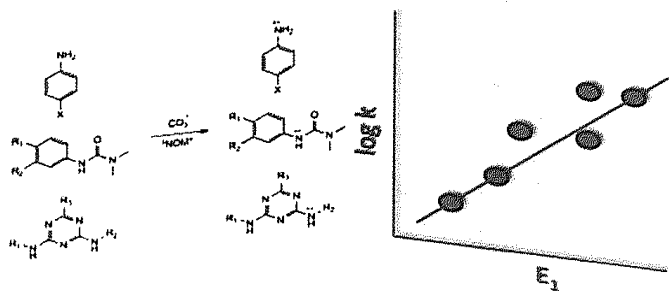


Chlorpropham and phenisopham: phototransformation and ecotoxicity of carbamates in the aquatic environment

Monica Passananti, Margherita Lavorgna, Maria Rosaria Ilesce, Marina DellaGreca, Emma Criscuolo, Alfredo Parrella, Marina Isidori and Fabio Temussi*

In this study, a comparison of two carbamic pesticides, chlorpropham and phenisopham, was carried out in terms of both photodegradability and ecotoxicity.

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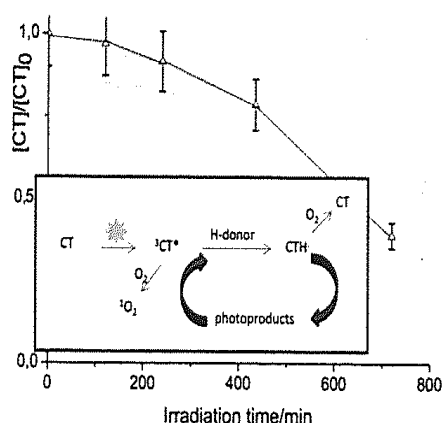


One electron oxidation potential as a predictor of rate constants of N-containing compounds with carbonate radical and triplet excited state organic matter

William A. Arnold*

One electron oxidation potential predicts reaction rate constants of two reactive intermediates, carbonate radical and triplet state excited organic matter.

839



Photoreactivity of the fungicide chlorothalonil in aqueous medium

Samira Bouchama, Pascal de Sainte-Claire, Emmanuel Arzoumanian, Esther Oliveros, Abdelaziz Boukamh and Claire Richard*

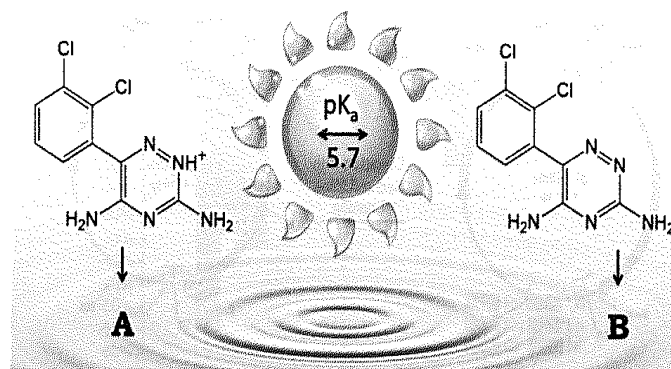
In water, chlorothalonil undergoes photolysis via the triplet excited state and generates singlet oxygen with high quantum yield.

848

Direct photodegradation of lamotrigine (an antiepileptic) in simulated sunlight – pH influenced rates and products

Robert B. Young, Benny Chefetz, Aiju Liu, Yury Desyaterik and Thomas Borch*

In simulated sunlight, pH influenced the direct photodegradation of lamotrigine, an antiepileptic drug recently detected in surface and drinking waters, producing different degradation rates, quantum yields, pathways, and photoproducts.

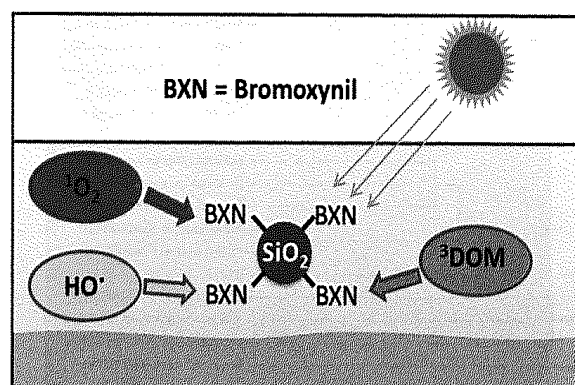


858

Photodegradation routes of the herbicide bromoxynil in solution and sorbed on silica nanoparticles

Juan P. Escalada, Valeria B. Arce, Luciano Carlos, Gabriela V. Porcal, M. Alicia Biasutti, Susana Criado, Norman A. García and Daniel O. Mártire*

We compare the kinetics of the main photodegradation pathways of bromoxynil free and bonded to silica nanoparticles in simulated natural waters.

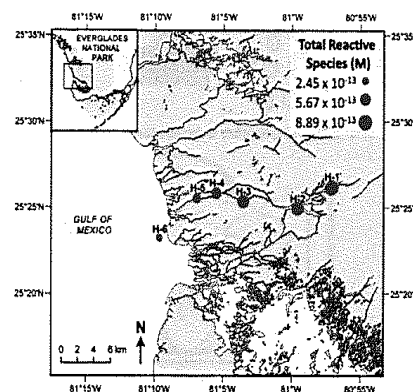


866

Photo-reactivity of natural dissolved organic matter from fresh to marine waters in the Florida Everglades, USA

Stephen A. Timko, Cristina Romera-Castillo, Rudolf Jaffé and William J. Cooper*

Photo-production of reactive species by NOM in the Florida Everglades was examined across salinity gradients and coupled with PARAFAC analysis.



REGULAR RESEARCH ARTICLES

PAPERS

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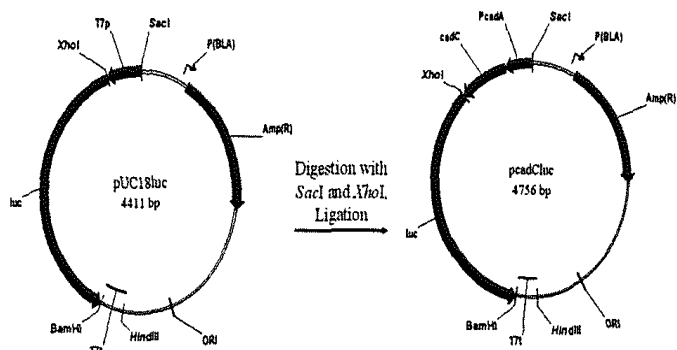
Early diagenetic processes generate iron and manganese oxide layers in the sediments of Lake Baikal, Siberia

Natascha T. Torres, Lawrence M. Och, Peter C. Hauser, Gerhard Furrer, Helmut Brandl, Elena Vologina, Michael Sturm, Helmut Bürgmann and Beat Müller*

Extraordinary buried iron- and manganese oxide layers were investigated in early diagenetic Lake Baikal sediments. Porewater analyses were performed on-site with a portable capillary electrophoresis instrument.



890

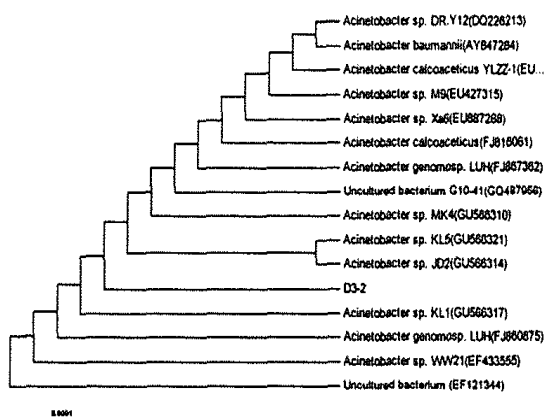


Assessing the effect of phosphate and silicate on Cd bioavailability in soil using an *Escherichia coli* *cadAp::luc*-based whole-cell sensor

Qi-Hui Hou, An-Zhou Ma, Ye Li, Xu-Liang Zhuang, Zhi-Hui Bai, Xin-Ke Zhang and Guo-Qiang Zhuang*

The immobilizing efficiencies of dipotassium phosphate and sodium silicate for Cd in soil were compared by *Escherichia coli* whole-cell sensor.

897

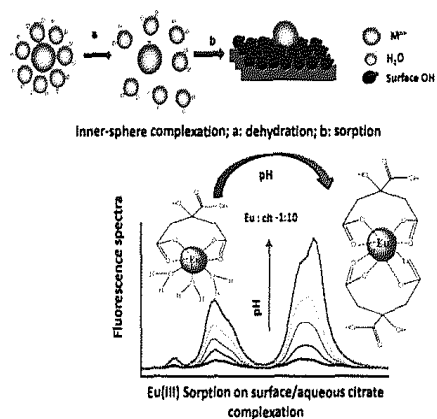


Lipopeptide biosurfactant production bacteria *Acinetobacter* sp. D3-2 and its biodegradation of crude oil

Mutai Bao,* Yongrui Pi, Lina Wang, Peiyan Sun, Yiming Li and Lixin Cao

In this work, a hydrocarbon-degrading bacterium D3-2 isolated from petroleum contaminated soil samples was investigated for its potential effect in biodegradation of crude oil. The strain was identified as *Acinetobacter* sp.

904



Influences of different environmental parameters on the sorption of trivalent metal ions on bentonite: batch sorption, fluorescence, EXAFS and EPR studies

P. K. Verma, P. N. Pathak,* P. K. Mohapatra, S. V. Godbole, R. M. Kadam, A. A. Veligzhanin, Y. V. Zubavichus and S. N. Kalmykov

Surface sorption and ligand complexation govern the speciation, hence fate of radionuclides in natural aquatic system.

916



Spatial and temporal distributions of contaminants emitted because of Chinese New Year's Eve celebrations in Wuhan

Ge Han, Wei Gong,* J. H. Quan, Jun Li and Miao Zhang

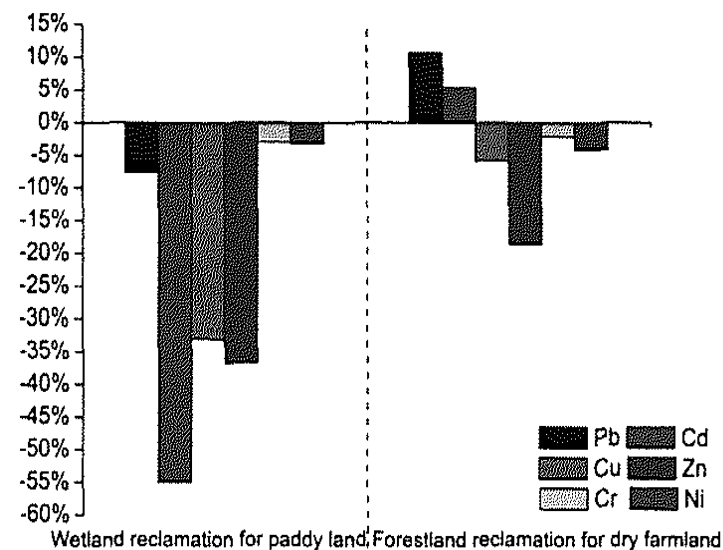
Activities involving firecrackers and fireworks on Chinese New Year's Eve (NYE) are common in Chinese culture.

924

Geochemical variability of heavy metals in soil after land use conversions in Northeast China and its environmental applications

Wei Jiao, Wei Ouyang,* Fanghua Hao, Bing Liu and Fangli Wang

Unlike most other areas in the world, the long-term agricultural reclamation in Northeast China has significantly decreased some metal concentrations in soil.



932

Preparation of Dufulin imprinted polymer on surface of silica gel and its application as solid-phase extraction sorbent

Shan Shan Miao, Hua Zi Wang, Yi Chen Lu, Hao Ran Geng and Hong Yang*

A new molecularly imprinted polymer based on silica-gel surface was developed using Dufulin (Duf) as template.

