

## Contents in Context

### *Environmental Chemistry*, Vol. 4(1), 2007

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#### ***Environmental Chemistry: Editorial 2007***

***Alison Green***

*Environ. Chem.* **2007**, 4, i

*Environmental Chemistry* is now entering its fourth year of publication. Are we beginning to facilitate links between diverse aspects of environmental science? Recent developments and future directions are discussed and new board members are introduced in this editorial.

#### **Intercomparison between FI-CL and ICP-MS for the determination of dissolved iron in Atlantic seawater**

***Andrew R. Bowie, Simon J. Ussher, William M. Landing, Paul J. Worsfold***

*Environ. Chem.* **2007**, 4, 1

Iron is arguably the most important trace element for the growth of marine organisms and is the limiting micronutrient for primary production in many parts of the world's oceans. The concentration of dissolved iron in seawater therefore influences the global carbon cycle and consequently Earth's climate. Hence, it is important to understand the marine biogeochemistry of iron and quantify its spatial and temporal distribution. In order to achieve this objective, it is essential that reported open-ocean concentrations of dissolved iron are accurate.

#### **Hydrocarbon degradation at high salinity by a novel extremely halophilic actinomycete**

***Ratiba Al-Mueini, Muna Al-Dalali, Issa S. Al-Amri, Heiko Patzelt***

*Environ. Chem.* **2007**, 4, 5

Large areas of arid countries, such as those of the Arabian Peninsula, Central Asia and Australia, are covered by saline sand and gravel deserts, which until recently were considered to be devoid of microbial life. Although in recent times a large number of salt-tolerant and drought-resistant microbes have been described, their metabolism – especially their potential to degrade xenobiotics – is still poorly understood. The ability to degrade xenobiotics is a prerequisite for the use of such organisms for pollution control and environmental field biotechnology. This study describes a potentially biotechnologically useful actinomycete that is able to degrade some xenobiotics under saline conditions.

#### **Partitioning and stability of engineered ZnO nanoparticles in soil suspensions using flow field-flow fractionation**

***Laura J. Gimbert, Rebecca E. Hamon, Phil S. Casey, Paul J. Worsfold***

*Environ. Chem.* **2007**, 4, 8

Nanoparticulate materials are increasingly being used as catalysts and lubricants, for pollution control and drug delivery, and in electronics, fabrics, cosmetics and sunscreens. In spite of this growth, information about the fate and toxicity of nanoparticles in the environment is limited, partly due to the lack of techniques capable of measuring nanoparticles in complex environmental matrices. One emerging tool, flow field-flow fractionation, can be used to determine the presence and particle size distribution of engineered nanoparticles, for example in soil pore waters, thereby enhancing our understanding of their environmental fate and impacts.

#### **Arsenic accumulation and speciation in freshwater fish living in arsenic-contaminated waters**

***Patcharin Jankong, Cherif Chalhoub, Norbert Kienzl, Walter Goessler, Kevin A. Francesconi, Pornsawan Visoottiviseth***

*Environ. Chem.* **2007**, 4, 11

Inorganic arsenic, a well-known human carcinogen, represents a major worldwide environmental problem because contaminated water supplies have led to widespread human exposure. This study investigates the arsenic content of freshwater fish from arsenic-contaminated and non-contaminated sites in Thailand, and reports high arsenic concentrations and significant amounts of inorganic arsenic in the edible muscle tissue. The data suggest that freshwater fish may represent a significant source of inorganic arsenic to some human populations.

#### **Agricultural acid sulfate soils: a potential source of volatile sulfur compounds?**

***Andrew S. Kinsela, Jason K. Reynolds, Mike D. Melville***

*Environ. Chem.* **2007**, 4, 18

Acid sulfate soils are important contributors to global environmental problems. Agricultural acid sulfate soils have recently been shown to emit sulfur dioxide, an important gas in global issues of acid rain, cloud formation and climate change. This emission is surprising because these soils tend to be wet and the gas is extremely water-soluble. The potential origins of this gas are not yet understood within the context of acid sulfate soils. Our new study reports the measurement of two potential precursors of sulfur dioxide, dimethylsulfide and ethanethiol, from both a natural and an agricultural acid sulfate soil in eastern Australia.

**Metals adsorbed to charcoal are not identifiable by sequential extraction***Yamin Ma, Andrew W. Rate**Environ. Chem.* **2007**, 4, 26

Charcoal is widespread in soils and may be a major component of soil organic matter. Trace metal ions in soils are predominantly associated with solid phase materials, including charcoal, and the identity of the solid phase and the mechanisms of association influence the geochemical behaviour of metals. Metals associated with soil mineral phases are estimated using techniques such as selective sequential extraction, and the sorption reactions of metal ions are well understood. Much less is known about the associations of trace metals with natural charcoal, and metals associated with charcoal in soils are likely to be misidentified in sequential extraction procedures.

**Concentration, UV-spectroscopic characteristics and fractionation of DOC in stormflow from an urban stream, Southern California, USA***John A. Izbicki, Isabel M. Pimentel, Russell Johnson, George R. Aiken, Jerry Leenheer**Environ. Chem.* **2007**, 4, 35

There is concern that there may be public health issues associated with dissolved organic carbon (DOC) because of its unknown composition and reactivity to disinfection in water used for public supply. Here, changes in the concentration and composition of DOC in stormflow (1995–2004) in the Santa Ana River and its tributaries is evaluated based on its optical properties, molecular weight and solubility differences of the contributing DOC components. Such a study may allow improved water management in the future. Ongoing work in the study area has shown that DOC in surface water diverted for groundwater recharge degrades to near natural levels in underlying aquifers pumped for public supply.

**Production and decomposition dynamics of hydrogen peroxide in freshwater***Luc E. Richard, Barrie M. Peake, Steven A. Rusak, William J. Cooper, David J. Burritt**Environ. Chem.* **2007**, 4, 49

Hydrogen peroxide ( $\text{H}_2\text{O}_2$ ) is the most stable reactive oxygen species (ROS) formed through irradiation of chromophoric dissolved organic matter (CDOM) in freshwater. It can act as a reductant or as an oxidant and decays largely through interaction with microorganisms via unknown mechanisms. In this way it can affect biological and chemical processes in natural waters and thus shape the ecosystem biogeochemistry.

**Molecular simulation studies on the adsorption of mercuric chloride***R. R. Kotdawala, Nikolaos Kazantzis, Robert W. Thompson**Environ. Chem.* **2007**, 4, 55

The Clean Air Act amendments of 1990 identified mercury and associated compounds as hazardous air pollutants of particular concern to human health and the environment. Coal-fired power plants and municipal solid waste incinerators are significant sources of mercury-containing emissions. Adsorption represents a common technique used to alleviate mercury contamination. The present study uses molecular simulations to study the correlation between key surface characteristics of the adsorbent and its mercury capturing ability with a view to the selection and design of novel adsorbents.