

## Contents in Context

### *Environmental Chemistry*, Vol. 6(5), 2009

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#### **Carp chemical sensing and the potential of natural environmental attractants for control of carp: a review**

*Aaron Elkins, Russell Barrow and Simone Rochfort*

*Environ. Chem.* **2009**, 6, 357

Carp are responsible for causing significant damage to lakes and rivers resulting in highly turbid water impacting native fish. At present there are no effective ways to manage the damage caused by carp or eradicate them, but the efficiency of carp removal from our waterways can be enhanced by the development of naturally occurring environmental attractants. As part of a broader pest management scheme the implementation of these attractants can significantly enhance the effectiveness of eradication programs and lead to the restoration of our waterways.

#### **Carbon monoxide emissions by phytoplankton: evidence from laboratory experiments**

*Valérie Gros, Ilka Peeken, Katrin Bluhm, Eckart Zöllner, Roland Sarda-Esteve and Bernard Bonsang*

*Environ. Chem.* **2009**, 6, 369

Carbon monoxide (CO) is a key component for atmospheric chemistry and its production in the ocean, although minor at the global scale, could play a significant role in the remote marine atmosphere. Up to now, CO production in the ocean was considered to mainly originate from the photo-production of dissolved organic matter (mainly under UV radiation). In this paper, we show evidence for direct production of CO by phytoplankton and we suggest it as a significant mechanism for CO production in the ocean.

#### **Water uptake of humic and fulvic acid: measurements and modelling using single parameter Köhler theory**

*Courtney D. Hatch, Kelly M. Gierlus, James Zahardis, Jennifer Schuttlefield and Vicki H. Grassian*

*Environ. Chem.* **2009**, 6, 380

Humic and fulvic acids are macromolecular, multifunctional, polyacidic compounds that are important proxies for humic-like substances (HULIS), which are ubiquitous components of tropospheric particulate matter. The hygroscopic nature of these substances suggests that they can contribute to direct and indirect climate forcing. Thus, the effects of water uptake in humic-like particles in the atmosphere must be well understood.

#### **Development of DNPH/HPLC method for the measurement of carbonyl compounds in the aqueous phase: applications to laboratory simulation and field measurement**

*Hongli Wang, Xuan Zhang and Zhongming Chen*

*Environ. Chem.* **2009**, 6, 389

Carbonyl compounds, a class of oxygenated organic matter, are crucial participants in atmospheric processes. Recently, studies have shown that the aqueous-phase processes of carbonyls have an important contribution to the formation of secondary organic aerosol (SOA), which is considered to have a significant impact on global climate change and human health. We developed the classical DNPH/HPLC method to characterise the aqueous-phase carbonyls, especially methacrolein, methyl vinyl ketone, glyoxal, and methylglyoxal, which are important precursors of SOA, in order to better understand the pathways of SOA formation in the atmosphere.

#### **Multi-criteria ranking and source apportionment of fine particulate matter in Brisbane, Australia**

*Adrian J. Friend and Godwin A. Ayoko*

*Environ. Chem.* **2009**, 6, 398

There are serious global concerns about the environmental and health effects of atmospheric air pollutants. However, estimates of pollutants from measurements made in the proximity of a source do not always represent the ultimate atmospheric concentrations. Therefore alternative methods of attributing pollutants to sources, and estimating their contributions to atmospheric concentrations, as demonstrated in the current work, will become an increasingly important area of environmental research.

#### **Photodegradation of nitrite in lake waters: role of dissolved organic matter**

*Daive Vione, Marco Minella, Claudio Minero, Valter Maurino, Paolo Picco, Aldo Marchetto and Gabriele Tartari*

*Environ. Chem.* **2009**, 6, 407

Nitrite is an important nutrient in surface waters, a key intermediate in the interconversion of nitrate into ammonium, and a considerable photochemical source of reactive species such as the hydroxyl radical. We have found that scavengers of hydroxyl radicals such as dissolved organic matter, which are usually supposed to inhibit the photodegradation of dissolved compounds, are able on the contrary to enhance the phototransformation of nitrite. The three weeks' lifetime of nitrite in the surface layer of lakes, derived from the results of the present work, would make photochemistry an important issue in determining the concentration of nitrite in lake water.

### **Gypsum saturation degrees and precipitation potentials from Dead Sea–seawater mixtures**

*Itay J. Reznik, Jiwchar Ganor, Assaf Gal and Ittai Gavrieli*

*Environ. Chem.* **2009**, *6*, 416

Since the 1960s the Dead Sea water level has dropped by nearly 30 m and over the last decade the rate of decline accelerated to over 1 m per year. Conveying seawater to the Dead Sea to stabilise or even raise its water level is currently being considered but may result in ‘whitening’ of the surface water through the formation of minute gypsum crystals that will remain suspended in the water column for a prolonged period of time. This paper is a first step in attaining the relevant physical and chemical parameters required to assess the potential for such whitening of the Dead Sea.

### **Ionic regulation in an alpine peatland in the Bogong High Plains, Victoria, Australia**

*Ewen Silvester*

*Environ. Chem.* **2009**, *6*, 424

Australian alpine peatlands are thought to have an important role in maintaining water quality in the associated headwater streams. This study has confirmed that these peatlands can significantly modify stream water through a range of mechanisms, including: nutrient uptake, salt sequestering, and the export of organic carbon. While the significance of this chemical regulation to down stream processes is yet to be fully understood, it is clear that these systems have considerable potential to modify water composition.

### **<sup>1</sup>H NMR metabolomics of earthworm responses to sub-lethal PAH exposure**

*Sarah A. E. Brown, Andre J. Simpson and Myrna J. Simpson*

*Environ. Chem.* **2009**, *6*, 432

Polycyclic aromatic hydrocarbons (PAHs) are common contaminants, but there has been limited research investigating the responses of earthworm exposure to sub-lethal PAH concentrations. In this study, <sup>1</sup>H nuclear magnetic resonance (NMR) metabolomics was used to characterise the metabolic responses of *Eisenia fetida* earthworm exposure in contact tests to 10, 50 and 100 µg cm<sup>-2</sup> naphthalene, phenanthrene and pyrene. The findings of this study highlight the potential of metabolomics as a tool for monitoring earthworm responses to sub-lethal concentrations of problematic environmental contaminants.

### **The aqueous geochemistry of thallium: speciation and solubility of thallium in low temperature systems**

*Yongliang Xiong*

*Environ. Chem.* **2009**, *6*, 441

The aqueous geochemistry of thallium is not well known in comparison with cadmium and lead, although it is more highly toxic, and at the same time has a wide range of industrial applications. A database allowing us to reliably predict the speciation and solubility of thallium in various environments in low temperature systems would be invaluable in providing some understanding of thallium’s mobilisation and mitigation. We propose here such a thermodynamic database based on critical reviews.

### **Low temperature headspace desorption of volatile organic compounds trapped in air sampling solid-supports**

*Francesc A. Esteve-Turrillas, Agustín Pastor and Miguel de la Guardia*

*Environ. Chem.* **2009**, *6*, 452

The monitoring of volatile organic compounds (VOCs) in air is of great importance for air quality on both local and global scales. The determination of VOCs can be carried out by gas chromatography–mass spectrometry (GC-MS) after active or passive sampling and (high temperature) thermal desorption. An attractive alternative would be to combine GC-MS with headspace (HS) systems as it allows simpler, faster, low temperature desorption. We present here the first report of HS-GC-MS for the determination of VOCs in air sampled using solid supports.