

## Contents in Context

### *Environmental Chemistry*, Vol. 6(3), 2009

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#### **MEMENTO: a proposal to develop a database of marine nitrous oxide and methane measurements**

*Hermann W. Bange, Tom G. Bell, Marcela Cornejo, Alina Freing, Günther Uher, Rob C. Upstill-Goddard and Guiling Zhang*

*Environ. Chem.* **2009**, 6, 195

Nitrous oxide and methane are atmospheric trace gases and, because they are strong greenhouse gases, they contribute significantly to the ongoing global warming of the Earth's atmosphere. Despite the well established fact that the world's oceans release nitrous oxide and methane to the atmosphere, the oceanic emission estimates of both gases are only poorly quantified. The MEMENTO (Marine Methane and Nitrous Oxide) database initiative is proposed as an effective way by which existing nitrous oxide and methane measurements can be used to reduce the uncertainty of the oceanic emissions estimates by establishing a global database.

#### **Predicting availability of mineral elements to plants with the DGT technique: a review of experimental data and interpretation by modelling**

*Fien Degryse, Erik Smolders, Hao Zhang and William Davison*

*Environ. Chem.* **2009**, 6, 198

Total concentrations of mineral elements in soil bear little relation to their availability for plants. The DGT (diffusive gradients in thin-films) technique has been found to be a good predictor of trace metal uptake and P deficiency, though not consistently in all studies for all elements. This review examines the fundamental basis for the relation between DGT fluxes and plant uptake and assesses under which conditions this relation may break down.

#### **The influence of megacities on global atmospheric chemistry: a modelling study**

*Timothy M. Butler and Mark G. Lawrence*

*Environ. Chem.* **2009**, 6, 219

Over half of the population of the world now live in urban areas, and the number of so-called 'megacities', with populations of ~10 million or more, is growing at a tremendous rate. We show how these patterns of urbanisation have the potential to influence the atmospheric chemical environment on a global scale, particularly through the effects of emissions from megacities on the reactive nitrogen cycle. With the growing worldwide interest in the study of the effects of megacities at all spatial scales, such as current European Union projects MEGAPOLI and CityZen, our study represents the first of many future studies that examine the effects of megacities on atmospheric chemistry on the global scale.

#### **Arsenic compounds in tropical marine ecosystems: similarities between mangrove forest and coral reef**

*Somkiat Khokiatwong, Narumol Kornkanitnan, Walter Goessler, Sabine Kokarnig and Kevin A. Francesconi*

*Environ. Chem.* **2009**, 6, 226

Despite the widespread occurrence of arsenobetaine in marine animals the origin of this arsenic compound remains unknown. A current hypothesis is that arsenobetaine is formed from more complex arsenic compounds found in marine algae. To test this hypothesis, we examined the arsenic compounds in a mangrove ecosystem where algae play a limited role in primary productivity.

#### **Legacy sources of mercury in an urbanised watershed**

*Heather F. Clark and Gaboury Benoit*

*Environ. Chem.* **2009**, 6, 235

Mercury is a neurotoxin that bioaccumulates and is associated with global contamination and often with regional atmospheric sources. However, in Connecticut, USA, in watersheds characterised by a gradient of forested to urban land uses we found that the predominant source of elevated Hg is local. This study uses a novel nested sampling method to pinpoint hot spots of mercury and presents inorganic mercury concentrations in water, sediment, soil, and aquatic organisms. The results indicate that mercury contamination is an environmental legacy associated with the silver plating industry and that local sources are critical to the biogeochemical mercury cycle here.

#### **Relationship between soil composition and retention capacity of terbutometon onto chalky soils**

*Achouak El Arfaoui, Stéphanie Sayen, Eric Marceau, Lorenzo Stievano, Emmanuel Guillon and Michel Couderchet*

*Environ. Chem.* **2009**, 6, 245

The wide use of pesticides for pest and weed control contributes to their presence in underground and surface waters, which has led to a continuously growing interest in their environmental fate. Soils play a key role in the transfer of these compounds from the sprayer to the water as a result of their capacity to retain pesticides depending on the soil components. The knowledge of soil composition should enable one to predict pesticide behaviour in the environment.

**Tolerance of perennial grasses to high copper in sand culture***Peter M. Kopittke, F. Pax C. Blamey, Anna R. Sheldon and Neal W. Menzies**Environ. Chem.* **2009**, 6, 253

Copper (Cu) is an essential element for the growth of plants, but various anthropogenic activities such as mining, smelting, disposal of wastes, and the use of Cu-containing fungicides have resulted in substantial Cu contamination at sites throughout the world. We used a sand-culture system to investigate the tolerance of seven perennial grasses to toxic levels of Cu. This study provides information to assist in the selection of grasses for the revegetation and stabilisation of Cu-contaminated sites.

**Effects of vehicle type and fuel quality on the exposure risk of toxic emissions from diesel vehicles***Peter F. Nelson**Environ. Chem.* **2009**, 6, 260

Motor vehicle emissions of toxic chemicals are a major contributor to urban air pollution, and to potential human health problems. Diesel vehicles have historically been major sources of smoke and fine particles that contain a wide range of toxic species. In this study the effects of vehicle type and fuel quality on the cancer forming risk of toxic compounds in diesel exhaust are determined. It is found that the major risk is due to toxic compounds such as benzene formed during fuel combustion in the vehicle engine.

**Recovery of nanosize zinc from phosphor wastes with an ionic liquid***Hsin-Liang Huang, H. Paul Wang, Edward M. Eyring and Juu-En Chang**Environ. Chem.* **2009**, 6, 268

Very fine phosphor ashes are discharged from particulate collection systems (such as bag houses) in the cathode ray tube or television disassembling processes. Effective recovery of ZnO and ZnS nanoparticles from the phosphor ash can be achieved by extraction with a room temperature ionic liquid. By synchrotron radiation X-ray absorption spectroscopy, the obtained molecular scale data turn out to be very useful in revealing speciation of zinc in the extraction process, which also facilitates the development of a simple nanoparticle recovery method.