

Contents in Context

Environmental Chemistry, Vol. 5(5), 2008

Provoking the air

Jonathan Williams

Environ. Chem. **2008**, 5, 317

Understanding ozone chemistry has been the aim of atmospheric chemists for over 50 years. Although the chemical mechanisms in current models become increasingly detailed and complex, it is far from clear that our continued pursuit of ever more trace level products will improve our understanding of the underlying photochemistry. Here we suggest a new, innovative measurement approach by which the chemical component of models can be tested and on which policy strategy can be forged.

Concentration and biotransformation of arsenic by *Prosopis* sp. grown in soil treated with chelating agents and phytohormones

Martha Laura López, José R. Peralta-Videa, Jason G. Parsons, Maria Duarte-Gardea and Jorge L. Gardea-Torresdey

Environ. Chem. **2008**, 5, 320

Arsenic (As) is a metalloid found throughout the environment. Although As can be released from natural phenomena, anthropogenic activities account for most As contamination worldwide. The toxicity of As depends on the form (inorganic or organic) and species (As^{III} or As^{V}), among others. Plants have the ability to absorb and bioreduce As, cleaning the soil and reducing the toxicity of As to some extent. The aim of the present research was to study the effects of cysteine, the chelating agents cyclohexylenedinitrotetraacetic acid and nitrilotriacetic acid, and the phytohormone kinetin on the As concentration and speciation in mesquite (*Prosopis* sp.). The results give an insight about how a desert plant absorbs, bioreduces, distributes and stores this toxic metalloid.

RP-HPLC measurement and quantitative structure–property relationship analysis of the *n*-octanol–water partitioning coefficients of selected metabolites of polybrominated diphenyl ethers

Yijun Yu, Weihua Yang, Zishen Gao, Michael H. W. Lam, Xiaohua Liu, Liansheng Wang and Hongxia Yu

Environ. Chem. **2008**, 5, 332

Polybrominated diphenyl ethers (PBDEs) are ubiquitous environmental contaminants and numerous studies have demonstrated a marked increase in the levels of PBDEs in human biological tissues and fluids, especially breast milk. How PBDEs are transported through the environment, taken up by biota, transported across membranes, and metabolised depends strongly on such fundamental properties as lipophilicity ($\log K_{\text{OW}}$). However, very little data on $\log K_{\text{OW}}$ exist for PBDEs. In the present paper, the authors determine PBDE metabolites' $\log K_{\text{OW}}$ using reversed-phase high performance liquid chromatography, as recommended by the Organisation for Economic Co-operation and Development and US Environmental Protection Agency, along with quantitative structure–property relationships.

Stable carbon isotope analysis of selected halocarbons at parts per trillion concentration in an urban location

M. I. Mead, M. A. H. Khan, I. D. Bull, I. R. White, G. Nickless and D. E. Shallcross

Environ. Chem. **2008**, 5, 340

Halocarbons can have significant effects on the atmosphere and the environment, particularly with regard to ozone depletion and climate change impacts. The determination of isotopic concentrations for selected halocarbon species should provide useful information to identify and constrain halocarbon sources and sinks within the urban environment. In the present study, a new instrumental method is described to determine these isotope ratios for selected halocarbons and the resultant data are interpreted in terms of local sources and sinks.

Copper and zinc spiking of biosolids: effect of incubation period on metal fractionation and speciation and microbial activity

Paramsothy Jeyakumar, Paripurnanda Loganathan, Sivalingam Sivakumaran, Christopher W. N. Anderson and Ronald G. McLaren

Environ. Chem. **2008**, 5, 347

Global sewage sludge (biosolids) production is increasing as a result of rapidly growing human population and ensuing industrial activities. Disposal of this waste is becoming a serious environmental issue because the high levels of heavy metals in biosolids can upset soil microbial activity and nutrient balance when the waste is added to forest or agricultural lands. In the present study, a biosolid matrix was spiked with copper and zinc as a model for an environmental scenario. The findings of the present study are applicable to environmental regulations that seek to protect agriculture land, human and animal health, and soil and drinking water quality, in scenarios where biosolids are applied to soil.

Cr^{III} binding by surface polymers in natural biomass: the role of carboxylic groups***Pablo Lodeiro, Adrian Fuentes, Roberto Herrero and Manuel E. Sastre de Vicente****Environ. Chem.* **2008**, *5*, 355

Large quantities of chromium are discharged into the environment as a result of its widespread use in modern industries, and consequently, chromium could constitute a serious pollution problem. Adsorption onto natural biomass offers real potential as a way of removing chromium from the environment, because such adsorbents contain biopolymers with particular chemical stability and selectivity towards metals. In addition, natural biomass constitutes an eco-friendly and cost-effective alternative to the existing methods. Here, specific interactions between chromium and the biomass are investigated.

Pb uptake by the freshwater alga *Chlorella kesslerii* in the presence of dissolved organic matter of variable composition***Cristina Lamelas and Vera I. Slaveykova****Environ. Chem.* **2008**, *5*, 366

Dissolved organic matter (DOM) is of utmost importance for a toxic metal's fate and ecotoxicity in the aquatic system, but the complex nature and variable composition of DOM makes the quantitative understanding of DOM's role in the environment very difficult. We have demonstrated that the assumption that the properties of a DOM mixture are the sum of the properties of its individual fractions can capture the main trends characterising the role of DOM in lead speciation and adsorption by freshwater microalgae. This was done by mixing the isolated, well-characterised fractions of DOM and measuring levels of free lead ion and Pb adsorbed and internalised by algae.