

Contents in Context

Environmental Chemistry, Vol. 3(5), 2006

Modelling Nitrogen Deposition on a Local Scale—A Review of the Current State of the Art

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Environ. Chem. **2006**, 3, 317

High levels of nitrogen in the environment may have a detrimental effect on ecosystems, especially over the long term. Models have been developed to describe the dispersion and deposition of nitrogen on a local scale, which take a number of factors into account such as the chemistry of nitrogen-containing species and the surrounding physical environment. Such models may be used by local authorities to control and monitor the impact of nitrogen from farms with animal production.

Iodine Excretion and Accumulation in Seaweed-Eating Sheep from Orkney, Scotland

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Environ. Chem. **2006**, 3, 338

Iodine is an essential element of mammals and iodine deficiency of mammals has been recorded in more than 100 countries worldwide. Additionally, radioactive iodine is a major threat from nuclear fallout and so-called 'dirty bombs'. Iodine supplementation is able to counteract deficiency and to reduce the potential for uptake of radioactive iodine. Seaweed, one of the best natural sources of iodine, has often been advocated for use as feed for livestock in order to increase the iodine concentration of our diets. The danger of excess iodine, however, has not been studied extensively. Here we investigate the bioavailability of iodine from brown kelps (*Laminaria digitata* and *Laminaria hyperborea*) and the adaptation of sheep to excess iodine intake.

Olive Oil Mill Wastewater Treatment by the Electro-Fenton Process

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Environ. Chem. **2006**, 3, 345

The combination of the Fenton's reagent with electrochemistry (the electro-Fenton process) represents an efficient method for wastewater treatment. This study describes the use of this process to clean olive oil mill wastewater, which is a real environmental problem in Mediterranean countries. Contrary to the conventional methods which reduce the pollution by removing the pollutants from the wastewater, the electro-Fenton process is shown to fully destroy (mineralize) olive oil mill wastes in water without previous extraction and without addition of chemical reagents.

Mechanisms of Boron Removal with Electrocoagulation

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Environ. Chem. **2006**, 3, 350

Various environmental regulation organizations have set up standards or guidelines to regulate the boron concentration in drinking water, as a result of concern for human and animal health. In 2004, the World Health Organization Guidelines for Drinking Water Quality recommended boron values of no more than 0.5 mg L⁻¹ in drinking water. Preliminary studies on boron removal with electrocoagulation have been carried out. However, in order to enhance boron removal using this method, and to meet the stringent guidelines set in place by the World Health Organization, there is a need to obtain a better understanding of how boron is removed from water by electrocoagulation.

Valence Bond Formulations of Mechanisms for the Formation and Decomposition of N₂O₅

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Environ. Chem. **2006**, 3, 355

N₂O₅ is an important nitrogen reservoir in polar stratospheric clouds found in Antarctica and involved with the ozone hole. Here we provide valence bond representations for the gas-phase formation and decomposition of this molecule.

Fitzroy River Basin, Queensland, Australia. I. Identification of Sediment Sources in Impoundments and Flood Events

G. B. Douglas, P. W. Ford, M. Palmer, R. M. Noble, R. Packett

Environ. Chem. **2006**, 3, 364

The Fitzroy River Basin is a major contributor to the loads of suspended sediment and nutrients reaching coastal areas in the southern Great Barrier Reef. Cost-effective investment in improved land, vegetation, and water management to lower these loads requires an understanding of the sources and movement of sediments within the basin. This multidisciplinary geochemical and modelling study provides for the first time a quantitative estimate of sediment sources and spatial and hydrology-related variation within the Fitzroy River Basin.

Fitzroy River, Queensland, Australia. II. Identification of Sources of Estuary Bottom Sediments

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Environ. Chem. **2006**, 3, 377

The Fitzroy River Basin constitutes a major source of suspended sediment and nutrient fluxes to the southern Great Barrier Reef. Improved land management practices to ameliorate these catchment loads require an understanding of the sediment sources and dynamics. This multidisciplinary geochemical and modelling study provides for the first time a quantitative estimate of sediment sources delivered to, and their degree of retention in, the Fitzroy River Estuary.