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Geoscience themed issue: editorial

Yu-ping Chin*

Guest editor Yu-ping Chin introduces this themed issue on geoscience.

2064

Structural characterization of dissolved organic matter: a review of current techniques for isolation and analysis

Elizabeth C. Minor,* Michael M. Swenson,
Bruce M. Mattson and Alan R. Oyler

Current approaches to isolation and structural characterization of natural dissolved organic matter are presented and evaluated for strengths and weaknesses.

2080

Use of stable isotopes to identify sources of methane in Appalachian Basin shallow groundwaters: a review

J. Alexandra Hakala*

This review focuses on existing research in the use of stable carbon and hydrogen isotopes of methane, coupled with ethane stable carbon isotopes and hydrocarbon ratios, to evaluate the potential effects of shale gas development on shallow groundwater in the Appalachian Basin.

2087

Effect of Michael adduction on peptide preservation in natural waters

G. A. McKee, M. E. Kobiela and P. G. Hatcher*

The Michael reaction, during which a model quinone is attached to tetrapeptides, affects peptide preservation through the formation of more stable decomposition products in anthropogenically polluted riverine water. This work demonstrates how the Michael reaction on tetrapeptides can be a route for their long term preservation.

2098

Contaminant-mediated photobleaching of wetland chromophoric dissolved organic matter

Maureen C. Langlois, Linda K. Weavers and Yu-Ping Chin*

Organic contaminants in wetlands undergo indirect photodegradation in the presence of chromophoric dissolved organic matter (CDOM), and in turn can mediate the photobleaching of CDOM.

2108

Inferring sources for mercury to inland lakes using sediment chronologies of polycyclic aromatic hydrocarbons

Matthew J. Parsons, David T. Long,* John P. Giesy and Kurunthachalam Kannan

Sediment PAH chronologies and compound ratios from inland lakes suggest the influence of local to sub-regional scale sources for mercury (Hg).

Using *in situ* voltammetry as a tool to identify and characterize habitats of iron-oxidizing bacteria: from fresh water wetlands to hydrothermal vent sites

D. J. MacDonald,* A. J. Findlay, S. M. McAllister, J. M. Barnett, P. Hredzak-Showalter, S. T. Krepski, S. G. Cone, J. Scott, S. K. Bennett, C. S. Chan, D. Emerson and G. W. Luther III*

In situ voltammetry used for chemical analysis of a variety of freshwater and marine habitats for Fe(II) oxidizing bacteria.

Chromium(III) oxidation by biogenic manganese oxides with varying structural ripening

Yuanzhi Tang,* Samuel M. Webb, Emily R. Estes and Colleen M. Hansel*

Manganese (Mn) oxides, which are generally considered biogenic in origin within natural systems, are the only oxidants of Cr(III) under typical environmental conditions.

Uranium incorporation into aluminum-substituted ferrihydrite during iron(II)-induced transformation

Michael S. Massey,* Juan S. Lezama-Pacheco, F. Marc Michel and Scott Fendorf*

Uranium retention processes (adsorption, precipitation, and incorporation into host minerals) exert strong controls on U mobility in the environment, and understanding U retention is therefore crucial for predicting the migration of U within surface and groundwater.

The interaction of human microbial pathogens, particulate material and nutrients in estuarine environments and their impacts on recreational and shellfish waters

Shelagh K. Malham,* Paulina Rajko-Nenow, Eleanor Howlett, Karen E. Tuson, Tracy L. Perkins, Denise W. Pallett, Hui Wang, Colin F. Jago, Davey L. Jones and James E. McDonald

Review of the interaction of human microbial pathogens, nutrients and flocs from rivers to coasts.

2156

Phosphorus availability explains patterns in a productivity indicator in temperate semi-natural vegetation

E. C. Rowe,* S. M. Smart and B. A. Emmett

Spatial variation in a trait-based indicator of plant productivity was mainly explained by an axis of variation from wet, organic soils to drier, mineral soils. However, extractable phosphorus explained residual variation considerably better than did mineralisable nitrogen.

2165

Coastal microbial quality of surface sediments in different environments along the Italian coast

G. Chiaretti, F. Onorati, P. Borrello, A. Orasi and C. Mugnai*

Typical ranges for microbiological parameters were derived statistically for four environmental types along the coast of Italy and can be used as a comparison in environmental studies.

2172

Measuring solids concentrations in urban stormwater and snowmelt: a new operational procedure

Kerstin Nordqvist, Helen Galfi,* Heléne Österlund, Jiri Marsalek, Camilla Westerlund and Maria Viklander

A comparative study of five methods measuring suspended sediment or solids concentrations in water-sediment mixtures indicated that depending on the method used, broadly varying results can be obtained.

2184

Mercury and lead blood concentrations in pregnant women from 10 caribbean countries

Martin S. Forde,* Eric Dewailly, Lyndon Robertson, Elhadji A. Laouan Sidi, Suzanne Côté, Lisa Sandy, Pierre Dumas and Pierre Ayotte

This paper describes for the first time the levels of mercury and lead in pregnant women from 10 caribbean countries.

Antibacterial activities of silver nanoparticles and antibiotic-adsorbed silver nanoparticles against biorecycling microbes

Chandni Khurana, Anjana K. Vala, Nidhi Andhariya, O. P. Pandey and Bhupendra Chudasama*

This article reports synthesis of silver nanoparticles and antibiotics-adsorbed silver nanoparticles and their antimicrobial activities against biorecycling microbes, *B. subtilis* and *Pseudomonas*.

Changes in wastewater treatment performance and activated sludge properties of a membrane bioreactor at low temperature operation

Chiqian Zhang, Guangzhi Wang and Zhiqiang Hu*

The membrane bioreactor (MBR) activated sludge process is being applied more and more for wastewater treatment due to its high treatment efficiency and low space requirement.

Prediction analysis of effluent removal in a septic sludge treatment plant: a biomimetics engineering approach

Ting Sie Chun,* M. A. Malek and Amelia Ritahani Ismail

Effluent discharge from septic tanks is affecting the environment in developing countries.