

## Looking back while moving forward

David M. Cwiertny

Dave Cwiertny, Editor-in-Chief of *Environmental Science: Water Research & Technology*, welcomes you to the first issue of the journal's sophomore year.

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## Research highlights: visible light driven photocatalysis and photoluminescence and their applications in water treatment

Qinmin Zheng, David T. Tan and Danmeng Shuai\*

We discuss three innovative materials used in photocatalysis and photoluminescence for water treatment applications, including graphitic carbon nitride (g-C<sub>3</sub>N<sub>4</sub>), red phosphorus, and upconversion phosphors (Y<sub>2</sub>SiO<sub>5</sub> doped with Pr and Li).

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**Membrane materials for water purification: design, development, and application**

Anna Lee,\* Jeffrey W. Elam and Seth B. Darling\*

New membrane technologies based on novel organic, inorganic, and hybrid materials and with unprecedented functionality are reviewed.

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**Inorganic engineered nanoparticles in drinking water treatment: a critical review**

Konstantinos Simeonidis,\* Stefanos Mourdikoudis,\* Eftimia Kaprara, Manassis Mitrakas and Lakshminarayana Polavarapu\*

This review summarizes the recent research in the field of inorganic engineered nanoparticle development with direct or potential interest for drinking water treatment.

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**Macromolecule-based platforms for developing tailor-made formulations for scale inhibition**

Amir Sheikhi, Na Li, Theo G. M. van de Ven\* and Ashok Kakkar\*

Macromolecules provide unique opportunities to inhibit scaling, a complex problem and a key challenge faced by water-based industries.

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**Inactivation of bacteria from contaminated streams in Limpopo, South Africa by silver- or copper-nanoparticle paper filters**

Theresa A. Dankovich,\* Jonathan S. Levine, Natasha Potgieter, Rebecca Dillingham and James A. Smith

There is an urgent need for inexpensive point-of-use methods to purify drinking water in developing countries to reduce the incidence of illnesses caused by waterborne pathogens.

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**Optimisation and costing of faecal sludge management options for Lusaka's informal settlements**

Ruth Kennedy-Walker, Tomas Holderness, David Alderson, Jaime M. Amezaga and Charlotte A. Paterson

This paper presents a methodology to support the implementation of Faecal Sludge Management services in informal settlements in Lusaka, The Republic of Zambia.

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**Acid–base dynamics in seawater reverse osmosis: experimental evaluation of a reactive transport algorithm**

Oded Nir,\* Liron Ophek and Ori Lahav

An advanced simulation algorithm enabling accurate predictions of acid–base properties in RO brine and permeate was developed and experimentally tested.

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**Nitrate removal from water using a nanopaper ion-exchanger**

Andreas Mautner,\* Henry A. Maples, Houssine Sehaqui, Tanja Zimmermann, Uxua Perez de Larraya, Aji P. Mathew, Chi Yan Lai, Kang Li and Alexander Bismarck\*

The development of a nanopaper ion-exchanger for the efficient removal of nitrates from water in continuous mode is presented.

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**A pilot-scale study of a powdered activated carbon-membrane bioreactor for the treatment of water with a high concentration of ammonia**

Senlin Shao, Fangshu Qu, Heng Liang,\* Haiqing Chang, Huarong Yu and Guibai Li

Ammonia removal was highly impacted by temperature and alkalinity. Fouling cake could remove a certain amount of ammonia.

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**A quantitative microbial risk assessment of wastewater treatment plant blending: case study in San Francisco Bay**

Edmund Y. Seto,\* Jon Konnan, Adam W. Olivieri,\*  
Richard E. Danielson and Donald M. D. Gray

Quantitative Microbial Risk Assessment (QMRA) to assess health risk associated with increasing extreme rainfall events and the practice of wastewater blending.

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**Development and field test of a mobile continuous flow system utilizing Chemcatcher for monitoring of rare earth elements in marine environments**

Jördis Petersen,\* Daniel Pröfrock, Albrecht Paschke,  
Jose A. C. Broekaert and Andreas Prange

Field testing of the novel system during a cruise in the North Sea yielded precise TWA concentrations of the analytes.

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**Effect of sewage sludge type on the partitioning behaviour of pharmaceuticals: a meta-analysis**

L. Berthod, G. Roberts, A. Sharpe, D. C. Whitley,  
R. Greenwood and G. A. Mills\*

Understanding the partitioning behaviour of active pharmaceutical ingredients between sludge and aqueous phases in wastewater treatment plants is important for environmental regulation.

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**Survey of green building water systems reveals elevated water age and water quality concerns**

William J. Rhoads,\* Amy Pruden and Marc A. Edwards

Widespread adoption of innovative water conservation strategies has potential unintended consequences for aesthetics and public health.

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**Silica scale formation and effect of sodium and aluminium ions -<sup>29</sup>Si NMR study**

L. Lunevich,\* P. Sancio, A. Smallridge and S. R. Gray

Silica scale formation on reverse osmosis (RO) membrane surface is a significant problem for operation of high recovery RO desalination plant.

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**Microbial fuel cells with an integrated spacer and separate anode and cathode modules**

Weihua He, Xiaoyuan Zhang, Jia Liu, Xiuping Zhu, Yujie Feng\* and Bruce E. Logan\*

Using wire spacers enabled in a reactor design that produced high power densities and maintained a stable structure under hydraulic pressure. The separation of the anodes and cathodes into separate modules provides a scalable MFC design with good accessibility for electrode construction, operation and maintenance.

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**Emerging investigators series: formation of disinfection byproducts during the preparation of tea and coffee**

Tom Bond,\* Seeheen C. Tang, Nigel Graham and Michael R. Templeton

This study examined the formation of selected disinfection byproducts (DBPs) during the chlorination of breakfast, Earl Grey and green tea, and from instant and filter coffee.

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**Future sustainable desalination using waste heat: kudos to thermodynamic synergy**

Muhammad Wakil Shahzad, Kim Choon Ng\* and Kyaw Thu

There has been a plethora of published literature on thermally-driven adsorption desalination (AD) cycles for seawater desalination, due to their favorable attributes in hybridizing with existing proven thermal desalination methods.

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**Demonstrating organic contaminant removal in an ozone-based water reuse process at full scale**

Judy Blackbeard, James Lloyd, Mirela Magyar,  
John Mieog, Karl G. Linden and Yaal Lester\*

The 350 ML per d Eastern Treatment Plant (ETP) tertiary facility produces "Class A" water for the city of Melbourne, Australia, which is used for irrigation, dual reticulation and fire fighting.

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**Characterization, fate and transport of floc aggregates in full-scale flocculation tanks**

Yamuna S. Vadasarukkai and Graham A. Gagnon\*

In-line measurements of floc size distributions at different locations in a hydraulic flocculation tank using a holographic microscopy.