Environmental Science
Water Research & Technology

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Emerging investigators series: prospects and challenges for high-pressure reverse osmosis in minimizing concentrated waste streams

A. Benjamin Schantz, Boya Xiong, Elizabeth Dees, David R. Moore, Xuejing Yang and Manish Kumar*

If challenges such as mechanical stability, scaling, biofouling and concentration polarization at high pressures are addressed, high-pressure RO could be used to efficiently remove water from high-salinity waste brines as part of a zero-liquid-discharge disposal process.

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Fundamental challenges and engineering opportunities in flue gas desulfurization wastewater treatment at coal fired power plants

Daniel B. Gingerich, Eric Grol and Meagan S. Mauter*

This review identifies challenges and opportunities facing the electricity generation sector in treating flue gas desulfurization wastewater.

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1,3,5-Trimethoxybenzene (TMB) as a new quencher for preserving redox-labile disinfection byproducts and for quantifying free chlorine and free bromine

Stephanie S. Lau, Ryan P. Dias, Kayla R. Martin-Culet, Nicholas A. Race, Marella H. Schammel, Keith P. Reber, A. Lynn Roberts and John D. Sivey*

1,3,5-Trimethoxybenzene can be used to quench residual chlorine and bromine without altering disinfection byproducts that are reactive toward traditional quenchers.

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A combined ultrafiltration–reverse osmosis process for external reuse of Weiyuan shale gas flowback and produced water

Can Guo, Haiqing Chang, Baicang Liu,* Qiping He, Boya Xiong, Manish Kumar and Andrew L. Zydney

External reuse of shale gas flowback and produced water using the UF-RO process and membrane fouling evaluation.

956

Propidium monoazide pretreatment on a 3D-printed microfluidic device for efficient PCR determination of 'live *versus* dead' microbial cells

Yanzhe Zhu, Xiao Huang, Xing Xie, Janina Bahnemann, Xingyu Lin, Xunyi Wu, Siwen Wang and Michael R. Hoffmann*

A microfluidic chip for differentiating live *versus* dead cells was designed and tested experimentally with lab and environmental samples.

964

Degradation mechanisms of cefotaxime using biochar supported Co/Fe bimetallic nanoparticles

Hongwei Wu,* Qiyan Feng,* Ping Lu, Meng Chen and Hong Yang

The synergetic reaction of adsorption and reduction caused cefotaxime efficient degradation by Co/Fe/MB and the degradation pathway was also analyzed.

Compound parabolic collector solar disinfection system for the treatment of harvested rainwater

André Strauss, Brandon Reyneke, Monique Waso and Wesaal Khan*

Cost-effective SODIS-CPC systems significantly improved the microbial quality of harvested rainwater. These point-of-use treatment systems can be implemented on site where standard water infrastructure cannot be employed. The use of a first flush diverter as a pre-filtration step also reduced microbial contamination.

Robust control synthesis for the activated sludge process

Bui Duc Hong Phuc, Sam-Sang You,* Boc Minh Hung and Hwan-Seong Kim

Control of the activated sludge process (ASP) is a challenging problem due to the complexity of the biological and chemical reactions, and large variations in the influent flow.

Lipolysis of domestic wastewater in anaerobic reactors operating at low temperatures

Evangelos Petropoulos,* Jan Dolfing, Yongjie Yu, Matthew J. Wade, Emma J. Bowen, Russell J. Davenport and Thomas P. Curtis

Poor breakdown of lipids is a major barrier to the anaerobic treatment of domestic wastewater at low temperatures.

Effects of an iron oxide–zeolite additive on process performance of anaerobic digestion of swine waste at mesophilic, ambient and psychrophilic temperatures

Xiaofei Lu, Haidong Wang, Fang Ma,* Ang Li and Guang Zhao

The improved process performance of AD of swine waste at mesophilic, ambient and psychrophilic temperatures by an iron oxide–zeolite additive.

1024

Elaboration of a chemical sensor based on polyaniline and sulfanilic acid diazonium salt for highly sensitive detection nitrite ions in acidified aqueous media

Abdoulaye Diarisso, Modou Fall* and Noureddine Raouafi

The work describes the use of sulfonic acid-functionalized GCE as a scaffold to build a highly sensitive PANI-based sensor for nitrite ions in aqueous medium.

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Effect of organic matter on the performance and N_2O emission of a granular sludge anammox reactor

Mingsheng Jia, Celia M. Castro-Barros, Mari K. H. Winkler and Eveline I. P. Volcke*

A continuously fed bubble column granular sludge anammox reactor was operated for 405 days to investigate the effect of organic matter on the reactor performance and N_2O emission.

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Performance of a seawater-driven forward osmosis process for pre-concentrating digested sludge centrate: organic enrichment and membrane fouling

Minh T. Vu, Ashley J. Ansari, Faisal I. Hai and Long D. Nghiem*

This study demonstrated the potential of seawater-driven forward osmosis for enriching organic matter in digested sludge centrate.

1057

Influence of spent filter backwash water recycling on pesticide removal in a conventional drinking water treatment process

Wei Li,* Xinran Liang, Jinming Duan,* Simon Beecham and Dennis Mulcahy

The effects of recycling spent filter backwash water (SFBW) on the removal of 14 organic pesticides were examined in a simulated conventional drinking water treatment process.