

# JOURNAL OF ENVIRONMENTAL ENGINEERING

Vol. 139 - 2013

SPIS TREŚCI

nr 1

## TECHNICAL PAPERS

- 1 Mass Transfer Kinetics of Phosphorus to Filter Media from Wastewater, Storm Water, and Surrogate Matrices / **Tingting Wu and John Sansalone**
- 11 Physical Modeling of Particulate Matter Washout from a Hydrodynamic Separator / **Hwan Cho and John Sansalone**
- 23 Effect of Dispersant on Transport of Nanoscale Iron Particles in Soils: Zeta Potential Measurements and Column Experiments / **Claudio Cameelle, Krishna R. Reddy, Kenneth Darko-Kagya, and Amid Khodadoust**
- 34 Enhanced Understanding of Sediment Phosphorus Dynamics in River Systems with a Simple Supplemental Mass Balance Tool / **Catherine J. Chomat and Kirk S. Westphal**
- 44 Modeling Effects of Sediment Diagenesis on Recovery of Hypolimnetic Oxygen / **Rakesh K. Gelda, Emmet M. Owens, David A. Matthews, Steven W. Effler, Steven C. Chapra, Martin T. Auer, and Rasika K. Gawde**
- 54 Distribution of Potentially Bioavailable Natural Organic Carbon in Aquifer Sediments at a Chloroethene-Contaminated Site / **L. K. Thomas, M.A. Widdowson, F. H. Chapelle, J.T. Novak, J.E. Boncal, and C.A. Lebrón**
- 61 Investigation of Flow Patterns in Storm Water Retention Ponds using CFD / **Sher Khan, Bruce W. Melville, Asaad Y. Shamseldin, and Christoph Fischer**
- 70 Modeling a Proposed Quarry Reservoir for Raw Water Storage in Atlanta, Georgia / **Vickie L. Singleton, Benjamin Jacob, Michael T. Feeney, and John C. Little**
- 79 Hybrid Treatment Process of using MIEX and High Performance Composite Coagulant for DOM and Bromide Removal / **Zhizhen Xu, Ruyuan Jiao, Hailong Liu, Dongsheng Wang, Christopher W.K. Chow, and Mary Drikas**
- 86 Silica-Titania-Coated Packing: Novel Solution Capable of 90% Hg Capture with Low Operation and Maintenance Costs / **A. Casasús, A. Gruss, D. Baun, M. Morales, and D. Mazyck**
- 95 Modeling Adsorption of Copper on Amine-Functionalized SBA-15: Predicting Breakthrough Curves / **Enshirah Da'na and Abdelhamid Sayari**
- 104 Treatment of Energetic Wastewater Containing 2,4-Dinitroanisole and N-Methyl Paranitro Aniline / **William E. Platten III, David Bailey, Makram T. Suidan, and Stephen W. Maloney**
- 110 Flocculation, Ozonation, and Fenton's Process in the Treatment of Distillery Effluents / **Rui C. Martins, Fábio L. Pinto, Sérgio Castro-Silva, and Rosa M. Quinta-Ferreira**

## CASE STUDIES

- 117 Using UV Spectroscopy and Molecular Weight Determinations to Investigate the Effect of Various Water Treatment Processes on NOM Removal: Australian Case Study / **Lionel Ho, Markus Hainthaler, and Gayle Newcombe**

## **TECHNICAL NOTES**

- 127 Effects of Physicochemical Properties of Nanofiltration Membranes on the Rejection of Small Organic DBP Precursors / **Yi-Li Lin**
- 137 Evaluation of Hydrogen Peroxide Chemical Quenching Agents following an Advanced Oxidation Process / **Olya S. Keen, Aaron D. Dotson, and Karl G. Linden**
- 141 Performance of Two-Stage Upflow Anaerobic Sludge Blanket Reactor Treating Wastewater from Latex-Processing Factory / **S. Phoolphundh, K. Hathaisamit, and S. Wongwises**

## **ERRATA**

- 147 Erratum for "Evaluation of Nutrient Release from Sediments of Artificial Lake" by Bomi Lim, Bomin Ki, and Jung Hyun Choi / **Bomi Lim, Bomin Ki, and Jung Hyun Choi**

**TECHNICAL PAPERS**

- 149 Characterization of Bulk Fluid and Transport Properties for Simulating Polymer-Improved Aquifer Remediation / **Jeff A.K. Silva, Matt Liberatore, and John E. McCray**
- 160 Effects of Hydraulic Detention Time, Water Depth, and Duration of Operation on Nitrogen and Phosphorus Removal in a Flow-Through Duckweed Bioremediation System / **Kossay K. Alahmady, Kevin Stevens, and Sam Atkinson**
- 167 Evaluation of Apparent Permeability and Field Assessment of Aged Asphalt Capping Systems / **Deyi Hou and Jian Luo**
- 176 Protocol to Include Ecosystem Service Constraints in a Wind Farm Cost Model / **Annette R. Grilli, Tania Lado Insua, and Malcolm Spaulding**
- 187 Internal Water Storage Enhances Exfiltration and Thermal Load Reduction from Permeable Pavement in the North Carolina Mountains / **Brad J. Wardynski, Ryan J. Winston, and William F. Hunt**
- 196 Air Flow Characteristics in Granular Biofilter Media / **Rune R. Andreasen and Tjalfe G. Poulsen**
- 205 Predicting Permeation of Organic Contaminants into Polyethylenes / **Jia Tang, Daniel L. Gallagher, and Andrea M. Dietrich**
- 213 Adsorptive Selenite Removal Using Iron-Coated GAC: Modeling Selenite Breakthrough with the Pore Surface Diffusion Model / **Dong Yan, Daniel Dianchen Gang, Ning Zhang, and LianShin Lin**
- 220 Gas Absorption Enhancement Mechanism in Mechanically Agitated Multiphase System: Effect of Fine Solid Particles and Interfacial Turbulence / **Shuo Zhang, Dong Wang, LiPing Yang, and ZhiHua Chen**
- 226 Nutrient Speciation and Distribution between Surface Water and Sediment in the Middle Reach of the Huai River, China / **Peifang Wang, Chao Wang, Li Zhao, Douglas J. Schnoebelen, Jin Qian, and Jun Hou**
- 235 Effective Inhibition of Bromate Formation with a Granular Molecular Sieve Catalyst Ce-MCM-48 during Ozonation: Pilot-Scale Study / **Zhimin Qiang, Fenglin Cao, Wencui Ling, Tao Zhang, and Weiwei Li**
- 241 Strategic Analysis of Computer Waste Management Options: Game-Theoretic Approach / **Rajendra Kumar Kaushal and Arvind K. Nema**
- 250 Bayesian Chemical Mass Balance Method for Surface Water Contaminant Source Apportionment / **Arash Massoudieh and Masoud Kayhanian**
- 261 Engine and Duty Cycle Variability in Diesel Construction Equipment Emissions / **Saeed Abolhasani and H. Christopher Frey**
- 269 Pollutant Distribution on Urban Surfaces: Case Study in Southern Brazil / **Maria do Carmo Cauduro Gastaldini and Ana Roberta Victoria Silva**

**CASE STUDIES**

- 277 Characterization of Storm Water-Suspended Sediments and Phosphorus in an Urban Catchment in Florida / **Mauricio E. Arias, Mark T. Brown, and John J. Sansalone**
- 289 Thermophilic Aerobic Treatment of Mycelia Sludge and Antibiotic Wastewater / **C. Furlong, P.J. Sallis, and T. Wilby**
- 295 Quantification of Hydrocarbon Contaminants in Meltwater and Sediment in a City Snow Pile / **Matthew Stewart, Alexander Holden, Melissa E. Haveroen, and Ania C. Ulrich**

### **TECHNICAL NOTES**

302 Effects of Storage Conditions on Chromium (III) and Chromium (VI) in Two Types of Potable Water / **Peter G. Green, Jeannie Darby, and Sarah Laybourne**

307 Bayesian and Frequentist Methods for Estimating Joint Uncertainty of Freundlich Adsorption Isotherm Fitting Parameters / **Julian L. Fairey and David G. Wahman**

### **DISCUSSIONS AND CLOSURES**

312 Discussion of "Enhancement of the Shear Strength of Wastewater Residuals Using Industrial Waste By-Products" by C. Kayser, T. Larkin, and N. Singhal / **Brendan C. O'Kelly**

315 Closure / **C. Kayser, T. Larkin, and N. Singhal**

**TECHNICAL PAPERS**

- 317 Hydrodynamic Modeling of First-Order Transport Timescales in the St. Louis Bay Estuary, Mississippi / **René A. Camacho and James L. Martin**
- 332 Quality and Quantity Monitoring of Five Rainwater Tanks in Western Sydney, Australia / **M. van der Sterren, A. Rahman, and G.R. Dennis**
- 341 Numerical Simulation and Assessment of the Effects of Operation and Baffling on a Potable Water Service Reservoir / **Jun-Mei Zhang, Boo Cheong Khoo, Heow Pueh Lee, Chit Pin Teo, Nazarudeen Haja, and Kai Qi Peng**
- 349 Application of Isotherm and Kinetic Models for the Removal of Lead Ions from Aqueous Solutions / **Hanan S. Ibrahim, Ahmed A. El-Kady, Nabila S. Ammar, Ladda Meesuk, Pornsawat Wathanakul, and Mosaad A. Abdel-Wahhab**
- 358 Performance Evaluation of Horizontal Subsurface Flow-Constructed Wetlands for the Treatment of Domestic Wastewater in the Tropics / **Njenga Mburu, Sylvie M. Tebitendwa, Diederik P.L. Rousseau, J.J.A. van Bruggen, and Piet N.L. Lens**
- 368 Predicting Arsenate Adsorption on Iron-Coated Sand Based on a Surface Complexation Model / **Sisi Que, Charalambos Papelis, and Adrian T. Hanson**
- 375 Heterogeneous Nitrification in a Full-Scale Rapid Sand Filter Treating Groundwater / **Laure Lopato, Nina Röttgers, Philip J. Binning, and Erik Arvin**
- 385 Comparison of Supersaturated Total Dissolved Gas Dissipation with Dissolved Oxygen Dissipation and Reaeration / **Ran Li, Ben R. Hodges, Jingjie Feng, and Xiaodong Yong**
- 391 Simulation-Optimization Model for Intermediate Reuse of Agriculture Drainage Water in Egypt / **Amr E. Fleifle, Oliver C. Saavedra Valeriano, Hossan M. Nagy, Farouk A. Elfetiany, Ahmed Tawfik, and Mohamed Elzeir**
- 402 Competitive Adsorption of p-Hydroxybenzoic Acid and Phenol on Activated Carbon: Experimental Study and Modeling / **Caroline Andriantsiferana, Carine Julcour-Lebigue, Carmen Creanga-Manole, Henri Delmas, and Anne-Marie Wilhelm**
- 410 Biosorption of U(VI) from Aqueous Solution by *Chlorella vulgaris*: Equilibrium, Kinetic, and Thermodynamic Studies / **Malihe Amini, Habibollah Younesi, and Nader Bahramifar**
- 422 Semicontinuous Operation of One-Stage Autothermal Thermophilic Aerobic Digestion of Sewage Sludge: Effects of Retention Time / **Shugen Liu, Ping Ning, Nanwen Zhu, Loretta Y. Li, and Xudong Gong**
- 428 Evaluation of Enhanced Reductive Dechlorination of Trichloroethylene Using Gene Analysis: Pilot-Scale Study / **H.Y. Chiu, J.K. Liu, H.Y. Chien, R.Y. Surampalli, and C.M. Kao**

**CASE STUDIES**

- 438 Effects of Different Layout Schemes on the Marine Environment of the Dalian Offshore Reclaimed Airport Island / **Nuo Wang, Hua-Kun Yan, Zhong-Bo Liu, Shi-Qi Tong, Tiao-Lan Yu, and Chen Liang**

## **TECHNICAL NOTES**

- 450 Reynolds-Averaged Navier-Stokes Simulation of the Flow and Tracer Transport in a Multichambered Ozone Contactor / **J. Zhang, A.E. Tejada-Martínez, and Q. Zhang**
- 455 Inverse Calculation Model for Optimal Design of Rectangular Sedimentation Tanks / **Xiaodong Liu, Hongqin Xue, Zulin Hua, Qi Yao, and Jin Hu**

**Natural Treatment Systems / Joel G. Burken****INTRODUCTION**

- 461 Special Section on Natural Treatment Systems: More Than Just a Solution to Pollution / **Joel G. Burken**

**TECHNICAL PAPERS**

- 462 Effects of Media and Plant Selection on Biofiltration Performance / **Michael E. Barrett, Maëlle Limouzin, and Desmond F. Lawler**
- 471 Green Roof Storm-Water Runoff Quantity and Quality / **Susan Morgan, Serdar Celik, and William Retzlaff**
- 479 Spatial Accumulation and Strength of Affiliation of Heavy Metals in Bioretention Media / **Philip Sumner Jones and Allen P. Davis**
- 488 In Situ and Microcosm Investigations into the Phytoremediation of Hydrocarbon-Contaminated Lagoon Sediments Using *Phragmites australis* / **Hannah E. Pinchin, John B. Williams, Eric May, Catherine Mant, and Brendan J. Hodgkinson**
- 496 Radial Oxygen Loss in Wetland Plants: Potential Impacts on Remediation of Contaminated Sediments / **Katy Euliss Smith and Tamara Olivia Luna**
- 502 Green Roof Systems as Sources or Sinks Influencing Heavy Metal Concentrations in Runoff / **S. Alsup, S. Ebbs, L. Battaglia, and W. Retzlaff**
- 509 Simulated Storm-Water Runoff Treatment by Duckweed and Algae Ponds / **Atreyee Sims and Zhiqiang Hu**

**TECHNICAL NOTES**

- 516 Case Study of St. Louis, Missouri: Comparison of Bioretention Performance to the Runoff Component of a Restored Water Balance / **Jay Hoskins and Jason Peterein**

**OTHER TECHNICAL PAPERS**

- 522 Comparison of Reaction Rates and Relative Efficiencies for Various Dechlorination Chemicals / **Benoit M. Hermant and Onita D. Basu**
- 530 Methodology for In Situ Column Testing to Improve Accuracy during Design and Specification of Aeration Systems / **Diego Rosso, Lu-Man Jiang, Paul Pitt, Charles S. Hocking, Michael K. Stenstrom, Sudhir Murthy, David M. Hayden, Joseph Zhong, Daniel H. Collier, Andrew Y. Kim, and Haomin Xu**
- 538 Estimate of the Decay Rate Constant of Hydrogen Sulfide from Drywall in a Simulated Bench-Scale Study / **Thabet M. Tolaymat, Amro M. El Badawy, and David A. Carson**
- 545 Assessment of Waste-Activated-Sludge Pretreatment by Ultrasound and Applicability of Biodegradability Indicators / **Peiman Kianmehr, Wayne Parker, and Peter Seto**
- 554 Framework for Evaluating Sorbent Usage Rate of Various Sorption Column Configurations with and without Bypass Blending / **Benjamin A. Stewart, Christian W. New, Ahmed A. Hosni, and Bruce I. Dvorak**
- 564 Model Prediction of Long-Term Reactive Core Mat Efficacy for Capping Contaminated Aquatic Sediments / **Dogus Meric, Ferdinand Hellweger, Sara Barbuto, Nima Rahbar, Akram N. Alshawabkeh, and Thomas C. Sheahan**

- 576 Optimization of Copper Removal from ACQ-, CA-, and MCQ-Treated Wood Using an Experimental Design Methodology / **Lucie Coudert, Jean-François Blais, Guy Mercier, Paul Cooper, Paul Morris, Louis Gastonguay, Amélie Janin, and Francois Zaviska**
- 588 Occurrence of Perfluorooctane Sulfonate in the Water Environment of Bangkok, Thailand / **Suwanna Kitpati Boontanon, Chinagarn Kunacheva, Narin Boontanon, Natchuda Musirat, Shigeo Fujii, and Shuhei Tanaka**
- 594 Impact of Iron Salt Dosage to Sewers on Downstream Anaerobic Sludge Digesters: Sulfide Control and Methane Production / **Huoqing Ge, Lishan Zhang, Damien J. Batstone, Jurg Keller, and Zhiguo Yuan**



**TECHNICAL PAPERS**

- 603 Impact of Media Aging on the Removal of Cryptosporidium in Granular Media Filters / **Isabelle Papineau, Nathalie Tufenkji, Pierre Servais, and Benoit Barbeau**
- 612 Postsedimentation Application of Polyaluminum Chloride to Enhance Dual Media Filter Performance / **Po-Hsun Lin, Leonard W. Lion, Monroe L. Weber-Shirk, and Christopher L. Bordlemay**
- 618 Monte Carlo Simulation-Aided Analytic Hierarchy Process Approach: Case Study of Assessing Preferred Non-Point-Source Pollution Control Best Management Practices / **Liang Jing, Bing Chen, Baiyu Zhang, Pu Li, and Jisi Zheng**
- 627 Extraction of PCBs from Transformer Oil and Its Dechlorination Using Visible Light / **Jiansong Kong, Gopal Achari, and Cooper H. Langford**
- 633 Leaching Behavior of Hazardous Heavy Metals from Lime Fly Ash Cements / **Ojas A. Chaudhari and Joseph J. Biernacki**
- 642 Evaluation of Leaching Protocols for Testing of High-Carbon Coal Fly Ash-Soil Mixtures / **Jason Becker, Ahmet H. Aydilek, Allen P. Davis, and Eric A. Seagren**
- 654 Two-Phase Biodegradation of Phenol in a Hollow Fiber Membrane Bioreactor / **Prashant Praveen and Kai-Chee Loh**
- 661 Ferrate and Alkaline Chlorination Treatment of Cyanide-Heavy Metal Maritime Wastewater / **Brian E. Reed, Anjuman A. Islam, and John Bendick**
- 667 Dimensionless Analysis of HSDM and Application to Simulation of Breakthrough Curves of Highly Adsorbent Porous Media / **Agustí Pérez-Foguet, Eva Casoni, and Antonio Huerta**
- 677 Overcoming Permanganate Stalling during Electromigration / **Daniel Hodges, Andy Fourie, David Thomas, and David Reynolds**
- 685 Evolution of Toxicity and Mineralization during the Treatment of Diethylphthalate in Water by Ozone and Activated Carbon Coupling / **Tatianne Ferreira de Oliveira, Benoît Cagnon, Henri Fauduet, Marina Licheron, and Olivier Chedeville**
- 692 Dynamic Behavior of Straining in Randomly Packed Beads: Experimental Study / **Bogdan Muresan, Nadia Saiyouri, and Pierre-Yves Hicher**
- 703 Life Cycle Analysis for Water and Wastewater Pipe Materials / **Fei Du, Gwendolyn J. Woods, Doosun Kang, Kevin E. Lansey, and Robert G. Arnold**
- 712 Effluent Particle Size and Permeability of Polyvinylchloride Membranes after Sodium Hypochlorite Exposure / **Yong-mei Liang, Jun Lu, Xue-bo Qin, Xin Yang, Bing Chen, Zai-li Zhang, and Wei Liu**
- 719 Multimodel, Multiple Watershed Examination of In-Stream Bacteria Modeling / **Jeffrey J. Iudicello and David A. Chin**
- 728 Predicting Between-Event Variability of Escherichia coli in Urban Storm Water / **D.T. McCarthy, A. Deletic, V.G. Mitchell, and C. Diaper**
- 738 Contribution of Water and Wastewater Infrastructures to Urban Energy Metabolism and Greenhouse Gas Emissions in Cities in India / **Leslie A. Miller, Anu Ramaswami, and Ravi Ranjan**
- 746 Impact of Infrastructure Coating Materials on Storm-Water Quality: Review and Experimental Study / **Andrew J. Whelton, Maryam Salehi, Matthew Tabor, Bridget Donaldson, and Jesus Estaba**

## **CASE STUDIES**

- 757 Rain Barrel-Urban Garden Stormwater Management Performance / **Aaron A. Jennings, Ata A. Adeel, Alex Hopkins, Alexandra L. Litofsky, and Steven W. Wellstead**
- 766 Estimation of Graywater Constituent Removal Rates in Outdoor Free-Water-Surface Wetland in Temperate Climate / **Jesse Bergdolt, Sybil Sharvelle, and Larry Roesner**

**TECHNICAL PAPERS**

- 773 Biological Nutrient Removal and Fouling Phenomena in a University of Cape Town Membrane Bioreactor Treating High Nitrogen Loads / **Alida Cosenza, Gaetano Di Bella, Giorgio Mannina, Michele Torregrossa, and Gaspare Viviani**
- 781 Proteinate-Capped Silver Nanoparticle Transport in Water-Saturated Sand / **Dianjun Ren and James A. Smith**
- 788 Arsenic Entrapment in Reactive Columns of Residual Soils / **Magalí E. Carro Perez and Franco M. Francisca**
- 796 Mathematical Model for Sequential Pickup of Chemical Contaminants by Magnetic Particles / **Stephen W. Bigger, Kasup Munaweera, Lawrence N. Ngeh, Peter Dann, and John D. Orbell**
- 803 Mechanism and Pathway of Tetrachloroethylene Dechlorination by Zero-Valent Iron with Cu or Cu/C / **Wei Zhang, Li Li, Bingzhi Li, Kuangfei Lin, Shuguang Lu, Rongbing Fu, Jiang Zhu, and Xinhong Cui**
- 810 Electrochemical Oxidation of Chlortetracycline Using Ti/IrO<sub>2</sub> and Ti/PbO<sub>2</sub> Anode Electrodes: Application of Experimental Design Methodology / **François Zaviska, Patrick Drogui, Jean-François Blais, Guy Mercier, and Samuel De La Rochebrochard d'Auzay**
- 822 Using Turbidity to Determine Total Suspended Solids in Storm-Water Runoff from Green Roofs / **Isam Al-Yaseri, Susan Morgan, and William Retzlaff**
- 829 Total Nitrogen Losses from Fertilized Turfs on Simulated Highway Slopes in Florida / **Sai Kakuturu, Manoj Chopra, Mike Hardin, and Marty Wanielista**
- 838 Modeling Sedimentation-Filtration Basins for Urban Watersheds Using Soil and Water Assessment Tool / **Jaehak Jeong, Narayanan Kannan, Jeff G. Arnold, Roger Glick, Leila Gosselink, Raghavan Srinivasan, and Michael E. Barrett**
- 849 Computational Fluid Dynamics Model of BioCAST Multienvironment Air-Lift Bioreactor / **Ryan S. D. Calder, Laleh Yerushalmi, and S. Samuel Li**
- 864 Performance of Air Suction Flow Biofilm Reactor in Treating Municipal-Strength Wastewater / **E. Clifford, P. Forde, S. McNamara, M. Rodgers, and E. O'Reilly**
- 873 Advanced Treatment of Vitamin C Wastewater by Coupling Electrochemical Oxidation and an Integrated Bioreactor / **Xu Ke, Hu Xiaobing, Wang Zhao, Ren Hongqiang, and Ding Lili**
- 881 Electrohydrolysis of Vinegar Fermentation Wastewater for Hydrogen Gas Production Using Different Types of Electrodes / **Fikret Kargi and Sedef Arikan**
- 887 Uranium Removal from Aqueous Solution by Banyan Leaves: Equilibrium, Thermodynamic, Kinetic, and Mechanism Studies / **Liangshu Xia, Kaixuan Tan, Xiao Wang, Weina Zheng, Wenjuan Liu, and Changai Deng**
- 896 Prediction of Rare Earth Elements in Neutral Alkaline Mine Drainage from Razi Coal Mine, Golestan Province, Northeast Iran, Using General Regression Neural Network / **Faramarz Doulati Ardejani, Reza Rooki, Behshad Jodieri Shokri, Teimour Eslam Kish, Ahmad Aryafar, and Pourya Tourani**

## **TECHNICAL NOTES**

- 908 Oxygen Transfer by Air Injection in Horizontal Pipe Flow / **Zegao Yin, David Z. Zhu, Dongsheng Cheng, and Bingchen Liang**
- 913 Simple Model of Tetracycline Antibiotic Resistance in Aquatic Environment: Accounting for Metal Coselection / **F.L. Hellweger**

**TECHNICAL PAPERS**

- 923 Determination of Porosity and Thickness of Biofilm Attached on Irregular-Shaped Media / **Meng Hu, Tian C. Zhang, John Stansbury, Jill Neal, and Edward J. Garboczi**
- 932 Comparison of Maintenance Cost, Labor Demands, and System Performance for LID and Conventional Stormwater Management / **James J. Houle, Robert M. Roseen, Thomas P. Ballestero, Timothy A. Puls, and James Sherrard Jr.**
- 939 Novel Fluidic Control System for Stacked Rapid Sand Filters / **Michael J. Adelman, Monroe L. Weber-Shirk, Jeffrey C. Will, Anderson N. Cordero, William J. Maher, and Leonard W. Lion**
- 947 Modeling of Water Quality Parameters Using Data-Driven Models / **H. Orouji, O. Bozorg Haddad, E. Fallah-Mehdipour, and M.A. Mariño**
- 958 Pilot-Scale Evaluation of GAC Adsorption Using Low-Cost, High-Performance Materials for Removal of Pesticides and Organic Matter in Drinking Water Production / **Thi Thuy Pham, Viet Anh Nguyen, and Bart Van der Bruggen**
- 966 Fenton and Photo-Fenton Oxidation of Petroleum Aromatic Hydrocarbons Using Nanoscale Zero-Valent Iron / **Mohammad Alizadeh Fard, Ali Torabian, Gholam Reza Nabi Bidhendi, and Behnoush Aminzadeh**
- 975 Silica Adsorbents and Peroxide Functionality for Removing Paraquat from Wastewater / **Shama F. Barna, Elizabeth A. Ott, Thu H. Nguyen, Mark A. Shannon, and Alexander Scheeline**
- 986 Porosity, Flow, and Filtration Characteristics of Frustum-Shaped Ceramic Water Filters / **Ismail Yakub, Anand Plappally, Megan Leftwich, Karen Malatesta, Katie C. Friedman, Sam Obwoya, Francis Nyongesa, Amadou H. Maiga, Alfred B.O. Soboyejo, Stefanos Logothetis, and Wole Soboyejo**
- 995 Adsorption of Fluoride from Water Using Sintered Clay-Hydroxyapatite Composites / **Ismail Yakub and Wole Soboyejo**
- 1004 Treatment of Restaurant Wastewater by Pilot-Scale Electrocoagulation-Electroflotation: Optimization of Operating Conditions / **Xusong Qin, Bin Yang, Furong Gao, and Guohua Chen**

**TECHNICAL NOTES**

- 1017 Evaluation of a Prediction Model for Influent Pharmaceutical Concentrations / **Karl J. Ottmar, Lisa M. Colosi, and James A. Smith**

**TECHNICAL PAPERS**

- 1023 Gravity-Powered Chemical Dose Controller for Sustainable, Municipal-Scale Drinking Water Treatment / **Karen A. Swetland, Monroe L. Weber-Shirk, and Leonard W. Lion**
- 1035 Spatial Service Location-Allocation Analysis for Siting Recycling Depots / **Jehng-Jung Kao, Yung-Tai Tsai, and You-Ti Huang**
- 1042 Modeling of Leachate Collection Systems with Filter Separators in Municipal Solid Waste Landfills / **R. Kerry Rowe and Yan Yu**
- 1053 Effects of pCO<sub>2</sub> on the Removal of Fluoride from Wastewater by Calcite / **Scott B. Sleaf, Brett D. Turner, Kristian Krabbenhøft, and Scott W. Sloan**
- 1062 Water Vapor Transport in Soils from a Pervaporative Irrigation System / **Lindsay C. Todman, Andrew M. Ireson, Adrian P. Butler, and Michael R. Templeton**
- 1070 Preparation of Waterborne Polyurethane Foam with Active Carbon and Its Adsorption for Phenol in Aqueous Solution / **Ning Mao, Lincheng Zhou, Zhengfang Ye, Wei Zheng, Lanqin Peng, and Yanfeng Li**
- 1080 Sample Collection into Sterile Vacuum Tubes to Preserve Arsenic Speciation in Natural Water Samples / **Orhan Gunduz, Hakan Gurleyuk, Ayse Cakir, Alper Elci, Alper Baba, and Celalettin Simsek**

**CASE STUDIES**

- 1089 Biodiversity of Polyphosphate Accumulating Bacteria in Eight WWTPs with Different Modes of Operation / **Lysann Mehlig, Mike Petzold, Carolin Heder, Susanne Günther, Susann Müller, Martin Eschenhagen, Isolde Röske, and Kerstin Röske**
- 1099 Comparison of Chlorine and Chloramines on Lead Release from Copper Pipe Rigs / **Meghan Woszczyński, John Bergese, and Graham A. Gagnon**
- 1108 Application of a Monitoring Plan for Storm-Water Control Measures in the Philadelphia Region / **Andrea L. Welker, Lynn Mandarano, Kathryn Greising, and Krista Mastrocola**

**TECHNICAL NOTES**

- 1119 Classification Methodology for Landfill Leachates / **David J. Tonjes**
- 1123 Coagulation Properties of Biodegradable Chitosan-CTA Coagulants in Turbidity Removal / **Xin Huang, Yabo Shang, Hu Yang, Yichun Chen, Zhen Yang, Aimin Chen, Yaobo Lu, Yuxiang Jiang, Wei Gu, Xiaozhi Qian, Aimin Li, and Rongshi Cheng**
- 1128 Dimethyl Sulfoxide Separating Waste Printed Circuit Boards by Dissolving Polymer Materials / **Ping Zhu, Yan Chen, Liang-you Wang, Ming Zhou, and Jing Zhou**
- 1132 Assessment of Car Wash Runoff Treatment Using Bioretention Mesocosms / **Michele E. Bakacs, Steven E. Yergeau, and Christopher C. Obropta**

**TECHNICAL PAPERS**

- 1137 Disinfection Methods for Treating Low TOC, Light Graywater to California Title 22 Water Reuse Standards / **Sara E. Beck, Roberto A. Rodríguez, Andrew Salveson, Nitin Goel, Sarah Rhodes, Paula Kehoe, and Karl G. Linden**
- 1146 LED-Based Photocatalytic Treatment of Pesticides and Chlorophenols / **Linlong Yu, Gopal Achari, and Cooper H. Langford**
- 1152 Coliform Sources and Mechanisms for Regrowth in Household Drinking Water in Limpopo, South Africa / **Jonathan E. Mellor, James A. Smith, Amidou Samie, and Rebecca A. Dillingham**
- 1162 Distribution and Accumulation of Trichloroethylene and Trichloroacetic Acid in Hybrid Poplars / **Lucas Odom, Joel Burken, and Lee Newman**
- 1168 Leaching of Arsenic, Lead, and Antimony from Highway-Marking Glass Beads / **Nimrat K. Sandhu, Lisa B. Axe, Kauser Jahan, Kandalam V. Ramanujachary, and Travis Francis Magdaleno**
- 1178 Inexact Chance-Constrained Waste-Load Allocation Model for Water Quality Management of Xiangxihe River / **P. Du, Y. P. Li, and G.H. Huang**
- 1198 Removal of Nitrogen and Phosphorus from Piggery Wastewater Effluent Using the Green Microalga *Scenedesmus obliquus* / **Min-Kyu Ji, Reda A.I. Abou-Shanab, Jae-Hoon Hwang, Thomas C. Timmes, Hyun-Chul Kim, You-Kwan Oh, and Byong-Hun Jeon**
- 1206 Foam-Assisted Delivery of Nanoscale Zero Valent Iron in Porous Media / **Yuanzhao Ding, Bo Liu, Xin Shen, Lirong Zhong, and Xiqing Li**
- 1213 Use of Hydraulic Pressure-Improved Electrokinetic Technique to Enhance the Efficiencies of the Remediation of PCP-Contaminated Soil / **Jui-Yuan Huang, Wing-Ping Liao, Siou-Mei Lai, and Renbo Yang**
- 1222 Biodegradation of TCP in a Sequencing Batch-Fluidized Bed Bioreactor with Waste Coke Particles as the Carrier / **Fangming Hu, Huihui Zhou, Zangfang Jin, Qin Sun, Zhiyan Pan, and Jesse Zhu**
- 1228 Effect of Polarity Reversal on Hexachlorobenzene Removal during Electrokinetic Fenton Process / **Anshy Oonnittan, Pirjo Isosaari, and Mika Sillanpää**

**TECHNICAL NOTES**

- 1233 Preliminary Field Evaluation of Soil Compaction in Rain Gardens / **Steven E. Yergeau and Christopher C. Obropta**

### **TECHNICAL PAPERS**

- 1237 Feasibility Study of As-Received and Modified (Dried/Baked) Water Treatment Plant Residuals for Use in Storm-Water Control Measures / **John Komlos, Andrea Welker, Vito Punzi, and Robert Traver**
- 1246 Biological Activated Carbon Treatment for Removing BTEX from Groundwater / **Wei Zhang, Weijie Ding, and Weichi Ying**
- 1255 Assessment of Clogging Dynamics in Permeable Pavement Systems with Time Domain Reflectometers / **Robert A. Brown and Michael Borst**
- 1266 Nitrogen Removal in Vertical-Flow Filters Filled with Lightweight Aggregate Made of Fly Ashes and Gravel / **Kamila Ostrowska, Wojciech Janczukowicz, Andrzej Białowiec, and Joanna Rodziewicz**
- 1273 Quality of Rainwater Runoff on Roofs and Its Relation to Uses and Rain Characteristics in the Villa Alexandra and Acacias Neighborhoods of Kennedy, Bogota, Colombia / **Andrés Torres, Sandra Méndez-Fajardo, Ángela Patricia Gutiérrez Torres, and Santiago Sandoval**
- 1279 Adsorption Kinetics and Equilibrium of Cu(II) from Aqueous Solution by Polyaniline/Coconut Shell-Activated Carbon Composites / **Xiaohong Fang, Xiaochen Xu, Shanshan Wang, and Dong Wang**
- 1285 Adsorptive Removal of Cadmium and Copper from Water by Mesoporous Silica Functionalized with N-(Aminothioxomethyl)-2-Thiophen Carboxamide / **Irina Georgescu, Mihaela Mureşeanu, Gabriela Cârjă, and Vasile Hulea**
- 1297 Performance of Chloride Ions on Electrocatalytic Oxidation Process Using Ti-Nanotubes/PDDA-PbO<sub>2</sub> Anode for Phenol Removal / **Qin Li, Hao An, Qiu Zhang, Hao Cui, Dejing Tao, Zhongbo Wei, and Jianping Zhai**

### **CASE STUDIES**

- 1307 In-Stream Dissolved Oxygen Impacts and Sediment Oxygen Demand Resulting from Combined Sewer Overflow Discharges / **Robert Miskewitz and Christopher Uchrin**



### **TECHNICAL PAPERS**

- 1315 Phosphorus Equilibrium. I: Impact of AlO<sub>x</sub> Media Substrates and Aqueous Matrices / **T. Wu and J. Sansalone**
- 1325 Phosphorus Equilibrium. II: Comparing Filter Media, Models, and Leaching / **T. Wu and J. Sansalone**
- 1336 Development of Chemical Reduction and Air Stripping Processes to Remove Mercury from Wastewater / **Dennis G. Jackson, Brian B. Looney, Robert R. Craig, Martha C. Thompson, and Thomas F. Kmetz**
- 1343 Design of Storm-Water Retention Ponds with Floating Treatment Wetlands / **Sher Khan, Bruce W. Melville, and Asaad Shamseldin**
- 1350 Instantaneous Stepwise-Steady CFD Model of BMP Response to Unsteady PM Loadings / **Hwan Chul Cho and John J. Sansalone**
- 1361 Zero-Valent Iron/Biotic Treatment System for Perchlorate-Contaminated Water: Lab-Scale Performance, Modeling, and Full-Scale Implications / **Mara R. London, David G. Wahman, Lynn E. Katz, and Gerald E. Speitel Jr.**
- 1368 Photodegradation of Dyes Using Multiwalled Carbon Nanotube and Ferrous Ion / **Niyaz Mohammad Mahmoodi**
- 1375 Leaching of Heavy Metals from Personal Computer Components: Comparison of TCLP with a European Leaching Test / **Dimitrios Komilis, Vassiliki Tataki, and Trifonas Tsakmakis**
- 1382 Synthesis of Amine-Functionalized Magnetic Ferrite Nanoparticle and Its Dye Removal Ability / **Niyaz Mohammad Mahmoodi**
- 1391 Aerobic Granulation in a Sequencing Batch Reactor Using Real Domestic Wastewater / **Jamile Wagner and Rejane Helena Ribeiro da Costa**
- 1397 Leaching of As, Cr, and Cu from High-Carbon Fly Ash–Soil Mixtures / **Enes Özkök, Allen P. Davis, and Ahmet H. Aydilek**

### **TECHNICAL NOTES**

- 1409 Disinfection of *Bacillus globigii* Spores Using an Atmospheric Pressure Microwave Plasma System / **Rutvij Kotecha, Sean Massie, Jeff Szabo, and Vesselin Shanov**

**TECHNICAL PAPERS**

- 1413 Alternative Land-Use Method for Spatially Informed Watershed Management Decision Making Using SWAT / **Sandra C. Karcher, Jeanne M. VanBriesen, and Christopher T. Nietch**
- 1424 Biofilter Media Gas Pressure Loss as Related to Media Particle Size and Particle Shape / **Lorenzo Pugliese, Tjalfe G. Poulsen, and Rune R. Andreasen**
- 1432 Integrated Approach to Simulate Stream Water Quality for Municipal Supply under a Changing Climate / **Erin Towler, Balaji Rajagopalan, David Yates, Alfredo Rodriguez, and R. Scott Summers**
- 1441 One-Dimensional Transient Analytical Solution for Gas Pressure in Municipal Solid Waste Landfills / **Yu-Chao Li, Jian Zheng, Yun-Min Chen, and Ru-Yang Guo**
- 1446 Effect of Mechanochemical Processing on Adsorptive Properties of Blast Furnace Slag / **Salvatore Andini, Raffaele Cioffi, Francesco Colangelo, Fabio Montagnaro, and Luciano Santoro**
- 1454 Synthesis and Characterization of Biomodified Rubber Asphalt: Sustainable Waste Management Solution for Scrap Tire and Swine Manure / **Ellie H. Fini, Daniel J. Oldham, and Taher Abu-Lebdeh**
- 1462 Comparative Study Using Chemical Wet Oxidation for Removal of Reactive Black 5 in the Presence of Activated Carbon / **Gülin Ersöz, Alessandra Napoleoni, and Süheyda Atalay**
- 1470 Coagulation of Oil in Water Using Sawdust and Bentonite and the Formation of a Floating Coagulated Material / **Tianlei Sun and D.D.L. Chung**
- 1482 Effect of Suspended Solids on the Sequential Disinfection of Secondary Effluent by UV Irradiation and Chlorination / **Yong-mei Liang, Zai-li Zhang, Xin Yang, and Wei Liu**
- 1488 Biodegradation Behavior of Municipal Solid Waste with Liquid Aspects: Experiment and Verification / **Xiaodong Liu, Jianyong Shi, Xuede Qian, and Zhiqiang Liao**