

ENVIRONMENTAL Science & Technology



September 1, 2015
Volume 49
Number 17
pubs.acs.org/est

Bioavailability Science to Regulation



ACS Publications
Most Trusted. Most Cited. Most Read.

www.acs.org

September 1, 2015: Vol. 49, Iss. 17

Content

1. From Bioavailability Science to Regulation of Organic Chemicals

Jose-J. Ortega-Calvo, Joop Harmsen, John R. Parsons, Kirk T. Semple, Michael D. Aitken, Charmaine Ajao, Charles Eadsforth, Malyka Galay-Burgos, Ravi Naidu, Robin Oliver, Willie J. G. M. Peijnenburg, Jörg Römbke, Georg Streck, and Bram Versonnen
Environmental Science & Technology 2015 49 (17), 10255-10264
DOI: 10.1021/acs.est.5b02412

2. The Nanoscale Basis of CO₂ Trapping for Geologic Storage

Ian C. Bourg, Lauren E. Beckingham, and Donald J. DePaolo
Environmental Science & Technology 2015 49 (17), 10265-10284
DOI: 10.1021/acs.est.5b03003

3. Effects of Governance on Availability of Land for Agriculture and Conservation in Brazil

Gerd Sparovek, Alberto Giaroli de Oliveira Pereira Barreto, Marcelo Matsumoto, and Göran Berndes
Environmental Science & Technology 2015 49 (17), 10285-10293
DOI: 10.1021/acs.est.5b01300

4. Energy Impacts of Wide Band Gap Semiconductors in U.S. Light-Duty Electric Vehicle Fleet

Joshua A. Warren, Matthew E. Riddle, Diane J. Graziano, Sujit Das, Venkata K. K. Upadhyayula, Eric Masanet, and Joe Cresko
Environmental Science & Technology 2015 49 (17), 10294-10302
DOI: 10.1021/acs.est.5b01627

5. Life-Cycle Energy Use and Greenhouse Gas Emissions of a Building-Scale Wastewater Treatment and Nonpotable Reuse System

Thomas P. Hendrickson, Mi T. Nguyen, Marsha Sukardi, Alexandre Miot, Arpad Horvath, and Kara L. Nelson
Environmental Science & Technology 2015 49 (17), 10303-10311
DOI: 10.1021/acs.est.5b01677

6. Medically-Derived ¹³¹I as a Tool for Investigating the Fate of Wastewater Nitrogen in Aquatic Environments

Paula S. Rose, Joseph P. Smith, Robert C. Aller, J. Kirk Cochran, R. Lawrence Swanson, and Richard B. Coffin
Environmental Science & Technology 2015 49 (17), 10312-10319
DOI: 10.1021/acs.est.5b00189

7. Transcriptome Analysis of Invasive Plants in Response to Mineral Toxicity of Reclaimed Coal-Mine Soil in the Appalachian Region

Thangasamy Saminathan, Sridhar A. Malkaram, Dharmesh Patel, Kaitlyn Taylor, Amir Hass, Padma Nimmakayala, David H. Huber, and Umesh K. Reddy
Environmental Science & Technology 2015 49 (17), 10320-10329
DOI: 10.1021/acs.est.5b01901

8. Formation of Low Volatility Organic Compounds and Secondary Organic Aerosol from Isoprene Hydroxyhydroperoxide Low-NO Oxidation

Jordan E. Krechmer, Matthew M. Coggon, Paola Massoli, Tran B. Nguyen, John D. Crounse, Weiwei Hu, Douglas A. Day, Geoffrey S. Tyndall, Daven K. Henze, Jean C. Rivera-Rios, John B. Nowak, Joel R. Kimmel, Roy L. Mauldin, III, Harald Stark, John T. Jayne, Mikko Sipilä, Heikki Junninen, Jason M. St. Clair, Xuan Zhang, Philip A. Feiner, Li Zhang, David O. Miller, William H. Brune, Frank

N. Keutsch, Paul O. Wennberg, John H. Seinfeld, Douglas R. Worsnop, Jose L. Jimenez, and

Manjula R. Canagaratna

Environmental Science & Technology 2015 49 (17), 10330-10339

DOI: 10.1021/acs.est.5b02031

9. Noncovalent Binding of Polycyclic Aromatic Hydrocarbons with Genetic Bases Reducing the in Vitro Lateral Transfer of Antibiotic Resistant Genes

Fuxing Kang, Xiaojie Hu, Juan Liu, and Yanzheng Gao

Environmental Science & Technology 2015 49 (17), 10340-10348

DOI: 10.1021/acs.est.5b02293

10. Long-Term Formaldehyde Emissions from Medium-Density Fiberboard in a Full-Scale Experimental Room: Emission Characteristics and the Effects of Temperature and Humidity

Weihui Liang, Shen Yang, and Xudong Yang

Environmental Science & Technology 2015 49 (17), 10349-10356

DOI: 10.1021/acs.est.5b02217

11. Reactivity of Uranium and Ferrous Iron with Natural Iron Oxyhydroxides

Brandy D. Stewart, A. Cristina Cismasu, Kenneth H. Williams, Brent M. Peyton, and Peter S. Nico

Environmental Science & Technology 2015 49 (17), 10357-10365

DOI: 10.1021/acs.est.5b02645

12. Contribution of Liquid/Gas Mass-Transfer Limitations to Dissolved Methane Oversaturation in Anaerobic Treatment of Dilute Wastewater

Hyeongu Yeo, Junyeong An, Robertson Reid, Bruce E. Rittmann, and Hyung-Sool Lee

Environmental Science & Technology 2015 49 (17), 10366-10372

DOI: 10.1021/acs.est.5b02560

13. Production of Hydroxyl Radical via the Activation of Hydrogen Peroxide by Hydroxylamine

Liwei Chen, Xuchun Li, Jing Zhang, Jingyun Fang, Yanmin Huang, Ping Wang, and Jun Ma

Environmental Science & Technology 2015 49 (17), 10373-10379

DOI: 10.1021/acs.est.5b00483

14. Experimental and Theoretical Study of Reactions of OH Radicals with Hexenols: An Evaluation of the Relative Importance of the H-Abstraction Reaction Channel

Yanbo Gai, Xiaoxiao Lin, Qiao Ma, Changjin Hu, Xuejun Gu, Weixiong Zhao, Bo Fang, Weijun

Zhang, Bo Long, and Zhengwen Long

Environmental Science & Technology 2015 49 (17), 10380-10388

DOI: 10.1021/acs.est.5b01682

15. Mercury Emission Ratios from Coal-Fired Power Plants in the Southeastern United States during NOMADSS

Jesse L. Ambrose, Lynne E. Gratz, Daniel A. Jaffe, Teresa Campos, Frank M. Flocke, David J.

Knapp, Daniel M. Stechman, Meghan Stell, Andrew J. Weinheimer, Christopher A. Cantrell, and Roy L. Mauldin, III

Environmental Science & Technology 2015 49 (17), 10389-10397

DOI: 10.1021/acs.est.5b01755

16. Prediction of Intrinsic Cesium Desorption from Na-Smectite in Mixed Cation Solutions

Keisuke Fukushi and Tomo Fukuiage

Environmental Science & Technology 2015 49 (17), 10398-10405

DOI: 10.1021/acs.est.5b01884

17. Long-Term Persistence of an Anxiolytic Drug (Oxazepam) in a Large Freshwater Lake

J. Klaminder, T. Brodin, A. Sundelin, N. J. Anderson, J. Fahlman, M. Jonsson, and J. Fick

Environmental Science & Technology 2015 49 (17), 10406-10412

DOI: 10.1021/acs.est.5b01968

18. Effect of Sediment Gas Voids and Ebullition on Benthic Solute Exchange

Sabine Flury, Ronnie N. Glud, Katrin Premke, and Daniel F. McGinnis
Environmental Science & Technology 2015 49 (17), 10413-10420
DOI: 10.1021/acs.est.5b01967

19. Spatial Variation of Aerosol Chemical Composition and Organic Components Identified by Positive Matrix Factorization in the Barcelona Region

Claudia Mohr, Peter F. DeCarlo, Maarten F. Heringa, Roberto Chirico, René Richter, Monica Crippa, Xavier Querol, Urs Baltensperger, and André S. H. Prévôt
Environmental Science & Technology 2015 49 (17), 10421-10430
DOI: 10.1021/acs.est.5b02149

20. Influence of Temperature, Relative Humidity, and Soil Properties on the Soil–Air Partitioning of Semivolatile Pesticides: Laboratory Measurements and Predictive Models

Cleo L. Davie-Martin, Kimberly J. Hageman, Yu-Ping Chin, Valentin Rougé, and Yuki Fujita
Environmental Science & Technology 2015 49 (17), 10431-10439
DOI: 10.1021/acs.est.5b02525

21. Sulfate Local Coordination Environment in Schwertmannite

Xiaoming Wang, Chunhao Gu, Xionghan Feng, and Mengqiang Zhu
Environmental Science & Technology 2015 49 (17), 10440-10448
DOI: 10.1021/acs.est.5b02660

22. Why Small Differences Matter: Elucidation of the Mechanisms Underlying the Transformation of 2OH- and 3OH-Carbamazepine in Contact with Sand Filter Material

Elena Brezina, Carsten Prasse, Manfred Wagner, and Thomas A. Ternes
Environmental Science & Technology 2015 49 (17), 10449-10456
DOI: 10.1021/acs.est.5b02737

23. Hierarchical Bayesian Approach To Reduce Uncertainty in the Aquatic Effect Assessment of Realistic Chemical Mixtures

Rik Oldenkamp, Harrie W. M. Hendriks, Dik van de Meent, and Ad M. J. Ragas
Environmental Science & Technology 2015 49 (17), 10457-10465
DOI: 10.1021/acs.est.5b02651

24. Breastfeeding as an Exposure Pathway for Perfluorinated Alkylates

Ulla B. Mogensen, Philippe Grandjean, Flemming Nielsen, Pal Weihe, and Esben Budtz-Jørgensen
Environmental Science & Technology 2015 49 (17), 10466-10473
DOI: 10.1021/acs.est.5b02237

25. Contribution of Brown Carbon to Direct Radiative Forcing over the Indo-Gangetic Plain

P. M. Shamjad, S. N. Tripathi, Ravi Pathak, M. Hallquist, Antti Arola, and M. H. Bergin
Environmental Science & Technology 2015 49 (17), 10474-10481
DOI: 10.1021/acs.est.5b03368

26. High-Resolution Satellite-Derived PM2.5 from Optimal Estimation and Geographically Weighted Regression over North America

Aaron van Donkelaar, Randall V. Martin, Robert J. D. Spurr, and Richard T. Burnett
Environmental Science & Technology 2015 49 (17), 10482-10491
DOI: 10.1021/acs.est.5b02076

27. Profile and Fate of Bacterial Pathogens in Sewage Treatment Plants Revealed by High-Throughput Metagenomic Approach

Bing Li, Feng Ju, Lin Cai, and Tong Zhang
Environmental Science & Technology 2015 49 (17), 10492-10502
DOI: 10.1021/acs.est.5b02345

28. Generating the Nighttime Light of the Human Settlements by Identifying Periodic Components from DMSP/OLS Satellite Imagery

Husi Letu, Masanao Hara, Gegen Tana, Yuhai Bao, and Fumihiko Nishio

29. Progress toward the Quantitative Analysis of PAHs Adsorbed on Soot by Laser Desorption/Laser Ionization/Time-of-Flight Mass Spectrometry

Alessandro Faccinetto, Cristian Focsa, Pascale Desgroux, and Michael Ziskind
Environmental Science & Technology 2015 49 (17), 10510-10520
DOI: 10.1021/acs.est.5b02703

30. Standard Protocol and Quality Assessment of Soil Phosphorus Speciation by P K-Edge XANES Spectroscopy

Florian Werner and Jörg Prietzel
Environmental Science & Technology 2015 49 (17), 10521-10528
DOI: 10.1021/acs.est.5b03096

31. Mitigation of Salinity Buildup and Recovery of Wasted Salts in a Hybrid Osmotic Membrane Bioreactor–Electrodialysis System

Yaobin Lu and Zhen He
Environmental Science & Technology 2015 49 (17), 10529-10535
DOI: 10.1021/acs.est.5b01243

32. Reactivity of Nanoscale Zero-Valent Iron in Unbuffered Systems: Effect of pH and Fe(II) Dissolution

Sungjun Bae and Khalil Hanna
Environmental Science & Technology 2015 49 (17), 10536-10543
DOI: 10.1021/acs.est.5b01298

33. Effects of Aftermarket Control Technologies on Gas and Particle Phase Oxidative Potential from Diesel Engine Emissions

Jelica Pavlovic, Amara L. Holder, and Tiffany L. B. Yelverton
Environmental Science & Technology 2015 49 (17), 10544-10552
DOI: 10.1021/acs.est.5b01487

34. Mechanism of Uranium Reduction and Immobilization in *Desulfovibrio vulgaris* Biofilms

Małgorzata Stylo, Nadja Neubert, Yvonne Roebbert, Stefan Weyer, and Rizlan Bernier-Latmani
Environmental Science & Technology 2015 49 (17), 10553-10561
DOI: 10.1021/acs.est.5b01769

35. Efficient Sorption and Removal of Perfluoroalkyl Acids (PFAAs) from Aqueous Solution by Metal Hydroxides Generated in Situ by Electrocoagulation

Hui Lin, Yujuan Wang, Junfeng Niu, Zhihan Yue, and Qingguo Huang
Environmental Science & Technology 2015 49 (17), 10562-10569
DOI: 10.1021/acs.est.5b02092

36. EDTA-Cross-Linked β -Cyclodextrin: An Environmentally Friendly Bifunctional Adsorbent for Simultaneous Adsorption of Metals and Cationic Dyes

Feiping Zhao, Eveliina Repo, Dulin Yin, Yong Meng, Shila Jafari, and Mika Sillanpää
Environmental Science & Technology 2015 49 (17), 10570-10580
DOI: 10.1021/acs.est.5b02227

37. Improving the Reactivity of Zerovalent Iron by Taking Advantage of Its Magnetic Memory: Implications for Arsenite Removal

Jinxiang Li, Zhong Shi, Bin Ma, Pingping Zhang, Xiao Jiang, Zhongjin Xiao, and Xiaohong Guan
Environmental Science & Technology 2015 49 (17), 10581-10588
DOI: 10.1021/acs.est.5b02699

38. Field Deployable Chemical Redox Probe for Quantitative Characterization of Carboxymethylcellulose Modified Nano Zerovalent Iron

Dimin Fan, Shengwen Chen, Richard L. Johnson, and Paul G. Tratnyek

39. Atmospheric Feedback of Urban Boundary Layer with Implications for Climate Adaptation

Marissa S. Liang and Timothy C. Keener
Environmental Science & Technology 2015 49 (17), 10598-10606
DOI: 10.1021/acs.est.5b02444

40. Barbecue Fumes: An Overlooked Source of Health Hazards in Outdoor Settings?

Chen-Chou Wu, Lian-Jun Bao, Ying Guo, Shao-Meng Li, and Eddy Y. Zeng
Environmental Science & Technology 2015 49 (17), 10607-10615
DOI: 10.1021/acs.est.5b01494

41. Carbon Nanotubes Released from an Epoxy-Based Nanocomposite: Quantification and Particle Toxicity

Lukas Schlagenhauf, Tina Buerki-Thurnherr, Yu-Ying Kuo, Adrian Wichser, Frank Nüesch, Peter Wick, and Jing Wang
Environmental Science & Technology 2015 49 (17), 10616-10623
DOI: 10.1021/acs.est.5b02750

42. Combined Effects from γ Radiation and Fluoranthene Exposure on Carbon Transfer from Phytoplankton to Zooplankton

Francisco J.A. Nascimento, Claus Svendsen, and Clare Bradshaw
Environmental Science & Technology 2015 49 (17), 10624-10631
DOI: 10.1021/acs.est.5b03128

43. The Pregnancy Exposome: Multiple Environmental Exposures in the INMA-Sabadell Birth Cohort

Oliver Robinson, Xavier Basagaña, Lydiane Agier, Montserrat de Castro, Carles Hernandez-Ferrer, Juan R. Gonzalez, Joan O. Grimalt, Mark Nieuwenhuijsen, Jordi Sunyer, Rémy Slama, and Martine Vrijheid
Environmental Science & Technology 2015 49 (17), 10632-10641
DOI: 10.1021/acs.est.5b01782

44. Lipopolysaccharide Density and Structure Govern the Extent and Distance of Nanoparticle Interaction with Actual and Model Bacterial Outer Membranes

Kurt H. Jacobson, Ian L. Gunsolus, Thomas R. Kuech, Julianne M. Troiano, Eric S. Melby, Samuel E. Lohse, Dehong Hu, William B. Chrisler, Catherine J. Murphy, Galya Orr, Franz M. Geiger, Christy L. Haynes, and Joel A. Pedersen
Environmental Science & Technology 2015 49 (17), 10642-10650
DOI: 10.1021/acs.est.5b01841

45. Levels of Phthalate Metabolites in Urine of Pregnant Women and Risk of Clinical Pregnancy Loss

Di Mu, Fumei Gao, Zhanlan Fan, Huan Shen, Hui Peng, and Jianying Hu
Environmental Science & Technology 2015 49 (17), 10651-10657
DOI: 10.1021/acs.est.5b02617

46. Characterization and Biological Potency of Mono- to Tetra-Halogenated Carbazoles

Nicole Riddell, Un-Ho Jin, Stephen Safe, Yating Cheng, Brock Chittim, Alex Konstantinov, Robert Parette, Miren Pena-Abaurrea, Eric J. Reiner, David Poirier, Tomislav Stefanac, Alan J. McAlees, and Robert McCrindle
Environmental Science & Technology 2015 49 (17), 10658-10666
DOI: 10.1021/acs.est.5b02751

47. Where Does the Transformation of Precipitated Ceria Nanoparticles in Hydroponic Plants Take Place?

Yuhui Ma, Peng Zhang, Zhiyong Zhang, Xiao He, Junzhe Zhang, Yayun Ding, Jing Zhang, Lirong Zheng, Zhi Guo, Lijuan Zhang, Zhifang Chai, and Yuliang Zhao
Environmental Science & Technology 2015 49 (17), 10667-10674
DOI: 10.1021/acs.est.5b02761

48. In Vitro Method To Assess Soil Arsenic Metabolism by Human Gut Microbiota: Arsenic Speciation and Distribution

Naiyi Yin, Zhennan Zhang, Xiaolin Cai, Huili Du, Guoxin Sun, and Yanshan Cui

Environmental Science & Technology 2015 49 (17), 10675-10681

DOI: 10.1021/acs.est.5b03046

49. Components of Particle Emissions from Light-Duty Spark-Ignition Vehicles with Varying Aromatic Content and Octane Rating in Gasoline

Daniel Z. Short, Diep Vu, Thomas D. Durbin, Georgios Karavalakis, and Akua Asa-Awuku

Environmental Science & Technology 2015 49 (17), 10682-10691

DOI: 10.1021/acs.est.5b03138

50. Atmospheric Mercury in the Barnett Shale Area, Texas: Implications for Emissions from Oil and Gas Processing

Xin Lan, Robert Talbot, Patrick Laine, Azucena Torres, Barry Lefer, and James Flynn

Environmental Science & Technology 2015 49 (17), 10692-10700

DOI: 10.1021/acs.est.5b02287

51. Indirect CO₂ Emission Implications of Energy System Pathways: Linking IO and TIMES Models for the UK

Hannah E. Daly, Kate Scott, Neil Strachan, and John Barrett

Environmental Science & Technology 2015 49 (17), 10701-10709

DOI: 10.1021/acs.est.5b01020

52. CO₂ Fixation, Lipid Production, and Power Generation by a Novel Air-Lift-Type Microbial Carbon Capture Cell System

Xia Hu, Baojun Liu, Jiti Zhou, Ruofei Jin, Sen Qiao, and Guangfei Liu

Environmental Science & Technology 2015 49 (17), 10710-10717

DOI: 10.1021/acs.est.5b02211

53. Methane Emissions from United States Natural Gas Gathering and Processing

Anthony J. Marchese, Timothy L. Vaughn, Daniel J. Zimmerle, David M. Martinez, Laurie L. Williams, Allen L. Robinson, Austin L. Mitchell, R. Subramanian, Daniel S. Tkacik, Joseph R. Roscioli, and Scott C. Herndon

Environmental Science & Technology 2015 49 (17), 10718-10727

DOI: 10.1021/acs.est.5b02275

54. Mechanisms of CO₂ Capture into Monoethanolamine Solution with Different CO₂ Loading during the Absorption/Desorption Processes

Bihong Lv, Bingsong Guo, Zuoming Zhou, and Guohua Jing

Environmental Science & Technology 2015 49 (17), 10728-10735

DOI: 10.1021/acs.est.5b02356

55. Dynamics of Magnesite Formation at Low Temperature and High pCO₂ in Aqueous Solution

Odeta Qafoku, David A. Dixon, Kevin M. Rosso, Herbert T. Schaeff, Mark E. Bowden, Bruce W. Arey, and Andrew R. Felmy

Environmental Science & Technology 2015 49 (17), 10736-10744

DOI: 10.1021/acs.est.5b02588

56. Comment on “MALDI-MS Imaging Analysis of Fungicide Residue Distributions on Wheat Leaf Surfaces”

D. Dong, W. Zheng, and C. Zhao

Environmental Science & Technology 2015 49 (17), 10745-10746

DOI: 10.1021/acs.est.5b02513

57. Response to Comment on “MALDI-MS Imaging Analysis of Fungicide Residue Distributions on Wheat Leaf Surfaces”

Suresh P. Annangudi, Kyung Myung, Cruz Avila Adame, Andrew J. Bowling, Mallika Dasari, and Jeffrey R. Gilbert

Environmental Science & Technology 2015 49 (17), 10747-10749

DOI: 10.1021/acs.est.5b03670

58. Comment on “UV Disinfection Induces a VBNC State in *Escherichia coli* and *Pseudomonas aeruginosa*”

Karl G. Linden, Natalie M. Hull, and Roberto A. Rodriguez
Environmental Science & Technology 2015 49 (17), 10750-10751
DOI: 10.1021/acs.est.5b02534

59. Response to Comment on “UV Disinfection Induces a VBNC State in *Escherichia coli* and *Pseudomonas aeruginosa*”

Shenghua Zhang, Chengsong Ye, Wenfang Lin, and Xin Yu
Environmental Science & Technology 2015 49 (17), 10752-10753
DOI: 10.1021/acs.est.5b03757

60. Correction to Levels of Polycyclic Aromatic Hydrocarbons in Maternal Serum and Risk of Neural Tube Defects in Offspring

Bin Wang, Lei Jin, Aiguo Ren, Yue Yuan, Jufen Liu, Zhiwen Li, Le Zhang, Deqing Yi, Lin-lin Wang, Yali Zhang, Xilong Wang, Shu Tao, and Richard H. Finnell
Environmental Science & Technology 2015 49 (17), 10754-10755
DOI: 10.1021/acs.est.5b03471