

JOHN D. FORTNER

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EDUCATION

Ph.D., Environmental Engineering

Department of Civil and Environmental Engineering, Rice University, 2006

- Dissertation: C₆₀ in Water: Aggregation Characterization, Reactivity and Behavior
- Research Advisor: Professor Joseph B. Hughes

B.S., Bioenvironmental Science

Department of Plant Pathology, Texas A&M University, 2000

- Magna Cum Laude

RESEARCH EXPERIENCE

Present

Post Doctoral Fellow

School of Civil and Environmental Engineering, Georgia Institute of Technology

- Investigating the reactivity of anthropogenic, carbon based nanomaterials in aqueous based systems
- Assessing natural attenuation as a viable remediation strategy for low level nitroaromatic (DNT, TNT) and nitroglycerin contaminated soils and groundwaters

2004-2006

Visiting Scientist

School of Civil and Environmental Engineering, Georgia Institute of Technology

- Investigated the fate, transport and reactivity of carbon nanomaterials, primarily as C₆₀ and multiwall carbon nanotubes, in natural and engineered systems

2005 July-Oct. **Visiting Scientist**

Institute for Geotechnical Engineering, Swiss Federal Institute of Technology Zurich (ETHZ)

- Investigated clay mineral interactions with carbon fullerenes in suspension
- Microbial fuel cell design and optimization utilizing carbon rich peat soils as a source of energy

- 2001-2004 **Graduate Research Assistant**
Department of Civil and Environmental Engineering, Rice University
- Investigated carbon based nanomaterials in aqueous systems
 - Investigated site specific, indigenous microbes capable of degrading dinitrotoluene (DNT) and the associated factors controlling rates of degradation
- 2004, 2006 **Visiting Scientist**
Jodel Corporation, Luanda, Angola
- Site visits, assessing disposal techniques for a variety of materials at local and regional hazardous waste facilities
 - Optimized a pilot scale landfarm designed to handle petroleum waste via onsite experimental analyses (ongoing)
 - Preliminary education development planning (ongoing)
- 1998-1999 **Undergraduate Research Assistant**
Department of Plant Pathology, Texas A&M University
- Planned and implemented a water monitoring program for a local watershed
 - Established protocols and databases for future water monitoring participants

PEER REVIEWED PUBLICATIONS

J. D. Fortner, D. I. Kim, A. M. Boyd, J. C. Falkner, J. B. Hughes and J. H. Kim, "Ozonation of Fullerenes in Water" Submitted to the *Journal of the American Chemical Society*.

Jaesang Lee, **John D. Fortner**, Joseph B. Hughes and Jae-Hong Kim, "Photochemical Production of Reactive Oxygen Species by C₆₀ in the Aqueous Phase during UV Illumination" *Environmental Science and Technology*, In Review.

D. I. Kim, **J. D. Fortner** and J. H. Kim, "A Multi-Channel Stopped Flow Reactor for Measuring Ozone Decay Rate: Instrument Development and Application" *Ozone Science and Engineering*, In Press.

Hoon Hyung, **John D. Fortner**, Joseph B. Hughes, and Jae-Hong Kim, "Natural Organic Matter Stabilizes Carbon Nanotubes in the Aqueous Phase" *Environmental Science and Technology*, 2006; 41, 179-184.

D. Y. Lyon, **J. D. Fortner**, C. M. Sayes, V. L. Colvin and J. B. Hughes, "Bacterial Cell Association and Antimicrobial Activity of a C₆₀ Water Suspension" *Environmental Toxicology and Chemistry*, 2005; 24 (11).

J. D. Fortner, D. Y. Lyon, C. M. Sayes, A. M. Boyd, J. C. Faulkner, Y. J. Tao, W. Guo, K. D. Ausman, V. L. Colvin and J. B. Hughes, "C₆₀ in Water: Nanocrystal Formation and Microbial Response" *Environmental Science and Technology*, 2005; 39 (11).

C. M. Sayes, **J. D. Fortner**, W. Guo, D. Y. Lyon, A. M. Boyd, K. D. Ausman, Y. J. Tao, B. Sitharaman, L. J. Wilson, J. B. Hughes, J. L. West and V. L. Colvin, "The Differential Cytotoxicity of Water Soluble Fullerenes" *Nano Letters*, 2004; 4 (10).

J. D. Fortner, C. Zhang, J. C. Spain and J. B. Hughes, "Factors Controlling Bioremediation of Dinitrotoluene in Vadose Zone Soils" *Environmental Science and Technology*, 2003; 37 (15).

CONFERENCE PROCEEDINGS AND PRESENTATIONS

Tront, J. M., **J. D. Fortner**, R. Bencheikh, F. E. Löffler, J. B. Hughes, A. M. Puzrin. "Electricity-supported contaminant reduction." Swiss Microbial Ecology Meeting, Bellinzona, Switzerland, September 29, 2006. *Poster Presentation*

Tront, J. M. **J. D. Fortner**, F. E. Löffler, J. B. Hughes, A. M. Puzrin. "Electricity-supported contaminant reduction: Geobacter and Anaeromyxobacter as model systems" Platform Presentation at the International Society for Microbial Ecology, Vienna, Austria, August 25, 2006

J. D. Fortner, A. M. Boyd, B. J. Lafferty, D. I. Kim, J. C. Faulkner, J. H. Kim, J. B. Hughes, "Ozonation of Nano-Scale C₆₀ Aggregates in Water" Gordon Research Conference (GRC), Environmental Sciences: Water; Plymouth, NH, June 2006.

M. Plötze, **J. Fortner**, C. Solenthaler, "Association of Nano-C₆₀ with Clay Minerals" 43rd Annual Meeting of the Clay Minerals Society, Oleron Island, France, June 2006.

J. D. Fortner, D. I. Kim, J. H. Kim, J. B. Hughes, "Ozonation of C₆₀ Aggregates in Water" Society of Environmental Toxicology and Chemistry (SETAC), 26th Annual Meeting, Baltimore, MD, November 2005. *Invited Platform Presentation*

J. D. Fortner, D. I. Kim, J. H. Kim, J. B. Hughes, "Transformation of Water-Stable, Nanoscale C₆₀ aggregates During Ozonation Processes" American Water Works Association (AWWA), Water Quality Treatment Conference (WQTC), Quebec City, Canada, November, 2005. *Proceeding and Platform Presentation*

J. D. Fortner, D. Y. Lyon, J. C. Faulkner, V. L. Colvin, P. J. Alvarez, J. H. Kim, J. B. Hughes, "Ozonation of Nano-C₆₀ Aggregates in Water" Center for Biological and Environmental Nanotechnology (CBEN): National Science Foundation (NSF) site visit, Rice University, Houston, TX, June 2005.

J. D. Fortner, D. Y. Lyon, V. L. Colvin, P. J. Alvarez, J. B. Hughes, "Fate, Transport and Reactivity of C₆₀ in Natural Systems" El Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional (CINVESTAV-IPN), Mexico City, Mexico, May 2005. *Invited Presentation*

J. D. Fortner, J. C. Falkner, E. M. Hotze, D. Y. Lyon, C. M. Sayes, K. D. Ausman, V. L. Colvin, J. B. Hughes, "C₆₀ Aggregates in Water: Formation Dynamics and Further Characterization" 229th American Chemical Society National Meeting, San Diego, CA, March 2005. *Platform Presentation*

D. Y. Lyon, **J. D. Fortner**, J. B. Hughes, P. J. Alvarez, “Impact of a C₆₀ Water Suspension on Bacteria” 229th American Chemical Society National Meeting, San Diego, CA, March 2005.

A. M. Boyd, D. Y. Lyon, V. Velasquez, C. M. Sayes, **J. D. Fortner**, and V. L. Colvin, “Photo-catalytic Degradation of Organic Contaminants by Water-Soluble Nanocrystalline C₆₀” 229th American Chemical Society National Meeting, San Diego, CA, March 2005.

J. B. Hughes, **J. D. Fortner**, B. Harriss, M. Millard, “Challenges in Environmental Engineering in Angola” Civil and Environmental Engineering Advisory Board, Georgia Institute of Technology, Atlanta, GA, November 2004. *Invited Presentation*

J. D. Fortner, J. C. Falkner, E. M. Hotze, D. Y. Lyon, K. D. Ausman, V. L. Colvin, and J. B. Hughes, “C₆₀ Aggregates in Water: Formation Dynamics and Characterization” Nano Days Conference, Sponsored by the Center for Biological and Environmental Nanotechnology (CBEN), Rice University, Houston, TX, 2004.

J. D. Fortner, D. Y. Lyon, C. M. Sayes, K. D. Ausman, V. L. Colvin, J. B. Hughes, “Characterization of Nano-C₆₀ Particles in Water” Center for Biological and Environmental Nanotechnology (CBEN): National Science Foundation (NSF) site visit, Rice University, Houston, TX, June 2004.

J. D. Fortner, D. Y. Lyon, C. M. Sayes, K. D. Ausman, V. L. Colvin, J. B. Hughes, “C₆₀ Aqueous Suspensions: Characterization and Biological Impact” Nano Days Conference, Sponsored by the Center for Biological and Environmental Nanotechnology (CBEN), Rice University, Houston, TX, September 2003.

J. D. Fortner, D. Y. Lyon, J. B. Hughes, “Potential for Hydroxylation of C₆₀ and C₆₀(OH)_n in Environmental Systems” Center for Biological and Environmental Nanotechnology (CBEN): National Science Foundation (NSF) site visit, Rice University, Houston, TX, June 2003.

J. D. Fortner, C. Zhang, J. B. Hughes, “Evaluating Feedback Inhibition during 2,4-Dinitrotoluene Biodegradation” *In situ* and On-Site Bioremediation Symposium, Battelle, Orlando, FL, June 2003.

J. D. Fortner, C. Zhang, K. E. Finnessy, J. B. Hughes, “*In situ* Biostimulation of Dinitrotoluene Mineralization in Vadose Zone Soils: Bench-Scale Analysis” Innovative Approaches to the *in situ* Assessment and Remediation of Contaminated Sites, NSF-Pan-American Advanced Study Institute, Rio de Janeiro, Brazil, July 22-Aug 2, 2002.

C. Zhang, **J. D. Fortner**, J. B. Hughes, “Respirometer Studies on 2,4-Dinitrotoluene and Implications to In-Situ Vadose Zone Bioremediation” Society of Environmental Toxicology and Chemistry (SETAC), 23rd Annual Meeting in North America, Salt Lake City, UT, November 2002.

C. Zhang, **J. D. Fortner**, J. B. Hughes, “Respirometer Study to Optimize 2,4-Dinitrotoluene Mineralization in Vadose Zone” Society of Environmental Toxicology and Chemistry (SETAC), 2002 South Central Regional Meeting, Lubbock, TX, June 2002.

J. D. Fortner, C. Zhang, K. E. Finnessy, J. B. Hughes, “Bench-Scale Analysis of *in situ* Dinitrotoluene Bioremediation for Vadose Zone Soils” The Third International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Battelle, Monterey, CA, May 2002.

TEACHING EXPERIENCE

2002-2004 **Teaching Assistant**

Department of Civil and Environmental Engineering, Rice University

- Assisted in teaching introductory level environmental engineering course (ENVI 201)
- Prepared and presented lectures
- Assisted in development and grading of homework and exams

2005, 2006 **Research Mentor**

Georgia Tech Environmental Engineering Research Internship Program (Summer)

- Guided high school students towards the design of a wastewater powered microbial fuel cell to operate a water treatment system applicable to developing countries

2004-Present **High School Science Fair Mentor**

C. H. Yoe High School, Cameron, Texas

- Volunteer advisor and mentor for high school students taking part in local, state and international science fair projects