

LIYUAN LIANG

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EDUCATION

1988	California Institute of Technology	Ph.D.	Environmental Engineering Sciences
1983	California Institute of Technology	M.S.	Applied Sciences

PROFESSIONAL POSITIONS

2007 – Present	Group Leader, Earth and Aquatic Sciences, Environmental Sciences Division, Oak Ridge National Laboratory (ORNL).
2005 – 2007	Office of Strategic Planning, ORNL. Rotational position assisting in (1) Strategic and business planning, (2) Laboratory Directed Research and Development programs (e.g., chairing LDRD-Seed Money Review Committee), and (3) Laboratory Director Office, specifically on initiatives related to Science to Energy and Environment Research.
2001 – 2005	School of Engineering and Director CFER, Cardiff University, Wales, UK. Experimental and chemical modeling of aquatic colloids and chemical reactions in engineering systems, including (1) particle separation in drinking water and wastewater treatment, (2) Fe(II) oxidation as applied in mine water treatment, (3) CO ₂ sequestration in oceanic environments. Teaching: (a) Advanced water engineering, (b) Waste management and recycling, (c) Environmental awareness and engineering, (d) environmental impact studies. Director of Cardiff Foundation of Environmental Research, raising funds for the University from the Landfill Tax Credit Scheme.
1999 – 2005	Senior Scientist, ESD, ORNL (part-time 2001-2005). Research into interfacial reactions of colloidal particles in water using neutron scattering techniques at NIST and LANCE and other aqueous and surface techniques. Led a project on geochemical investigation of long-term performance of permeable reactive barriers. Modeling of dissolution of CO ₂ in water in relation to technology development for ocean CO ₂ sequestration.
1997 – 1999	Senior Lecturer, Department of Earth Sciences, Cardiff University, Wales, UK. Research: (1) dissolution of iron oxide induced by organic ligands and colloidal particle mobility in porous media, (2) chemical reactions pertinent to in situ treatment technologies. Coordinated the Cardiff Institute for Environmental Research; Teaching: pollution impact on aquatic systems, global change, and environmental remediation technologies.
1990 – 1997	Research Scientist, ESD, ORNL. Led and coordinated Environmental Engineering research group on (1) in-situ physicochemical treatment technologies for groundwater remediation, and (2) mechanistic understanding of geochemical processes in natural systems. Responsible for developing projects, allocating funds, ensuring staff coverage, dealing with personnel issues, space allocation, and annual appraisal promotion reviews.
1988 – 1990	Assistant Professor, Department of Environmental Health, University of South Carolina. Research the distribution of heavy metals in river water and sediments. Developed and taught courses in hazardous material management.

PROFESSIONAL ACTIVITIES

Advisory Committee, session chair, and invited speaker for the 1st International Conference on Environmental Sciences and Technology, New Orleans, Jan 2005.

External examiner for Ph.D. thesis (Nottingham University, UK, Nov 2004).
Organizing Committee, International Symposium on Permeable Reactive Barriers, Belfast, UK, March 2004.
Organizer for Conference co-organizer for Environmental particles symposium for 77th American Chemical Society Colloid and Surface Science symposia, Atlanta, June 2003.
Co-organizer & speaker for a workshop by Permeable Reactive Barriers Network and First Faraday, UK, 2002.
Steering Committee Member, US Remediation Technology Development Forum (RTDF), Permeable Reactive Barriers Action Team (1996-current).

PATENT

West, O.R. C. Tsouris and L. Liang. 2003. Method and Apparatus for Efficient Injection of CO₂ in Oceans. Patent 6,598,407. US Patent Office.

SELECT RECENT PUBLICATIONS (from >50)

Johs, A., L. Shi, T. Droubay, J.F. Ankner and L. Liang. 2010. Characterization of the decaheme c-type cytochrome OmcA in solution and on hematite surfaces by small angle x-ray scattering and neutron reflectometry. *Biophys. J.* 98:3035-3043.

Guo, H.-B., A. Johs, J.M. Parks, L. Olliff, S.M. Miller, A.O. Summers, L. Liang and J.C. Smith. 2010. Structure and conformational dynamics of the metalloregulator MerR upon binding of Hg(II). *J. Mol. Biol.* 398:555-568.

Parks, J.M., H. Guo, C. Momany, L. Liang, S.M. Miller, A.O. Summers and J.C. Smith. 2009. Mechanism of Hg-C protonolysis in the organomercurial lyase MerB. *J. Amer. Chem. Soc.* 131:13278-13285.

Dong, W., L. Liang, S. Brooks, G. Southworth and B. Gu. 2010. Roles of dissolved organic matter in the speciation of mercury and methylmercury in a contaminated ecosystem in Oak Ridge, Tennessee. *Environ. Chem.* 7:94-102.

Miller, C., G. Southworth, S.C. Brooks, L. Liang and B. Gu. 2009. Kinetic controls on the complexation between mercury and dissolved organic matter in a contaminated environment. *Environ. Sci. Technol.* 43:8548-8553.

Hofmann, A. and L. Liang. 2007. Mobilization of colloidal ferrihydrite particles in porous media – an inner-sphere complexation approach. *Geochim. Cosmochim. Acta* 71:5847-5861.

Liang L., G.R. Moline, W. Kamolpornwijit, and O.R. West. 2005. Influence of hydrogeochemical processes on zero-valent iron reactive barrier performance: a field investigation. *J. Cont. Hydrol.* 78:291-312.

Wang W., B. Gu, L. Liang, and W. Hamilton. 2003. Fabrication of two- and three-dimensional silica nanocolloidal particle arrays. *J. Phys. Chem. B.* 107:3400-3404.

Kamolpornwijit, W., L. Liang, O.R. West, G.R. Moline, and A.B. Sullivan. 2003. Preferential flow path development and its influence on long-term PRB performance: column study. *J. Cont. Hydrol.* 66:161-178.

Lee, S.Y., L. Liang, D. Riestenberg, O.R. West, C. Tsouris, and E. Adams. 2003. CO₂ hydrate composite for ocean carbon sequestration. *Environ. Sci. Technol.* 37:3701-3708.

Liang, L., N. Korte, B. Gu, R. Puls, and C. Reeter. 2000. Geochemical and microbial reactions affecting the long-term performance of in situ iron barriers. *Adv. Environ. Res.* 4:273-286.

Phillips, D.H., B. Gu, D.B. Watson, Y. Roh, L. Liang, and S.Y. Lee. 2000. Performance evaluation of a zero-valent iron reactive barrier: mineralogical characteristics. *Environ. Sci. Technol.* 34:4169-4176.

Gu B., J. Schmitt, Z. Chen, L. Liang, and J.F. McCarthy. 1994. Adsorption-desorption of natural organic matter on iron-oxide: mechanisms and models. *Environ. Sci. Technol.* 28:38-46.

Liang, L., J.A. McNabb, J.M. Paulk, B. Gu and J.F. McCarthy. 1993. Kinetics of Fe(II) oxygenation at low partial pressure of oxygen in the presence of natural organic matter. *Environ. Sci. Technol.* 27:1864-1870.

McCarthy, J.F., T.M. Williams, L. Liang, P.M. Jardine, A.V. Palumbo, L.W. Cooper, L.W. Jolley, and D.L. Taylor. 1993. Mobility of natural organic matter in a sandy aquifer. *Environ. Sci. Technol.* 27:667-676.

Liang, L. and J.J. Morgan. 1990. Chemical aspects of iron oxide coagulation in water: laboratory studies and implication for natural systems. *Aquatic Sci.* 52:32-55.

CURRENT COLLABORATORS: J. Ankner (ORNL); B. Gu (ORNL); D. Myles (ORNL); T. Phelps (ORNL); T. Magnuson (Idaho State Univ.); R. Riding (Univ. Wales); R. Rinaldi (Univ. Perugia); K. Shelly (ANL); H. Schober (Institut Laue-Langevin); L. Shi (PNNL); W. Wang (ORNL).

GRADUATE AND POSTDOCTORAL ADVISORS: J. J. Morgan (Cal. Inst. Tech).

POSTDOCTORAL SCHOLARS SUPERVISED: A. Agrawal (Wright State Univ.), M. Dickey (Industry), A. Hofmann (Lille Univ., France), S. Lee (Texas A&M), W. Kamolpornwijit (New Jersey Inst. Tech.), D. Sapsford (Cardiff Univ.), W. Wang (ORNL), A. Johs (ORNL).