

YUQIANG BI

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EDUCATION:

- May 2014 **Ph.D.**, *Environmental Engineering*, University of Michigan, Ann Arbor
Dissertation title: “*Investigating the Role of Iron Sulfide on the Long-Term Stability of Reduced Uranium under Oxidic Groundwater Conditions*”
- June 2009 **M.S.**, *Soil Science (Biogeochemistry Focus)*, North Carolina State University
Thesis title: “*Production of Co-Siderophore Complexes by Ligand-Promoted Dissolution*”
- June 2007 **B.S.**, *Environmental Science*, Nanjing University, Nanjing, China

RESEARCH EXPERIENCE:

- 2014 – pres. **Postdoctoral Research Associate**, University of Michigan
Supervisors: Drs. Kim F. Hayes and Brian Ellis
- Develop radiochemical and mass spectrometric techniques to quantify radium-226 in high salinity produced waters from hydraulic fracturing.
 - Examine the feasibility and efficiency of modified ion exchange resin for removing radium-226 from produced wastewater.
 - Investigate the mobility of biogenic non-crystalline U(IV) associated with iron sulfides under fluctuating redox conditions.
 - Assist with laboratory management and coordination of a research group composed of graduate and undergraduate students.
- 2009 – 2014 **Graduate Student Research Assistant**, University of Michigan
Advisor: Dr. Kim F. Hayes
- Designed batch and flow-through reactor systems to investigate the stability and transformation of reduced uranium nanoparticles under oxidic groundwater conditions.
 - Demonstrated the role of iron sulfide minerals in inhibiting the oxidative dissolution of U(IV) solids using experimental and molecular modeling approaches.
 - Characterized interfacial reactions and secondary oxidation products with synchrotron-based X-ray diffraction and X-ray absorption spectroscopy.
 - Evaluated the presence and transformation of chromium(VI) in drinking water systems.
- 2007 – 2009 **Graduate Research Assistant**, North Carolina State University
Advisor: Dr. Owen Duckworth
- Investigated the thermodynamics and kinetics of ligand-promoted dissolution of iron hydroxide minerals.
 - Evaluated the biogeochemical cycling of cobalt involving microbial exudates in the terrestrial environment.
- 2006 – 2007 **Undergraduate Research Assistant**, Nanjing University
Advisor: Drs. Hongyan Guo and Xiaorong Wang
- Designed microcosm experiments to assess the bioavailability of cadmium in response of elevated atmospheric ozone concentration on suburban agricultural land.

PEER-REVIEWED PUBLICATIONS:

6. **Bi, Y.**, and Hayes, K. F., **2014**, Surface Passivation Limited UO₂ Oxidative Dissolution in the Presence of FeS. *Environmental Science & Technology*, **2014**, 48 (22), 13402-13411
5. Carpenter, J.R., **Bi, Y.**, and Hayes, K. F., **2014**, Influence of iron sulfides on abiotic oxidation of UO₂ by nitrite and dissolved oxygen in natural sediments. *Environmental Science & Technology*, in press
4. **Bi, Y.**, and Hayes, K. F., **2014**, Nano-FeS Inhibits UO₂ Reoxidation under Varied Oxidic Conditions. *Environmental Science & Technology*, 48 (1), 632-640.
3. **Bi, Y.**, Hyun, S. P., Kukkadapu, R. K., Hayes, K. F., **2013**, Oxidative Dissolution of UO₂ in A Simulated Groundwater Containing Synthetic Nanocrystalline Mackinawite. *Geochimica et Cosmochimica Acta*, 102 (0), 175-190.
2. **Bi, Y.**, Hesterberg, D. L., and Duckworth, O.W., **2010**, Siderophore-Promoted Dissolution of Cobalt from Hydroxide Minerals, *Geochimica et Cosmochimica Acta*, 74 (10), 2915-2925.
1. Ren L., **Bi, Y.**, Su, Y., Wang, X., Concentrations, Distributions and Risk Assessment of DDTs, HCHs and PCBs in Waters and Surface Sediments of Wuzhishan Area, *Journal of Agro-Environment Science* **2007**, 5, 153-161.

Manuscripts in Preparation:

3. **Bi, Y.**, M. A. Stylo, R. Bernier-Latmani, and Hayes, K. F., Enhanced mobility of Biogenic Non-Crystalline U(IV) by Iron Sulfide Minerals. In preparation for submission within the academic year.
2. **Bi, Y.**, Carpenter, J. R., Davis, J., and Hayes, K. F., Evaluation of Uranium Stability in Subsurface Following Reductive Transformation: A Review. In preparation for submission within the academic year.
1. Upadhyaya, G., Ghosh, P., Clancy, T., **Bi, Y.**, Carpenter, J., Hayes, K. F., and Raskin, L., Anaerobic Biologically Active Carbon (BAC) Bioreactor for Simultaneous Removal of Uranium and Nitrate From Drinking Water. In preparation for *Water Research*

TECHNICAL REPORTS:

1. Hayes, K. F., **Bi, Y.**, Carpenter, J., Hyng, S. P., Rittmann, B. E., Zhou, C., Vannela, R., and Davis, J. A., 2014. "Assessing the Role of Iron Sulfides in the Long Term Sequestration of Uranium by Sulfate-Reducing Bacteria", 64 p, DOI: 10.2172/1121431

CONFERENCE PRESENTATIONS (FIRST-AUTHOR):

15. Bi, Y., Zhang, H., Hayes K.F., Ellis, B.R, Removal of Radium from Shale Gas Wastewater Using Cation Exchange Resin, *the 249th ACS National Meeting*, Denver, CO, Mar. 22-26, 2015
14. Bi, Y., Stylo, M., Bernier-Latmani, R., Hayes K.F., Rapid Mobilization of Noncrystalline U(IV) Coupled with FeS Oxidation, *the 249th ACS National Meeting*, Denver, CO, Mar. 22-26, 2015
13. Bi, Y., and Hayes, K.F., Nano-FeS Limits UO₂ Oxidation by Controlling Oxygen Levels in Groundwater, *Goldschmidt 2014*, Sacramento, CA, June 8-13, 2014, poster presentation
12. Bi, Y., and Hayes, K.F., Nano-FeS control of UO₂ reoxidation in simulated groundwater, *the 247th American Chemical Society National Meeting*, Dallas, TX, Mar.16-20, 2014, oral presentation
11. Bi, Y., and Hayes, K.F., Enhanced Stability and Inhibited Dissolution of Uraninite by Nanoparticulate Iron Sulfide under Oxidic Conditions, *Goldschmidt 2013*, Florence, Italy, August 25-31, 2013, oral presentation
10. Bi, Y., Carpenter, J.R., and Hayes, K.F., Impact of iron sulfide minerals on UO₂ reoxidation in groundwater, *the 245th American Chemical Society National Meeting*, New Orleans, LA, April 7-11, 2013, oral presentation
9. Bi, Y., Hyun, S.P., and Hayes, K.F., Inhibited Oxidation of Synthetic Uraninite by Mackinawite, *the U.S. Department of Energy Subsurface Biogeochemical Research Annual Meeting*, Washington D.C., April 30- May 2, 2012, poster presentation
8. Bi, Y., Carpenter, J.R., Hyun, S.P., and Hayes, K.F., Inhibited Oxidation of Synthetic Uraninite in the Presence of FeS and the Implication to U Remediation, *the 243th American Chemical Society*

- National Meeting*, San Diego, CA, March 25-29, 2012, oral presentation (Certificate of Merit Award)
7. Bi, Y., Hyun, S.P., and Hayes, K.F., The Double Role of Iron Sulfide Minerals in Remediation of Uranium-contaminated Groundwater, *Engineering Graduate Symposium*, University of Michigan, Ann Arbor, November 11, 2011, poster presentation
 6. Bi, Y., Hyun, S.P., and Hayes, K.F., Dissolution of Uraninite by Dissolved Oxygen under Simulated Groundwater Conditions in the Presence of Mackinawite (FeS), *the 241th American Chemical Society National Meeting*, Anaheim, CA, March 27-31, 2011, oral presentation
 5. Bi, Y., Hyun, S.P., and Hayes, K.F., Oxidative Dissolution of Uraninite in the Presence of Mackinawite (FeS) under Simulated Groundwater Conditions, *the 2010 American Geophysical Union Fall Meeting*, San Francisco, CA, December. 13-17, 2010, poster presentation
 4. Bi, Y., Hyun, S.P., and Hayes, K.F., Oxidative Dissolution of Mackinawite by Dissolved Oxygen in the Presence of Synthetic Uraninite, *the 239th American Chemical Society National Meeting*, San Francisco, CA, March 21-25, 2010, poster presentation
 3. Bi, Y., and Duckworth, O.W. Siderophore-Mediated Dissolution of Co-Substituted Goethite, *the 237th American Chemical Society National Meeting*, Salt Lake City, UT, March 22-26, 2009, poster presentation
 2. Bi, Y., and Duckworth, O.W. Dissolution of Co-substituted Iron Oxides in the Presence of Siderophore, *Fourth Annual NC State University Graduate Student Research Symposium*, Raleigh, NC, March 18, 2009, poster presentation
 1. Bi, Y., and Duckworth, O.W. Siderophore-Promoted Dissolution of Co-Bearing Minerals, *Soil Science Society of North Carolina 52nd Annual Meeting*, Raleigh, NC, January 20, 2009, poster presentation (2nd place award)

AWARDS AND GRANTS:

2014	2014 Goldschmidt Conference Travel Grant
2013	Rackham Ph.D. Candidate Research Grant, University of Michigan, Ann Arbor
2012	U.S. DOE Subsurface Biogeochemical Research Program Travel Fellowship
2011	Rackham Graduate Student Research Grant, University of Michigan, Ann Arbor
2011	Richard F. and Eleanor A. Towner Prize for Distinguished Academic Achievement, College of Engineering, University of Michigan
2009	ACS Environmental Chemistry Graduate Student Award
2009	Outstanding Poster Prize, Soil Science Society of North Carolina 52 nd Annual Meeting
2008	Phi Kappa Phi National Honor Society
2008	William Walton Stevens and Emily Inscoe Stevens Scholarship
2007	Graduation with Honors, Nanjing University
2006	Outstanding Student Leadership Award, Nanjing University
2004 – 2006	Renmin Scholarship, Nanjing University
2005	Ouyang Zao Fellowship, Nanjing University

TEACHING EXPERIENCE AND TRAINING:

- Nov. 2014 **Postdoctoral Short-Course on College Teaching in Science and Engineering**
Center for Research on Learning and Teaching, University of Michigan
- Certificate of training in pedagogy and navigating academia as a future faculty member
- 2012 – 2013 **Graduate Student Instructor (GSI), Aquatic Chemistry (CEE 481/581)**
Department of Civil & Environmental Engineering, University of Michigan
- Course focused on the principles of aquatic chemistry and reactions applicable to the analysis of chemical compositions of natural and engineered water systems.
- Designed computer lab materials, including syllabus, presentations, and problem sets.
 - Presented lectures and instructed students to learn Visual MINTEQ 3.0 – a chemical equilibrium software, for aqueous speciation calculations.
 - Scored 4.4/5.0 on student evaluation of “The instructor was an excellent teacher”.

- Winter 2013 **Special Lecturer, Environmental Organic Chemistry (CEE 682)**
Department of Civil & Environmental Engineering, University of Michigan
- Fall 2010 **Graduate Student Instructor, Design of Environ. Engineering Systems (CEE 460)**
Department of Civil & Environmental Engineering, University of Michigan
Course focused on biological, physical and chemical processes and reactor configurations applicable to water quality control and wastewater treatment operations.
- Lead group discussion session and course review.
 - Developed inquiry-based course plans and facilitated the site visits to Ann Arbor Drinking Water Treatment Plant (DWTP).
 - Evaluated student assignments and project reports.
- Fall 2008 **Graduate Teaching Assistant, Soil Science (SSC 200)**
Department of Soil Science, North Carolina State University
- Instructed laboratory sessions of introductory soil science.
 - Graded lab assignments, assisted with experiment setup, and introduced concepts on soil mineralogy.

STUDENT MENTORING:

- Hui Zhang Graduate student researcher, current M.S.E. student in CEE
Victor Le Summer Undergraduate Researcher, past undergraduate student in CEE
Lawrence Lai Undergraduate Researcher, past undergraduate student in ChemE

INSTRUMENTATION, ANALYTICAL, AND TECHNICAL SKILLS:

Surface and solid characterization techniques: X-ray Absorption Spectroscopy (XAS –XANES/EXAFS), X-ray Photoelectron Spectroscopy (XPS), Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), and X-ray Diffraction (XRD).

Aquatic chemistry: Inductive Coupled Plasma - Mass Spectrometry (ICP-MS), Atomic Absorption (AA), Ion Chromatography (IC), Total Organic Carbon (TOC), UV-Vis Spectrophotometry, High-performance liquid chromatography (HPLC).

Data processing, analysis, and modeling software: Specifically interested in chemical speciation (Visual MINTEQ), reaction kinetics, and performing statistical analyses (i.e., SAS and R).

PROFESSIONAL SERVICE AND MEMBERSHIP:

- Reviewer, Journals: *Environmental Science & Technology*; *Chemosphere*; *Journal of Contaminant Hydrology*; *Chemical Geology*
Proposals: *SSRL X-ray/VUV*; *Canadian Light Source (CLS) Facility*
- Member, American Chemical Society
Member, Geochemical Society
Member, Association of Environmental Engineering & Science Professors
Member, American Geophysical Union

UNIVERSITY SERVICE:

University of Michigan (2009 – 2014):

- 2014 Student Representative, CEE Faculty Search Committee
2013 Facilitator, Environmental Engineering Journal Club
2012 Member, CEE Department Visit Day Committee

Nanjing University (2003 – 2007):

- 2004 – 2005 Chairperson, Undergraduate Student Association, School of the Environment

OUTREACH ACTIVITIES:

Nov. 2014 Contributor, UM Center for Education and Outreach programs

Future-U (<http://ceo.umich.edu/futureu/>)

This program engages middle school-aged students from under-resourced communities in a variety of academic disciplines, including environmental engineering. Students participate in various "water-energy-environment" activities on campus to experience science and college life.

June 2013 Instructor, UM Center for Education and Outreach programs

College 101 (<http://ceo.umich.edu/college101/>)

This summer program offers opportunities for high school students to visit UM's campus and experience college culture by attending a variety of academic presentations and informative programs.

MEDIA COVERAGE:

Science Highlights in Stanford Synchrotron Radiation Lightsource (SSRL) headline news:

<http://www-ssrl.slac.stanford.edu/newsletters/headlines/headlines_08-13.html>