

MENGQIANG “MIKE” ZHU, Ph.D.

ASSISTANT PROFESSOR

Soil and Environmental Biogeochemistry
Department of Ecosystem Science and Management
University of Wyoming, Laramie, WY 82071
Office: Ag Building 1007

Phone: 307-766-5523 (Office)

Webpage: <http://www.uwyo.edu/zhuensochem/>

Email: mzhu6@uwyo.edu

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AREAS OF SPECIALIZATION

Phosphorus biogeochemistry
Structure and Reactivity of environmental minerals
Synchrotron X-ray techniques

EDUCATION

- | | |
|------|--|
| 2010 | Ph.D. Environmental Soil Chemistry
University of Delaware, Newark, DE
Advisor: Dr. Donald L. Sparks |
| 2005 | M.S. Environmental Chemistry
Research Center for Eco-Environmental Sciences
Chinese Academy of Sciences, Beijing, China |
| 2002 | B.E., Environmental Engineering
North China Electric Power University, Baoding, China |

PROFESSIONAL EXPERIENCE

- | | |
|-------------------|--|
| 08/2013 – present | Assistant Professor
Department of Ecosystem Science and Management, University of Wyoming |
| 08/2013 – present | Guest Researcher
Geochemistry Department, Energy Geoscience Division, Lawrence Berkeley
National Laboratory, Berkeley, CA. Host: Dr. Glenn A. Waychunas |
| 01/2010 – 01/2013 | Postdoctoral Research Fellow
Geochemistry Department, Earth Science Division (currently Energy Geoscience
Division), Lawrence Berkeley National Laboratory, and Department of Earth and
Planetary Science, University of California, Berkeley, CA
Mentors: Dr. Glenn Waychunas (LBNL) and Prof. Jillian F. Banfield (UCB) |
| 06/2006 – 06/2010 | Graduate Research Fellow
Institute of Soil and Environmental Quality
Environmental Soil Chemistry Group, Department of Plant and Soil Sciences,
University of Delaware, Newark, DE |
| 09/2002 – 07/2005 | Graduate Research Assistant
Lake Restoration and Molecular Environmental Science Group, Research Center
for Eco-Environmental Sciences, Chinese Academy of Sciences, Beijing, China |

AWARDS AND HONORS

2018	Nominated for National Synchrotron Light Source-II Users' Executive Committee (UEC) for the 2018-2020 term
2017	Synchrotron Environmental Science VII Travel Award, Brookhaven National Laboratory
2014	Synchrotron Environmental Science VI Early Career Travel Award, Argonne National Laboratory
2010	Environmental Chemistry Graduate Student Awards, American Chemical Society
2009	Joe B. and Martha Dixon Soil Mineralogy Award, Soil Science Society of America
2009	Competitive Graduate Fellowship, University of Delaware
2006 – 2009	Graduate Fellowship, Institute of Soil and Environmental Quality, University of Delaware
2009	Graduate Student Travel Award, University of Delaware
2004 – 2005	Graduate Scholarship Award, Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences
1999 – 2001	Excellent Student Award, North China Electric Power University, China
2000	Placed 2 nd in National College Contest in Mathematical Modeling, China

PROFESSIONAL SERVICE**National and International Level**

2017 – Present	Associate Editor , <i>Soil Science Society of America Journal</i>
2016 – Present	Associate Editor , <i>Geochemical Transactions</i>
2009 – Present	Reviewer <i>Environmental Science and Technology Letter</i> <i>Environmental Science and Technology</i> <i>Geochimica Cosmochimica Acta</i> <i>Environmental Science: Nano</i> <i>Soil Science Society of America Journal</i> <i>Langmuir</i> <i>American Mineralogist</i> <i>Chemical Geology</i> <i>Geochemical Transactions</i> <i>Journal of Colloid and Interface Sciences</i> <i>Journal of Hazardous Materials</i> <i>Water Research</i> , <i>Journal of Physical Chemistry C</i> . <i>Applied Catalysis B</i> <i>Nanoscale Research Letter</i> <i>Spectrochimica Acta A</i>

- 2012 – Present **User Proposal Reviewer**, Stanford Synchrotron Radiation Lightsource, Canadian Light Source
- 2011 – Present **Grant Proposal Reviewer**, U. S. National Science Foundation research proposals – Geobiology and Low-Temperature Geochemistry Program
- 2014 **Grant Proposal Reviewer**, U. S. National Science Foundation Post-Doctoral Fellowship proposal review panelist, Geobiology and Low-Temperature Geochemistry Program
- 2012 – 2018 **Co-Chair, Symposiums at National Conferences (7)**
- 1) Structures and reactivity of clays and nanoparticles in soils and sediments, The 55th Annual Meeting of the Clay Minerals Society, Illinois, IL June 11 – 14, 2018
 - 2) Formation, structure, reactivity and applications of manganese oxides, 255th American Chemical Society, New Orleans, March 18 – 22, 2018
 - 3) Iron and manganese oxides: their formation, structure, reactivity, and applications, 254th American Chemical Society, Washington D.C., August 20 – 24, 2017
 - 4) Iron oxides: formation, structure, reactivity and applications, 249th American Chemical Society, Denver, March 22 – 26, 2015
 - 5) Advances in understanding the environmental geochemistry of manganese (Mn) oxides, American Chemical Society, Dallas, March 16 – 20, 2014
 - 6) Advances in understanding the chemistry of light elements at environmental interfaces, American Chemical Society, New Orleans, April 7 – 11, 2013
 - 7) Nucleation, growth and aggregation of mineral particles in geochemical and biogeochemical systems, American Geophysical Union, San Francisco, December 3-7, 2012
- 2014 **Committee Chair, Student Presentation Competition**, Soil Chemistry Division, Soil Science Society of America, Long Beach, California
- 2011 – 2013 **Judge, Student Presentation Competition**
- 1) Student oral and poster presentations, Division of Environmental Chemistry, 242nd American Chemical Society National Meeting, Denver, CO, 2011
 - 2) Student poster presentations, the 22nd Goldschmidt Geochemistry Conference, Montréal, Quebec, 2012

University and Departmental Level

- 2017 **Search Committee**, post-doc position in Transmission Electron Microscopy
- 2017 – present **College Curriculum Committee**, College of Agriculture and Natural Resources, University of Wyoming,
- 2014 – Present **Department Seminar Organizing**, 5 times, Department of Ecosystem Science and Management, University of Wyoming
- 2013 – Present **Graduate Student Recruiting Committee**, Department of Ecosystem Science and Management, University of Wyoming
- 2015 **Search Committee**, Assistant Professor position in Soil Microbiology, Department of Ecosystem Science and Management, University of Wyoming

2013 – 2015 **Wyoming Stable Isotope Facility Steering Committee**, University of Wyoming
 2014 **Grant Proposal Panelist**, 250 K Initiative, University of Wyoming

Professional Society Memberships

American Chemical Society
 Soil Science Society of America
 American Geological Union
 The Geochemical Society
 Clay Mineral Society

TACHING, ADVISING AND MENTORING EXPERIENCE

Courses Taught

2018 – present REWM 4710/5710: Watershed Water Quality and Management
 2014 – present SOIL 4130/5130: Chemistry of the Soil Environment
 2014 – present SOIL 3130: Soils and Environmental Quality
 2015 – present SOIL 5590-01: Soil Mineralogy

Postdoctoral Advisees

09/2016 – 03/2017 Fei Wang, Department of Ecosystem Sci. & Mgt., University of Wyoming
 08/2015 – 09/2016 Xiaoming Wang, Department of Ecosystem Sci. & Mgt., University of Wyoming

Doctoral Advisees

9/2017 – Present Ke Wen, Dept. of Ecosystem Sci. & Mgt., University of Wyoming
 9/2017 – Present Than Dam, Dept. of Ecosystem Sci. & Mgt., University of Wyoming
 11/2014 – Present Peng Yang, Dept. of Ecosystem Sci. & Mgt., University of Wyoming
 06/2014 – Present Qian Wang, Dept. of Ecosystem Sci. & Mgt., University of Wyoming
 02/2014 – Present Chunhao Gu, Dept. of Ecosystem Sci. & Mgt., University of Wyoming
 02/2016 – 10/2017 Zhuojun Zhang, visiting Ph.D. student, Institute of Geochemistry, Chinese Academy of Sciences, Guiyang, Guizhou, China. Ending in 10/2017
 07/2014 – 06/2015 Xiaoming Wang, visiting Ph.D. student, Huazhong Agricultural University, Wuhan, China.
 07/2010 – 07/2013 Benjamin Legg, *co-advised*, Department of Earth and Planetary Science, University of California - Berkeley

Undergraduate Advisees

09/2015 – 05/2017 Kacey Charles Myers, Department of Animal Science, University of Wyoming

10/2015 – 05/2016	Zackary Scott Fullerton, Department of Molecular Biology, University of Wyoming
09/2015 – 05/2016	Victor Wang, Department of Chemistry, University of Wyoming
09/2015 – 03/2016	Sam Fikru Belew, School of Energy Resources, University of Wyoming
09/2014 – 09/2015	Yifei Shao, Department of Chemistry, Department of Ecosystem Sci. & Mgt., University of Wyoming
10/2014 – 02/2015	Zackary Carl Meek, Department of Ecosystem Sci. & Mgt., University of Wyoming
07/2014 – 02/2014	Xianya Liao, China University of Geosciences, Wuhan, China
2012	John Li, Department of Earth and Planetary Science, University of California, Berkeley

High School Advisees

06/2016 – 07/2016	Cameron Miller, Cheyenne South High School, Cheyenne WY
06/2016 – 07/2016	Nicholas McDaniel, Cypress Woods High School, Houston TX

Visiting Scholars and Students

09/2017 – Present	Juan Wu, Shandong Agricultural University, China
09/2017 – Present	Dong Ma, Shandong Agricultural University, China
10/2017 – Present	Hongtu Xie, Institute of Applied Ecology, Chinese Academy of Sciences, China
09/2016	Morgan Barnes (graduate student), University of California - Merced
08/2015 – 08/2016	Xiuhong Jia (Lecture), Ph.D., Huazhong Agricultural University, Wuhan, China

Student Thesis Committees Served (other than students in my research team)

2017 – present	Ph.D. thesis committee, Opeoluwa Wonuola Olawale, Department of Petroleum Engineering, University of Wyoming
2016 – present	MS. thesis committee, Lindsay J. Arvin, Department of Geology and Geophysics, University of Wyoming
2015 – present	Ph.D. thesis committee, Yun Xie, Department of Petroleum Engineering, University of Wyoming
2016 – present	Ph.D. thesis committee, Shixun Bai, Department of Petroleum Engineering, University of Wyoming
2015 – 2017	Master thesis committee, Amber Elizabeth Zandanel, Department of Geology and Geophysics, University of Wyoming

2015 – 2017 Master thesis committee, Gretchen A. Hough, Department of Geology and Geophysics, University of Wyoming

RESEARCH PROJECTS FUNDED				
(Only list the allocations to Dr. Zhu’s group; total \$1,136,300 with federal contribution of \$764,953)				
Year	Agency	Funding	Title	Investigators
2017	Agriculture and Agri-Food Canada	\$8,000	Modulation of vegetation effects on organic P composition during pedogenesis in a semi-arid ecosystem	Mengqiang Zhu (PI)
2016 – 2019	Department of Energy-EPSCoR	\$450,000 (Plus \$46,500 from UW)	Nucleation, Growth, and Aggregation of Todorokite Nanoparticles from Both Geochemical and Materials Science Perspectives	Mengqiang Zhu (PI), Dongsheng Li (Non-funded Co-PI, PNNL) <i>4% funding rate</i>
2016	Summer Research Apprentice Program (for high school students), Wyoming NSF EPSCoR	\$6,000	Removal of Mn(II) by manganese (IV) oxides using column experiments	Mengqiang Zhu (PI)
2016 – 2017	Roy J. Shlemon Center for Quaternary Studies	\$11,900	Phosphorus Speciation and Bioavailability Evolution During Soil Development in the Quaternary Period	Mengqiang Zhu (PI)
2015 – 2018	NSF Geobiology and Low-Temperature Geochemistry Program (EAR1529937)	\$261,953	The Geochemical Processes Controlling Mn(III) and Vacancy Concentrations in Birnessite Structure	Mengqiang Zhu (PI), Kenneth Livi (JHU) <i>10% funding rate</i>
2015 – 2016	School of Energy Resources, University of Wyoming	\$86,848	Pore-space Alteration Induced by Mineral Dissolution and Precipitation under Flow Conditions	Mengqiang Zhu (PI) Mohammad Piri
2015	Energy Clusters, College of Engineering, University of Wyoming	\$5,500	Travel fund to Goldschmidt Conference in Prague	Mengqiang Zhu (PI)
2014 – 2016	Wyoming Restoration and Reclamation Center	\$60,000	Trace Element Geochemistry of Soils in the Coalbed Natural Gas Produced Water Disposal	Mengqiang Zhu (PI), K.J. Reddy, Bill DiRienzo

			Ponds in the Powder River Basin, Wyoming	(Wyoming DEQ)
2014 – 2016	University of Wyoming Agriculture Experimental Station (AES) Competitive Grants Program	\$74,302	Temporal and Spatial Variations of Soil Phosphorus Speciation in a Cold Semi-arid Climate	Mengqiang Zhu (PI), Larry Munn, David Williams, Jay Norton, Yongfeng Hu (CLS), Teresa Lehmann

RESEARCH GRANT PROPOSALS PENDING

Year	Agency	Funding	Title	Investigators
2018 – 2023	NSF-Early Career Award	\$680,000	Mineralogical and Geochemical Control of Phosphorous Dynamics during Pedogenesis	Mengqiang Zhu (PI)
2018 - 2020	NSF Geobiology and Low-Temperature Geochemistry Program	\$450,000	Birnessite Recrystallization and its Impacts on Mn and Trace Metal Cycling in Suboxic Environment	Eef Elzinga (PI, Rutgers Uni.), Mengqiang Zhu (Co-PI), Mark Krekeler (Co-PI, Miami Uni.)

RESEARCH GRANT PROPOSALS NOT FUNDED

2018	Energy GA	\$31000	Low-temperature synthesis of tunneled manganese oxides: Implications for energy applications and environment	Mengqiang Zhu (PI)
2017 - 2019	NSF	\$220,000	Effects of global warming on organic P composition in Arctic soils	Mengqiang Zhu (PI)
2017 – 2020	NSF	\$450,000	Birnessite Recrystallization and its Impacts on Mn and Trace Metal Cycling in Suboxic Environment	Eef Elzinga (PI, Rutgers Uni.), Mengqiang Zhu (Co-PI), Mark Krekeler (Co-PI, Miami Uni.)

2017 – 2022	NSF-Early Career Award	\$600,000	Mineralogical and Geochemical Control of Phosphorous Dynamics during Pedogenesis	Mengqiang Zhu (PI)
2016 – 2019	Department of Energy	\$600,000 <i>(\$260,017 Zhu’s share)</i>	Impacts of Complexing Ligands and Natural Organic Matter on Technetium (VII) Reduction by Fe (II) Species in Subsurface Environments	Mengqiang Zhu (PI), Huichun Zhang (Temple Uni.), Hailiang Dong (Miami Uni.)
2016 – 2020	NSF-EPSCoR	\$5 million (\$385,461 Zhu’s share)	RII Track-2 FEC: Managing the Salt to Achieve Local and Transregional Sustainability in Water and Food Systems (Brant, PD Wyoming)	Jonathan Bryant (PI) Investigators: Mengqiang Zhu and other 20 people
2016 – 2017	University of Wyoming NSF EPSCoR Outside-the-Box grants	\$50,000	Dust-Borne Phosphorus Speciation and its Solubility in the Alpine Lakes of the Rocky Mountains	Mengqiang Zhu (PI)
2016 – 2017	University of Wyoming NASA EPSCoR	\$20,000	Dust-Borne Phosphorus Speciation and its Chemical Alteration in Natural Waters	Mengqiang Zhu (PI)
2015 – 2019	NSF EPSCoR Program	\$5 million (\$172,073 Zhu’s share)	Safeguarding Food Security by Optimizing Rhizosphere Processes that Limit Green Water Availability and Productive Flow	Matthew Morra (PI, University of Idaho), Mengqiang Zhu, along with other ~ 10 co-PIs
2015 – 2018	NSF Environmental Chemical Science Program	\$500,000 (\$274,316, Zhu’s share)	Reduction and Complexation of Mn by Humic Substances: Implications for Mn(III) Environmental Fate and	Mengqiang Zhu (PI), Robert Young (CSU)

			humic Substance Degradation	
2015 – 2017	Wyoming Center for Environmental Hydrology and Geophysics	\$131,867	Assessing Speciation and Fate of Phosphorus in Aeolian Dust Deposit on the Watershed in a Semi- arid Environment	Mengqiang Zhu (PI), Steven Hart (UC- Merced)
2014	UW Office of Academic Affairs – Graduate Student Summer Research Support	\$5,000	Enhancing Graduate Student Research Experience in using National Research Facilities	Mengqiang Zhu (PI)
2014 – 2017	NSF Geobiology and Low-Temperature Geochemistry Program	\$455,699	Biotic and Abiotic Formation of Birnessite under Diverse Environmentally-Relevant Conditions	Mengqiang Zhu (PI), Kenneth Livi (JHU)

SYCHROTRON X-RAY BEAMTIME USER’S PROPOSALS APPROVED (AUG 2013 -)

Year	Light Sources	Title	Investigators
2017 - 2019	Canadian Light Source	Phosphorus Speciation and Stability in Aeolian Dust	Mengqiang Zhu
2016 - 2018	Stanford Synchrotron Radiation Lightsource SLAC National Accelerator Laboratory	Birnessite Interactions with Low Concentrations of Aqueous Mn(II)	Mengqiang Zhu
2015 - 2017	Canadian Light Source	Phosphorus Speciation Evolution Across Climate Gradients	Mengqiang Zhu
2015 -2017	Advanced Photon Source, Argonne National Laboratory	Structural and Compositional Alteration of Birnessite During Reductive Dissolution by Humic Substances	Mengqiang Zhu
2014 - 2016	Advanced Photon Source, Argonne National Laboratory	Determine the Mn(II)-birnessite Reaction Mechanism Regarding its Control on Mn(III) and Vacancy Concentrations	Mengqiang Zhu
2014	Advanced Photon Source, Argonne National Laboratory	<i>Rapid Proposal</i> : Determining Sulfate Binding Geometry using Differential PDF	Mengqiang Zhu
2014 - 2015	Stanford Synchrotron Radiation Lightsource, SLAC National	Sulfate Adsorption Complexes on Surfaces of Iron Oxides	Mengqiang Zhu

Accelerator Laboratory			
2014 - 2015	Stanford Synchrotron Radiation Lightsource, SLAC National Accelerator Laboratory	Determination of Soil P Speciation for Evaluation of Phosphorous Availability in a Semi-arid climate	Mengqiang Zhu
2013 - 2014	Stanford Synchrotron Radiation Lightsource, SLAC National Accelerator Laboratory	The Structure of Phosphate Adsorption Complexes on Fe(III) Oxides	Mengqiang Zhu

SYCHROTRON X-RAY BEAMTIME USER’S PROPOSALS PENDING

Year	Light Sources	Title	Investigators
2018	Stanford Synchrotron Radiation Lightsource SLAC National Accelerator Laboratory	Effects of ligands and NOM on structure and properties of biogenic Mn oxides	Mengqiang Zhu

PUBLICATONS ([Google Scholar Citations](#))

Books and special issues edited (2)

1. Feng X., Li W., **Zhu M.**, Sparks D. L., *Advances in the Environmental Biogeochemistry of Manganese Oxides*, ACS Symposium Series, American chemical society, **2015**, ISBN13: 9780841230965, eISBN: 9780841230958.
2. Jun Y., **Zhu M.** and Peak D., *Frontiers and Advances in Environmental Soil Chemistry*, A special issue in *Geochemical Transactions* in honor of Prof. Donald Sparks, in progress, **2017**

Manuscripts in preparation (4) (* graduate students or postdocs)

1. *Wang X., Philips B., Feng X., and **Zhu M.**, High energy X-ray scattering and spectroscopic analysis of phosphate adsorption and precipitation on hydrous aluminum oxides, to be submitted to *SOILS (invited contribution)* in **5/2018**
2. *Gu C., Cade-Menun B., Hart S., and **Zhu M.**, Decline of vegetation impacts on organic P transformation with pedogenesis, to be submitted to *Soil Biol. Biochem.* in **6/2018**
3. *Zhang Z., Hu Y., and **Zhu M.** Distribution and speciation of phosphorus in a granite weathering profile in a temperate climate, to be submitted to *Geochim Cosmochim Acta* in **06/2018**
4. Bhasker R., Sun J., Jamieson J., Siade A., **Zhu M.** and Prommer H., Quantification of arsenic adsorption and oxidation on manganese oxide, to be submitted to *Environ. Sci. Technol.* in **5/2018**

Manuscripts in review or revision (4) (* graduate students or postdocs)

1. *Wang Q., *Yang P. and **Zhu M.**, Effects of cations on structural transformation of birnessite by fulvic acid, *Geochim. Cosmochim. Acta*, submitted in **4/2018**
2. *Gu C., Hart S., Tuner B., Hu Y., and Zhu M., Aeolian dust deposition perturbs phosphorus transformations during long-term ecosystem development, *Geochim. Cosmochim. Acta*, submitted in **3/2018**
3. *Yang P, Lee S., Post J.E., Xu H. *Wang Q., Xu W. and **Zhu M.**, Trivalent manganese on vacancies triggers rapid transformation of layered to tunneled manganese oxides (TMOs): Implications for occurrence of TMOs in low-temperature environment, *Geochim. Cosmochim. Acta*, in revision in **4/2018**
4. Zhao S., *Wang Q., Sun J., Borkiewicz O.J., Huang R., Saad E.M., Fields B., Chen S., **Zhu M.** and Tang Y., Effect of Zn(II) presence during mineral formation on the structure of layered Mn oxides, *Chem. Geol.*, submitted in **12/2017**

Published Journal Articles (46) (* graduate students or postdocs; # undergraduate students)

1. Dou X., Wang G., **Zhu M.**, Liu F., Li W., Mohan D., Pittman C. Identification of Fe and Zr oxide phases in an iron-zirconium binary oxide and arsenate complexes adsorbed onto their surfaces, *J. Hazard. Mater.*, Accepted, **4/2018**
2. *Wang X., Wang Z., Peak D., Feng X., and **Zhu M.**, Quantification of Co-existing Sulfate Inner- and Outer-Sphere Complexation on Hematite Surfaces, *ACS Earth Space Chem.*, Article ASAP in **3/2018**
3. Feng X., Wang P., Shi Z., Kwon K.D., Zhao H., Hui Y., Lin Z., **Zhu M.**, Liu F., Sparks D.L., A Quantitative Model for the Coupled Kinetics of Arsenic Adsorption/Desorption and Oxidation on Manganese Oxides, *Environ. Sci. Technol. Lett.*, **2018**, 5 (3),175–180
4. *Zhang Z., Goldstein H.L., Reynolds R., Hu Y., *Wang X. and **Zhu M.**, Phosphorous Speciation and Solubility in Aeolian Dust Deposited in the Interior American West, *Environ. Sci. Technol.*, **2018**, 52 (5), 2658-2667
5. *Wang Q., *Yang P. and **Zhu M.**, Structural Transformation of Birnessite by Fulvic Acid under Anoxic Conditions, *Environ. Sci. Technol.*, **2018**, 52 (4), 1844 -1853
6. *Wang X., Kubicki J.D., Boily J. F., Glenn W.A., Hu Y., Feng X., and **Zhu M.**, Binding Geometries of Silicate Species on Ferrihydrite Surfaces, *ACS Earth Space Chem.*, **2018**, 2 (2), 125 – 134

7. Chen S., Zhang S., Wang T., Lei Z., **Zhu M.**, Dai X., Liu F., Li J., Yin H., Structure and Properties of Vanadium-doped δ -MnO₂ and Enhanced Pb²⁺ Adsorption and Phenol Photocatalytic Degradation, *Mater. Chem. Phys.*, **2018**, 208, 258-267
8. *Wang X., Hu Y., Tang Y., *Yang P., Feng X., Xu W. and **Zhu M.**, Phosphate and Phytate Adsorption and Precipitation on Ferrihydrite Surfaces, *Environ. Sci.: Nano*, **2017**, 4, 2193 - 2204
9. Qafoku O., Pearce CI., Neumann A., Kovarik L., **Zhu M.**, Ilton ES, Bowden ME., Resch CT., Arey BW, Arenholz E., Felmy AR.,Rosso KM, Tc (VII) and Cr (VI) Interaction with Naturally Reduced Ferruginous Smectite from a Redox Transition Zone, *Environ. Sci. Technol.* **2017**, 51 (16), 9042 - 9052
10. *Gu C., Wang Z., Kubicki JD, Wang X. and **Zhu M.**, Correction to X-ray Absorption Spectroscopic Quantification and Speciation Modeling of Sulfate Adsorption on Ferrihydrite Surfaces, *Environ. Sci. Technol.* **2017**
11. Liang X., Zhao Z., **Zhu M.**, Liu F., Wang L., Yin H., Qiu G., Cao F., Liu X. and Feng X., Self-Assembly of Birnessite Nanoflowers by Staged Three-Dimensional Oriented Attachment, *Environ. Sci.: Nano*, **2017**, 4, 1656-1669
12. Wan B., Yan Y., **Zhu M.**, Wang X., Liu F., Tan W. and Feng X., Quantitative and Spectroscopic Investigations of the Co-sorption of Myo-inositol Hexakisphosphate and Cadmium (II) on to Hematite, *Eur J. Soil. Sci.*, **2017**, 68 (3): 374–383
13. Wang Y., Fan T., Liu C., Li W., **Zhu M.**, Fan J., Gong H., Zhou D. and Sparks D.L., Macroscopic and Microscopic Investigation of Adsorption and Precipitation of Zn on γ -alumina in the Absence and Presence of As, *Chemosphere*, **2017**, 178:309-316
14. Saad E., Sun J., Chen S., Borkiewicz, Z., **Zhu M.**, Duckworth, O. and Tang Y., Siderophore and Organic Acid Promoted Dissolution and Transformation of Cr(III)-Fe(III)-(oxy)hydroxides, *Environ. Sci. Technol.*, **2017**, 51 (6):3223
15. Legg B., **Zhu M.**, Zhang H., Waychunas G., Gilbert B. and Banfield J., A Model for Nucleation A Model for Nucleation When Nuclei Are Nonstoichiometric: Understanding the Precipitation of Iron Oxyhydroxide Nanoparticles, *Cryst. Growth Des.*, **2016**, 16:5726
16. *Wang Q., #Liao X., Xu W., Livi K.J., Ren Y. and **Zhu M.**, Synthesis of Birnessite in the Presence of Phosphate, Silicate or Sulfate, *Inorg. Chem.*, **2016**, 55:10248
17. *Gu C., Wang Z., Kubicki J.D., *Wang X. and **Zhu M.**, X-ray Absorption Spectroscopic Quantification and Speciation Modeling of Sulfate Adsorption on Ferrihydrite Surfaces, *Environ. Sci. Technol.*, **2016**, 50:8067
18. Wang X., **Zhu M.**, Koopal L.K., Li W., Xu W., Liu F., Zhang J., Liu Q., Feng X., Sparks D.L., Effects of Crystallite Size on the Structure and Magnetism of Ferrihydrite, *Environ. Sci.: Nano*, **2016**, 3:190-202

19. Zhao H., **Zhu M.**, Li W., Elzinga E.J., Villalobos M., Liu F., Zhang J., Feng X., and Sparks D.L., Redox Reactions between Mn (II) and Hexagonal Birnessite Change its Layer Symmetry, *Environ. Sci. Technol.*, **2016**, 50:1750
20. **Zhu M.**, Frandsen C., Wallace A.F., Legg B, Khalid S., Zhang H., Morup S., Banfield J.F. and Waychunas G.A. Precipitation Pathways for Ferrihydrite Formation in Acidic Solutions, *Geochim. Cosmochim. Acta*, **2016**,172:247
21. *Wang X., *Gu C., Feng X. and **Zhu M.**, Sulfate Local Coordination Environment in Schwertmannite, *Environ. Sci. Technol.*, **2015**, 49:10440
22. Feng X., Wang X., **Zhu M.**, Koopal L.K., Xu H., Wang Y., Liu F., Effects of Phosphate and Silicate on the Transformation of Hydroxycarbonate Green Rust to Ferric Oxyhydroxides, *Geochim. Cosmochim. Acta*, **2015**, 17:1
23. Wang X., **Zhu M.**, Lan S., Ginder-Vogel M., Liu F., Feng X., Formation and Secondary Mineralization of Ferrihydrite in the Presence of Silicate and Mn(II), *Chem. Geol.*, **2015**, 415: 37
24. Wang X., Lan S., **Zhu M.**, Ginder-Vogel M., Yin H., Liu F., Tan W. and Feng X. The Presence of Ferrihydrite Promotes Abiotic Mn(II) Oxidation and Formation of Birnessite. *Soil Sci. Soc. Am. J.*, **2015**, 79, 5:1297
25. Li H., Liu F., **Zhu M.**, Feng X., Zhang J. and Yin H., Structure and Properties of Co-doped Cryptomelane and its Enhanced Removal of Pb²⁺ and Cr³⁺ from Wastewater, *J. Environ Sci.*, **2015**, 24:77
26. Yin H., Liu Y., Koopal L. K., Feng X., Chu S., **Zhu M.**, Liu F., High Co-doping Promotes the Transition of Birnessite Layer symmetry from Orthogonal to Hexagonal, *Chem. Geol.* **2015**, 410:12
27. Yin H., Dai X., **Zhu M.**, Li F., Feng X., Liu F., Fe-doped Cryptomelane Synthesized by Refluxing at Atmosphere: Structure, Properties and Photocatalytic Degradation of Phenol, *J. Hazard. Mater.* **2015**, 410:12
28. Yin H., Feng X., Tan W., Koopal L.K., Hu T., **Zhu M.**, Liu F. Structure and Properties of Vanadium (V)-doped Hexagonal Turbostratic Birnessite and its Enhanced Scavenging of Pb²⁺ from Solutions, *J. Hazard. Mater.*, **2015**, 288:80
29. Legg B. A., **Zhu M.**, Comolli L.R., Gilbert B., Banfield J.F., Impacts of Ionic Strength on Three-Dimensional Nanoparticle Aggregate Structure and Consequences for Environmental Transport and Deposition, *Environ. Sci. Technol.*, **2014**, 48 (23):13703
30. Legg B. A., **Zhu M.**, Comolli L.R., Gilbert B., Banfield J.F., Determination of the Three-Dimensional Structure of Ferrihydrite Nanoparticle Aggregates, *Langmuir*, **2014**, 30 (33):9931
31. **Zhu M.**, Northrup P., Shi C., Billinge S.J.L., Sparks, D.L., and Waychunas, G.A., The Structure of Sulfate Adsorption Complexes on Ferrihydrite, *Environ. Sci. Technol. Lett.*, **2014**, 1 (1): 97

32. **Zhu M.**, Puls B. W., Zhang H., Kubicki J. and Waychunas G. A. *In situ* Structural Characterization of Ferric Iron Dimers in Aqueous Solutions: Identification of μ -oxo Species, *Inorg. Chem.* **2013**, 52 (12): 6788
33. Li W., Wang Y.-J., **Zhu M.**, Zhou D., Phillips B. L., Sparks D. L., Inhibition Mechanisms of Zn Precipitation on Aluminum Oxide by Glyphosate, *Environ. Sci. Technol.*, **2013**, 47 (9):4211
34. **Zhu M.**, Legg. B., Zhang H., Gilbert B., Ren Y., Banfield, J. and Waychunas, G.A., Early-stage Formation of Iron Oxyhydroxides During Neutralization of Simulated Acid Mine Drainage Solutions, *Environ. Sci. Technol.*, **2012**, 46(15):8140
35. Livi K. J. T., Lafferty B. J., **Zhu M.**, Zhang S., Gaillot A. and Sparks D. L., Electron Energy-Loss Safe-Dose Limits for Manganese Valence Measurements in Environmentally Relevant Manganese Oxides, *Environ. Sci. Technol.*, **2012**, 46(2):970
36. **Zhu M.**, Farrow C. L., Post J. E., Livi K. J. T., Billinge S. J. L., Ginder-Vogel M. and Sparks D. L., 2012, Structural Study of Poorly-Crystalline Abiotic and Biotic Mn-oxides Using Atomic Pair Distribution Function, *Geochim. Cosmochim. Acta.*, **2012**, 81:39
37. Zhang H., Bayne M., Fernando S., Legg B., **Zhu M.**, Lee Penn R., and Banfield J. F., Size - Dependent Bandgap of Nano-Goethite, *J. Phys. Chem. C.*, **2011**, 115(36):17704
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39. **Zhu M.**, Ginder-Vogel M. and Sparks D. L. Ni (II) Sorption on Biogenic Mn-oxides with Varying Mn Octahedral Layer Structure, *Environ. Sci. Technol.* **2010**, 44(12):4472
40. **Zhu M.**, Ginder-Vogel M., Parikh S. J., Feng X. and Sparks D. L. Cation Effects on the Layer Structure of Biogenic Mn-Oxides, *Environ. Sci. Technol.* **2010**, 44(12):4465
41. Feng X., **Zhu M.**, Ginder-Vogel M., Ni C., Parikh S. J., Sparks D. L., Formation of Nanocrystalline Todorokite from Biogenic Mn Oxides, *Geochim. Cosmochim. Acta.* **2010**, 74:3232
42. **Zhu M.**, Paul K. P., Kubicki J. and Sparks D. L., Quantum Chemical Study of As(III, V) Adsorption on Mn-oxides: Implications for As(III) Oxidation, *Environ. Sci. Technol.*, **2009**, 43 (17):6655
43. **Zhu M.** and Pan G., Quantum Chemical Studies of Mononuclear Zinc Species of Hydration and Hydrolysis, *J. Phys. Chem. A*, **2005**, 109 (33):7648
44. **Zhu M.**, Pan G., Li X. et al., Zn (II) Adsorption and Precipitation at the γ -MnOOH-Water Interfaces: DFT and XANES Calculation Studies. *Acta Phys-Chim. Sin.*, **2005**, 21(12):1378 (in Chinese)
45. **Zhu M.**, Pan G., Li X. et al., EXAFS Studies of Zn (II) Adsorption and Precipitation on γ -MnOOH Surface under Different pH Conditions. *Acta Phys-Chim. Sin.*, **2005**, 21(10):1169 (in Chinese)
46. Li X., Pan G., **Zhu M.**, et al., Impacts of pH on Aqueous Zn(II) Microstructure. *Nucl. Technol.*, **2004**, 27(12):895-898 (in Chinese)

INVITED CONFERENCE PRESENTATIONS (5)

1. **Zhu M.**, Transformation Pathway of layered to tunneled manganese oxides: the role of Mn(III) adsorbed on vacancies, Goldschmidt Conference, Boston, August 2018
2. **Zhu M.**, Structural transformation of birnessite by partial reduction, Clay Mineral Society Meeting, Urbana Champaign, June 2018
3. **Zhu M.**, Phosphorus Biogeochemical Transformation and Effects of Aeolian Dust Deposition during Long-term Soil Development in Semi-arid Ecosystems, Synchrotron Environmental Science Symposium 7, Brookhaven National Laboratory, Long Island, New York, October 30 – November 1, 2017
4. **Zhu M.**, Understanding Phosphate and Silicate Adsorption, Precipitation and Polymerization on Mineral Surfaces Using Differential PDF Analysis, 253rd ACS National Meeting in San Francisco, CA, April 2 - 6, 2017
5. **Zhu M.**, Geochemical Processes Controlling Mn(III) and Vacancy Concentrations in Layered Manganese Oxides, 252nd ACS National Meeting in Philadelphia, PA, August 21 - 25, 2016

INVITED DEPARTMENT SEMINARS (20)

1. **Zhu M.**, Aeolian Dust Deposition Perturbs Phosphorous Biogeochemical Transformation, School of Earth Surface Systems, Tianjin University, Tianjin, China, August 17, **2017**
2. **Zhu M.**, Structural Transformation of Layered Mn Oxides during Oxidative Precipitation and Reductive Dissolution: Implications for Metal Fate and Transport, Institute of Soil Sciences, Chinese Academy of Sciences, Nanjing, China, August 15, **2017**
3. **Zhu M.**, Iron Oxyhydroxide Formation in solution: From Molecular Clusters to Nanoparticles, College of Environmental Science and Engineering, Nanjing University, Nanjing, China, August 14, **2017**
4. **Zhu M.**, Phosphorus Biogeochemical Transformation and Effects of Aeolian Dust Deposition during Long-term Soil Development in Semi-arid Ecosystems, UC Merced Environmental Systems Seminar, Wednesday, January 25, **2017**
5. **Zhu M.**, Phosphorous Transformation during Pedogenesis and its Fixation Mechanisms on Mineral Surfaces, Institute of Soil Sciences, Chinese Academy of Sciences, Nanjing, China, August 14, **2016**
6. **Zhu M.**, Effects of Mineral-Water Interfacial Processes for Metal Fate and Transport in the Environment, School of Environmental Science and Engineering, Nanjing University, Nanjing, China, August 10, **2016**

7. **Zhu M.**, Structure and Reactivity of Layered Mn oxides: Implications for Metal Fate and Transport in the Environment, School of Earth Science and Engineering, Nanjing University, Nanjing, China, August 9, **2016**
8. **Zhu M.**, Structure and Reactivity of Layered Mn oxides: Implications for Metal Fate and Transport in the Environment, Beijing University, Beijing, China, August 3, **2016**
9. **Zhu M.**, Phosphorous Transformation during Pedogenesis and its Fixation Mechanisms on Mineral Surfaces, China Agricultural University, Beijing, China, August 2, **2016**
10. **Zhu M.**, Mineral Reactivity Controls Metal Fate and Transport in the Environment, School of Environmental Engineering, North China Electric Power University, Baoding, January 7, **2014**
11. **Zhu M.**, Applications of Synchrotron X-ray Techniques in Studying Soil Fertility, Department of Plant Nutrition, China Agriculture University, Beijing, January 4, **2014**
12. **Zhu M.**, A Quick-EXAFS Study of Fe(III) Precipitation. Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, Beijing, China, Beijing, January 3, **2014**
13. **Zhu M.**, Ferric Iron Hydrolysis and Precipitation: A New Pathway Identified. Colorado State University, Department of Crop and Plant Sciences, Fort Collins, CO, November 11, **2013**
14. **Zhu M.**, Molecular-Scale understanding of ferric iron hydrolysis and precipitation, Institute of Soil Sciences, Chinese Academy of Sciences, Nanjing, China, September 19, **2013**
15. **Zhu M.**, Structure and Reactivity of Biogenic Mn Oxides, Huazhong Agricultural University, College of Natural Resources and Environment, Wuhan, China, September 18, **2013**
16. **Zhu M.**, Iron Oxyhydroxide Precipitation: from Molecular Clusters to Nanoparticles, Huazhong Agricultural University, College of Natural Resources and Environment, Wuhan, China, September 17, **2013**
17. **Zhu M.**, Minerals Dictate Metal Fate and Transport in Natural and Engineered Environmental Systems, Department of Civil and Environmental Engineering, University of Houston, Houston, April 3, **2013**
18. **Zhu M.**, Key Role of Soil Minerals in Metal Biogeochemical Cycling, Department of Ecosystem Science and Management, University of Wyoming, March, Laramie, March 4, **2013**
19. **Zhu M.**, Environmental Mineral Nanoparticles: Key Players in Metal Biogeochemical Cycling, Department of Earth and Environmental Sciences, Temple University, Philadelphia, February 23, **2013**
20. **Zhu M.**, Iron Oxide formation: from Molecular Clusters to Nanoparticles, Advanced Photon Source Users Meeting, Argonne National Laboratory, Argonne, Chicago, December 21, **2012**

CONFERENCE PRESENTATIONS (VOLUNTEERED, 71) (* indicating students or postdocs)

1. *Yang P., *Wang Q., Xu W., and **Zhu M.**, Effects of Ligands on Structural Transformation of Birnessite during the Reaction with Mn(II), 255th ACS National Meeting in New Orleans, LA, March 18 - 22, **2018**, Poster presentation

2. *Yang P., Lee S., Post J.E., Xu H., *Wang Q. Xu W., and **Zhu M.**, Rapid Transformation of Layered to Tunneled Manganese Oxide Triggered by Interlayer Mn(III), 255th ACS National Meeting in New Orleans, LA, March 18 - 22, **2018**, Oral presentation
3. *Wang Q., *Yang P., and **Zhu M.**, Reductive Dissolution Kinetics of birnessite by Natural Organic Matters, 255th ACS National Meeting in New Orleans, LA, March 18 - 22, **2018**, Oral presentation
4. **Zhu M.**, The role of trivalent manganese in mineralogy and geochemistry of birnessite, 255th ACS National Meeting in New Orleans, LA, March 18 - 22, **2018**, Oral presentation
5. *Gu C., Hart S.C., Munn L.C., Hu Y., and **Zhu M.** Evaluation of the Walker and Syers model using phosphorous K-edge XANES spectroscopy for four semi-arid soil chronosequences, Synchrotron Environmental Science Symposium 7, Brookhaven National Laboratory, Long Island, New York, October 30 – November 1, **2017**, Poster presentation
6. *Gu C., Hart S.C., Berhe A.A, Hu Y and **Zhu M.** Phosphorus Speciation in the Pools of the Walker and Syers Model, ASA, CSSA and SSSA International Annual Meetings, Tampa, Florida, October 22-25, **2017**, Oral presentation
7. **Zhu M.** and *Wang Q., Effects of Cations on Structural Transformation of Layered Manganese Oxides during Oxidation of Fulvic Acid, ASA, CSSA and SSSA International Annual Meetings, Tampa, Florida, October 22-25, **2017**, Oral presentation
8. *Zhang Z., Goldstein H., Reynolds R., and **Zhu M.**, Phosphorus Speciation in Dust and Source Soils in the Interior American West, 253rd ACS National Meeting in San Francisco, CA, April 2 - 6, **2017**, Poster presentation
9. *Zhang Z., Liu C., Zhao Z. and **Zhu M.** Distribution and Speciation of Phosphorus in a Granite Weathering Profile in a Temperate Climate, 253rd ACS National Meeting in San Francisco, CA, April 2 - 6, **2017**, Oral presentation
10. *Wang Q., *Yang P. and **Zhu M.**, Adsorption and Oxidation of Fulvic Acid by Birnessite under Various pH Conditions, 253rd ACS National Meeting in San Francisco, CA, April 2 - 6, **2017**, Poster presentation
11. *Wang Q., *Yang P. and **Zhu M.**, Cation Effects on the Adsorption and Oxidation of Fulvic Acid by Manganese Oxides, 253rd ACS National Meeting in San Francisco, CA, April 2 - 6, **2017**, Oral presentation
12. *Yang P., *Wang Q. and **Zhu M.**, Reactions of Birnessite with Mn(II) under Anoxic Conditions, 253rd ACS National Meeting in San Francisco, CA, August 21-25, **2016**, Poster presentation
13. *Yang P., *Wang Q., and **Zhu M.**, Cation Effects on the Reaction between Birnessite and Mn(II), 253rd ACS National Meeting in San Francisco, CA, August 21-25, **2016**, Oral presentation

14. **Zhu M.**, Application of Differential Atomic Pair Distribution Function Analysis in Determining Nutrient Fixation Mechanisms on Mineral Surfaces, ASA, CSSA and SSSA International Annual Meetings, Phoenix, Arizona, November 6 – 9, **2016**. Oral presentation
15. *Gu C., Hart, S.C., Cade-Menun B.J., Hu Y. and **Zhu M.** Applicability of Sequential Chemical Extraction in Determining Phosphorus Transformation during Soil Development Under Semi-Arid Climate. ASA, CSSA and SSSA International Annual Meetings, Phoenix, Arizona, November 6 – 9, **2016**. Poster presentation
16. *Gu C., Evans S.E., Burke I.C. and **Zhu M.**, Phosphorus Speciation Evolution Across a Climate Gradient in Semi-Arid Prairie Soils, ASA, CSSA and SSSA International Annual Meetings, Phoenix, Arizona, November 6 – 9, **2016**. Poster presentation
17. **Zhu M.** and *Wang X., Differential pair distribution function and spectroscopic characterization of phosphate and phytate adsorption and precipitation on ferrihydrite surfaces, 252nd ACS National Meeting in Philadelphia, PA, August 21-25, **2016**. Oral presentation
18. *Wang Q., *Liao X., Xu W., Livi K., Ren Y., and **Zhu M.**, Single approach to synthesize birnessite of various sizes, 251st ACS National Meeting, San Diego, CA, March 13 - 17, **2016**, Poster presentation
19. *Wang X. and **Zhu M.**, Structural characterization of phosphate and silicate surface species on metal oxides, 251st ACS National Meeting, San Diego, CA, March 13 - 17, **2016**, Poster presentation
20. *Gu C., Evans S.E., Burke I.C. and **Zhu M.**, Phosphorus Speciation Changes in Semi-arid Grassland Soils along a Climate Gradient in Inner Mongolia, China, 251st ACS National Meeting, San Diego, CA, March 13 - 17, **2016**, Poster presentation
21. *Wang X., Peak D. and **Zhu M.**, Sulfate Complexation on Hematite Surfaces, 251st ACS National Meeting, San Diego, CA, March 13 - 17, **2016**, Oral presentation
22. *Wang Q., *Yang P. and **Zhu M.**, Adsorption and Oxidation of Fulvic Acid by Birnessite, 251st ACS National Meeting, San Diego, CA, March 13 - 17, **2016**, Oral presentation
23. *Yang P., *Wang Q., Livi K., **Zhu M.**, Cation Effects on the Reactions of Birnessite with Mn(II), 251st ACS National Meeting, San Diego, CA, March 13 - 17, **2016**, Oral presentation
24. *Gu C., Hart S.C., Cade-Menun B.J., Hu Y., Munn L.C. and **Zhu M.**, Phosphorus Speciation Evolution During Pedogenesis in a Semi-arid Environment, 251st ACS National Meeting, San Diego, CA, March 13 - 17, **2016**, Oral presentation
25. *Wang Q., *Yang P. and **Zhu M.**, Adsorption and oxidation of fulvic acid by birnessite, Critical Zone Science, Sustainability, and Services in a Changing World, West Lafayette, IN, October 22 – 24, **2015**, Poster presentation
26. **Zhu M.**, *Gu C, *Wang X, Kubicki J and Feng X, Sulfate complexation on iron(III) oxyhydroxide surfaces and in the structure of schwertmannite, 25th Goldschmidt Conference, Prague, Czech Republic, August 16 – 21, **2015**, Oral presentation

27. *Wang Y., Fan T., Zhou D., Li W., **Zhu M.** and Donald Sparks, Macroscopic and microscopic investigation of adsorption and precipitation of Zn on γ -alumina as affected by As, 249th ACS National Meeting, Denver, CO, March 22-26, **2015**, Oral presentation
28. Tang Y., Huang R., Fields B., **Zhu M.** and Zhao S., Enhanced phosphate sorption on metal-doped birnessite, 249th ACS National Meeting, Denver, CO, March 22-26, **2015**. Oral presentation
29. *Gu C., *Wang X., **Zhu M.**, Identification and quantification of sulfate surface complexes on ferrihydrite, 249th ACS National Meeting, Denver, CO, March 22-26, **2015**. Oral presentation
30. *Wang X., *Gu C., Feng X. and **Zhu M.**, The Sulfate coordination environment in Schwertmannite, 249th ACS National Meeting, Denver, CO, March 22-26, **2015**. Oral presentation
31. *Wang Q., *Liao X. and **Zhu M.**, Effects of the presence of oxyanions during birnessite synthesis on birnessite particle sizes and application for removal of lead, 249th ACS National Meeting, Denver, CO, March 22-26, **2015**. Oral presentation
32. **Zhu M.**, *Gu C. and Wang Z., Identification and Quantification of Sulfate Surface Complexes Formed on Ferrihydrite Surfaces Under Various Experimental Conditions, ASA, CSSA and SSSA International Annual Meeting, Long Beach, November 2-5, **2014**, Oral presentation
33. *Wang X., *Gu C., Feng X-H, and **Zhu M.**, The Sulfate Local Atomic Environment in Schwertmannite, ASA, CSSA and SSSA International Annual Meeting, Long Beach, November 2-5, **2014**, Poster presentation
34. *Wang X., Li W., **Zhu M.**, Feng X-H, and Sparks. D.L., Effect of Ferrihydrite Crystallite Size on Phosphate Adsorption Reactivity, ASA, CSSA and SSSA International Annual Meeting, Long Beach, November 2-5, **2014**, Oral presentation
35. *Gu C., Munn L.C., Hart S.C., Hu Y. and **Zhu M.**, Phosphorus Speciation during Soil genesis in a Semi-arid Environment, ASA, CSSA and SSSA International Annual Meeting, Long Beach, November 2-5, **2014**, Oral presentation
36. *Wang X., Gu C., Feng X-H and **Zhu M.**, The Sulfate Coordination Environment in Schwertmannite, Synchrotron Environmental Science VI, Argonne National Laboratory, Chicago, IL. September 11-12, **2014**, Poster presentation
37. **Zhu M.**, Banfield J.F., and Waychunas G.A., Precipitation Pathways for Ferrihydrite Formation in Acidic Solutions, Synchrotron Environmental Science VI, Argonne National Laboratory, Chicago, IL. September 11-12, **2014**, Oral presentation
38. Gilbert, B., Legg B., **Zhu M.**, Zhang H., Saldi G. D., Duval D., Knauss K. G., Waychunas G. A. and Banfield J. F., Role of iron chemistry in oxyhydroxide nucleation and olivine carbonation, Geosciences Research Program, Office of Basic Energy Sciences, Geosciences Models –Where are the Rocks? Gaithersburg, Maryland, May 14-16, **2014**
39. **Zhu M.** Molecular structure of sulfate adsorption complexes on ferrihydrite: Impacts of pH, ionic strength, and wetness, 247th American Chemical Society National Meeting, Dallas, March 16 – 20, **2014**. Oral presentation

40. Feng X., Zhao H., Liu F., Tan W., Qiu G., Yin, H., Li W., **Zhu M.** and Sparks, D. L., Transformation of hexagonal birnessite into triclinic birnessite by aqueous Mn(II) and the formation of todorokite, 247th American Chemical Society National Meeting, Dallas, March 16 – 20, **2014**. Oral presentation
41. **Zhu M.**, et al., Sulfate adsorption on ferrihydrite studied by sulfur K-edge EXAFS spectroscopy and differential PDF analyses. 245th American Chemical Society National Meeting, New Orleans, April 7 – 11, **2013**. Oral presentation
42. Feng, X., Li W., **Zhu M.**, Northrup P. and Sparks D. L. Sorption mechanism of myoinositol hexaphosphate on boehmite: A ³¹P NMR and P EXAFS Study. 245th American Chemical Society National Meeting, New Orleans, Louisiana, April 7-11. **2013**. Oral presentation
43. Borch T., Shimizu M., Obst M., **Zhu M.** and Kappler A. Structure and reactivity of ferrihydrite-organic matter coprecipitates. 245th American Chemical Society National Meeting, New Orleans, Louisiana, April 7-11. **2013**. Oral presentation
44. **Zhu M.**, et al., *In situ* structural characterization of ferric iron dimers in aqueous nitrate solutions: Identification of μ -oxo species, 244th American Chemical Society National Meeting, Philadelphia, PA, Aug. 19-23, **2012**. Poster presentation
45. **Zhu M.**, et al., Ferrihydrite formation: from molecular clusters to nanoparticles, 244th American Chemical Society National Meeting, Philadelphia, PA, August 19-23, **2012**. Oral presentation
46. **Zhu M.**, et al., Early-stage phase transformation and growth of iron oxyhydroxides during neutralization of simulated acid mine drainage, Goldschmidt 2012 Conference, Montréal, Jun 24-29, **2012**. Oral presentation
47. Livi K.J.T., Lafferty B., **Zhu M.**, Zhang S., Gaillot A. and Sparks D.L., Nanoscale Measurement of Manganese Valence in Mn-oxides, Goldschmidt 2012 Conference, Montréal, Jun 24-29, **2012**. Oral presentation
48. Dideriksen K., Gilbert B., Frandsen C., **Zhu M.**, Stipp S.L.S. and Banfield J.F., The possible role of crystal conduction and inter-particle electron transfer in Fe-oxide phase transformation and growth, Goldschmidt 2012 Conference, Montréal, Jun 24-29, **2012**. Oral presentation
49. **Zhu M.**, et al., Study of Formation and Aggregation of Akaganeite Nanoparticles Using In situ Small Angle X-ray Scattering, 243rd American Chemical Society National Meeting, San Diego, CA, Mar. 25-29, **2012**. Oral presentation
50. **Zhu M.**, et al., Study of Interactions Between Cations and Nanoparticulate Layered Mn Oxides Using X-ray Atomic Pair Distribution Functions (PDF), 243rd American Chemical Society National Meeting, San Diego, CA, Mar 25-29, **2012**. Poster presentation
51. **Zhu M.**, et al., Time-resolved Study of Early-stage Formation of Iron Oxyhydroxide Nanoparticles in Simulated Acid Mine Drainage (AMD) Solutions, AGU Fall Meeting, San Francisco, CA, Dec. 5 – 9, **2011**. Poster presentation
52. **Zhu M.**, et al., Time-resolved Study of Early-stage Formation of Schwertmannite Nanoparticles in Iron Sulfate Solutions, 48th The Clay Minerals Society annual meeting, Lake Tahoe, NV, Sept. 25 – 30, **2011**. Oral presentation

53. **Zhu M.**, et al., Time-resolved Study of Early-stage Formation of Iron Oxyhydroxide Nanoparticles, 242nd American Chemical Society National Meeting, Denver, CO, Aug. 28-Sept. 1, **2011**. Oral presentation
54. Legg B.A., Comolli L.R., Csencsits R., **Zhu M.**, Gilbert B. and Banfield J.F., Using Cryo Transmission Electron Microscopy to Characterize Nanoparticle aggregate structure, 242nd American Chemical Society National Meeting, Denver, CO, Aug. 28-Sept. 1, **2011**. Oral presentation
55. **Zhu M.**, et al., Effects of Zn^{2+} and Ni^{2+} on reduction of δ - MnO_2 by dissolved Mn^{2+} , 242nd American Chemical Society National Meeting, Denver, CO, Aug. 28-Sept. 1, **2011**. Poster presentation
56. **Zhu M.**, et al., Structural Study of Biotic and Abiotic Poorly Crystalline Layered Manganese Oxides Using the Atomic Pair Distribution Function Technique, Geological Society of America (GSA) Annual Meeting, Denver, CO, Oct. 31-Nov. 3, **2010**. Oral presentation
57. Ginder-Vogel M., Lafferty B.J., **Zhu M.**, and Sparks D.L., Simultaneous As(III) and As(V) retention by hydrous Mn(IV) oxide, 239th American Chemical Society National Meeting, San Francisco, CA, March 21 – 25, **2010**. Oral presentation
58. **Zhu M.**, et al., Structural Investigation of Biogenic Mn-oxides Using Synchrotron X-ray Techniques, Department of Plant and Soil Sciences Symposium, Newark, DE. May 20, **2010**. Oral Presentation
59. **Zhu M.**, et al., Structural Study of Poorly Crystalline Layered Manganese Oxides Using the Atomic Pair Distribution Function Technique, ASA-CSSA-SSSA 2009 International Annual Meetings, Pittsburg, PA., Nov. 1-5, **2009**. Oral presentation
60. **Zhu M.**, et al., A Quantum Chemical and X-ray Absorption Spectroscopy Investigation of Arsenic and Nickel Sorption Mechanism on Mn-oxides. DFG-IUSS Symposium on Advances in Molecular Modeling of Biogeochemical Interfaces-Perspectives for Soil Research, Jena, Germany, Oct. 6-9, **2009**. Oral presentation
61. Sparks, D.L. and **Zhu M.** The Value of a Multi-Scale, Multi-Tool Approach in Elucidating Metal(loid) Biogeochemistry in the Environment. DFG-IUSS Symposium on Advances in Molecular Modeling of Biogeochemical Interfaces- Perspectives for Soil Research, Jena, Germany, October 6-9, **2009**. Keynote.
62. **Zhu M.** et al., pH Effects on the Structure of Biogenic Mn-oxides, 237th American Chemical Society National Meeting, Salt Lake City, Utah, March 22-26, **2009**. Oral presentation
63. **Zhu M.** and D. L. Sparks. Ni (II) Sorption on Biogenic Manganese Oxides Formed at Various pHs. GSA-ASA-CSSA-SSSA Joint Annual Meeting, Houston, Texas, Oct. 5-9, **2008**. Poster presentation
64. Parikh S.J., Jonsson C.M., Jonsson C.L., **Zhu M.**, Hazen R.M., Sverjensky D.A., and Sparks D.L., Molecular Mechanisms of Glutamic and Aspartic Acid Sorption to Oxyhydroxide Minerals, GSA-ASA-CSSA-SSSA Joint Annual Meeting, Houston, Texas, Oct. 5-9, **2008**. Oral presentation

65. Feng XH, Ginder-Vogel M., **Zhu M.**, and Sparks D., Birnessite formation and its transformation in acid media, 236th American Chemical Society National Meeting, Philadelphia, Pennsylvania, Aug. 17-21, **2008**. Oral presentation
66. **Zhu M.**, et al., Quantum Chemical Modeling of Arsenic (III, V) Adsorption and Oxidation on Manganese Oxides. 236th American Chemical Society National Meeting, Philadelphia, Pennsylvania, Aug. 17-21, **2008**. Oral presentation
67. **Zhu M.**, et al., pH-induced Structural Change in Biogenic Mn(IV)-oxides. 236th American Chemical Society National Meeting, Philadelphia, PA, Aug. 17-21, **2008**. Poster presentation
68. **Zhu M.**, et al., Effects of Environmental Conditions on the Properties of Biogenic Manganese Oxides, ASA-CSSA-SSSA International Annual Meeting, New Orleans, Louisiana, Nov. 4-8, **2007**, Oral presentation
69. **Zhu M.**, et al., Effects of P and Ca on adsorption kinetics and filtration removal of As(V) by AA, GFO and TiO₂, 232nd American Chemical Society National Meeting, San Francisco, CA. Sept 10-14, **2006**. Poster presentation
70. **Zhu M.** and Pan G., Metastable Equilibrium Adsorption (MEA) Theory IX: Quantum Chemical and XAFS Studies of Zinc Adsorption on Manganite, The China International Symposium on Persistent Toxic Substances, May **2004**. Poster presentation
71. **Zhu M.** and Pan G., Metastable Equilibrium Adsorption (MEA) theory VIII. Quantum Chemical and XAFS Studies of Zinc Species in Water Solution under Full pH Conditions, The China International Symposium on Persistent Toxic Substances, May **2004**. Poster presentation

WORKSHOPS ATTENDED (5)

1. Application and Data Analysis of ³¹P NMR Spectra in Soil Science. Organizers: Barbara Cade-Menun, Agriculture and Agri-Food Canada, Swift Current, Saskatchewan, July 27 – 30, **2016**
2. Integrating Synchrotron Techniques into Environmental Carbon Science, Organizers: Colleen Hansel and John Bargar, SSRL/LCLS Annual Users' Meeting & Workshops, Menlo Park, California, October 1, **2013**
3. MicroXAS Imaging with SSRL's New 2-5 keV Beam Line 14-3. Organizers: Samuel Webb, SSRL/LCLS Annual Users' Meeting & Workshops, Menlo Park, California, October 2, **2013**
4. Synchrotron Techniques in Metal Biogeochemistry: Across Time and Spatial Scales. Organizers: Colleen Hansel and John Bargar, SSRL/LCLS Annual Users' Meeting & Workshops, Menlo Park, California, October 2, **2013**
5. Fundamentals and Applications of Synchrotron X-ray techniques, Summer Graduate School, Sponsored by Ministry of Education of R. R. China and Chinese Academy of Sciences, held at the University of Science and Technology of China, August 1 – 21, **2004**