MENGQIANG "MIKE" ZHU, Ph.D.

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Soil and Environmental Biogeochemistry
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AREAS OF SPECIALIZATION

Soil phosphorus biogeochemistry; Mineral-water interfacial reactions; Structure, formation and transformation of soil 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

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 2nd in National College Contest in Mathematical Modeling, China

PROFESSIONAL SERVICE

National and International Level

2016 – Present **Associate Editor**, *Geochemical Transactions*

2017 – Present **Associate Editor**, *Soil Science Society of America Journal*

2009 – Present **Reviewer**
Environmental Science and Technology
Geochimica Cosmochimica Acta.
Chemical Geology
American Mineralogist
Langmuir
Journal of Colloid and Interface Sciences
Journal of Hazardous Materials
Water Research, Journal of Physical Chemistry C.
Applied Catalysis B
Nanoscale Research Letter
Spectrochimica Acta A

2012 – Present **User Proposal Reviewer,** Stanford Synchrotron Radiation Lightsource

2013 – Present **User Proposal Reviewer,** 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 – 2015 **Co-Chair, Symposiums at National Conferences**

1) Iron and manganese oxides: their formation, structure, reactivity, and applications,

254th American Chemical Society, Washington D.C., August 20-24, 2017

2) Iron oxides: formation, structure, reactivity and applications, 249th American Chemical Society, Denver, March 22-26, 2015

3) Advances in understanding the environmental geochemistry of manganese (Mn) oxides, American Chemical Society, Dallas, March 16 – 20, 2014

4) Advances in understanding the chemistry of light elements at environmental interfaces, American Chemical Society, New Orleans, April 7 – 11, 2013

5) 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

2013 – Present **Graduate Student Recruiting Committee**, Department of Ecosystem Science and Management, University of Wyoming

2015 **Search Committee**, Assistant Professor position in Soil Microbiology

2014 **Grant Proposal Panelist**, 250 K Initiative, University of Wyoming

2013 – 2015 **Wyoming Stable Isotope Facility Steering Committee**, 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

2014 – 2017 SOIL 4130/5130: Chemistry of the Soil Environment

2014 – 2017 SOIL 3130: Soils and Environmental Quality

2015 – 2017 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

REESARCH PROJECTS FUNDED
(Only list the allocations to Dr. Zhu's group; total $1,003,003 with federal contribution of $711,953)

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
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) *4% funding rate*
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) *10% funding rate*
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 Ponds in the Powder River Basin, Wyoming	Mengqiang Zhu (PI), K.J. Reddy, Bill DiRienzo (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

REESARCH GRANT PROPOSALS PENDING

Year	Agency	Funding	Title	Investigators
2018 – 2023	NSF-Early Career Award	$600,000	Mineralogical and Geochemical Control of Phosphorous Dynamics during Pedogenesis	Mengqiang Zhu (PI)

REESARCH GRANT PROPOSALS NOT FUNDED				
2017 - 2019	NSF	$220,000	Effects of global warming on organic P composition in Arctic soils	2017 - 2019
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 *($260,017 Zhu's share)*	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	Mengqiang Zhu (PI)

			Alteration in Natural Waters	
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 humic Substance Degradation	Mengqiang Zhu (PI), Robert Young (CSU)
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
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	*Rapid Proposal*: Determining Sulfate Binding Geometry using Differential PDF	Mengqiang Zhu
2014 - 2015	Stanford Synchrotron Radiation Lightsource, SLAC National Accelerator Laboratory	Sulfate Adsorption Complexes on Surfaces of Iron Oxides	Mengqiang Zhu
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
2017	National Synchrotron Light Source II (Science Commission proposal)	The Structure of Phosphate Adsorption Complexes on Fe(III) Oxides	Mengqiang Zhu
2017	Canadian Light Source (Special request)	Compositional Alteration of Natural Organic Carbon during Adsorption and Oxidation by Manganese Oxides	Mengqiang Zhu

PUBLICATONS

Books and special issues edited (1)

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*, in honor of Prof. Donald Sparks, pending, **2017**

Manuscripts in preparation (3) (* graduate students or postdocs)

1. *Gu C., Hart S., Tuner B., Hu Y., and **Zhu M**., Aeolian dust deposition perturbs phosphorus transformations during long-term ecosystem development, to be submitted in 11/2017
2. *Wang X., Wang Z., Peak D. and **Zhu M**., Surface complexation of sulfate on hematite, to be submitted in 11/2017
3. *Wang Q., *Yang P. and **Zhu M**., Effects of cations on structural transformation of birnessite by fulvic acid, to be submitted in 11/2017

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

1. *Yang P, Lee S., Post J.E., Xu H. *Wang Q., Xu W. and **Zhu M**., Divalent manganese triggers rapid transformation of layered to tunneled manganese oxide at room temperature, *Proc. Natl. Acad. Sci. U.S.A.*, submitted in 10/2017
2. *Wang X., Kubicki JD, Boily J., Waychunas GA, Hu Y., Feng X. and **Zhu M**., Binding geometries of silicate species on ferrihydrite surfaces, *ACS Earth Space Chem*., submitted in 9/2017
3. *Zhang Z., Goldstein HL., 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.*, submitted in 9/2017
4. *Wang Q., *Yang P. and **Zhu M.**, Structural transformation of birnessite by fulvic acid under anoxic conditions, *Environ. Sci. Technol.,* submitted in 8/2017

Peer-reviewed Journal Articles (39) (* graduate students or postdocs; # undergraduate students)

1. *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, Accepted.

2. 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

3. *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

4. 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

5. 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 haematite, *Eur J. Soil. Sci.*, **2017**, 68 (3): 374–383

6. 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

7. 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

8. 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

9. *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

10. *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

11. 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

12. 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

13. **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

14. *Wang X., *Gu C., Feng X. and **Zhu M.**, Sulfate Local Coordination Environment in Schwertmannite, *Environ. Sci. Technol.,* **2015**, 49:10440

15. 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

16. 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

17. 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

18. 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 Pb^{2} + and Cr^{3+} from Wastewater, *J. Environ Sci.*, **2015**, 24:77

19. 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

20. 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

21. 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 Pb^{2+} from Solutions, *J. Hazard. Mater.,* **2015**, 288:80

22. 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

23. 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

24. **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

25. **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

26. 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

27. **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

28. 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

29. **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

30. 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

31. Lafferty B. J., Ginder-Vogel M., **Zhu M**., Livi K. J. T. and Sparks D. L., Arsenite Oxidation by a Poorly-Crystalline Manganese Oxide 2. Results from X-ray Absorption Spectroscopy and X-ray Diffraction, *Environ. Sci. Technol.,* **2010**, 44(22): 8467

32. **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

33. **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

34. Feng X., **Zhu M**., Ginder-Vogel M., Ni C., Parikh S. J., Sparks D. L., Formation of Nano-crystalline Todorokite from Biogenic Mn Oxides, *Geochim. Cosmochim. Acta.* **2010***,* 74:3232
35. **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
36. **Zhu M**. and Pan G., Quantum Chemical Studies of Mononuclear Zinc Species of Hydration and Hydrolysis, *J. Phys. Chem. A*, **2005**, 109 (33):7648
37. **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)
38. **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)
39. 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)

CONFERENCE PRESENTATIONS (64) (* indicating students or postdocs)

1. *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, August 21-25, **2017,** Poster presentation
2. *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, August 21-25, **2017,** Oral presentation
3. *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, August 21-25, **2017,** Poster presentation
4. *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, August 21-25, **2017,** Oral presentation
5. *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
6. *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
7. **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

8. 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

9. *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

10. **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

11. *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

12. *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

13. *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

14. *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

15. *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

16. *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

17. *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

18. *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

19. **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

20. *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

21. 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
22. *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
23. *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
24. *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
25. **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
26. *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
27. *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
28. *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
29. *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
30. **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
31. 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**
32. **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
33. 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 binessite by aqueous Mn(II) and the

formation of todorokite**,** 247th American Chemical Society National Meeting, Dallas, March 16 – 20, **2014**. Oral presentation

34. **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
35. Feng, X., Li W., **Zhu M**., Northrup P. and Sparks D. L. Sorption mechanism of myoinositol hexaphosphate on boehmite: A ^{31}P NMR and P EXAFS Study. 245th American Chemical Society National Meeting, New Orleans, Louisiana, April 7-11. **2013**. Oral presentation
36. 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
37. **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
38. **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
39. **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
40. Livi K.J.T., Lafferty B., **Zhu M.**, Zhang S., Gaillot A. and Sparks D.L., Nanoscale Measurement of Manganese Calence in Mn-oxides, Goldschmidt 2012 Conference, Montréal, Jun 24-29, **2012**. Oral presentation
41. 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
42. **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
43. **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
44. **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
45. **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

46. **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
47. 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
48. **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
49. **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
50. 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
51. **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
52. **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
53. **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
54. 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.
55. **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
56. **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
57. 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

58. 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
59. **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
60. **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
61. **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
62. **Zhu M**., et al., Effects of P and Ca on adsorption kinetics and filtration removal of As(V) by AA, GFO and TiO_2, 232nd American Chemical Society National Meeting, San Francisco, CA. Sept 10-14, **2006**. Poster presentation
63. **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
64. **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

INVITED TALKS (20)

1. 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

2. 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

3. 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

4. Geochemical Processes Controlling Mn(III) and Vacancy Concentrations in Layered Manganese Oxides, 252nd ACS National Meeting in Philadelphia, PA, August 21-25, 2016
5. 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. 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. 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. Structure and Reactivity of Layered Mn oxides: Implications for Metal Fate and Transport in the Environment, Beijing University, Beijing, China, August 3, 2016
9. Phosphorous Transformation during Pedogenesis and its Fixation Mechanisms on Mineral Surfaces, China Agricultural University, Beijing, China, August 2, 2016
10. Mineral Reactivity Controls Metal Fate and Transport in the Environment, School of Environmental Engineering, North China Electric Power University, Baoding, January 7, 2014
11. Applications of Synchrotron X-ray Techniques in Studying Soil Fertility, Department of Plant Nutrition, China Agriculture University, Beijing, January 4, 2014
12. 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. 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. Molecular-Scale understanding of ferric iron hydrolysis and precipitation, Institute of Soil Sciences, Chinese Academy of Sciences, Nanjing, China, September 19, 2013
15. Structure and Reactivity of Biogenic Mn Oxides, Huazhong Agricultural University, College of Natural Resources and Environment, Wuhan, China, September 18, 2013
16. Iron Oxyhydroxide Precipitation: from Molecular Clusters to Nanoparticles, Huazhong Agricultural University, College of Natural Resources and Environment, Wuhan, China, September 17, 2013
17. Minerals Dictate Metal Fate and Transport in Natural and Engineered Environmental Systems, Department of Civil and Environmental Engineering, University of Houston, Huston, April 3, 2013
18. Key Role of Soil Minerals in Metal Biogeochemical Cycling, Department of Ecosystem Science and Management, University of Wyoming, March, Laramie, March 4, 2013
19. Environmental Mineral Nanoparticles: Key Players in Metal Biogeochemical Cycling, Department of Earth and Environmental Sciences, Temple University, Philadelphia, February 23, 2013
20. Iron Oxide formation: from Molecular Clusters to Nanoparticles, Advanced Photon Source Users Meeting, Argonne National Laboratory, Argonne, Chicago, December 21, 2012

WORKSHOPS ATTENDED (5)

1. Application and Data Analysis of ^{31}P 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**