Dr. Jie Ling

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Associate Professor of Chemistry
University of Alabama in Huntsville

Professional Preparation

University of Notre Dame, Notre Dame, IN	Environmental Engineering	Postdoc	2012
Auburn University, Auburn, AL	Inorganic Chemistry	Ph.D.	2007
Wuhan University, Wuhan, China Wuhan University, Wuhan, China	Organic Chemistry Chemistry	M.Sc. B.Sc.	2002 1998

Appointments

08/2022 – present	Associate Professor	University of Alabama, Huntsville, AL
06/2017 – 05/2018	Visiting Professor	University of South Carolina, Columbia, SC
08/2016 – 07/2022	Assistant Professor	Claflin University, Orangeburg, SC
07/2015 – 07/2016	Senior Research Chemist	National Gypsum Co., Charlotte, NC
04/2012 – 06/2015	Senior Research Scientist	Rockwood Lithium Inc., Kings Mountain, NC

Research Grants

(1) NSF-PREM, “Soft Matter Research & Technology and Quantum Confined Materials Design (SMaRT QD)”, $193,662 (subaward), August 2021 to July 2022, Role: co-PI
(2) DOD HBCU/MI, “Synthesis and Characterization of Novel Inorganic Optical Crystalline Materials”, $546,999, July 2020 to July 2022, Role: PI
(3) DOD HBCU/MI, “Enhancing the Research and Education Program in Materials Chemistry at Claflin University: Acquisition of Single Crystal XRD and Microspectrophotometer”, $425,461, July 2021 to July 2022, Role: PI
(4) DOE-MSIPP, “Development of Robust Cationic Metal-Organic Frameworks for Removing Anionic Radionuclides from Nuclear Waste Streams”, $239,740, May 2021 to May 2022, Role: PI
(5) NSF EPSCoR RII Track-1, “Materials Assembly and Design Excellence in South Carolina”, $450,000, September 2017 to September 2022, Role: Target faculty
(6) NSF EPSCoR GEAR CRP, “Deep Learning of Discovery of Noncentrosymmetric Materials with Second-order Nonlinear Optical Behavior”, $15,000 (subaward), January 2019 to December 2019, Role: co-PI
(7) NSF EPSCoR Stimulus, “Affordable High-Performance Li-S Batteries”, $10,000 (subaward), January 2019 to December 2019, Role: co-PI
(8) NSF ChemMatCARS, “Faculty and Student Team Research Award”, $10,000, Summer 2018, Role: PI
(9) DOE-MSIPP, “Synthesis and Characterization of Environmentally Relevant Actinide Metal Clusters to Aid in Development of Novel Remediation Tactics and to Improve Understanding of Aqueous Waste Streams and the Radionuclide Products Forming within the Deep Vadose Zone at Hanford and at the Fukushima Plant in Japan”, $333,964, September 2017 – March 2019, Role: PI

(10) Claflin University, "Faculty Research Seed Award", $3,000, January 2017 to December 2017, Role: PI

Awards

(1) BR-SIP Award for Mentoring Research Students, 2020, Claflin University, SC
(2) Attorney William H. and Annette B. Johnson Annual Faculty Award for Innovative Scientific Research, 2019, Claflin University, SC
(3) Faculty and Student Team Research Award, 2018, NSF's ChemMatCAR, Argonne National Laboratory, Lemont, IL
(4) Faculty Research Infrastructure Award, 2017, Claflin University, SC
(5) Best Graduate Research Poster Award, 2007, Auburn University, AL
(6) Graduate Research Travel Award, 2006, Auburn University, AL
(7) Graduate Student Research Award, 2002, Wuhan University, China
(8) National Scholarship of Analysis & Measurement, 1996, Chinese Society of Analytical Measurement, China

Academic Training

2021 Fall	Machine Learning and AI Tutorials, Brookhaven National Laboratory
2018 Summer	Training on Synchrotron XRD, Argonne National Laboratory
2010 Summer	Nuclear Fuel Cycle Workshop, Savannah River National Laboratory
2004-present	Radiation Safety Training at Auburn, ND, UofSC, and ANL

Synergistic Activities

(1) Reviewer for NSF proposals and chemistry journals, 2020 - present
(2) X-ray facility manager, Claflin University, 2016 – 2022
(3) DOE minority workforce development program coordinator, Claflin University, 2020 – 2022
(4) Judge for high school science fair and SERMACS poster competition, 2016-2022

Patents

(1) "Fire-resistant gypsum board", E. Stav, J. Ling, R. Iyer, National Gypsum, Charlotte, NC, US, 2017
(2) "Hydrothermal conversion of Np and Pu dioxide into Np (IV) and Pu (IV) iodate", T. E. Albrecht-Schmitt, T. H. Bray, J. Ling, Auburn University, Auburn, AL, US, 2007

Publications (* = corresponding author, ‡ = undergraduate authors)
(Google Scholar ID: http://scholar.google.com/citations?user=pEyCqysAAAAJ&hl=en)

(1) M. Wei, J. Song, R. Chen, H. Liu, Y. Wang, Y. Qiao, J. Ling, T. Su, H. Ju, X. Zhou, Z. Weng, "Two substituted tetrazole-base isomers of $[M_2(PPT)(OH)(SO_4)(H_2O)]_n$ (M = Zn, Cd): The in-situ syntheses and characterization", *Inorganica Chim. Acta* 542 (**2022**) 121101.
(2) Z. Weng, X. Zhou, J. Ling, P. Xiang, Y. Huang, H. Ju, S. Chen, Z. Zhang, "Five zinc supramolecular assemblies constructed from flexible bispyridinecarboxamide and a series

of substituted isophthalates: synthesis and characterization", *J. Solid State Chem.* 305 (**2022**) 122660.

(3) J. Ling*, H. Zhang, K. Yuan, D. Burgess‡, J. Hu, M. Hu, "Hydrothermal syntheses and crystal structures of molybdenum tellurites", *J. Solid State Chem.* 287 (**2020**) 121317.

(4) Y. Song, J. Lindsay, Y. Zhao, A. Nasiri, S.-Y. Louis, J. Ling, M. Hu, J. Hu, "Machine learning based prediction of noncentrosymmetric crystal materials", *Comput. Mat. Sci.* 183 (**2020)** 109792.

(5) Z. Weng, P. Xiang, J. Ling, M. Huang, W. Yang, Z. Zheng, X. Deng, H. Ju, Y. Huang, "In situ synthesis and characterization of a series of new pyridyl containing complexes based on 3d metals: from oligomer to 3D framework", *J. Solid State Chem.* 287 (**2020**) 121326.

(6) J. Ling*, H. Zhang, J. Qiu, M. Stoffer‡, D. Burgess‡, P. C. Burns, "Pyrophosphate and methylenediphosphonate incorporated uranyl peroxide cage clusters", *Cryst. Growth Des.* 18 (**2018**) 7720.

(7) J. Ling*, H. Lu, Y. Wang, K. Johnson‡, S. Wang, "One-dimensional chain structures of hexanuclear uranium(IV) clusters bridged by formate ligands", *RSC Adv.* 8 (**2018**) 34947.

(8) Y. Wang, T. Duan, Z. Weng, J. Ling, X. Yin, L. Chen, D. Sheng, J. Diwu, S. Wang, "Mild periodic acid flux and hydrothermal methods for the synthesis of crystalline f-element-bearing iodate compounds", *Inorg. Chem. 56* (**2017)** 13041.

(9) J. Ling, F. Hobbs‡, S. Prendergast‡, P. Adelani, J. Qiu, Z. Weng, P. C Burns, "Hybrid uranium–transition-metal oxide cage clusters", *Inorg. Chem. 53* (**2014)** 12877.

(10) J. Qiu, J. Ling, C. Sieradzki, K. Nguyen‡, E.M. Wylie, P.C. Burns, "Expanding the crystal chemistry of uranyl peroxides: four hybrid uranyl-peroxide structures containing EDTA", *Inorg. Chem. 53* (**2014)** 12084.

(11) J. Qiu, J. Ling, L. Jouffret, J.E.S. Szymanowski, P.C. Burns, "Water-soluble multi-cage super tetrahedral uranyl peroxide phosphate clusters", *Chem. Sci.* 5 (**2014**) 303.

(12) Z. Liao, J. Ling, L.R. Reinke‡, J.E.S. Szymanowski, G. E. Sigmon, P. C. Burns, "Cage clusters built from uranyl ions bridged through peroxo and 1-hydroxyethane-1,1-diphosphonic acid ligands", *Dalton Trans.* 42 (**2013**) 6793.

(13) J. Ling, M. Ozga‡, M. Stoffer‡, P. C. Burns, "Uranyl peroxide pyrophosphate cage clusters with oxalate and nitrate bridges", *Dalton Trans.* 41 (**2012**) 7278.

(14) P. Miro, J. Ling, J. Qiu, P. C. Burns, L. Gagliardi, C. J. Cramer, "Experimental and computational study of a new wheel-shaped $\{[W_5O_{21}]_3[(U(VI)O_2)_2(\mu\text{-}O_2)]_3\}^{30-}$ polyoxometalate", *Inorg. Chem.* 51 (**2012**) 8784.

(15) Z. Weng, S. Wang, J. Ling, J. Morrison, P. C. Burns, "$(UO_2)_2[(UO_4(trz)_2)(OH)_2$: A U(VI) coordination intermediate between a tetraoxido core and a uranyl ion with cation-cation interactions", *Inorg. Chem.* 51 (**2012**) 7185.

(16) Ling, J. Qiu, P. C. Burns, "Uranyl peroxide oxalate cage and core-shell clusters containing 50 and 120 uranyl ions", *Inorg. Chem.* 51 (**2012**) 2403.

(17) J. Qiu, J. Ling, A. Sui‡, J.E.S. Szymanovski, A. Simonetti, P. C. Burns, "Time-resolved self-assembly of fullerene-topology core-shell cluster containing 68 uranyl polyhedra", *J. Am. Chem. Soc.* 134 (**2012**) 1810.

(18) D. K. Unruh, J. Ling, J. Qiu, L. Pressprich‡, M. Baranay‡, M. Ward‡, P. C. Burns, "Complex nanoscale cage clusters built from uranyl polyhedra and phosphate tetrahedra", *Inorg. Chem.* 50 (**2011**) 5509.

(19) J. Ling, J. Qiu, J. E. S. Szymanovski, P. C. Burns, "Low-symmetry uranyl pyrophosphate cage

clusters", *Chem.- Eur. J.* 17 (**2011**) 2571.
(20) L. Wu, J. Ling, Z. Wu, "A highly active and recyclable catalysis: phosphine dendrimer-stabilzied nickle nanoparticles for Suzuki coupling reaction", *Adv. Synth. Catal.* 353 (**2011**) 1452.
(21) J. Ling, M. Ward‡, P. C. Burns, "Hydrothermal syntheses and structures of the uranyl tellurates $AgUO_2(HTeO_5)$ and $Pb_2UO_2(TeO_6)$", *J. Solid State Chem.* 184 (**2011**) 401.
(22) J. Ling, J. Qiu, G. E. Sigmon, M. Ward‡, P. C. Burns, "Uranium pyrophosphate and diphosphonate polyoxametalates", *J. Am. Chem. Soc.* 132 (**2010**) 13395.
(23) J. Ling, G. E. Sigmon, M. Ward‡, N. Roback, P. C. Burns, "Syntheses, structures, and IR spectroscopic characterizations of new uranyl sulfate/selenate 1D-chain, 2D-sheet and 3D-framework", *Zeit. fur Kristallogr.* 225 (**2010**) 230.
(24) S. Wang, E. Alekseev, J. Ling, G. Liu, T. Albrecht-Schmitt, "Polarity and chirality in uranyl borates: insights into understanding the vitrification of nuclear waste and the development of nonlinear optical materials", Chem. Mater. 22 (**2010**) 2155.
(25) J. Ling, C. Wallace, J. E. S. Szymanovski, P. C. Burns, "Hybrid uranium-oxalate fullerene topology polyoxometalates", *Angew. Chem., Int. Ed.* 49 (**2010**) 7271.
(26) J. Ling, J. E. Morrison, M. Ward‡, P. C. Burns, "Syntheses, structures and characterizations of open framework uranyl germanates", *Inorg. Chem.* 49 (**2010**) 7123.
(27) S. Wang, E. V. Alekseev, J. Ling, S. Skanthakumar, L. Soderholm, W. Depmier, T. E. Albrecht-Schmitt, "Neptunium diverges sharply from uranium and plutonium in crystalline borate matrixes: Insights into the complex behavior of the early actinide relevant to nuclear waste storage", *Angew. Chem., Int. Ed.* 49 (**2010**) 1263.
(28) J. Ling, S. Wu, F. Chen, J. T. Shafer, T. E. Albrecht-Schmitt, "Does iodate incorporate into layered uranyl phosphates during hydrothermal crystallization?", *Inorg. Chem.* 48 (**2009**) 10995.
(29) G. E. Sigmom, J. Ling, D. K. Unruh, M. Ward‡, P.C. Burns, "Uranyl-peroxide interactions favor nano-cluster assembly", *J. Am. Chem. Soc.* 131 (**2009**) 16648.
(30) S. Wu, J. Ling, S. Wang, S. Skanthankumar, L. Soderholm, T. E. Albrecht-Schmitt, "Uranyium (VI) adopts a tetraoxido core", *Eur. J. Inorg. Chem.* 27 (**2009**) 4039.
(31) G. E. Sigmom, D. K. Unruh, J. Ling, B. Weaver‡, M. Ward‡, P.C. Burns, "Symmetry vs minimal pentagonal adjacencies in uranium-based polyoxometalate fullerene topologies", *Angew. Chem., Int. Ed.* 48 (**2009**) 2737.
(32) J. Ling, G. E. Sigmon, P. C. Burns, "Syntheses, structures, characterizations, and charge-density matching of novel amine-templated uranyl selenates", *J. Solid State Chem.* 182 (**2009**) 402.
(33) J. Ling, T. E. Albrecht-Schmitt, "Intercalation of iodic acid into the layered uranyl iodate, $UO_2(IO_3)_2(H_2O)$", *Inorg. Chem.* 46 (**2007**) 346.
(34) T. H. Bray, J. Ling, T. E. Albrecht-Schmitt, "Unexpected oxidation-reduction and crystallization behavior of U, Np and Pu iodates mediated by water-limiting conditions", *Inorg. Chem.* 46 (**2007**) 3663.
(35) J. Ling, T. E. Albrecht-Schmitt, "Selenium oxoanion compounds of palladium (II)", *Inorg. Chem.* 46 (**2007**) 5686.
(36) Y.B. Xiao, J. Ling, S.H. Qian, W.J. Zheng, W.Y. Xu, "Preconcentration of trace arsenite and arsenate with titanium dioxide nanoparticles and subsequent determination by silver

diethyldithiocarbamate spectrophotometric method", *Water Envi. Res.* 79 (**2007**) 1015.
(37) J. Ling, T. E. Albrecht-Schmitt, "Square-planar noble metal iodate $[M(IO_3)_4]^{n-}$ (M= Pd^{II}, Au^{III}; n=2,1) anions and their ability to form polar and centrosymmetric architectures", *Eur. J. Inorg. Chem.* 5 (**2007**) 652.
(38) J. Ling, T. E. Albrecht-Schmitt, "Syntheses, structures and properties of $Ag_2(MoO_3)_3SeO_3$ and Ag_4 $(Mo_2O_5)(SeO_4)_2(SeO_3)$", *J. Solid State Chem.* 180 (**2007**) 1601.
(39) Z. Assefa, J. Ling, R. E. Sykora, T. E. Albrecht-Schmitt, "Syntheses, structures, and vibrational spectroscopy of the two-dimensional iodate $Ln(IO_3)_3$ and $Ln(IO_3)_3(H_2O)$", *J. Solid State Chem*. 179 (**2006**) 3653.
(40) Y. Liu, J. Ling, W. Li, X.G. Zhang, "Effective synthesis of carbon-coated Co and Ni naocrystallites with improved magnetic properties by AC arc discharge under an N_2 atmosphere", *Nanotech.* 15 (**2004**) 43.
(41) J. Ling, Y. Liu, G.M. Hao, X.G. Zhang, "Preparation of carbon-coated Co and Ni nanocrystallites by a modified AC arc discharge method", *Mater. Sci. Eng. B* 100 (**2003**) 186.
(42) J.Y. Zhang, L.P. Gong, Y.X. Luo, W.Y. Xu, J. Ling, "Biodegradation of lignin in wheat straw by alkalophilic ligninolytic bacteria by compounded carbon", *Chinese Environ. Sci.* 23 (**2002**) 70.