

CURRICULUM VITAE

James August Ridenour

The George Washington University - Department of Chemistry
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Education

The George Washington University

Ph.D., Chemistry

Advisor: Dr. Christopher L. Cahill – cahill@gwu.edu

Washington, D.C

May 2020

Dickinson College

B.S., Chemistry and History

Advisor: Dr. Sarah St. Angelo – stangels@dickinson.edu

Carlisle, PA

May 2014

Scholarships and Awards

NNSA Nuclear Science and Security Consortium Graduate Fellow	2017 – Present
Metropolitan Washington Chapter ARCS Foundation Scholar	2018 – 2019
Young Investigator Travel Award: International Conference on <i>f</i> -Elements	2018
Tuition Scholarship: ACA Summer Course in Crystallography	2016
Bourbon F. Scribner Graduate Student Endowment Scholarship	2015
ACS Undergraduate Award in Inorganic Chemistry	2014

Research Experience

The George Washington University

Graduate Research Assistant:

- Participated in research with carbonate eutectic molten salt cells for graphitic carbon deposition.
- Conducted and communicated fundamental research on lanthanide and actinide materials, studying structure, structure-property relationships, and supramolecular assembly.
- Evaluated materials with techniques such as single crystal and powder X-ray diffraction and Raman, IR, UV-Vis, and luminescent spectroscopies for characterizing of materials.
- Managed X-ray diffraction and spectroscopic instrumentation, valued at \$750,000, laboratory supply and equipment orders, and undergraduate students for a multidisciplinary research group.
- Led collaborative efforts with research teams at universities and national laboratories on radiochemistry projects.

Washington, D.C

2015 – Present

Los Alamos National Laboratory

NSSC-LANL Keepin Nonproliferation Science Summer Fellow:

Chemistry Division – Nuclear and Radiochemistry

- Detected low energy X-ray radiation for the identification and analysis of radioactive isotopes utilizing silicon drift detector techniques.
- Participated in a multidisciplinary team to evaluate and meet programmatic goals of radiological isotopic identification.

Los Alamos, NV

Jun. – Aug. 2018

Teaching Experience

The George Washington University

Washington, D.C

Graduate Teaching Assistant - Science of Nuclear Materials (ScNM)

Fall 2016 – 2019

- Organized lecture, laboratory, discussion, and review sessions on topics relevant to nuclear science and security.
- Developed and updated course material and evaluative products, including integrating HPGe gamma spectroscopy techniques.

Graduate Teaching Assistant - Contemporary Science for Nonsci. Majors:

Jan. – Jul. 2015

- Developed lecture materials for weekly laboratory practicals.
- Directed laboratory safety sessions, graded course material, and hosted weekly office hours.

Dickinson College

Carlisle, PA

Teaching Assistant – Organic Chem. I/Thermodynamics and Kinetic

Jan. – Dec. 2013

- Assisted instructor with small groups of students in weekly laboratory practicals.
- Led pre-laboratory discussion sections on laboratory safety and procedure.

Additional Experience

Nuclear Science and Security Consortium (NSSC) Fellow

Washington, D.C., Los Alamos, NV

Ph.D. Graduate Fellow – National Nuclear Security Admin., NSSC

Fall 2017 – Present

- Engaged in technical discussions and demonstrations of U.S. nuclear science and security operations, radiological identification techniques and strategies, and nonproliferation capabilities.
- Participated in nuclear science and security short courses (examples below) highlighting and/or demonstrating nuclear security capabilities in; radiological identification, missile defense, and nonproliferation

Extracurricular Activities

Nuclear Security Policy Boot Camp (2019)

Hosted by The George Washington University and the Nuclear Science and Security Consortium

Intensive short course on nuclear science and security, arms control, safeguards, weapons and energy. <https://bootcampnsp.elliott.gwu.edu/>

NSSC-LANL Keepin Nonproliferation Science Summer Program (2018)

Hosted by the NNSA Nuclear Science and Security Consortium, Los Alamos National Laboratory, and Sandia National Laboratory. Mentors: Dr. Robert Rundberg and Dr. Rian Bahrn

Extended research program at Los Alamos National Laboratory with mentor-driven research projects and symposia on nuclear security science, technology and policy.

<https://nssc.berkeley.edu/events-and-programs/nssc-summer-schools/nssc-lanl-summer-school/>

Short Course on Nuclear Weapon and Related Security Issues (2017)

Hosted by AIP and APS/FPS at the Elliot School at The George Washington University

Technical workshop symposium on topics relating to nuclear weapons and security.

<https://www.aps.org/units/fps/meetings/nucwpissues/>

Genie 2000 Gamma Analysis: Foundations and Optimization Course (2016)

Hosted by Mirion Technologies

Technical short course on Mirion spectroscopy software and gamma spectroscopic analysis.

Publications (Peer-Reviewed)

15. J. A. Ridenour, M. H. Schofield, C. L. Cahill (2019) “Structural and Computational Investigation of Halogen Bonding Effects on Spectroscopic Properties within a Series of Halogenated Uranyl Benzoates”, *Cryst. Growth Des.*, Accepted Article. <https://pubs.acs.org/doi/abs/10.1021/acs.cgd.9b01567>
14. J. A. Ridenour, R. G. Surbella III, A. V. Gelis, D. Koury, F. Poineau, K. R. Czerwinski, C. L. Cahill (2019) “An Americium-Containing Metal-Organic Framework: A Platform for Studying Transplutonium Elements” *Angew. Chem.*, 58, 16508-16511. <https://onlinelibrary.wiley.com/doi/full/10.1002/anie.201909988>
13. A. T. Kerr, J. A. Ridenour, A. A. Noring, C. L. Cahill (2019) “Two uranyl-copper(II) bimetallic coordination polymers containing trans-3,3(pyridyl)acrylic acid: structural variance through synthetic subtleties” *Inorg. Chim. Acta.*, 494, 204-210. <https://doi.org/10.1016/j.ica.2019.05.024>
12. K. P. Carter, J. A. Ridenour, M. Kalaj, C. L. Cahill (2019) “A Thorium Metal-Organic Framework with Outstanding Thermal and Chemical Stability” *Chem. Eur. J.*, 25, 7114-7118. <https://onlinelibrary.wiley.com/doi/full/10.1002/chem.201901610>
11. G. E. Gomez, J. A. Ridenour, N. M. Byrne, A. P. Shevchenko, C. L. Cahill (2019) “Novel Heterometallic Uranyl-Transition Metal Materials: Structure, Topology, and Solid State Photoluminescence Properties” *Inorg. Chem.*, 58, 11, 7243-7254. <https://pubs.acs.org/doi/abs/10.1021/acs.inorgchem.9b00255>
10. K. P. Carter, M. Kalaj, A. Kerridge, J. A. Ridenour, C. L. Cahill (2018) “How to Bend the Uranyl Cation via Crystal Engineering” *Inorg. Chem.*, 57(5), 2714-2723. <https://pubs.acs.org/doi/abs/10.1021/acs.inorgchem.7b03080>
9. J. A. Smith, M. A. Singh-Wilmot, K. P. Carter, C. L. Cahill, J. A. Ridenour (2018) “Lanthanide-2,3,5,6-Tetrabromoterephthalic Acid Metal-Organic Frameworks: Evolution of Halogen...Halogen Interactions across the Lanthanide Series and Their Potential as Selective Bifunctional Sensors for the Detection of Fe³⁺, Cu²⁺, and Nitroaromatics.” *Cryst. Growth. Des.*, 19(1), 305. <https://pubs.acs.org/doi/10.1021/acs.cgd.8b01426>
8. J. A. Ridenour, C. L. Cahill (2018) “Nine isomorphous lanthanide-uranyl f-f bimetallic materials with 2-thiophenecarboxylic acid and terpyridine: structure and concomitant luminescent properties.” *CrystEngComm* 20, 4997. <http://dx.doi.org/10.1039/C8CE00811F>
7. M. Finn, J. A. Ridenour, J. Heltzel, C. L. Cahill, A. Voutchkova-Kostal (2018) “Next-generation water-soluble homogeneous catalysts for conversion of glycerol to lactic acid.” *Organometallics* 37(9), 1400. <https://pubs.acs.org/doi/10.1021/acs.organomet.8b00081>
6. J. A. Ridenour; C. L. Cahill (2018) “Synthesis, structural analysis, and supramolecular assembly of a series of *in situ* generated uranyl-peroxide complexes with functionalized 2,2'-bipyridine and varied carboxylic acid ligands.” *New J. Chem.* 42, 1816. <http://dx.doi.org/10.1039/C7NJ03828C>
5. R. J. Batrice, J. A. Ridenour, R. L. Ayscue III, J. A. Bertke, K. E. Knope (2017) “Synthesis, structure, and photoluminescent behavior of molecular lanthanide-2-thiophenecarboxylate-2,2':6'2"-terpyridine materials.” *CrystEngComm* 19, 5300. <http://dx.doi.org/10.1039/C7CE01192J>

4. J. A. Ridenour; M. M. Pynch; Z. J. Manning; J. A. Bertke; C. L. Cahill (2017) "Two novel bimetallic transition metal-uranyl one-dimensional coordination polymers with manganese(II) and cobalt(II) incorporating bridging diglycolate (2,2'-oxydiacetate) ligands." *Acta Crystallogr., Sect. C: Cryst. Struct. Commun.* 73. <http://dx.doi.org/doi:10.1107/S2053229617009263>
3. J. A. Ridenour; C. L. Cahill (2017) "Synthesis, crystal structure, and topological analysis of a Lap-bromobenzoic acid-terpyridine 1D-coordination polymer with repeating decameric units and a new 3, 3, 3, 5, 5 pentanodal net topology with a novel point symbol." *Inorg. Chim. Acta.* <http://dx.doi.org/10.1016/j.ica.2017.05.062>
2. J. A. Ridenour; K. P. Carter; C. L. Cahill (2017) "RE-p-halobenzoic acid-terpyridine complexes, part III: structural and supramolecular trends in a series of p-iodobenzoic acid rare-earth hybrid materials." *CrystEngComm* 19, 1190. <http://dx.doi.org/10.1039/C6CE02356H>
1. J. A. Ridenour; K. P. Carter; R. J. Butcher; C. L. Cahill (2017) "RE-p-halobenzoic acid-terpyridine complexes, Part II: structural diversity, supramolecular assembly, and luminescence properties in a series of p-bromobenzoic acid rare-earth hybrid materials." *CrystEngComm* 19, 1172. <http://dx.doi.org/10.1039/C6CE02355J>

Presentations (Conference and Grant Reviews)

6. Poster: J. A. Ridenour, R. G. Surbella, III, A. V. Gelis, F. Poineau, D. Koury, K. Czerwinski, C. L. Cahill. "Metal-Organic Frameworks as a Platform for Probing Transplutonium Electronic Structure and Signatures." NNSA University Program Review; June 4-6, 2019, Raleigh, North Carolina.
5. Talk: J. A. Ridenour, C. L. Cahill. "UO₂²⁺ and Ln³⁺ Materials as a Forum for An³⁺ (Am³⁺ and Cm³⁺) Substitution and Study." NSSC Schubert Grant Review; September 27, 2018, Las Vegas, Nevada.
4. Poster: J. A. Ridenour, C. L. Cahill. "Structural and Spectroscopic Characterization of Novel Uranium (U⁴⁺) and Uranyl (UO₂²⁺) Sulfate-Chloride Materials." 10th International Conference on f-Elements (ICFE-10); September 3-6, 2018, Lausanne, Switzerland.
3. Poster: J. A. Ridenour, K. P. Carter, R. J. Butcher, C. L. Cahill. "A Systematic Exploration of Rare-earth-p-halobenzoic acid-terpyridine Materials: Structural and Supramolecular Trends in Three Series of Molecular Complexes synthesized *via* Hydrothermal Methods." 28th Rare Earth Research Conference; June 18-22 2017; Ames, IA.
2. Poster: J. A. Ridenour, C. L. Cahill. "Synthesis, structural analysis, and supramolecular assembly of a series of *in-situ* generated uranyl-peroxide complexes." 254th ACS National Meeting; August 20-24, 2017; Washington, DC.
1. Poster Highlight Talk and Poster: J. A. Ridenour, C. L. Cahill, "Supramolecular assembly and a novel topology within a structurally diverse series of lanthanide p-bromobenzoic acid-terpyridine complexes." 66th Annual Meeting of the American Crystallographic Association; July 22-26, 2016; Denver, CO.