Robert W. Lord

Postdoctoral Researcher rwl45@drexel.edu
Drexel University, *Philadelphia, PA* (817) 751-1657

Education

The Pennsylvania State University, University Park, PA Jul 2016 – May 2021

- Ph.D., Chemistry
  - Dissertation: "Synthesis and Characterization of Transition Metal Nitride and Selenide Nanocrystals and Heterostructures
  - Advisor: Prof. Raymond E. Schaak

Texas Tech University, Lubbock, Tx Jan. 2014 – May 2016

- B.S., Chemistry

University of Texas at Arlington, Arlington, TX Aug. 2007 – Dec. 2012

- Physics w/Electrical Engineering emphasis

Research Experience

Drexel University, Postdoctoral Researcher June 2021 – present

Department of Materials Science and Engineering, **Advisor Prof. Yury Gogotsi**

The Pennsylvania State University, Graduate Researcher Jul. 2016 – May 2021

Department of Chemistry, **Advisor Prof. Raymond E. Schaak**

- Synthesized complex, heterostructured metal nitride nanoparticles through colloidal, seeded growth on noble metal nanoparticles
- Synthesized novel phase of $Cu_{2-x}Se$ nanoparticles identified through high-resolution transmission electron microscopy, energy dispersive spectroscopy, and X-ray diffraction
- Leveraged skills and knowledge in transmission electron microscopy to characterize bulk and nanomaterials in several collaborative projects including mixed metal sufide nanorods, $MoAl_{1-x}B$ nanolaminates, mesoporous MoB nanoparticles, and chiroptical Au nanorods

Texas Tech University, Undergraduate Researcher Jan. 2015 – May 2016

Department of Chemistry, **Advisor Prof. Louisa Hope-Weeks**

- Synthesized mixed oxide aerogels using epoxide-induced sol gel formation and characterized their porosity by Brunauer, Emmett and Teller (BET) analysis, catalytic surface area by temperature programmed reduction and their photocatalytic properties by UV-Vis absorption

Teaching

Graduate Teaching Assistant, The Pennsylvania State University, University Park, PA

- CHEM 111: Experimental Chemistry I Spring 2018
- CHEM 451: Experimental Physical Chemistry I Fall 2017

Undergraduate Teaching Assistant, Texas Tech University, Lubbock, TX

- CHEM 1107: Experimental Principles of Chemistry I Spring 2016

Work Experience

Xenco Laboratories, Dallas TX — Jan 2009 – Dec. 2013

Wet Chemistry Analyst — Jan. 2013 – Dec. 2013

- Modified analytical procedures and SOPs to better match state and federal guidelines
- Analyzed environmental samples by titrimetric, colorimetric, gravimetric, and potentiometric methods

Volatile Organic Analyst — Jan. 2009 – Dec. 2012

- Analyzed environmental samples by GC/MS and GC/FID
- Assisted in the maintenance and repair of laboratory equipment

Honors and Awards

Continuing Graduate Student Award	Oct. 2019
Sloan Institutional Match Scholarship	Aug. 2019
Departmental Travel Award	Jul. 2019
Bunton-Waller Graduate Fellowship	Aug. 2016

Publications

8) Garcia-Herrera, L. F.; McAllister, H. P.; Xiong, H.; Wang, H.; **Lord, R. W.**; O'Boyle, S. K.; Imamovic, A.; Steimle, B. C.; Schaak, R. E.; Plass, K. E. Multi-Step Regioselectivity and Non-Kirkendall Anion Exchange of Copper Chalcogenide Nanorods. *Chem. Mater.* 2021, 33, 3841-3850.

7) Di Domizio, G.A.; Alameda, L.T.; Fanghanel, J.; **Lord, R. W.**; Miller, J. R.; Schaak, R. E. Real-Time Monitoring of Completing Nanoparticle Formation Pathways During Cation Exchange Using Benchtop Light Scattering. *Chem. Mater.* 2021*,* 33, 3936-3944.

6) Hernández-Pagán, E. A.; **Lord, R. W.**; Veglak, J.; Schaak, R. E. Incorporation of Metal Phosphide Domains into Colloidal Hybrid Nanoparticles. *Inorg. Chem.* 2021, 60, 7, 4278-4290.

5) **Lord, R. W**.; Fanghanel, J.; Holder, C. F.; Dabo, I.; Schaak, R. E. Colloidal Nanoparticles of a Metastable Copper Selenide Phase with Near-Infrared Plasmon Resonance. *Chem. Mater.* 2020, 32, 10227-10234.

4) Steimle, B. C.; **Lord, R. W.**; Schaak, R. E. Phosphine-Induced Phase Transition in Copper Sulfide Nanoparticles Prior to Initiation of A Cation Exchange Reaction. *J. Am. Chem. Soc.* 2020, 142, 13345-13349.

3) Steimle, B. C.; Fagan, A. M.; Butterfield, A. G.; **Lord, R. W.**; McCormick, C. R.; Di Domizio, G. A.; Schaak, R. E. Experimental Insights into Partial Cation Exchange Reactions for Synthesizing Heterostructured Metal Sulfide Nanocrystals. *Chem. Mater.* 2020, 32, 5461-5482.

2) Alameda, L. T.; **Lord, R. W.**; Barr, J. A.; Moradifar, P.; Metzger, Z. P.; Steimle, B. C.; Holder, C. F.; Alem, N.; Sinnott, S. B.; Schaak, R. E. Multi-Step Topochemical Pathway to Metastable Mo_2AlB_2 and Related Two-Dimensional Nanosheet Heterostructures. *J. Am. Chem. Soc.* 2019, 141, 10852-10861.

1) **Lord, R. W.**; Holder, C. F.; Fenton, J. L.; Schaak, R. E. Seeded Growth of Metal Nitrides on Noble-Metal Nanoparticles to Form Complex Nanoscale Heterostructures. *Chem. Mater.* 2019, 31, 4605-4613.

Presentations

"Seeded growth of metal nitrides on noble-metal nanoparticles to form complex nanoscale heterostructures" — Oct. 2019
- Poster – Materials Day, Penn State University, University Park, PA

"Seeded growth of metal nitrides on noble-metal nanoparticles to form complex nanoscale heterostructures" — Aug. 2019
- Poster – American Chemical Society National Meeting, San Diego, CA.

"Improving the figure of merit in thermoelectric material by minimizing thermal conductivity" — Apr. 2018
- Oral presentation – Department of Chemistry, Penn State University, University Park, PA

"Synthesis of highly porous monolithic $InNbO_4$ aerogels" — Mar. 2016
- Poster – American Chemical Society National Meeting, San Diego, CA.

Affiliations

Member, Materials Research Society — 2019 – present
Member, American Chemical Society — 2014 – present
Member, Sigma Pi Sigma — 2010 – present

Community Service and Outreach

Volunteer, Stem Open House, Penn State University, University Park, PA — Nov. 2019
Volunteered to speak with prospective graduate STEM students from underrepresented groups about when the university has to offer and about my experiences.

Volunteer, Highway clean up, ACS Student Chapter, Texas Tech University, Lubbock, TX — SP 2015 – SP 2016
Volunteered to participate in the highway cleanup project each semester as a part of the ACS Student Chapter at Texas Tech University.