

R. Dominic Ross, Ph.D.

Materials Science Division, Lawrence Livermore National Laboratory, Livermore, CA 94550

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Experience

Postdoctoral Researcher, Lawrence Livermore National Laboratory <i>Advisor: Dr. Christopher Hahn</i>	08/2023-present
Graduate Student Researcher, University of Wisconsin-Madison <i>Advisor: Professor Song Jin</i>	08/2018-07/2023
Undergraduate Student Researcher, The Ohio State University <i>Advisor: Professor Joshua Goldberger</i>	01/2015-05/2018
NSF REU Fellow, Colorado State University <i>Advisor: Professor Justin Sambur</i>	05/2017-08/2017

Education

Ph.D., Materials Chemistry <i>University of Wisconsin-Madison, Department of Chemistry</i> <i>Dissertation: Structure-Property Relationships of Electrocatalysts for Two-Electron Selective Oxygen Reduction Reaction in Acidic and Neutral Media</i>	2018-2023
B.S., Chemistry <i>The Ohio State University, Department of Chemistry and Biochemistry</i> <i>Thesis: Electrochemical Properties of Hydrogen Absorbing Zintl Phases</i> <i>Cum Laude, with Honors Research Distinction</i>	2014-2018

Honors and Awards

Beamline proposal at BESSY (OAESE@EMIL endstation) awarded 5 total shifts	2023
Five beamline proposals awarded time at Advanced Photon Source	2019-2023
Student Research Grant Competition Conference Presentation Award	2021, 2023
Graduate Student Faculty Liaison Committee Travel Award	2021
Honorable Mention, NSF Graduate Research Fellowship Program	2020
Honors Arts & Sciences Undergraduate Research Scholarship	2017-2018
Booth Scholarship	2017-2018
Chellis Family Scholarship	2016-2017
Summer Undergraduate Research Fellow	2016
MacNevin Memorial Fund Scholarship	2015-2016

Publications

Underline indicates undergraduate mentee. †Indicates equal contribution.

13. Triggs, C.T.; **Ross, R.D.**; Mihalyi-Koch, W.; Clewett, C.M.; Sanders, K.M.; Guzei, I.A.; Jin, S. *Submitted*.
12. Huang, J.; Wang, R.; Sheng, H.; Zhu, X.; **Ross, R.D.**; Hua, D.; Lin, L.; Fu, Q.; Li, Y.; Zhang, Q.; Gu, L.; Wang, X.; Xu, P.; Lu, J.; Jiang, S.; Han, J. Song, B.; Jin, S. *Submitted*.
11. **Ross, R.D.**; Lee, K.; Cintrón, G.J.Q.; Sheng, H.; Schmidt, J.R.; Jin, S. *Submitted*.
10. Sheng, H.; **Ross, R.D.**; Schmidt, J.R.; Jin, S. Metal Compound-Based Electrocatalysts for Hydrogen Peroxide Electrosynthesis and the Electro-Fenton Process. *ACS Energy Lett.* **2022**, 8, 196-212.
9. **Ross, R.D.**; Sheng, H.; Ding, Y.; Janes, A.N.; Schmidt, J.R.; Segre, C.U.; Feng, D.; Jin, S. Operando Elucidation of Electrocatalytic and Redox Mechanisms on a 2D Metal Organic Framework Catalyst for Efficient Electrosynthesis of Hydrogen Peroxide in Neutral Media. *J. Am. Chem. Soc.* **2022**, 144, 15845-15854.

8. Sheng, H.; Janes, A.N.; **Ross, R.D.**; Hofstetter, H.; Lee, K.; Schmidt, J.R.; Jin, S. Linear paired electrochemical valorization of glycerol enabled by the electro-Fenton process using a stable NiSe₂ cathode. *Nat. Catal.* **2022**, *5*, 716–725.
7. **Ross, R.D.**; Sheng, H.; Parihar, A.; Huang, J.; Jin, S. Compositionally Tuned Trimetallic Thiospinel Catalysts for Enhanced Electrosynthesis of Hydrogen Peroxide and Built-In Hydroxyl Radical Generation. *ACS Catal.* **2021**, *11*, 12643-12650.
6. Huang, J.; Sheng, H.; **Ross, R.D.**; Han, J.; Wang, X.; Song, B.; Jin, S. Modifying redox properties and local bonding of Co₃O₄ by CeO₂ enhances oxygen evolution catalysis in acid. *Nat. Commun.* **2021**, *12*, 3036.
5. Sheng, H. †; Janes, A.N. †; **Ross, R.D.**; Kaiman, D.; Huang, J.; Song, B.; Schmidt, J.; Jin, S. Stable and selective electrosynthesis of hydrogen peroxide and electro-Fenton process on CoSe₂ polymorph catalysts. *Energy Environ. Sci.* **2020**, *13*, 4189-4203.

At Ohio State

4. Cultrara, N.D.; Arguilla, M.Q.; Jiang, S.; Sun, C.; Scudder, M.R.; **Ross, R.D.**; Goldberger, J.E. Group-13 and Group-15 Doping of Germanane. *Beilstein J. Nanotechnol.* **2017**, *8*, 1642-1648.
3. Arguilla, M.Q.; Cultrara, Scudder, M.R.; Jiang, S.; **Ross, R.D.**; Goldberger, J.E. Optical Properties and Raman-Active Phonon Modes in Two-Dimensional Honeycomb Zintl Phases. *J. Mater. Chem. C* **2017**, *5*, 11259-11266.
2. Arguilla, M.Q.; Cultrara, N.D.; Baum, Z.J.; Jiang, S.; **Ross, R.D.**; Goldberger, J.E. EuSn₂As₂: An Exfoliatable Layered Zintl-Klemm Phase. *Inorg. Chem. Front.* **2017**, *4*, 378-386.
1. Arguilla, M.Q.; Katoch, J.; Krymowski K.; Cultrara, N.; Xu, J.; Xi, X.; Hanks, A.; Jiang, S.; **Ross, R.D.**; Koch, R.J.; Ulstrup, S.; Bostwick, A.; Jozwiak, C.; Rotenberg, E.; McComb, D.; Shan, J.; Windl, W.; Kawakami, R.K.; Goldberger, J.E. NaSn₂As₂: An Exfoliatable Layered van der Waals Zintl Phase. *ACS Nano* **2016**, *10*, 9500-9508.

Presentations

5. “Facet-dependent behavior of the two-electron oxygen reduction reaction a layered palladium diselenide catalyst for the electrosynthesis of hydrogen peroxide.” 2023 Spring American Chemical Society Meeting – Indianapolis, IN. Oral Presentation.
4. “Structural Design of Transition Metal Sulfide and Selenide Catalysts Towards Enhanced Electrosynthesis of Hydrogen Peroxide.” 2022 Spring American Chemical Society Meeting – San Diego, CA. Oral Presentation.
3. “Elucidating Active Structures of 2D Metal Organic Framework Catalysts for Electrochemical Two-Electron Oxygen Reduction.” 2021 Fall Materials Research Society Meeting – Boston, MA. Oral Presentation.
2. “Elucidating Active Structures of 2D Metal Organic Framework Catalysts for Electrochemical Two-Electron Oxygen Reduction.” 239th Electrochemical Society Meeting – Virtual. Oral Presentation, *Invited*.
1. “Electrocatalytic Properties of Hydrogen Absorbing Zintl Phases.” 2017 Ohio Inorganic Weekend – Columbus, OH. Poster Presentation.

Outreach, Mentoring, and Extracurriculars

At UW-Madison

Research Mentor to Graduate Student	2022-2023
Research Mentor to Graduate Student	2021-2023
Scanning Electron Microscope Co-Instrument Manager	2022-2023
Perpetual Notion Machine Host/Producer, WORT-FM	2022
Catalyst Program Peer Mentor	2021-2022
Wisconsin Science Festival, Jin Group Booth	2019, 2021, 2022
Research Mentor to Undergraduate Student	2019-2020
John L. Schrag Analytical Fund Committee	2019-2020
APS/IIT XAFS Summer School	2019
Chemistry Opportunities (CHOPS) Host	2019

At Ohio State

Off the Lake Productions (Theatre & Community Service)
Stage Manager (2017-2018), Technical Director (2015-2016)

2014-2018

Teaching

Grader, *University of Wisconsin-Madison*
Chemistry of Inorganic Nanomaterials (Graduate Level)

2021, 2022

Teaching Assistant, *University of Wisconsin-Madison*
Advanced General Chemistry, General Chemistry II Lab & Discussions

2018-2020

Teaching Assistant, *The Ohio State University*
General Chemistry I, General Chemistry II Lab & Recitations

2016-2018