

POLY 306

Education

University of Oregon, Eugene, OR Anticipated in 2018
Master of Science in Chemistry

University of California, Irvine, Irvine, CA June 2017
Bachelor of Science in Chemistry

Work/Research Experience

Undergraduate Researcher, University of California, Irvine, Irvine, CA 2015-2017
Advisor: Dr. Jenny Y. Yang

Project 1: Synthesized and experimentally measured ruthenium complex's ability to transfer a hydride to CO₂ electrocatalytically, to produce formate (HCO₂⁻) for fuel cell use.

- Researched a cost and time efficient way to synthesize a ruthenium hydride complex by reading and combining four literature preps, saving five hours of refluxing and \$360 per batch.
- Synthesized metal complex by implementing air sensitive chemistry techniques such as using a glove box and Schlenk line.
- Purified complex by recrystallization and characterized by ¹H-NMR, ³¹P-NMR, UV-Vis, and cyclic voltammetry (CV).
- Performed and analyzed controlled potential electrolysis results to quantify the Faradaic yield of HCO₂⁻ by solvent suppression in NMR experiments.

Project 2: Assisted in the synthesis of a nickel complex, and its hydride derivative. The complex was used as a hydride donor in acidic solutions to form H₂ for possible fuel cell use in an electrocatalytic, carbon-neutral cycle.

- Synthesized nickel complex with an 80% yield by metalating ligand with nickel starting material in glove box.
- Characterized complex to verify purity by ¹H-NMR, ³¹P-NMR, CV, and elemental analysis.
- Measured stability of complex via ³¹P-NMR in air-free, buffered solutions by analyzing NMR shifts.

Barista and Learning Coach, Starbucks Corporation, Irvine, CA 2013-2015

Job Detail: Trained new baristas, executed cash handling skills, prepared beverages, and provided an enjoyable experience to customers.

- Communicated corporate policies, procedures, and expectations to 12 new baristas.
- Supervised store when managers were unavailable by delegating tasks, ensuring customer satisfaction, and minimizing waste.
- Anticipated daily store needs by organizing, keeping inventory, and tracking pastry and beverage consumption to increase efficiency.
- Provided exceptional customer service skills by creating a welcoming environment and connecting with customers when working the register.

Peer-Reviewed Research Publications

Tsay, C.; Livesay, B. N.; **Ruelas, S.**; Yang, J. Y. "Solvation Effects on Transition Metal Hydricity." *Journal of the American Chemical Society* **2015**, *137* (44), 14114-14121.

Affiliations

Women in Chemistry at UCI, Member/Mentor 2016-2017

Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS), Member 2016-Present

American Chemical Society, Member 2015-Present

Awards

2016 SACNAS Student Presentation Award	2016
Michael E. Gebel Award: UC Irvine Department of Chemistry award in recognition of Students who wish to make a difference in the world with their science (nominated by advisor)	2016
California State Seal of Bi-literacy: Fluent in Spanish	2014

Volunteer Work

LEAPS—Taught middle school children about chemical phenomena by performing demonstrations and explaining reasons behind experimental outcomes.	2015-2017
Stand Up to Cancer—Raised money and awareness about cancer by running a 5K each year.	2015-2016
UCI American Chemical Society Chemistry Club, Historian—Documented, planned, and executed events hosted by the club.	2013-2017
St. Philip Neri Parish—Set up nave in preparation for Mass.	2011-Present
Relay for Life—Raised money and awareness about cancer by walking as a part of a team during a day-long event.	2011-2015
Rimrock Convalescence Hospital—Prepared and executed activities for residents.	2008-2013

Poster Presentations

- “Investigation of Aqueous Acidity of a Ruthenium Hydride and its Potential for Electrocatalytic CO₂ Reduction.” Undergraduate Research Opportunities Program Symposium, Irvine, CA. May 20th, 2017.
- “Investigation of Ruthenium Hydride Acidity in Water and Formate Production.” 254th American Chemical Society National Meeting, San Francisco, CA. April 2nd- 6th, 2017.
- “Investigation of Ruthenium Hydride Acidity in Water and Formate Production.” 2016 SACNAS National Conference, Long Beach, CA. October 13th-15th, 2016.
- “Aqueous Stability and Catalytic HER Activity of [(DHMPPE)₂Ni][BF₄]₂ Under Various pH Conditions.” Undergraduate Research Opportunities Program Symposium, Irvine, CA. May 21st, 2016.
- “Aqueous Stability and Catalytic HER Activity of [(DHMPPE)₂Ni][BF₄]₂ Under Various pH Conditions.” 251st American Chemical Society National Meeting, San Diego, CA. March 13th-17th, 2016.