

HANNAH J. SAYRE

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EDUCATION

The Ohio State University Ph.D. Chemistry	2018
Virginia Tech M.S. Chemistry	2015
University of Cincinnati B.S. Chemistry	2009

RESEARCH EXPERIENCE

Northeastern University <i>Assistant Professor</i>	2021
College of Science, Department of Chemistry and Chemical Biology College of Engineering, Department of Chemical Engineering	
Princeton University <i>BioLEC Lead Distinguished Postdoctoral Researcher</i>	2018 – 2021
Photophysical and photochemical investigation of Ir(III) and Ni(II) photocatalysts Advisor: Prof. Gregory Scholes	
The Ohio State University <i>Graduate Researcher</i>	2015 – 2018
Dirhodium(II,II) complexes as red-light absorbing photosensitizers and as catalysts for photocatalytic proton reduction Advisor: Prof. Claudia Turro	
Virginia Tech, Department of Chemistry <i>Graduate Researcher</i>	2012 – 2015
Modification of excited-state behavior with ligand substitution in Ru(II),Rh(III) supramolecular bimetallic complexes Advisors: Prof. Karen Brewer and Prof. James Tanko	
University of Cincinnati <i>Undergraduate Researcher</i>	2007 – 2009
Synthesis and characterization of iron clusters and photo-activated Fe ^{III/II} reduction Advisor: Prof. Michael Baldwin	

TEACHING EXPERIENCE

Northeastern University	
CHEM 1151	Fall 2021
The Ohio State University	
Head Teaching Assistant	Fall 2016
Elementary Chemistry Recitation	Fall 2016
General Chemistry for Engineers Laboratory	2015
Virginia Tech	
General Chemistry Laboratory for Chemistry Majors	2013 – 2015

INDUSTRY EXPERIENCE

ISOTEC Stable Isotopes, Chemist

Isotopically labelled algae processing and drug-grade ^{13}C urea purification 2009 – 2011

PRESENTATIONS

Invited Talks

- Bio-Inspired Ir(III) PCET Photocatalysis, ACS National Meeting, Virtual 2020
- Bio-Inspired Photoredox Catalysis, Solar Fuels GRS, Il Ciocco, Italy, Cancelled 2020
- Seeding Collaborative Research, BioLEC Midterm Review, Washington, DC 2020
- Dirhodium(II,II) Complexes as Red-Light Absorbing Photosensitizers, Ohio Photochemical Society, Toledo, OH 2018
- Enhanced Photocatalyst Activation in Ru(II),Rh(III) Supramolecular Bimetallic Complexes with Ligand Substitution, Air Force Research Laboratory, Dayton, OH 2017
- Photocatalyst Design with Consideration of Ligand Sigma-Donor Ability and Substrate Accessibility to Catalytically Active Site, ACS National Meeting, San Diego, CA 2016

Contributed Presentations

- Charge Recombination Deferred: PCET Improves Photocatalysis Efficiency, Eastern Regional Photosynthesis Conference, Virtual 2021
- Bioinspired Light-Escalated Chemistry, Princeton Research Day, Princeton, NJ 2019
- Formamidinate-Bridged Rh₂(II,II) Dimer as a Robust, Red-Light Absorbing Photosensitizer for Proton Reduction, ACS National Meeting, Washington, DC 2017
- Rh₂(II,II) Dimers as Photosensitizers for Photocatalytic Proton Reduction, ACS Central Regional Meeting, Detroit, MI 2017

Poster Presentations

- PCET-Based Ligand Slows Charge Recombination with an Ir(III) Photocatalyst, National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCChE), Virtual 2021
- An Iridium Photocatalyst with a PCET Donor, Inter-American Photochemical Society (I-APS) Meeting, Sarasota, FL 2020
- BioLEC Center Poster, DOE Energy Frontier Research Center All PI Meeting, Washington, DC 2019
- Enhanced Excited States for Cross Coupling Catalysis, International Conference on Photochemistry (ICP), Boulder, CO 2019

Red-Light Activated Photocatalytic Proton Reduction with a Dirhodium(II,II) Photosensitizer, I-APS Meeting, Sarasota, FL	2018
Storing Red Light Energy as Solar Fuel with a Broad-Spectrum Rh ₂ (II,II) Photosensitizer, Ohio Inorganic Weekend, Columbus, OH	2017
Formamidinate-Bridged Rh ₂ (II,II) Dimers as Robust, Red-Light Absorbing Photosensitizers for Photocatalyzed Proton Reduction, Photochemistry GRC	2017
Spectroelectrochemical Investigation of Rh ₂ (II,II) Dimers, I-APS Meeting, Sarasota, FL	2017
Mixed-Donor, alpha-Hydroxy Acid-Containing Chelates for Binding and Light-Triggered Release of Iron, Oesper Poster Session, Cincinnati, OH	2008

OUTREACH AND SERVICE

Graduate School: A Chemist's Perspective, Virtual high school outreach	2020 – 2021
Princeton Research Day, Session Chair	2019
Frontiers in Energy Research Newsletter, Editorial Board Member	2018
NOBCChE Outreach, Columbus, OH	2018
Invention Convention, Ohio State Fair, Columbus, OH	2017
Horizon Science Academy STEM Fair, Columbus, OH	2016
Karen Brewer Memorial Magic Show, Blacksburg, VA	2016
Science Day at Innis Elementary School, Columbus, OH	2015 – 2016
Christiansburg Elementary School Chemistry Demos, Christiansburg, VA	2015
Margaret Beeks Elementary School Chemistry Demos, Blacksburg, VA	2015
Virginia Science Festival, Roanoke, VA	2014
Montgomery County Head Start Preschools Chemistry Demos	2014
Chemical Illusions Blacksburg Middle School, Blacksburg, VA	2013 – 2015
Kindergarten-to-College Chemistry Demos, Blacksburg, VA	2013 – 2015
Miamisburg District Elementary Science Fair	2010 – 2011

AWARDS

Teaching Award, Virginia Tech	2013
Inorganic Chemistry Award, University of Cincinnati	2008

PUBLICATIONS

Sayre, H. J.; Ripberger, H.; Odella E.; Scholes, G. D.; Moore, T. A.; Moore, A. L.; Knowles, R. R. "Bimolecular Charge Recombination Inhibited by PCET Ligand Coordination to an Ir(III) Photocatalyst" *J. Am. Chem. Soc.*, 2021, 143, 13034-13043, doi: 10.1021/jacs.1c01701

Sayre, H. J.; Tian, L.; Son, M.; Hart, S. M.; Liu, X.; Arias-Rotondo, D. M.; Rand, B. P.; MacMillan, D. W. C.; Schlau-Cohen, G. S.; Scholes, G. D. "Solar Fuels and Feedstocks: The Quest for Renewable Black Gold" *Energy Environ. Sci.*, 2021, 14, 1402-1419, doi: 10.1039/D0EE03300F

Kudisch, B.; **Sayre, H. J.;** Tian, L.; Schwartz, K. N. "Viewpoint on the 2019 International Conference on Photochemistry" *J. Phys. Chem.* 2019, 123, 8977-8981, doi: 10.1021/acs.jpca.9b09156

Sayre, H. "New Developments on the Carbon Capture Frontier" *Frontiers in Energy Research Newsletter*, Winter 2019.

Xue, C.; **Sayre, H. J.;** Turro, C. "Electron Injection into Titanium Dioxide by Panchromatic Dirhodium Photosensitizers with Low Energy Red Light" *Chem. Comm.* 2019, 55, 10428-10431, doi: 10.1039/c9cc04677a.

Sayre, H. "Scientists Discover Stable Material for Sulfur Dioxide Capture" *Frontiers in Energy Research Newsletter*, Fall 2018.

Sayre, H. J.; Millet, A.; Dunbar, K. R.; Turro, C. "Photocatalytic H₂ Production by Dirhodium(II,II) Photosensitizers with Red Light" *Chem. Comm.* 2018, 54, 8332-8334, doi: 10.1039/c8cc03631d.

Whittemore, T. J.; Millet, A.; **Sayre, H. J.;** Xue, C.; Dolinar, B. S.; White, E. G.; Dunbar, K. R.; Turro, C. "Tunable Rh₂(II,II) Light Absorbers as Excited-State Electron Donors and Acceptors Accessible with Red/Near-Infrared Irradiation" *J. Am. Chem. Soc.* 2018, 140, 5161-5170, doi: 10.1021/jacs.8b00599

Whittemore, T. J.; **Sayre, H. J.;** Xue, C.; White, T. A.; Gallucci, J. C.; Turro, C. "New Rh₂(II,II) Complexes for Solar Energy Applications: Panchromatic Absorption and Excited-State Reactivity" *J. Am. Chem. Soc.* 2017, 139, 14724-14732, doi: 10.1021/jacs.7b08489

Sayre, H. J.; White, T. A.; Brewer, K. J. "Increased Photocatalytic Activity in Ru(II),Rh(III) Supramolecular Bimetallic Complexes with Terminal Ligand Substitution" *Inorg. Chim. Acta*, 2017, 454, 89-96, doi: 10.1016/j.ica.2016.06.020

Zigler, D. F.; Morseth, Z. A.; White, T. A.; Canterbury, T. R.; **Sayre, H. J.;** Rodríguez-Corrales, J. Á.; Brennaman, M. K.; Brewer, K. J.; Papanikolas, J. M. "Ultrafast Kinetics of Supramolecules with a Ru(II)- or Os(II)-polypyridyl Light Absorber, cis-Rh(III)Cl₂-polypyridyl Electron Collector, and 2,3-bis(2-pyridyl)pyrazine Bridge" *Inorg. Chim. Acta*, 2017, 454, 266-274, doi: 10.1016/j.ica.2016.06.034

Sayre, H. J.; Milos, K.; Goldcamp, M. J.; Schroll, C. A.; Krause, J. A.; Baldwin, M. J. "Mixed-Donor, alpha-Hydroxy Acid-Containing Chelates for Binding and Light-Triggered Release of Iron" *Inorg. Chem.* 2010, 49, 4433-4439, doi: 10.1021/ic9018629