Kate M. Waldie

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EDUCATION

2010-2016 Stanford University, Stanford, CA
Ph.D. in Chemistry
Advisor: Professor Robert M. Waymouth
Cumulative GPA: 4.04/4.00
Thesis: "Investigations of Homogeneous Ruthenium and Cobalt Complexes for Electrocatalytic Transformations."

2005-2010 University of Victoria, British Columbia, Canada
B.Sc. Chemistry, Honours with Distinction
Cumulative GPA: 8.86/9.00
Honours Thesis: "Synthesis, characterization, and electrochemical studies of new bis(imino)indigo ("Nindigo") derivatives and their binuclear palladium complexes."

PROFESSIONAL EXPERIENCE

09/2018-present Assistant Professor, Department of Chemistry and Chemical Biology
Rutgers, The State University of New Jersey

2016-2018 Postdoctoral Scholar, Department of Chemistry and Biochemistry
University of California San Diego
Advisor: Professor Clifford P. Kubiak

AWARDS & HONORS

Graduate:

2015-2016 Center for Molecular Analysis and Design (CMAD) Fellowship, Stanford University
2011-2014 Natural Sciences and Engineering Research Council of Canada (NSERC) Postgraduate Scholarship, Doctoral Level
2010-2013 Stanford Graduate Fellowship in Science and Engineering, Gabilan Fellow
2010-2011 Natural Sciences and Engineering Research Council of Canada (NSERC) Postgraduate Scholarship, Masters Level
2010 Henry Taube Award, Stanford University

Undergraduate:

2010 ACS Division of Inorganic Chemistry Undergraduate Award in Inorganic Chemistry
2010 British Columbia Inorganic Discussion Weekend Poster Prize

2010	Natural Sciences and Engineering Research Council of Canada (NSERC) Undergraduate Student Research Award
2010	Society of Chemical Industry Canada Section Merit Award
2005-2009	University of Victoria Excellence Award Scholarship
2009	Canadian Society for Chemistry Silver Medal Award
2009	Charles Humphrey Memorial Scholarship in Chemistry
2009	Frank and Margaret Gibbs Scholarship
2009	Hazel T. Knox Memorial Scholarship
2009	Natural Sciences and Engineering Research Council of Canada (NSERC) Undergraduate Student Research Award
2009	Undergraduate Research Scholarship in Chemistry
2009	University of Victoria Faculty Scholarship
2009	University of Victoria Science Undergraduate Research Award
2008	Charles Humphrey Memorial Scholarship in Chemistry
2008	Natural Sciences and Engineering Research Council of Canada (NSERC) Undergraduate Student Research Award
2008	Stephen A. Ryce Memorial Scholarship
2008	University of Victoria Science Undergraduate Research Award
2006	Seaspan International Ltd. Scholarship
2005	British Columbia Provincial Scholarship
2005	Oak Bay Municipal Scholarship
2005	Miller Thomson Foundation National Scholarship
2005	Royal Canadian Legion Sir Percy Lake Memorial Scholarship
2005	Soroptimist Club Violet Richardson Award for Young Women

PUBLICATIONS

* Denotes corresponding author. † These authors contributed equally.

1. Cook, A.W.; Emge, T.J.; Waldie, K.M.* Insights into Formate Oxidation by a Series of Cobalt Piano-Stool Complexes Supported by Bis(phosphino)amine Ligands. *Inorg. Chem.*, **2021**, *60*, 7372-7380.
2. Barrett, J.A.; Brunner, F.M.; Cheung, P.L.; Kubiak, C.P.; Lee, G.L.; Miller, C.J.; Waldie, K.M.; Zhanaidarova, A. Approaches to Controlling Homongeneous Electrochemical Reduction of Carbon Dioxide. In *Carbon Dioxide Electrochemistry: Homogeneous and Heterogeneous Catalysis*; Robert, M.; Costentin, C.; Daasbjerg, K., Eds.; Energy and Environment Series No. 28; Royal Society of Chemistry, 2021; pp 1-66.
3. Cook, A.W.; Waldie, K.M.* Molecular Electrocatalysts for Alcohol Oxidation: Insights and Challenges for Catalyst Design. *ACS Appl. Energy Mater.*, **2020**, *3*, 38-46. *Invited article as part of the Young Investigator Forum*.
4. Ostericher, A.L.; Waldie, K.M.; Kubiak, C.P.* Utilization of Thermodynamic Scaling Relationships in Hydricity to Develop Nickel Hydrogen Evolution Reaction Electrocatalysts with Weak Acids and Low Overpotentials. *ACS Catal.*, **2018**, *8*, 9596-9603.

5. McLoughlin, E.†; Waldie, K.M.†; Ramakrishnan, S.; Waymouth, R.M.* Protonation of a Cobalt Phenylazopyridine Complex at the Ligand Yields a Proton, Hydride, and Hydrogen Atom Transfer Reagent. *J. Am. Chem. Soc.*, **2018**, *140*, 13233-13241.
6. Waldie, K.M.; Brunner, F.M.; Kubiak, C.P.* Transition Metal Hydride Catalysts for Sustainable Interconversion of CO_2 and Formate: Thermodynamic and Mechanistic Considerations. *ACS Sustainable Chem. Eng.*, **2018**, *6*, 6841-6848.
7. Waldie, K.M.†; Ostericher, A.L.†; Reineke, M.H.; Sasayama, A.F.; Kubiak, C.P.* Hydricity of Transition Metal Hydrides: Thermodynamic Considerations for CO_2 Reduction. *ACS Catal.*, **2018**, *8*, 1313-1324. *Selected for ACS Editor's Choice*.
8. Waldie, K.M.; Kim, S.-K.; Ingram, A.J.; Waymouth, R.M.* Cyclopentadienyl Cobalt Complexes as Precatalysts for Electrocatalytic Hydrogen Evolution. *Eur. J. Inorg. Chem.*, **2017**, 2755-2761.
9. Waldie, K.M.†; Ramakrishnan, S.†; Kim, S.-K.; Maclaren, J.K.; Chidsey, C.E.D.; Waymouth, R.M.* Multielectron Transfer at Cobalt: Influence of the Phenylazopyridine Ligand. *J. Am. Chem. Soc.*, **2017**, *139*, 4540-4550.
10. Waldie, K.M.; Flajslik, K.R.; McLoughlin, E.; Chidsey, C.E.D.; Waymouth, R.M.* Electrocatalytic Alcohol Oxidation with Ruthenium Transfer Hydrogenation Catalysts. *J. Am. Chem. Soc.*, **2017**, *139*, 738-748.
11. Ramakrishnan, S.†; Waldie, K.M.†; Warnke, I.; De Crisci, A.G.; Batista, V.S.;* Waymouth, R.M.;* Chidsey, C.E.D.* Experimental and Theoretical Study of CO_2 Insertion into Ruthenium Hydride Complexes. *Inorg. Chem.*, **2016**, *55*, 1623-1632.
12. Nawn, G.; Waldie, K.M.; Oakley, S.R.; Peters, B.D.; Mandel, D.; Patrick, B.O.; McDonald, R.; Hicks, R.G.* Redox-Active Bridging Ligands based on Indigo Diimine ("Nindigo") Derivatives. *Inorg. Chem.*, **2011**, *50*, 9826-9837.
13. Oakley, S.R.; Nawn, G.; Waldie, K.M.; MacInnis, T.D.; Patrick, B.O.; Hicks, R.G.* "Nindigo": Synthesis, Coordination Chemistry, and Properties of Indigo Diimines as a new class of Functional Bridging Ligands. *Chem. Comm.*, **2010**, *46*, 6753-6755.

PRESENTATIONS (2011-present)

1. International Solar Fuels Conference, Virtual Meeting. July 28, 2021. "*Insights into Metal-Hydride Formation for Electrocatalytic Oxidation Reactions*." (selected for talk)
2. Inorganic and Organometallic Young Investigator Symposium, ACS Middle Atlantic Regional Meeting, University of Delaware, DE. June 10, 2021. "*Photoswitchable Extended Network Materials*." (invited talk)
3. Energy Catalysis Symposium, ACS Middle Atlantic Regional Meeting, University of Delaware, DE. June 10, 2021. "*Insights into Electrocatalytic Oxidation Reactions using First-Row Transition Metal Complexes*." (invited talk)
4. Emerging Areas in Inorganic Chemistry Symposium, 259th ACS National Meeting & Exposition, Philadelphia, PA. March 24, 2020. "*First-row transition metal complexes for the electrocatalytic oxidation of liquid fuels*." (invited talk, symposium co-organizer) *Cancelled due to Covid-19*

5. Rutgers, The State University of New Jersey, New Brunswick, NJ. December 10, 2019. "*Photoswitchable Metal Organic Frameworks (MOFs).*" (invited talk)
6. 258th ACS National Meeting & Exposition, San Diego, CA. August 28, 2019. "*Development of Molecular Catalysts for Energy-Related Transformations.*" (talk)
7. Muhlenberg College, Allentown, PA. October 26, 2018. "*Using Thermodynamic Hydricity as a Guide for Electrocatalyst Design.*" (invited talk)
8. 255th ACS National Meeting & Exposition, New Orleans, LA. March 20, 2018. *"Electrocatalytic Formate Oxidation with an Iridium Hydride Complex."* (talk)
9. 255th ACS National Meeting & Exposition, New Orleans, LA. March 18, 2018. *"Hydricity and Other Thermodynamic Considerations for CO_2 Reduction."* (poster)
10. Rutgers, The State University of New Jersey, New Brunswick, NJ. February 8, 2018. "*Chemical and Electrochemical Approaches to Moving Protons and Electrons with Metal Hydride Complexes.*" (invited talk)
11. ETH Zürich, Laboratorium für Anorganische Chemie, Switzerland. November 14, 2017. "*Chemical and Electrochemical Approaches to Moving Protons and Electrons with Metal Hydride Complexes.*" (invited talk)
12. Southern California Inorganic Photochemistry Conference, University of Southern California Wrigley Institute, CA. September 16, 2017. *"Electrochemical Reduction of Imidazolium Carboxylates."* (talk)
13. 253rd ACS National Meeting & Exposition, San Francisco, CA. April 2, 2017. *"N-Heterocyclic Carbenes as Promoters for the Heterogeneous Reduction of CO_2 at Metal Electrodes."* (talk)
14. Southern California Inorganic Photochemistry Conference, University of Southern California Wrigley Institute, CA. September 17, 2016. *"NHC Promoters for the Heterogeneous Reduction of CO_2 at Metal Electrodes."* (talk)
15. 30th Annual Johnson Symposium, Stanford University, CA. October 9, 2015. *"Multi-Electron Transfer at Cobalt: Influence of the Azopyridine Ligand."* (poster)
16. Annual GCEP Research Symposium 2014: Moving the Clean Energy Agenda Forward, Stanford University, CA. October 14, 2014. *"Chemical and Electrochemical Investigations of the Transfer Hydrogenation Catalyst [Ru(CNN)(dppb)H]."* (poster)
17. 29th Annual Johnson Symposium, Stanford University, CA. October 10, 2014. *"Chemical and Electrochemical Investigations of the Transfer Hydrogenation Catalyst [Ru(CNN)(dppb)H]."* (poster)
18. 248th ACS National Meeting & Exposition, San Francisco, CA. August 11, 2014. *"Chemical and Electrochemical Investigations of the Transfer Hydrogenation Catalyst [Ru(CNN)(dppb)H]."* (poster)
19. International Symposium on Homogeneous Catalysis XIX, Ottawa, Canada. July 4, 2014. *"Chemical and Electrochemical Investigations of the Transfer Hydrogenation Catalyst [Ru(CNN)(dppb)H]."* (poster)

20. Annual GCEP Research Symposium 2013: Advanced Technologies for Affordable Low-Carbon Energy, Stanford University, CA. October 8, 2013. *"Carbonyl Insertion into the Ruthenium-Hydride Bond of [Ru(CNN)(dppb)H] and Electrocatalytic Hydrogen Evolution with (cyclopentadienyl)Cobalt(III) having a Pyridylpyrazole Ligand."* (poster)
21. Annual GCEP Research Symposium 2011: Addressing the Changing Energy Landscape, Stanford University, CA. October 4, 2011. *"Investigations of Octahedral Ruthenium Transfer Hydrogenation Catalysts for the Electrochemical Oxidation of Alcohols."* (poster)

SERVICE ACTIVITIES

Journal Reviewer	*ACS Applied Energy Materials*, *ACS Catalysis*, *Angewandte Chemie, ChemElectroChem*, *Chemical Science*, *Chemical Society Reviews*, *Chemistry – A European Journal*, *ChemSusChem*, *Inorganic Chemistry*, *Nature*, *Organometallics*
Grant Reviewer	ACS Petroleum Research Fund (2022) ACS Petroleum Research Fund (2021) DOE Basic Energy Sciences (2021) DOE Basic Energy Sciences (2020) NSF Grant Review Panellist (2019)
Organizer	Diversity in Chemistry Seminar Series, Rutgers University (2021-present)
Co-Organizer	"Emerging Areas in Inorganic Chemistry" Symposium, 259th ACS National Meeting, *cancelled due to Covid-19* (2020) International Solar Fuels Young Conference (ISF-2 Young), San Diego, CA (2017)
Faculty Advisor	CCB Diversity Committee, Rutgers University (2021-present)
Faculty Mentor	Aresty Summer Science Program (2019-2021) Research Intensive Summer Experience (RISE) Program (2019-2021)
Member	Rutgers School of Arts & Sciences Core Requirements Committee (2021-present)

RESEARCH PROGRAM

Current Support	ACS Petroleum Research Fund, Doctoral New Investigator Grant Kate M. Waldie (PI) $110,000 01/01/2022-08/31/2024 *Noble-Metal Reactivity at Cobalt: Using Redox Active Ligands to Promote Multi-Electron Transformations*, 65171-DNI3
Graduate Students	Hellan Kadukumblayil Moncy (2021-present, joint with Goldman Group) Navar Mercer White (2020-present) Sriram Katipamula (2018-present) Siddhant Warrier (2018-present) Minzhu Zou (2018-present)
Postdoc. Associates	Dr. Andrew Cook (2019-2021)

Undergraduates	Andrew Fedors, 2021-present (Aresty Program 2021, Rutgers 2024) Kaitlin Cheung, 2020-present (Rutgers 2023) Isabella Niedzwiecki, 2020-present (Aresty Program 2020, Rutgers 2023) Priya Patel, 2018-present (Aresty Program 2019, Rutgers 2022) Ronaldo Franjul, Summer 2020 (RISE Program 2020) Zachary Clifford, Summer 2019 (RISE Program 2019) Victoria Diaz, Summer 2018 (RISE Program 2021) Jingjing Jin, Fall 2018 (Rutgers 2019)

TEACHING

Chem 459/549	Electroanalytical Chemistry (Fall 2018, Fall 2020)
Chem 164	Honors General Chemistry II (Spring 2020, Spring 2022)