Christina W. Li

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PROFESSIONAL POSITIONS

Assistant Professor *2016-Present*
Purdue University, Department of Chemistry, West Lafayette, IN

Organic Chemistry Intern *2009-2010*
Bayer CropScience, Discovery Chemistry, Frankfurt Höchst, Germany

EDUCATION

UC Berkeley, Department of Chemistry, Berkeley, CA *2015-2016*
Postdoctoral Fellow
Advisor: Professor A. Paul Alivisatos

Stanford University, Stanford, CA. *2010-2015*
Ph.D. Chemistry, June 2015
Advisor: Professor Matthew W. Kanan

Harvard University, Cambridge, MA. *2005-2009*
A.B. Chemical and Physical Biology, June 2009
Advisor: Professor David A. Evans

RESEARCH OVERVIEW

The Li group focuses on the development of new synthetic methods for molecularly-precise materials and their applications in thermal catalysis, renewable energy conversion, organic synthesis, and optoelectronics. Focus areas include colloidal synthesis, nanoparticle ligand exchange, single atom functionalization, electrocatalysis, gas-phase catalysis, mechanistic studies, X-ray spectroscopy, and electron microscopy.

AWARDS AND HONORS

National Science Foundation CAREER Award	*2021*
Outstanding Contributions to Teaching by an Assistant Professor, Purdue University College of Science	*2020*
Seeds for Success Award, Purdue University	*2018*
Showalter Research Trust Award, Purdue University	*2018*

Gordon Research Conference in Catalysis, Best Poster Award	*2018*
Kirk Endowment Exploratory Research Award, Purdue University	*2016*
Daniel Cubicciotti Student Award, Electrochemical Society	*2015*
Abbott Laboratories Fellow, Stanford Graduate Fellowship	*2013-2015*
Global Climate and Energy Project Distinguished Student Lecturer Award, Stanford University	*2014*
National Science Foundation Graduate Research Fellowship	*2010-2013*
Pfizer Undergraduate Research Fellowship	*2008*
Harvard College Research Program Fellowship	*2007*

PUBLICATIONS (INDEPENDENT RESEARCH)

*****Corresponding Author**,** †Equal Contribution, *Undergraduate Author*

15. Hong, W.†; Meza, E.†; **Li, C. W.*** Controlling Co–S Coordination Environment in Co-Doped WS_2 Nanosheets for Electrochemical Oxygen Reduction. *Submitted.*
14. Shumski, A. J.; Swann, W. A.; Escorcia, N. J.; **Li, C. W.*** Heterogeneous Hydroxyl-Directed Hydrogenation: Control of Diastereoselectivity through Bimetallic Surface Composition. *Submitted.*
13. Martinez, E. Y.; Zhu, K.; **Li, C. W.*** Influence of the Defect Stability on n-Type Conductivity in Electron-Doped α- and β-$Co(OH)_2$ Nanosheets. *Inorg. Chem.,* **2021***, ASAP. (Invited Article: Heterogeneous Interfaces through the Lens of Inorganic Chemistry)*
12. Yadav, V.; Lowe, J. S.; Shumski, A. J.; *Liu, E. Z.*; Greeley, J.; **Li, C. W.*** Modulating the Structure and Hydrogen Evolution Reactivity of Metal Chalcogenide Complexes through Ligand Exchange onto Colloidal Au Nanoparticles. *ACS Catalysis,* **2020**, *10*, 13305-13313.
11. Martinez, E. Y.; Zhu, K.; **Li, C. W.*** Reversible Electron Doping of Layered Metal Hydroxide Nanoplates (M = Co, Ni) Using n-Butyllithium. *Nano Letters,* **2020**, 20, 7580-7587*.*
10. Escorcia, N. J.; LiBretto, N. J.; Miller, J. T.; **Li, C. W.*** Colloidal Synthesis of Well-Defined Bimetallic Nanoparticles for Non-Oxidative Alkane Dehydrogenation. *ACS Catalysis*, **2020**, *10*, 9813-9823*.*
9. Meza, E.; Diaz, R. E.; **Li, C. W.*** Solution-Phase Activation and Functionalization of Colloidal WS_2 Nanosheets with Ni Single Atoms. *ACS Nano*, **2020**, *14*, 2238-2247.
8. Hong, W.; **Li, C. W.*** Microstructural Evolution of Au@Pt Core-shell Nanoparticles under Electrochemical Polarization. *ACS Appl. Mater. Interfaces*, **2019**, *11*, 30977-30986.
7. Martinez, E. Y.; **Li, C. W.*** Surface Functionalization of Pt Nanoparticles with Metal Chlorides for Bifunctional CO Oxidation. *Polyhedron*, **2019**, *170*, 239-244. (*Invited Article: Women with MOxy: Metal Oxide Chemistry from Female Investigators)*
6. Huang, X.; Shumski, A. J.; *Zhang, X.*; **Li, C. W.*** Systematic Control of Redox Properties and Oxygen Reduction Reactivity through Colloidal Ligand-Exchange Synthesis of Pd on Au. *J. Am. Chem. Soc.*, **2018**, *140*, 8918-8923.

PUBLICATIONS (POSTDOCTORAL AND GRADUATE RESEARCH)

5. **Li, C. W.**†; Verdaguer-Casadevall, A.†; Johansson, T. P.; Scott, S. B.; McKeown, J. T.; Kumar, M.; Stephens, I. E. L.; Kanan, M. W.*; Chorkendorff, I.* Probing the Active Surface Sites for CO Reduction on Oxide-derived Copper Electrocatalysts. *J. Am. Chem. Soc.* **2015**, *137*, 9808-9811.
4. **Li, C. W.**; Ciston, J.; Kanan, M. W.* Electroreduction of carbon monoxide to liquid fuel on oxide-derived nanocrystalline copper. *Nature* **2014**, *508*, 504-507.
3. Chen, Y.; **Li, C. W.**; Kanan, M. W.* Aqueous CO_2 Reduction at Very Low Overpotential on Oxide-derived Au Nanoparticles. *J. Am. Chem. Soc.* **2012**, *134*, 19969-19972.
2. **Li, C. W.**; Kanan, M. W.* CO_2 Reduction at Low Overpotential on Cu Electrodes Resulting from the Reduction of Thick Cu_2O Films. *J. Am. Chem. Soc.* **2012**, *134,* 7231-7234.
1. Peterson, A. A.; Grabow, L. C.; Brennan, T. P.; Shong, B.; Ooi, C.; Wu, D. M.; **Li, C. W.**; Kushwaha, A.; Medford, A.; Mbuga, F.; Li, L.; Norskov, J.* Finite-Size Effects in O and CO Adsorption for the Late Transition Metals. *Topics in Catalysis* **2012**, 1-7.

PATENTS

2. **Li, C. W.**; Shumski, A. J.; Swann, W. A. Heterogeneous Substrate-Directed Hydrogenation: Control of Diastereoselectivity through Bimetallic Surface Ensemble Geometry. U.S. Patent Application No. 63,135,777. January 11, 2021.
1. Kanan, M. W.; Chen, Y.; **Li, C. W.** Catalysts for Low Temperature Electrolytic CO_2 Reduction. U.S. Patent 9,255,335, February 9, 2016.

FUNDING SOURCES

ACTIVE SUPPORT

NSF CAREER Award (CHE-2045013) *2021-2026*
"CAREER: CAS: Colloidal Ligand-Exchange Synthesis of Dilute Noble Metal Surfaces for Electrosynthesis of Hydrogen Peroxide"

NSF Engineering Research Center (EEC-1647722) *2017-2022*
"Center for Innovative and Strategic Transformation of Alkane Resources (CISTAR)"

NSF Standard Grant (DMR-2004339) *2020-2023*
"Enhance Exciton Transport in Perovskite Quantum Dot Solids Through Coherent Interactions"

COMPLETED SUPPORT

Purdue Research Foundation Grant *2020-2021*
"A General Platform for Electron Doping and Atomically-Precise Surface Functionalization of Two-Dimensional Nanomaterials"

Purdue Research Foundation Summer Faculty Grant *2020*

"A General Platform for Electron Doping and Atomically-Precise Surface Functionalization of Two-Dimensional Nanomaterials"

Ralph W. and Grace M. Showalter Research Trust Award *2018-2019*
"Sinter-Resistant Core-Shell Catalysts for Carbon Monoxide Oxidation Prepared via Colloidal Ligand Exchange"

Purdue Research Foundation Grant *2018-2019*
"Surface Ligands Control the Selectivity of Pd Nanoparticles in Catalytic Hydrosilylation"

Kirk Endowment Exploratory Research Recharge Grant *2016-2018*

SELECTED PRESENTATIONS

22. University of Oregon, Eugene, OR. October 22, 2021.
21. Columbia University, New York, NY. September 24, 2021.
20. Rice University, Houston, TX. September 8, 2021.
19. Texas A&M University, College Station, TX. *Virtual*. May 20, 2021.
18. CISTAR Brown Bag Seminar Series. *Virtual*. March 17, 2021.
17. University of California, San Diego. La Jolla, CA. *Virtual.* December 11, 2020.
16. Washington University in St. Louis. St. Louis, MO. *Virtual.* December 3, 2020.
15. University of California, Riverside. Riverside, CA. *Virtual.* November 6, 2020.
14. University of Indiana, Bloomington. Bloomington, IN. *Virtual.* September 22, 2020.
13. ACS Central Regional Meeting. Columbus, OH. "Electrocatalysis for Sustainable Energy" May 27-28, 2020. *(Postponed due to COVID-19)*
12. ACS Spring Meeting. Philadelphia, PA. "Emerging Areas in Inorganic Chemistry" March 24, 2021. *(Postponed due to COVID-19)*
11. ACS Spring Meeting. Philadelphia, PA. "Molecular Insight in Materials Catalysis" March 22, 2021. *(Postponed due to COVID-19)*
10. GRC, Atomically-Precise Nanochemistry. Galveston, TX. February 9-14, 2020. Poster.
9. ACS Fall Meeting. San Diego, CA. "Charge and Substrate Transport in 3D Electrocatalytic Materials" August 26, 2019.
8. North American Catalysis Society Meeting (NAM). Chicago, IL. June 23-28, 2019.
7. CISTAR Annual Meeting. West Lafayette, IN. May 22, 2019.
6. Auburn University. Auburn, AL. April 23, 2019.
5. Purdue University Fort Wayne. Fort Wayne, IN. April 12, 2019.
4. GRC, Inorganic Reaction Mechanisms. Galveston, TX. March 10-15, 2019. Poster.
3. GRC, Colloidal Semiconductor Nanocrystals. Smithfield, RI. July 15-20, 2018. Short Talk.
2. GRC, Catalysis. New London, NH. June 24-29, 2018. Poster.
1. GRC, Inorganic Chemistry. Biddeford, ME. June 17-22, 2018. Poster.

ENGAGEMENT ACTIVITIES

Outreach Activities

Organized professional development panel: "Jobs in the Semiconductor Industry"	*2021*
Hosted an undergraduate for an NSF REU program	*2019*
Designed and organized "AP Fridays" electrochemistry outreach event for high-school students	*2018-present*
Participated in "Feasting with Faculty" program for undergraduate students	*2018-present*
Discussion leader and career panelist at the Inorganic Chemistry GRS	*2018*
Hosted a high-school chemistry teacher for an NSF RET program	*2018*
Guest speaker at the Summer Science Program for high school students	*2017-present*
Launched and organized Purdue Student Hosted Colloquium Series	*2017-present*
Mentor for the Purdue Student Soybean Product Innovation Competition	*2016-present*

Professional Activities

Manuscript Reviewer: Nature Communications, Nature Catalysis, Journal of the American Chemical Society, Nano Letters, ACS Catalysis, Chemistry of Materials, Journal of Physical Chemistry, ACS Applied Materials and Interfaces, ACS Applied Energy Materials, ACS Energy Letters, Chemical Science, Journal of Catalysis, Catalysis Today, Nano Energy, Applied Catalysis B

Ad Hoc Grant Reviewer: NSF Catalysis Program, ACS PRF DNI Program

Review Panel Member: NSF Catalysis Program

Symposium Organizer:

North American Catalysis Society Meeting, July 2019, Electrocatalysis and Photocatalysis

ACS Spring Meeting 2020, Molecular Insight in Materials Catalysts (postponed due to COVID-19)

Purdue University

Graduate Studies Committee	*2020-present*
Undergraduate Studies Committee	*2016-2020*
College of Science Elections Committee	*2018-present*
Department of Chemistry Executive Committee	*2017-2019*
Search Committee for an Inorganic Faculty Position	*2017, 2018, 2019*

TEACHING ACTIVITIES

Title of Course	Semester	Course	# of Students
General Chemistry II	Spring 2021	CHM 116, UG	1338
Inorganic Seminar	Spring 2021	CHM 695, Grad	40
Advanced Inorganic Chemistry	Fall 2020	CHM 641, Grad	15
Jr.-Sr. Chemistry Seminar	Spring 2020	CHM 494, UG	34
Inorganic Seminar	Spring 2020	CHM 695, Grad	49
Advanced Inorganic Chemistry	Fall 2019	CHM 641, Grad	22
General Chemistry II	Spring 2019	CHM 116, UG	541
Inorganic Seminar	Spring 2019	CHM 695, Grad	45
Advanced Inorganic Chemistry	Fall 2018	CHM 641, Grad	22
General Chemistry II	Spring 2018	CHM 116, UG	642
Inorganic Seminar	Spring 2018	CHM 695, Grad	38
Advanced Inorganic Chemistry	Fall 2017	CHM 641, Grad	17
Advanced Inorganic Chemistry	Fall 2016	CHM 641, Grad	24

MENTORING ACTIVITIES

Current Graduate Students	Year of Entry
Vamakshi Yadav, *CISTAR Fellow* M.S. IIT Gandhinagar, B.S. University of Delhi	2017
Wei Hong, *Purdue Research Foundation Fellow* M.S. University of Akron, B.E. East China University of Science and Technology	2017
Kuixin Zhu B.S. Tsinghua University	2018
Daniel Clark, *Andrews Fellowship* B.S. Hope College	2018
William Swann B.S. University of South Alabama	2019
Nicholas Koehn B.S. St. Norbert's College	2020

Ph.D. Degrees Granted

Eve Martinez, *Bilsland Fellowship, Purdue Research Foundation Fellow* B.S. Knox College	Ph.D., May 2021

Nicole Escorcia, *CISTAR Fellow* — Ph.D., May 2021
M.S. and B.S. St. John's University

Erika Meza, *Purdue Research Foundation Fellow* — Ph.D., May 2021
B.S. Union College

Alexander Shumski — Ph.D., May 2021
B.S. Penn State University

M.S. Degrees Granted

Toma Bhowmick — M.S., May 2021
B.S. University of Dhaka