

STEVEN P. CUMMINGS

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EDUCATION

- Ph.D. in Inorganic Chemistry** May 2012
Purdue University – West Lafayette, IN
Thesis Title: *Modifying the axial ligand of diruthenium compounds to be purposed for silicon chemistry*
- B.S. in Neuroscience and B.A. in Chemistry** June 2007
University of California, Santa Cruz – Santa Cruz, CA

RESEARCH EXPERIENCE

- Assistant Professor** 2017 – current
Howard University
- *Application of boron clusters to develop new transition metal compounds for studies in asymmetric catalysis*
- Post-Doctoral Fellow:** with Dr. Ben Stokes 2015 – 2017
University of California, Merced
- *Method development and scope discovery for hydrogenation of unsaturated hydrocarbons using water*
 - *Determine efficacy of proposed mechanism and develop homogenous catalyst for hydrogenation using water as the proton source*
 - *New lab setup by training graduate and undergraduate students, assist with grant writing*
 - *Chemical Hygiene Officer responsible for preparation of SOP's and maintaining compliance with CalOSHA and EH&S*
- Post-Doctoral Fellow:** with Dr. Chris Reed 2012 – 2015
University of California, Riverside
- *Syntheses dependent on air-free techniques via glove box and Schlenk lines for carborane acid preparation along with PFA and stainless steel Schlenk lines for HF and F₂ gases*
 - *Synthesis and characterization of highly reactive cationic compounds stabilized by carborane anions for manuscript preparation*
 - *Chemical Hygiene Officer responsible for preparation of SOP's and maintaining compliance with CalOSHA and EH&S*
- Graduate Research Assistant:** with Dr. Tong Ren 2007 – 2012
Purdue University
- *Synthesized ligands for preparation of organometallic diruthenium compounds along with their characterization for manuscript preparation*
 - *Trained graduate and undergraduate students in synthetic and characterization techniques while using safe laboratory practices*
 - *Maintained lab equipment and purchased raw materials for the group*
- Research Assistant:** with Dr. Scott Oliver 2005 – 2007
University of California, Santa Cruz
- *Synthesized cationic layered structures utilizing open layers for anion exchange of hazardous materials in aqueous media*

TEACHING EXPERIENCE

Lecturer: CalState Fullerton 2013

- Lecturer for general chemistry course responsible for presenting and testing students on material according to state standards

Teaching Assistant: Purdue University 2007 – 2009

- TA for general chemistry and lab courses of 48 students ensuring standard lab safety and techniques for three semesters
- TA for general chemistry and CASPiE lab module guiding 46 students in the design and completion of a laboratory project following standard lab safety and techniques

Modified Supplemental Instructor: University of California, Santa Cruz 2004 – 2006

- Tutor and TA for general chemistry, biochemistry, genetics

TECHNICAL EXPERTISE

- Inorganic/organometallic and organic synthesis
- Methodology Development
- Solid State Synthesis using hydrothermal techniques
- Schlenk lines, glove box and fluorine line techniques
- Electrochemistry, FT-IR, UV-vis-NIR, NMR, GC, ESI-MS, Fluorometry, XPS, magnetic balance
- Varian, Kaleidagraph, ChemDraw, EndNote, SHELXTL, Gaussian, Spartan

AFFILIATIONS

American Chemical Society

AWARDS AND HONORS

Dr. Ian Rothwell Inorganic Literature Seminar Award – Spring 2010

Outstanding Chemistry Teaching Assistant Award – Fall 2009

SELECTED PUBLICATIONS

Cummings, Steven P.; Le, T. N.; Fernandez, G.; Quiambo, L.; and Stokes, Benjamin. J.; *J. Am. Chem. Soc.* **2016**, *138*, 6107.

"Tetrahydroxydiboron-Mediated Palladium-Catalyzed Transfer Hydrogenation and Deuteration of Alkenes and Alkynes Using Water as the Stoichiometric H or D Atom Donor"

Cummings, S. P.; Hratchian, H. P.; Reed, C. A.; *Angew. Chem. Int. Ed.* **2016**, *55*, 1382.

"The Strongest Acid: Protonation of Carbon Dioxide"

Pookpanratana, S.; Savchenko, I.; Natoli, S. N.; Cummings, S. P.; Richter, L. J.; Robertson, J. W. F.; Richter, C. A.; Ren, T.; Hacker, C. A. *Langmuir* **2014**, *30*, 10280.

"Attachment of a Diruthenium Compound to Au and SiO₂/Si Surfaces by "Click" Chemistry"

Cao, Z.; Xi, B.; Jodoin, D. S.; Zhang, L.; Cummings, S. P.; Gao, Y.; Tyler, S. F.; Fanwick, P. E.; Crutchley R. J.; Ren, T.; *J. Am. Chem. Soc.* **2014**, *136*, 12174.

"Diruthenium-Polyyne-diyl-Diruthenium Wires: Electronic Coupling in the Long Distance Regime"

Nava, M.; Stoyanova, I. V.; Cummings, S. P.; Stoyanov E. S.; Reed, C. A.; *Angew. Chem. Int. Ed.* **2014**, *53*, 1131.

"The Strongest Brønsted Acid. Protonation of Alkanes at Room Temp."

Savchenko, J.; Cao, Z.; Natoli, S. N.; Cummings, S. P.; Prentice, B. M.; Fanwick P. E.; Ren, T.; *Organometallics*, **2013**, 32, 6461.

"New Diruthenium Bis-alkynyl Compounds as Potential Ditopic Linkers"

Cummings, S.P.; Savchenko, J.; Fanwick, P.E.; Ren, T. *J. Organomet. Chem.* **2013**, 745-746, 93.
(*Special Issue: 50th Anniversary*)

"Using Dialkyl-Triazene to Protect Organometallic Diazonium Compounds"

Cummings, S.P.; Savchenko, J.; Fanwick, P.E.; Kharlamova, A.; Ren, T. *Organometallics*, **2013**, 32, 1129.

"Diruthenium Alkynyl Compounds with Phosphonate Capping Groups"

Cummings, S.P.; Cao, Z.; Fanwick, P.E.; Kharlamova, A.; Ren, T. *Inorg. Chem.* **2012**, 51, 7561.

"Diruthenium(III,III) Ethynyl-phenyleneimine Molecular Wires: Preparation via On-Complex Schiff Base Condensation"

Cummings, S.P.; Geanes, A.R.; Fanwick, P.E.; Kharlamova, A.; Ren, T. *J. Organomet. Chem.* **2011**, 696, 3955.

(*Special Issue: Caulton – Metal Carbon Multiple Bonds*)

"Diruthenium σ -Iminophenylacetylide Complexes from On-Complex Schiff Base Condensation"

Cummings, S.P.; Savchenko, J.; Ren, T. *Coord. Chem. Rev. (Review)* **2011**, 15-16, 1587.

"Functionalization of flat Si surfaces with inorganic compounds--Towards molecular CMOS hybrid devices"

Cummings, S.P.; Liskey, C.W.; Geanes, A.R.; Fanwick, P.E.; Ren, T. *Organometallics* **2010**, 29, 2783.

"Diruthenium Phenylacetylide Complexes Bearing para-/meta-Amino Phenyl Substituents"

Swanson, C.H.; Cummings, S.P.; Grysell, M.; Tran, D.T.; Rogow, D.L.; Oliver, A.G.; Oliver, S.R.J. *Dalton Trans.* **2009**, 9849.

"A metal-organic framework *via* the reaction of benzoate with a cationic inorganic material"

PRESENTATIONS

Cummings, S.P.; Le, T. N.; Fernandez, G.; Quiambo, L.; Stokes, B. J.; ACS San Diego – 2016 (*oral*)
"Efficient Hydrogenation of Olefins Using Water as the Hydrogen Source"

Cummings, S.P.; Fanwick, P.; Kharlamova, A.; Ren, T.; ACS San Diego – 2012 (*oral*)
"Bis-iminophenylacetylide Diruthenium Complexes Synthesized by On-Complex Schiff Base Condensation"

Cummings, S.P.; Cao, Z.; Geanes, A.; Liskey, C.; Ren T.; PINDU – 2010 (*poster*)
"Progress in Synthesis and Characterization of Magnetic Molecules for Device Current Modulation"

Cummings, S.P.; Geanes, A.; Liskey, C.; Savchenko, J.; Ren T.; PINDU – 2009 (*poster*)
"Progress in Synthesis and Characterization of Magnetic Molecules for Device Current Modulation"

Cummings, S.P.; Liskey, C.; Ren T.; PINDU – 2008 (*poster*)
"Synthesis and Characterization of Magnetic Molecules for Device Current Modulation"

References

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