RICHARD L. BRUTCHEY, Ph.D.
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Professional Experience

Professor of Chemistry, University of Southern California	2016-Present
Ray R. Irani, Chairman of Occidental Petroleum Corporation Chair in Chemistry	2026-Present
Joseph Meyerhoff Visiting Professor, Weizmann Institute of Science	2022
Inorganic Section Head, Department of Chemistry, University of Southern California	2021-Present
Vice Chair, Department of Chemistry, University of Southern California	2014-2021
Associate Professor of Chemistry, University of Southern California	2013-2016
Visiting Professor of Chemistry, Swiss Federal Institute of Technology Zürich	2014
Assistant Professor of Chemistry, University of Southern California	2007-2013
Postdoctoral Fellow, UC Santa Barbara	2005-2007
Graduate Researcher, Department of Chemistry, UC Berkeley	2000-2005
Undergraduate Researcher, Department of Chemistry, UC Irvine	1997-2000

Professional Preparation

B.S., Chemistry (*magna cum laude*), UC Irvine 2000
Honors thesis title: "New Polymer Precursors from Polyhedral Oligosilsesquioxane Frameworks"
Advisor: Professor Frank J. Feher

Ph.D., Chemistry, UC Berkeley 2005
Thesis title: "Design and Synthesis of Heterogeneous Catalysts and Catalyst Supports Derived from Molecular Precursors"
Advisor: Professor T. Don Tilley

Postdoctoral Fellow, Materials, UC Santa Barbara 2005-2007
Advisor: Professor Daniel E. Morse

Honors & Awards

- ACS Langmuir Award, 2026
- RCSA Cottrell STAR (Science Teaching and Research) Award, 2025
- Fellow of the American Association for the Advancement of Science, 2024
- Fellow of the Royal Society of Chemistry, 2024
- USC Mentoring Award for Faculty Mentoring Graduate Students, 2023
- Phi Kappa Phi Faculty Recognition Award, 2021
- ACS Smalley-Curl Nanoscience Award, 2020
- RCSA SEED (Singular Exceptional Endeavor of Discovery) Award, 2020
- USC Mentoring Award for Faculty Mentoring Undergraduate Students, 2018
- RCSA Scialog® Collaborative Awards, 2014 & 2015
- Royal Society of Chemistry *Chemical Communications* Emerging Investigator, 2012
- Royal Society of Chemistry *Dalton Transactions* New Talent Honoree, 2012
- USC Raubenheimer Junior Faculty Award for Excellence in Teaching, Research & Service to the University, 2011
- Research Corporation for Science Advancement (RCSA) Cottrell Scholar Award, 2010
- National Science Foundation Graduate Research Fellowship, 2000
- Barry M. Goldwater Scholarship, 1998

- Phi Beta Kappa, 1998
- University of California Regents Scholarship, 1996

Professional Activities

- Associate Editor, *Inorganic Chemistry* (2023-present).
- Member of American Chemical Society (Division of Inorganic Chemistry and Division of Colloid and Surface Chemistry), Materials Research Society, AAAS (Chemistry Section), Royal Society of Chemistry.
- Chair, ACS Division of Inorganic Chemistry Nanoscience Subdivision (2026); Chair-Elect, ACS Division of Inorganic Chemistry Nanoscience Subdivision (2025).
- Editorial advisory board member for *Chemistry of Materials* (ACS) 2014-2020 and *Inorganic Chemistry* (ACS) 2020-2022.
- Guest Editor, Virtual Issue on Inorganic Nanomaterials, *Inorganic Chemistry* (2022).
- *Ad hoc* referee for *Accounts of Chemical Research*, *ACS Applied Energy Materials*, *ACS Applied Engineering Materials*, *ACS Applied Materials & Interfaces*, *ACS Applied Nano Materials*, *ACS Catalysis*, *ACS Energy Letters*, *ACS Nano*, *ACS Nanoscience Au*, *ACS Sustainable Chemistry & Engineering*, *ACS Omega*, *Advanced Materials*, *Advanced Functional Materials*, *Advanced Sustainable Systems*, *Angewandte Chemie International Edition*, *Applied Physics Letters*, *Chemical Communications*, *Chemical Reviews*, *Chemical Science*, *Chemical Society Reviews*, *Chemistry of Materials*, *Crystal Growth & Design*, *CrystEngComm*, *Dalton Transactions*, *Helvetica Chimica Acta*, *Inorganic Chemistry*, *Inorganic Chemistry Frontiers*, *Inorganica Chimica Acta*, *Journal of the American Chemical Society*, *Journal of Crystal Growth*, *Journal of the Electrochemical Society*, *Journal of Materials Chemistry A & C*, *Journal of Physical Chemistry C*, *Journal of Physical Chemistry Letters*, *Journal of Solid State Chemistry*, *Langmuir*, *Physical Chemistry Chemical Physics*, *Progress in Photovoltaics*, *Nano Letters*, *Nanoscale*, *Nature Chemistry*, *Nature Communications*, *Reaction Chemistry & Engineering*, *Science*, *Science Advances*, and *Small*.
- *Ad hoc* and panel referee for NSF DMR, IIP, and CHE; *ad hoc* referee for DOE BES and panel referee for DOE EERE; *ad hoc* referee for AFOSR; *ad hoc* referee for ACS PRF; *ad hoc* referee for Research Corporation for Science Advancement (RCSA); *ad hoc* referee for NSFC/RGC (PRC/Hong Kong); *ad hoc* referee for Swiss Federal Laboratories for Materials Science and Technology (Switzerland); *ad hoc* referee for the Pazy Foundation (Israel); *ad hoc* referee for Austrian Academy of Sciences (Austria).
- Chaired symposia: Pacifichem (2010), ACS National Meeting (spring 2011), NSF-sponsored SusChEM Workshop (2012), XXIV International Materials Research Congress (2015), XXVI International Materials Research Congress (2017), ACS National Meeting (spring 2018), DOE Materials Chemistry PI Meeting (2018), XXVIII International Materials Research Congress (2019).
- Organized symposia: Inorganic Materials symposium for ACS WRM (2011), DIC symposium on Solution Processed Semiconductors for ACS National Meeting (spring 2015), DIC symposium for the ACS Award in the Chemistry of Materials for ACS National Meeting (spring 2015), DIC symposium on Inorganic Chemistry of Lead Halide Perovskites for ACS National Meeting (spring 2018), symposium on Materials and the Environment for XXVIII International Materials Research Congress (2019), DIC symposium on Tailored Precursor Design for Inorganic Material Synthesis for ACS National Meeting (fall 2023), DIC symposium for the F. Albert Cotton Award in Synthetic Inorganic Chemistry for ACS National Meeting (spring 2026).
- Emeritus Member of Board of Directors for Anton B. Burg Foundation (2026-present); Member of Board of Directors for Anton B. Burg Foundation (2015-2025).
- Board Member of Kalaniyot Chapter at USC (2025-present).
- ACS National Awards selection sub-committee chair (Inorganic Section, 3-year term), ACS Tolman Award selection committee chair (Southern California Section, 2-year term).

- External Advisory Committee member for School of Science at Hong Kong University of Science and Technology (2023-2026).
- External Review Committee member for Department of Chemistry at UC Riverside (2024).

Publications & Presentations

Key: Corresponding author(s) underlined; USC advised undergraduate, graduate, and postdoctoral trainee(s) asterisked*.

(a) Independent Peer Reviewed Journal Articles from USC – Manuscripts Submitted

[1] Madani, M. S.; Pan, B.; Forsberg, A. P.*; Ward-O'Brien, B.*; **Brutchey, R. L.**; Malmstadt, N. *In Situ* Synchrotron SAXS Reveals Ionic Liquid-Enhanced Nucleation during Polyol Synthesis of Platinum Nanoparticles. **2026**, manuscript submitted.
[2] Chen, Y.*; **Brutchey, R. L.** Cu and Ag Separation in Alkahest-Enabled Electrochemical Processing of Sulfide Minerals. **2026**, manuscript submitted.
[3] Sun, Z.*; Carroll, M. V.; Chen, Y.*; Russell, P. P.; Claes, R.; Squires, A. G.; Scanlon, D. O.; **Brutchey, R. L.** Dimension-Controlled $Cu_{3-y}A_yVS_{4-x}Se_x$ (A = K, Rb, Cs) via Soft Chemistry for Tunable Solar Absorbers. **2026**, manuscript submitted.
[4] Ward-O'Brien, B.*; Lee, H.; Baddour, F. G.; Ruddy, D. A.; **Brutchey, R. L.** Direct Colloidal Synthesis of High-Entropy Carbide Nanoparticles with Altered CO_2 Hydrogenation Selectivity. **2026**, manuscript submitted.
[5] Brady, C. E.; Forsberg, A.*; Chai, W.; Cabado, P.; Mader, K.; Zakharov, D.; Yang, J.; Werth, C. J.; Baddour, F.; Henkelman, G.; **Brutchey, R. L.**; Humphrey, S. M. ReO_x Nano-Islands Supported on Ag: Active Catalysts for Partial Oxidation of Methane to Methanol and Other Light Liquid Oxygenates. **2026**, manuscript submitted.

(b) Independent Peer Reviewed Journal Articles from USC – Manuscripts In Press or Published

[6] Pan, B.; Forsberg, A. P.*; Chairil, R.; Madani, M. S.; Habas, S. E.; Baddour, F. G.; **Brutchey, R. L.**; Malmstadt, N. Decoding α-MoC_{1-x} Nanoparticle Formation in Continuous Flow *via* Machine Learning. *Small* **2026**, *22*, e74006.
[7] Sun, Z.*; **Brutchey, R. L.** Molecular Programming of Diorganyl Dichalcogenides for Rational Nanocrystal Design. *Accounts of Chemical Research* **2026**, *59*, 1546-1556.
[8] Pakhanyan, C. P.*; Forsberg, A. P.*; **Brutchey, R. L.** Cation-Exchange and Lateral Ripening in Wurtzite-Like $CuInSe_2$ Formation from Weissite-Like $Cu_{2-x}Se$. *Nanoscale* **2026**, *18*, 8376-8384.
[9] Forsberg, A. P.*; Khakre, Y.; Marinescu, S. C.; **Brutchey, R. L.** Sustainable Synthesis of NiMo Alloy Nanoparticles for Hydrogen Evolution Catalysis Using a Recyclable Ionic Liquid Solvent. *ChemSusChem* **2026**, *19*, e70620.
[10] Sun, Z.*; Ward-O'Brien, B.*; Chen, Y.*; **Brutchey, R. L.** Size-Controlled Synthesis of Ultrasmall Cu_3VS_4 Nanocrystals via Direct Ternary Nucleation. *Chemical Communications* **2026**, *62*, 5655-5659.
[11] Ward-O'Brien, B.*; Forsberg, A.*; Chen, Y.*; Malmstadt, N.; Madani, M. S.; **Brutchey, R. L.** Mechanistic Insights into the Aminolytic Decomposition of $Mo(CO)_6$ to Form MoC_{1-x} Nanoparticles. *Chemistry of Materials* **2026**, *38*, 1951-1959.
[12] Chen, Y.*; **Brutchey, R. L.** Mild and Selective Alkahest-Enabled Electrochemical Extraction of Critical Elements from Ores. *ACS Energy Letters* **2026**, *11*, 2282-2289.
[13] Strumolo, M. J.*; Chen, Y.*; **Brutchey, R. L.** Solution Processed CuAgS Absorber Layers from a Thiol-Amine-Based Ink. *Journal of Solid State Chemistry* **2026**, *353*, 125664.
[14] Strumolo, M. J.*; Sun, Z.*; Larimojarad, I.; Kapadia, R.; **Brutchey, R. L.** Data Driven Control of Defect Formation in Solution Deposited Sb_2Se_3 Thin Films. *Advanced Materials Interfaces* **2025**, *12*, e00798.
[15] Sun, Z.*; Pakhanyan, C. P.*; Saleem, U.; Feldman, E. I.; Sharada, S. M.; **Brutchey, R. L.** Polymorphic Control of $CsGaE_2$ (E = S, Se) Using Diorganyl Dichalcogenide Precursors. *Inorganic Chemistry* **2025**, *64*, 21796-21800.

[16] Sun, Z.*; Pham, N.; Derakhshan, S.; **Brutchey, R. L.** Colloidal Synthesis of Ultrathin $KFeS_2$ and $RbFeS_2$ Magnetic Nanowires with Non-van der Waals 1D Structures. *Chemical Science* **2025**, *16*, 18722-18728.
[17] Sun, Z.*; Baluyot-Reyes, N.; Zamarripa, K.*; Djurovich, P. I.; Thompson, M. E.; **Brutchey, R. L.** Polytypic Zn–(In,Ga)–Se Nanocrystals with Tunable Emission. *Nano Letters* **2025**, *25*, 14310-14316.
[18] Sun, Z.*; Chen, Y.*; **Brutchey, R. L.** Band Gap Engineering and Metastable Phase Discovery in $Cu_2BaSnS_{1-x}Se_x$ Nanocrystals *via* Topotactic Anion Exchange. *Journal of the American Chemical Society* **2025**, *147*, 21219-21230.
[19] Koskela, K. M.*; Pakhira, A.; Strumolo, M. J.*; Banerjee, S.; **Brutchey, R. L.** Interplay Between Cation "Coloring" and Stereochemically Active Lone Pairs in $AgBiS_2$ Thin Films. *Inorganic Chemistry* **2025**, *64*, 10097-10105. (most read article)
[20] Crans, K.D.*; Sun, Z.*; Nehoray, A. A.*; **Brutchey, R. L.** Data-Driven Mapping of the Cesium Cadmium Bromide Phase Space Utilizing a Soft-Chemistry Approach. *Inorganic Chemistry* **2025**, *64*, 10228-10237.
[21] Bang, S.; Liu, J.; Wang, B.; Mora Perez, C.; Liu, T.-R.; Crans, K. D.*; Sun, Z.*; Strzelecki, A.; Prehzdo, O. V.; Shao, Y.-T.; Guo, X.; **Brutchey, R. L.** High Pressure Phase Transition of Metastable Wurtzite-Like $CuInSe_2$ Nanocrystals. *Chemistry of Materials* **2025**, *37*, 2611-2618.
[22] Chairil, R.; Forsberg, A. P.*; **Brutchey, R. L.**; Malmstadt, N. High-Throughput Reaction Discovery for Cs-Pb-Br Nanocrystal Synthesis. *Reaction Chemistry & Engineering* **2025**, *10*, 398-406.
[23] Crans, K. D.*; Cohen, H.; Nehoray, A. A.*; Oron, D.; Kazes, M.; **Brutchey, R. L.** A Redox Active Ionic Liquid Surace Treatment for Healing $CsPbBr_3$ Nanocrystals. *Nano Letters* **2024**, *24*, 16015-16021.
[24] Sun, Z.*; Mora Perez, C.; Prezhdo, O. V.; **Brutchey, R. L.** Colloidal $AInSe_2$ (A = K, Rb, Cs) Nanocrystals with Tunable Crystal and Band Structures. *ACS Nanoscience Au* **2024**, *4*, 381-390.
[25] Pan, B.; Madani, M. S.; Forsberg, A. P.*; **Brutchey, R. L.**; Malmstadt, N. Solvent Dependence of Ionic Liquid-Based Pt Nanoparticle Synthesis: Machine Learning-Aided In-Line Monitoring in a Flow Reactor. *ACS Nano* **2024**, *18*, 25542-25551.
[26] Karadaghi, L. R.*; Williamson, E. M.*; To, A. T.; Forsberg, A. P.*; Crans, K. D.*; Perkins, C. L.; Hayden, S. C.; LiBretto, N. J.; Baddour, F. G.; Ruddy, D. A.; Malmstadt, N.; Habas, S. E.; **Brutchey, R. L.** Multivariate Bayesian Optimization of CoO Nanoparticles for CO_2 Hydrogenation Catalysis. *Journal of the American Chemical Society* **2024**, *146*, 14246-14259.
[27] Kleinhanns, T.; Milillo, F.; Calcabrini, M.; Fiedler, C.; Horta, S.; Balazs, D.; Strumolo, M. J.*; Hasler, R.; Llorca, J.; Tkadletz, M.; **Brutchey, R. L.**; Ibañez, M. A Route to High Thermoelectric Performance: Solution-Based Control of Microstructure and Composition in Ag_2Se. *Advanced Energy Materials* **2024**, *14*, 2400408.
[28] Pan, B.; Karadaghi, L. R.*; **Brutchey, R. L.**; Malmstadt, M. A Multistep, Multicomponent Extraction and Separation Microfluidic Route to Recycle Water-Miscible Ionic Liquid Solvents. *Industrial & Engineering Chemistry Research* **2024**, *63*, 489-497.
[29] Lee, H.*; Theerthagiri, J.; Kumari, M. L. A.; Min, A.; Moon, C. J.; Anbazhagan, V.; **Brutchey, R. L.**; Choi, M. Y. Leveraging Phosphate Group in Pd/PdO Decorated Nickel Phosphate Microflowers via Pulsed Laser for Robust Hydrogen Production in Hydrazine-Assisted Electrolyzer. *International Journal of Hydrogen Energy* **2024**, *57*, 176-186.
[30] Williamson, E. M.*; **Brutchey, R. L.** Using Data-Driven Learning to Predict and Control the Outcomes of Inorganic Materials Synthesis. *Inorganic Chemistry* **2023**, *62*, 16251-16262. (most read article)
[31] Karadaghi, L. R.*; Pan, B.; Baddour, F. G.; Malmstadt, N.; **Brutchey, R. L.** A Techno-Economic Approach to Guide the Selection of Flow Recyclable Ionic Liquids for Nanoparticle Synthesis. *RSC Sustainability* **2023**, *1*, 1861-1873.
[32] Williamson, E. M.*; Sun, Z.*; Tappan, B. A.*; **Brutchey, R. L.** Predictive Synthesis of Copper Selenides using a Multidimensional Phase Map Constructed with a Data-Driven Classifier. *Journal of the American Chemical Society* **2023**, *145*, 17954-17964.

[33] Crans, K. D.*; Bain, M.; Bradforth, S. E.; Oron, D.; Kazes, M.; **Brutchey, R. L.** The Surface Chemistry of Ionic Liquid-Treated $CsPbBr_3$ Quantum Dots. *Journal of Chemical Physics* **2023**, *158*, 174709.
[34] Strumolo, M. J.*; Eremin, D. B.; Wang, S.; Mora Perez, C.; Prezhdo, O. V.; Figueroa, J. S.; **Brutchey, R. L.** Formation of a P_{16}^{2-} Ink from Elemental Red Phosphorus in a Thiol-Amine Mixture. *Inorganic Chemistry* **2023**, *62*, 6197-6201. (most read article)
[35] Pan, B.; Karadaghi, L. R.*; **Brutchey, R. L.**; Malmstadt, N. Purification of Ionic Liquid Solvents in a Self-Optimizing, Continuous Microfluidic Process via Extraction of Metal Ions and Phase Separation. *ACS Sustainable Chemistry & Engineering* **2023**, *11*, 228-237.
[36] Williamson, E. M.*; Sun, Z.*; Mora-Tamez, L.*; **Brutchey, R. L.** Design of Experiments for Nanocrystal Syntheses: A How-To Guide for Proper Implementation. *Chemistry of Materials* **2022**, *34*, 9823-9835.
[37] Williamson, E. M.*; Ghrist, A.*; Karadaghi, L. R.*; Smock, S. R.*; Barim, G.*; **Brutchey, R. L.** Creating Ground Truth for Nanocrystal Morphology: A Fully Automated Pipeline for Unbiased Transmission Electron Microscopy Image Analysis. *Nanoscale* **2022**, *14*, 15327-15339.
[38] Karadaghi, L. R.*; To, A. T.; Habas, S. E.; Baddour, F. G.; Ruddy, D. A.; **Brutchey, R. L.** Activating Molybdenum Carbide Nanoparticle Catalysts Under Mild Conditions Using Thermally Labile Ligands. *Chemistry of Materials* **2022**, *34*, 8849-8857.
[39] Koskela, K. M.*; Mora Perez, C.; Eremin, D. B.; Evans, J. M.; Lewis, N. S.; Prezhdo, O. V.; **Brutchey, R. L.** Polymorphic Control of Solution Processed Cu_2SnS_3 Films with Thiol-Amine Ink Formulation. *Chemistry of Materials* **2022**, *34*, 8654-8663.
[40] Chang, C.; Lee, S. H.; Spadaro, M. C.; Koskela, K. M.*; Kleinhanns, T.; Costanzo, T.; Arbiol, J.; **Brutchey, R. L.**; Ibáñez, M. Surface Functionalization of Surfactant-Free Particles: A Strategy to Tailor the Properties of Nanocomposites for Enhanced Thermoelectric Performance. *Angewandte Chemie, International Edition* **2022**, *61*, e202207002. (very important paper)
[41] Cottingham, P.*; **Brutchey, R. L.** Temperature-Dependent Behavior in the Local Structure of $BaTiO_3$ Nanocrystals. *CrystEngComm* **2022**, *24*, 5400-5404. (HOT article)
[42] Koskela, K. M.*; Quiton, S. J.; Sharada, S. M.; Williams, T. J.; **Brutchey, R. L.** Kinetics and Mechanistic Details of Bulk ZnO Dissolution Using a Thiol-Imidazole System. *Chemical Science* **2022**, *13*, 3208-3215.
[43] Karadaghi, L. R.*; Madani, M. S.; Williamson, E. M.*; To, A. T.; Habas, S. E.; Baddour, F. G.; Schaidle, J. A.; Ruddy, D. A.; **Brutchey, R. L.**; Malmstadt, N. Throughput Optimization of Molybdenum Carbide Nanoparticle Catalysts in a Continuous Flow Reactor Using Design of Experiments. *ACS Applied Nano Materials* **2022**, *5*, 1966-1975.
[44] Tappan, B. A.*; Crans, K. D.*; **Brutchey, R. L.** Formation Pathway of Wurtzite-Like $Cu_2ZnSnSe_4$ Nanocrystals. *Inorganic Chemistry* **2021**, *60*, 17178-17185.
[45] Koskela, K. M.*; Strumolo, M. J.*; **Brutchey, R. L.** Progress of Thiol-Amine "Alkahest" Solutions for Thin Film Deposition. *Trends in Chemistry* **2021**, *3*, 1061-1073.
[46] Koskela, K. M.*; Tadle, A. C.; Chen, K.; **Brutchey, R. L.** Solution Processing Cu_3BiS_3 Absorber Layers with a Thiol-Amine Solvent Mixture. *ACS Applied Energy Materials* **2021**, *4*, 11026-11031.
[47] Smock, S. R.*; Alimento, R.; Mallikarjun Sharada, S.; **Brutchey, R. L.** Probing the Ligand Exchange of *N*-Heterocyclic Carbene-Capped Ag_2S Nanocrystals with Amines and Carboxylic Acids. *Inorganic Chemistry* **2021**, *60*, 13699-13706.
[48] Tappan, B. A.*; Chu, W.; Mecklenburg, M.; Prezhdo, O. V.; **Brutchey, R. L.** Discovery of a Wurtzite-like $Cu_2FeSnSe_4$ Semiconductor Nanocrystal Polymorph and Implications for Related $CuFeSe_2$ Materials. *ACS Nano* **2021**, *15*, 13463-13474.
[49] Tappan, B. A.*; Zhu, B.; Cottingham, P.*; Mecklenburg, M.; Scanlon, D. O.; **Brutchey, R. L.** Crystal Structure of Colloidally Prepared Metastable Ag_2Se Nanocrystals. *Nano Letters* **2021**, *21*, 5881-5887.

[50] Williamson, E. M.*; Tappan, B. A.*; Mora-Tamez, L.*; Barim, G.*; **Brutchey, R. L.** Statistical Multi-Objective Optimization of Thiospinel $CoNi_2S_4$ Nanocrystal Synthesis via Design of Experiments. *ACS Nano* **2021**, *15*, 9422-9433.
[51] Smock, S. R.*; Chen, Y.; Rossini, A. J.; **Brutchey, R. L.** The Surface Chemistry and Structure of Colloidal Lead Halide Perovskite Nanocrystals. *Accounts of Chemical Research* **2021**, *54*, 707-718.
[52] Tabatabaei, K.; Sully, H. R.; Ju, Z.; Hellier, K.; Lu, H.*; Perez, C. J.; Newton, K. A.; **Brutchey, R. L.**; Bridges, F.; Carter, S. A.; Kauzlarich, S. M. Structural Insights on Microwave-Synthesized Antimony-Doped Germanium Nanocrystals. *ACS Nano* **2021**, *15*, 1685-1700.
[53] Karadaghi, L. R.*; Malmstadt, N.; Van Allsburg, K. M.; **Brutchey, R. L.** Techno-Economic Analysis of Recycled Ionic Liquid Solvent Used in a Model Colloidal Platinum Nanoparticle Synthesis. *ACS Sustainable Chemistry & Engineering* **2021**, *9*, 246-253.
[54] Tappan, B. A.*; **Brutchey, R. L.** Polymorphic Metastability in Colloidal Semiconductor Nanocrystals. *ChemNanoMat* **2020**, *6*, 1567-1588.
[55] Tappan, B. A.*; Chen, K.; Lu, H.*; Mallikarjun Sharada, S.; **Brutchey, R. L.** Synthesis and Electrocatalytic HER Studies of Carbene-Ligated $Cu_{3-x}P$ Nanocrystals. *ACS Applied Materials & Interfaces* **2020**, *12*, 16394-16401.
[56] Tappan, B. A.*; Horton, M. K.; **Brutchey, R. L.** Ligand-Mediated Phase Control in Colloidal $AgInSe_2$ Nanocrystals. *Chemistry of Materials* **2020**, *32*, 2935-2945.
[57] Koskela, K. M.*; Melot, B. M.; **Brutchey, R. L.** Solution Deposition of a Bournonite $CuPbSbS_3$ Semiconductor Thin Film from the Dissolution of Bulk Materials with a Thiol-Amine Solvent Mixture. *Journal of the American Chemical Society* **2020**, *142*, 6173-6179.
[58] Chen, Y.; Smock, S. R.*; Flintguber, A. H.; Perras, F. A.; **Brutchey, R. L.**; Rossini, A. J. The Surface Termination of $CsPbBr_3$ Perovskite Quantum Dots Determined by Solid-State NMR Spectroscopy. *Journal of the American Chemical Society* **2020**, *142*, 6117-6127. (highly cited paper by Web of Science)
[59] Wang, L.; Karadaghi, L. R.*; **Brutchey, R. L.**; Malmstadt, N. Self-Optimizing Parallel Millifluidic Reactor for Scaling Nanoparticle Synthesis. *Chemical Communications* **2020**, *56*, 3745-3748.
[60] Smock, S. R.*; Tabatabaei, K.; Williams, T. J.; Kauzlarich, S. M.; **Brutchey, R. L.** Surface Coordination Chemistry of Germanium Nanocrystals Synthesized by Microwave-Assisted Reduction in Oleylamine. *Nanoscale* **2020**, *12*, 2764-2772.
[61] Baddour, F. G.; Roberts, E. J.*; To, A. T.; Wang, L.; Habas, S. E.; Ruddy, D. A.; Bedford, N. M.; Wright, J.; Nash, C. P.; Schaidle, J. A.; **Brutchey, R. L.**; Malmstadt, N. An Exceptionally Mild and Scalable Solution-Phase Synthesis of Molybdenum Carbide Nanoparticles for Thermocatalytic CO_2 Hydrogenation. *Journal of the American Chemical Society* **2020**, *142*, 1010-1019. (highlighted in *C&EN*)
[62] Greaney, M. J.*; Joy, J.; Combs, B. A.*; Das, S.; Buckley, J. J.*; Bradforth, S. E.; **Brutchey, R. L.** Effects of Interfacial Ligand Type on Hybrid P3HT:CdSe Quantum Dot Solar Cell Device Parameters. *Journal of Chemical Physics* **2019**, *151*, 074704.
[63] Roberts, E. J.*; Karadaghi, L. R.*; Wang, L.; Malmstadt, N.; **Brutchey, R. L.** Continuous Flow Methods of Fabricating Catalytically Active Metal Nanoparticles. *ACS Applied Materials & Interfaces* **2019**, *11*, 27479-27502.
[64] Mora-Tamez, L.*; Barim, G.*; Downes, C.; Williamson, E. M.*; Habas, S. E.; **Brutchey, R. L.** Controlled Design of Phase- and Size-tunable Monodisperse Ni_2P Nanoparticles in a Phosphonium-based Ionic Liquid through Response Surface Methodology (RSM). *Chemistry of Materials* **2019**, *31*, 1552-1560.
[65] Cottingham, P.*; **Brutchey, R. L.** Depressed Phase Transitions and Thermally Persistent Local Distortions in $CsPbBr_3$ Quantum Dots. *Chemistry of Materials* **2018**, *30*, 6711-6716.
[66] Barim, G.*; Smock, S. R.*; Antunez, P. D.*; Glaser, D.*; **Brutchey, R. L.** Phase Control in the Colloidal Synthesis of Well-Defined Nickel Sulfide Nanocrystals. *Nanoscale* **2018**, *10*, 16298-16306.
[67] Smock, S. R.*; Williams, T. J.; **Brutchey, R. L.** Quantifying the Thermodynamics of Ligand Binding to $CsPbBr_3$ Quantum Dots. *Angewandte Chemie International Edition* **2018**, *57*, 11711-11715. (hot article; highlighted in *C&EN*)

[68] Tappan, B. A.*; Barim, G.*; Kwok, J. C.*; **Brutchey, R. L.** Utilizing Diselenide Precursors Towards the Rationally Controlled Synthesis of Metastable $CuInSe_2$ Nanocrystals. *Chemistry of Materials* **2018**, *30*, 5704-5713.
[69] Roberts, E. J.*; Read, C. G.; Lewis, N. S.; **Brutchey, R. L.** Phase Directing Ability of an Ionic Liquid Solvent for the Synthesis of Colloidal Ni_2P Nanocrystals. *ACS Applied Energy Materials* **2018**, *1*, 1823-1827.
[70] McCarthy, C. L.*; **Brutchey, R. L.** Preparation of Electrocatalysts Using a Thiol-Amine Solution Processing Method. *Dalton Transactions* **2018**, *47*, 5137-5143.
[71] McCarthy, C. L.*; **Brutchey, R. L.** Solution Deposited $Cu_2BaSnS_{4-x}Se_x$ from a Thiol-Amine Solvent Mixture. *Chemistry of Materials* **2018**, *30*, 304-308.
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[5] Morse, D. E.; Schwenzer, B.; Gomm, J. R.; Roth, K. M.; Heiken, B.; **Brutchey, R.** Biologically Inspired Synthesis of Thin Films and Materials without a Molecular Template and without Organic Contaminants. U.S. Patent 2007/0254141, November 1, 2007.

(g) Invited Presentations (since 2008)

[1] 7th Annual UC Davis Inorganic Chemistry Symposium; Davis CA; October 29, 2026.
[2] National Meeting of the American Chemical Society; Chicago, IL; August 25 & 26, 2026.
[3] Novel Optical Materials and Applications (NOMA) Conference; Long Beach, CA; July 30, 2026
[4] Organometallic Chemistry Gordon Conference; Newport, RI; July 14, 2026.
[5] DOE-BES Materials Chemistry PI Meeting; Bethesda, MD; July 8, 2026.
[6] University of Illinois Chicago; Chicago, IL; April 21, 2026.
[7] Colorado School of Mines; Golden, CO; April 10, 2026.
[8] National Meeting of the American Chemical Society; Atlanta, GA; March 24, 2026.
[9] Cottrell Scholar Conference; Tucson, AZ; July 16, 2025.
[10] University of Texas at Austin; Austin, TX; April 15, 2025.
[11] University of Southern California; Los Angeles, CA; April 1, 2025.
[12] National Meeting of the American Chemical Society; San Diego, CA; March 23 & 24, 2025.
[13] University of Houston; Houston, TX; February 25, 2025.

[14] NSF Nanoscale Science and Engineering Grantees Conference; Arlington, VA; December 10, 2024.
[15] National Meeting of the American Chemical Society; Denver, CO; August 18 & 21, 2024.
[16] DOE-BES Materials Chemistry PI Meeting; Gaithersburg, MD; August 6, 2024.
[17] Pennsylvania State University; State College, PA; March 26, 2024
[18] National Meeting of the American Chemical Society; New Orleans, LA; March 18, 2024.
[19] Atomically Precise Nanochemistry Gordon Conference; Galveston, TX; February 6, 2024.
[20] University of Notre Dame; South Bend, IN; September 20, 2023.
[21] Iowa State University; Ames, IA; September 1, 2023.
[22] National Meeting of the American Chemical Society; San Francisco, CA; August 23, 2023.
[23] UC San Diego; La Jolla, CA; March 3, 2023.
[24] Cal State Northridge; Los Angeles, CA; October 19, 2022.
[25] National Meeting of the American Chemical Society; Chicago, IL; August 21, 2022.
[26] Weizmann Institute of Science; Rehovot, Israel, July 20, 2022.
[27] Ben-Gurion University of the Negev; Beersheba, Israel; July 5, 2022.
[28] Hebrew University of Jerusalem; Jerusalem, Israel; June 23, 2022.
[29] UC Irvine; Irvine, CA; March 28, 2022.
[30] National Meeting of the American Chemical Society; San Diego, CA; March 23, 2022.
[31] Washington State University; Pullman, WA (virtual); November 15, 2021.
[32] DOE-BES Materials Chemistry PI Meeting (virtual); July 21, 2021.
[33] University of Manchester; Manchester, England (virtual); April 9, 2021.
[34] National Meeting of the American Chemical Society (virtual); April 7&15, 2021.
[35] National Meeting of the American Chemical Society; San Francisco, CA; August 18, 2020 (canceled because of COVID-19 pandemic).
[36] Cal State Long Beach; Long Beach, CA; September 20, 2019.
[37] National Meeting of the American Chemical Society; San Diego, CA; August 25, 2019.
[38] Purdue University; West Lafayette, IN; April 30, 2019.
[39] National Meeting of the American Chemical Society; Orlando, FL; April 1, 2019.
[40] DOE-BES Materials Chemistry PI Meeting; Gaithersburg, MD; July 9, 2018.
[41] National Meeting of the American Chemical Society; New Orleans, LA; March 18, 2018.
[42] XXVI International Materials Research Congress; Cancún, Mexico; August 20, 2017.
[43] University of Texas at Austin; Austin, TX; June 2, 2017.
[44] UC Riverside; Riverside, CA; April 28, 2017.
[45] Iowa State University; Ames, IA; April 7, 2017.
[46] Michigan State University; East Lansing, MI; March 30, 2017.
[47] University of Oregon; Eugene, OR; October 1, 2016.
[48] Chemical Heritage Foundation Innovation Day; Philadelphia, PA; September 13, 2016.
[49] Colloidal Semiconductor Nanocrystals Gordon Conference; West Dover, VT; August 3, 2016.
[50] DOE-BES Materials Chemistry PI Meeting; Gaithersburg, MD; July 12, 2016.
[51] University of Southern California; Los Angeles, CA; April 19, 2016.
[52] University of Missouri; Columbia, MO; April 15, 2016.
[53] National Meeting of the American Chemical Society; San Diego, CA; March 13, 2015.
[54] QUIMICUBA 2015; Havana, Cuba; October 16, 2015.
[55] University of Pennsylvania; Philadelphia, PA; October 2, 2015.
[56] XXIV International Materials Research Congress; Cancún, Mexico; August 16, 2015.
[57] University of Minnesota; Minneapolis, MN; April 9, 2015.
[58] National Meeting of the American Chemical Society; Denver, CO; March 24, 2014.
[59] Scialog Conference on Solar Energy Conversion; Tucson, AZ; October 14, 2014.
[60] National Meeting of the American Chemical Society; San Francisco, CA; August 11, 2014.
[61] DOE-BES Materials Chemistry PI Meeting; Gaithersburg, MD; July 13, 2014.
[62] Inorganic Chemistry Gordon Conference; University of New England, ME; June 10, 2014.
[63] Workshop on Quantum Solar Energy Conversion; Rauris, Austria; March 17, 2014.

[64] ETH Zürich; Zürich, Switzerland; March 4, 2014.
[65] National Meeting of the Materials Research Society; Boston, MA; December 1, 2013.
[66] Colorado School of Mines; Golden, CO; November 15, 2013.
[67] Scialog Conference on Solar Energy Conversion; Tucson, AZ; October 15, 2013.
[68] University of Washington; Seattle, WA; April 30, 2013.
[69] National Meeting of the American Chemical Society; New Orleans, LA; April 8, 2013.
[70] Santa Clara University; Santa Clara, CA; March 8, 2013.
[71] University of Southern California; Los Angeles, CA; November 6, 2012.
[72] Solid State Chemistry Gordon Conference; Colby-Sawyer College, NH; July 22, 2012.
[73] DOE-BES Materials Chemistry PI Meeting; Gaithersburg, MD; July 15, 2012.
[74] National Renewable Energy Laboratory; Golden, CO; May 23, 2012.
[75] Université de Picardie Jules Verne; Amiens, France; May 2, 2012.
[76] ETH Zürich; Zürich, Switzerland; April 26, 2012.
[77] National Meeting of the American Chemical Society; San Diego, CA; March 27, 2012.
[78] California Institute of Technology; Pasadena, CA; March 19, 2012.
[79] UC Berkeley; Berkeley, CA; February 10, 2012.
[80] UC Santa Barbara; Santa Barbara, CA; November 16, 2011.
[81] American Chemical Society WRM2011; Pasadena, CA; November 11, 2011.
[82] The Ohio State University; Columbus, OH; October 28, 2011.
[83] University of Wisconsin – Madison; Madison, WI; October 27, 2011.
[84] UC San Diego; La Jolla, CA; October 14, 2011.
[85] Cottrell Scholar Conference; Tucson, AZ; July 6, 2011.
[86] UC Davis; Davis, CA; May 3, 2011.
[87] University of Texas at Austin; Austin, TX; April 22, 2011.
[88] Texas A&M University; College Station, TX; April 20, 2011
[89] University of Houston; Houston, TX; April 18, 2011.
[90] UC Irvine; Irvine, CA; April 14, 2011.
[91] UC Riverside; Riverside, CA; April 8, 2011.
[92] National Meeting of the American Chemical Society; Anaheim, CA; March 27, 2011.
[93] Precursor Energetics, Inc.; Santa Clara, CA; August 16, 2010.
[94] Nanotechnology Symposium, DuPont Central Research; Wilmington, DE; May 26, 2010.
[95] Cal State Los Angeles; Los Angeles, CA; May 18, 2010.
[96] Iowa State University; Ames, IA; April 23, 2010.
[97] Université de Montréal; Montréal, QC; April 1, 2010.
[98] Université Laval; Québec City, QC; March 31, 2010.
[99] National Meeting of the American Chemical Society; San Francisco, CA; March 21, 2010.
[100] Cal State Long Beach; Long Beach, CA; March 17, 2010.
[101] University of La Verne; La Verne, CA; December 9, 2009.
[102] DOE-BES Catalysis PI Meeting; Annapolis, MD; June 1, 2009.
[103] US-Japan Nano Hybrids Workshop; Himeji, Japan; May 15, 2009.
[104] Air Force Research Laboratory Materials Science Directorate; WPAFB, OH; July 28, 2008.
[105] National Meeting of the American Chemical Society; New Orleans, LA; April 15, 2008.

(h) Contributed Presentations (since 2008)

[1] Pacsurf 2018; Waikoloa Beach, HI; December 3, 2018.
[2] Pacifichem 2015; Honolulu, HI; December 15, 2015.
[3] Inorganic Chemistry Gordon Conference; University of New England, ME; June 17, 2012.
[4] Pacifichem 2010; Honolulu, HI; December 15, 2010.
[5] Solid State Chemistry Gordon Conference; Colby-Sawyer College, NH; August 1, 2010.
[6] Inorganic Chemistry Gordon Conference; University of New England, ME; June 20, 2010.

[7] National Meeting of the American Chemical Society; Washington, D.C.; August 16, 2009.
[8] Clusters, Nanocrystals & Nanostructures Gordon Conference; Mt. Holyoke, MA; July 19, 2009.
[9] National Meeting of the Materials Research Society; San Francisco, CA; April 14, 2009.
[10] Dalton Discussions #11; Berkeley, CA; June 23, 2008.

Current Funding

[1] Title: Multidimensional Phase Maps for the Accelerated Synthesis and Study of Metastable Materials
Agency: DOE BES DE-SC0006812
Total Amount: $534,696
Period: 09/23-08/26
Role: sole PI
Time: 10%

[2] Title: New Directions in the Materials Chemistry of Thiol-Amine Precursor Inks
Agency: NSF DMR SSMC 2418013
Total Amount: $548,709
Period: 09/24-08/27
Role: sole PI
Time: 10%

[3] Title: Corrosion-Resistant High Entropy Alloy Nanocrystals for Thermocatalytic CO_2 Hydrogenation
Agency: ACS Petroleum Research Fund
Total Amount: $125,000
Period: 01/25-12/26
Role: PI
Time: 1%

[4] Title: NSF-BSF: Quantifying the Nature of N-Heterocyclic Carbene-Gold Nanoparticle Interactions
Agency: NSF CHE MSN 2505279
Total Amount: $353,549
Period: 07/25-06/28
Role: PI
Time: 5%

[5] Title: Chemically Informed Digital Twins for Predictive Materials Synthesis
Agency: DOE BES DE-SC0006812
Total Amount: $676,000
Period: 09/26-12/29
Role: sole PI
Time: 10%

Prior Funding

[1] Title: Engineering Microfluidic Mixing for Green Nanocrystal Manufacturing
Agency: NSF CMMI 0926969
Total Amount: $270,000 (Brutchey = $135,000)
Period: 09/09-08/11
Role: co-PI (PI: Noah Malmstadt, USC Department of Chemical Engineering & Materials Science)
Time: 10%

[2] Title: New Low-Temperature Synthetic Routes to Functional Perovskite and Semiconductor Nanocrystals
Agency: NSF DMR 0906745
Amount: $350,000
Period: 08/09-12/12
Role: sole PI

Time: 10%

[3] Title: A Generalized Synthetic Route to Nontoxic Semiconductor Nanocrystals for Use in Inexpensive Solar Cells
Agency: Research Corporation for Science Advancement
Amount: $75,000 direct costs
Period: 01/11-12/13
Role: sole PI

[4] Title: Synthesis of Multifunctional Nanoparticles for Drug Delivery
Agency: L. K. Whittier Foundation
Total Amount: $25,000 direct costs
Period: 01/12-12/13
Role: PI
Time: 5%

[5] Title: Emerging Materials for Solar Energy Conversion and Solid State Lighting
Agency: DOE-EFRC DE-SC0001013
Total Amount: $12,000,000 (Brutchey = $800,000)
Period: 08/09-07/14
Role: co-PI (PI: P. Dan Dapkus, USC Department of Electrical Engineering)
Time: 10%

[6] Title: Nanoparticle Properties and Alveolar Epithelial Barrier/Transport Functions
Agency: NIH
Total Amount: $1,125,000 direct costs (Brutchey = $24,000 direct costs)
Period: 07/09-06/14
Role: co-Investigator (PI: Edward Crandall, Keck School of Medicine)
Time: 5%

[7] Title: Mitigating Breakdown in High Energy Density Perovskite Polymer Nanocomposite Capacitors
Agency: DOE BES DE-FG02-11ER46826
Amount: $450,000
Period: 07/11-06/14
Role: sole PI
Time: 10%

[8] Title: *tert*-Butyl Chalcogenides as Useful Synthetic Tools for the Synthesis and Surface Modification of Semiconductor Nanocrystals
Agency: NSF DMR 1205712
Total Amount: $345,000
Period: 07/12-06/15
Role: sole PI
Time: 10%

[9] Title: Scialog: Investigation into Interfacial States in Hybrid Polymer:Nanocrystal Solar Cells – Finding a Path to High Efficiencies
Agency: Research Corporation for Science Advancement
Total Amount: $100,000 direct costs (Brutchey = $33,000 direct costs)
Period: 01/14-12/16
Role: PI
Time: 5%

[10] Title: Continuous Microfluidic Approach for Scalable Nanoparticle Catalyst Synthesis
Agency: Alliance for Sustainable Energy, LLC AFA-6-62006-01
Total Amount: $21,400
Period: 01/16-05/16
Role: PI
Time: 1%

[11] Title: Sustainable Scale-up of Nanoparticle Manufacturing Using Microreactors
Agency: NSF CMMI 1436872
Total Amount: $300,000 (Brutchey = $150,000)
Period: 08/14-7/17
Role: co-PI (PI: Noah Malmstadt, USC Department of Chemical Engineering & Materials Science)
Time: 5%
[12] Title: Low-Temperature Chemical Routes to Functional Complex Oxide Nanocrystals
Agency: DOE BES DE-SC0006812
Amount: $450,000
Period: 09/14-08/17
Role: sole PI
Time: 10%
[13] Title: Scialog: What's Inside a Perovskite Solar Cell?
Agency: Research Corporation for Science Advancement
Total Amount: $100,000 direct costs (Brutchey = $33,000 direct costs)
Period: 01/15-12/17
Role: PI
Time: 5%
[14] Title: Catalytic Upgrading of Pyrolysis Products
Agency: Alliance for Sustainable Energy, LLC REJ-6-62198
Total Amount: $60,000
Period: 11/16-09/17
Role: PI
Time: 1%
[15] Title: High-Throughput Continuous Flow Synthesis of Tunable Metal and Mixed-Metal Carbide and Phosphide Nanoparticles for Biomass Conversion Processes
Agency: Alliance for Sustainable Energy, LLC REJ-6-62198
Total Amount: $30,000
Period: 04/18-10/18
Role: PI
Time: 1%
[16] Title: Solution Processing of Bulk Semiconductors with a Thiol-Amine Solvent Mixture
Agency: NSF DMR 1506189
Total Amount: $390,000
Period: 08/15-07/19
Role: sole PI
Time: 10%
[17] Title: Chemical Routes to Accessing Metastable Phases in Colloidal Nanocrystals
Agency: DOE BES DE-SC0006812
Amount: $449,000
Period: 09/17-08/20
Role: sole PI
Time: 10%
[18] Title: Flow Reactors for Rapid Screening of Reaction Parameters to Synthesize Metal and Metal Carbide Nanoparticles for Biomass Conversion Processes
Agency: Alliance for Sustainable Energy, LLC XAT-9-92219-01
Total Amount: $40,000
Period: 08/19-12/20
Role: PI
Time: 5%
[19] Title: Highly Parallel Three-Dimensional Microfluidic Systems for Manufacturing Catalytic

Nanoparticles
Agency: NSF CMMI 1728649
Amount: $350,000 (Brutchey = $175,000)
Period: 07/17-06/21
Role: co-PI (PI: Noah Malmstadt, USC Department of Chemical Engineering & Materials Science)
Time: 5%

[20] Title: Continuous Flow Synthesis of Non-Metal Nanoparticle Catalysts for Selective Conversion of C1 Intermediates
Agency: Alliance for Sustainable Energy, LLC DE-AC36-08GO28308
Total Amount: $60,000
Period: 09/21-01/23
Role: PI (co-PI: Noah Malmstadt, USC Department of Chemical Engineering & Materials Science)
Time: 1%

[21] Title: Revealing the Mechanisms of Bulk Material Dissolution in Thiol-Amine Solvent Mixtures Toward the Solution Deposition of Chalcogenide Thin Films
Agency: NSF DMR 1904719
Amount: $400,000
Period: 08/19-07/23
Role: sole PI
Time: 10%

[22] Title: Unravelling the Mechanisms of Phase Determination in Metastable Multinary Chalcogenides
Agency: DOE BES DE-SC0006812
Total Amount: $450,000
Period: 09/20-08/23
Role: sole PI
Time: 10%

[23] Title: SEED: Optimization of Quantum Dot Nanofabrication Based on High-Throughput Continuous Flow Chemistry
Agency: Research Corporation for Science Advancement
Total Amount: $50,000
Period: 10/20-09/23
Role: sole PI
Time: 5%

[24] Title: Accelerating the Development of Catalytic Materials Through Continuous Flow Synthesis Approaches Coupled with In Line Monitoring
Agency: Alliance for Sustainable Energy, LLC DE-AC36-08GO28308
Total Amount: $60,000
Period: 9/23-05/24
Role: PI (co-PI: Noah Malmstadt, USC Department of Chemical Engineering & Materials Science)
Time: 1%

[25] Title: Quantifying the Nature of N-Heterocyclic Carbene-Gold Nanoparticle Interactions (Declined)
Agency: United States-Israel Binational Science Foundation
Total Amount: $250,000 (Brutchey = $83,332)
Period: 10/25-09/28
Role: co-PI (co-PI: Uri Banin and Elad Gross, Hebrew University of Jerusalem)
Time: 5%

[26] Title: From Defect Spectroscopy to Self Healing in Lead Halide Perovskite Nanocrystals
Agency: United States-Israel Binational Science Foundation
Total Amount: $202,500 (Brutchey = $101,250)
Period: 10/21-09/25
Role: co-PI (co-PI: Dan Oron, Weizmann Institute of Science, Israel)

Time: 5%

[27] Title: Establishing Connections between In Situ Monitoring of Nanoparticles During Continuous Flow Synthesis and Catalytically Relevant Materials Properties
Agency: Alliance for Sustainable Energy, LLC SUB-2024-10509
Total Amount: $75,000
Period: 09/24-08/25
Role: PI
Time: 1%

Instructional Activity

(a) Courses Taught

Course	Title	Enrollment	Instructor Rating (Course Rating)*	% of Enrolled Students Responding
CHEM 203 (Fall 2007)	Chemistry in Life: AIDS Drug Discovery and Development	294	3.91 (3.91)	33
CHEM 203 (Fall 2008)	Chemistry in Life: AIDS Drug Discovery and Development	300	3.82 (3.92)	14
CHEM 203 (Fall 2009)	Chemistry in Life: AIDS Drug Discovery and Development	300	3.87 (3.76)	34
CHEM 455 (Fall 2013)	Chemical Nanotechnology	5	5.00 (5.00)	100
CHEM 455 (Fall 2014)	Chemical Nanotechnology	6	4.83 (4.67)	100
CHEM 455 (Fall 2015)	Chemical Nanotechnology	2	5.00 (4.50)	100
CHEM 455 (Fall 2016)	Chemical Nanotechnology	10	4.89 (4.22)	90
CHEM 455 (Spring 2019)	Chemical Nanotechnology	10	3.86 (3.62)	80
CHEM 455 (Spring 2022)	Chemical Nanotechnology	4	3.94 (4.00)	100
CHEM 455 (Spring 2023)	Chemical Nanotechnology	3	4.00 (4.00)	100
CHEM 455 (Spring 2024)	Chemical Nanotechnology	6	3.96 (3.97)	100
CHEM 455 (Spring 2025)	Chemical Nanotechnology	11	4.00 (3.89)	36
CHEM 455 (Spring 2026)	Chemical Nanotechnology	11	3.56 (3.63)	55
CHEM 515 (Fall 2008)	Structure and Bonding in Inorganic and Organometallic Chemistry	20	4.25 (3.90)	100
CHEM 515 (Fall 2009)	Structure and Bonding in Inorganic and Organometallic Chemistry	21	4.06 (3.94)	86
CHEM 515 (Fall 2010)	Structure and Bonding in Inorganic and Organometallic Chemistry	21	4.26 (3.89)	100
CHEM 515 (Fall 2011)	Structure and Bonding in Inorganic and Organometallic Chemistry	22	4.55 (4.25)	91

CHEM 515 (Fall 2017)	Structure and Bonding in Inorganic and Organometallic Chemistry	19	3.75 (3.75)	63
CHEM 515 (Fall 2018)	Structure and Bonding in Inorganic and Organometallic Chemistry	10	3.65 (3.81)	90
CHEM 515 (Fall 2019)	Structure and Bonding in Inorganic and Organometallic Chemistry	21	3.70 (3.71)	67
CHEM 515 (Fall 2020)**	Structure and Bonding in Inorganic and Organometallic Chemistry	9	3.79 (3.89)	100
CHEM 515 (Fall 2021)**	Structure and Bonding in Inorganic and Organometallic Chemistry	13	3.70 (3.72)	38
CHEM 515 (Fall 2022)	Structure and Bonding in Inorganic and Organometallic Chemistry	12	3.74 (3.89)	50
CHEM 515 (Fall 2023)	Structure and Bonding in Inorganic and Organometallic Chemistry	14	3.33 (3.33)	43
CHEM 515 (Fall 2024)	Structure and Bonding in Inorganic and Organometallic Chemistry	12	3.84 (3.82)	92
CHEM 515 (Fall 2025)	Structure and Bonding in Inorganic and Organometallic Chemistry	8	3.56 (3.78)	38
CHEM 515 (Fall 2026)	Structure and Bonding in Inorganic and Organometallic Chemistry			
CHEM 516 (Spring 2009)	Synthesis, Reactivity and Mechanism in Inorganic and Organometallic Chemistry	14	3.83 (3.83)	86
CHEM 524 (Spring 2013)	Inorganic Materials Chemistry	8	4.83 (4.67)	75
CHEM 580 (Fall 2010)	Current Topics in Inorganic Chemistry and Nanoscience	6	5.00 (4.83)	100
CHEM 580 (Fall 2011)	Current Topics in Inorganic Chemistry and Nanoscience	9	4.50 (4.00)	89
CHEM 580 (Fall 2015)	Current Topics in Inorganic Chemistry and Nanoscience	8	4.63 (4.50)	100
CHEM 580 (Fall 2019)	Current Topics in Inorganic Chemistry and Nanoscience	11	3.55 (3.76)	64
CHEM 580 (Fall 2025)	Current Topics in Inorganic Chemistry and Nanoscience	7	3.00 (4.00)	14
CHEM 599 (Spring 2010)	Special Topics: Inorganic Materials Chemistry	7	4.29 (4.43)	100
CHEM 599 (Spring 2012)	Special Topics: Inorganic Materials Chemistry	8	4.88 (4.63)	100

*Beginning in Fall 2018 the rating is based on a Likert scale of 4; prior to Fall 2018 the rating is based on a Likert scale of 5.

**Course given online or partially online because of COVID-19 pandemic.

(b) Graduate Students Advised

Matthew Franzman (Ph.D. conferred), 2007-2010, Assistant Professor of Forensic Science at University of Baltimore
Laura Lazarus (Ph.D. conferred), 2008-2012, Professor of Chemistry at Fullerton College
Christopher Beier (Ph.D. conferred), 2008-2013, Technical Director, Spherix Mineral Products
Michelle Norako (Ph.D. conferred), 2008-2013, Senior Winemaker at NexTerra Wine Company
Priscilla Antunez (NSF graduate research fellow; Ph.D. conferred), 2009-2014, Deputy Chief Strategy Officer at Brookhaven National Laboratory
Matthew Greaney (2015 ACS Division of Inorganic Chemistry Young Investigator Awardee, Ph.D. conferred), 2010-2015, Group Leader at Clariant International, Ltd.
Jannise Buckley (NSF graduate research fellow; Ph.D. conferred), 2010-2015, Chief Product Officer at Ciencia Labs
Sean Culver (NSF graduate research fellow; Ph.D. conferred), 2011-2016, Cell R&D Manager at Peak Energy
Haipeng Lu (2019 ACS Division of Physical Chemistry Young Investigator Awardee, Ph.D. conferred), 2012-2017, Associate Professor of Chemistry at Hong Kong University of Science and Technology
Carrie McCarthy (NSF graduate research fellow; Ph.D. conferred), 2013-2018
Gözde Barim (Ph.D. conferred), 2013-2018, Senior Scientist at Alsym Energy
Emily Roberts (2018 ACS Kenneth G. Hancock Memorial Awardee; Ph.D. conferred), 2014-2019, Patent Prosecution Associate at Morrison Foerster
Sara Smock (NSF graduate research fellow; Ph.D. conferred), 2016-2021, Materials & Process Manager at GKN Aerospace
Bryce Tappan (Ph.D. conferred), 2016-2021, Senior Scientist at SES AI Corporation
Kristopher Koskela (Ph.D. conferred), 2017-2022, Staff Process Engineer at Applied Materials
Lanja Karadaghi (Ph.D. conferred), 2018-2023, Principal Engineer at Northrop Grumman
Emily Williamson (Ph.D. conferred), 2018-2023, AI Applications Engineer at SandBox Semiconductor
Kyle Crans (Ph.D. conferred), 2020-2025, Process Engineer at Lam Research
Marissa Strumolo (Ph.D. conferred), 2020-2025, Sales Manager at Waters Corporation
Allison Forsberg, 2021-2026
Hyeyeon Lee (visiting student from Gyeongsang National University, South Korea), 2021-2022
Zhaohong Sun, 2022-2026
Iris Berg (visiting student from Hebrew University of Jerusalem, Israel), 2023
Yizhen Chen, 2023-present
Christopher Pakhanyan, 2023-present
Han Chi, 2024-present
Ariana Nygren, 2024-present
Nicole Ammari, 2025-present
Zihang Sun, 2025-present

(c) Postdoctoral Fellows Advised

Dr. David Webber (Ph.D. University of Durham), 2008-2013, Chemical Hygiene Officer at University of Southern California
Dr. Federico Rabuffetti (Ph.D. Northwestern University), 2010-2014, Associate Professor of Chemistry at Wayne State University
Dr. Elsa Couderc (Ph.D. CEA Grenoble), 2012-2014, Open Science Officer, Sorbonne Université
Dr. Patrick Cottingham (Ph.D. Johns Hopkins University), 2015-2018, Senior PV Chemist, Starpath

Dr. Lucía Mora (Ph.D. Universidad Nacional Autónoma de México), 2016-2018, Assistant Professor, School of Chemistry, UNAM
Dr. Brendan Ward-O'Brien (Ph.D. University of Manchester), 2024-2026

(d) Undergraduate Students Advised

Marie Cuevas Heffern (NSF graduate research fellow), 2008-2009; Ph.D. in Chemistry, Northwestern, 2014; Associate Professor of Chemistry, University of California, Davis
Viridiana Pérez, 2008; Ph.D. in Chemistry, Université Laval (Québec City), 2016; CEO & Co-Founder of NANOSentinel
Ariane Beaupré, 2009; M.S. in Chemistry, Université Laval (Québec City); Director of Scientific Projects at Boite à Science
Amy DeVita-McBride, 2009-2010; M.S. in Materials Science & Engineering, USC
Brittany Daniels, 2009-2010; Project Engineer, Chevron Corporation
Maxwell Chang, 2010-2011
Hannah Hinton, 2011/2012; Manager, Supply Chain Engineering, SpaceX
Antonio Tinoco, 2013; Ph.D. in Chemistry, University of Rochester, 2020; Assistant Professor of Chemistry & Biochemistry, University of California, Los Angeles
James Munteanu, 2013; Undergraduate student at Cerritos College/Cal Poly Pomona
Joseph Morris, 2012-2013; Engineer, Schlumberger Limited
Jessica Rafson, 2012-2013; Ph.D. in Chemistry, Cornell University, 2021; Research Chemistry at Food and Drug Administration
Jose Araujo, 2010-2014; Ph.D. in Chemistry, University of Washington, 2020; Electro Optical Engineer at Meta
John Lee (NSF graduate research fellow), 2011-2014; Ph.D. in Chemistry, UC Berkeley, 2019; Scientist II at Nurix Therapeutics
Marie Claire Trinidad, 2014; Tesla Energy
Karla Abuyen, 2015; Ph.D. in Molecular Biology, USC, 2024
Olivia Hull, 2015; Ph.D. in Chemistry, Kansas State University, 2023; Researcher II at NREL
Emily Schueller, 2014-2016; Ph.D. in Materials, UCSB, 2020; Principal Materials and Processes Engineer, Northrop Grumman
Rachel Gaspar, 2015; Ph.D. candidate in Atmospheric and Oceanic Science, University of Colorado
Karla Macias, 2016; Analyst, Marvin Engineering Company
Daniela Glaser, 2016-2017; J.D., UCLA, 2021; Associate at Fish & Richardson
Solomon Kim, 2016-2018
Michael Espejel, 2018; Undergraduate student at Cerritos College
Eden Tzanetopoulos (NSF graduate research fellow), 2018; Ph.D. candidate in Chemistry, University of Washington
Aaron Ghrist (NSF graduate research fellow), 2020-2021; Ph.D. candidate in Applied Physics, Stanford University
Fernanda Romero, 2022; Undergraduate student at Cerritos College
Ashley Kilmnick, 2023-2025; Ph.D. candidate in Chemistry, University of Texas at Austin
Ariel Nehoray, 2023-present; Ph.D. candidate in Chemistry, Pennsylvania State University
Grace Solis, 2023; Undergraduate student at Cerritos College
Nicole Ammari, 2023, 2024; Ph.D. candidate in Chemistry, USC
Karla Zamarripa, 2024; Undergraduate student at Cerritos College
Abby Deinert, 2025; Quality Engineer at Mattel
Gizelle Contreras, 2025; Undergraduate student at Cerritos College
Yasmine Salazar, 2025; Undergraduate student at Cerritos College
Sophia Young, 2026; Undergraduate student at USC

Johnjunel Bantilan, 2026; Undergraduate student at Cerritos College
Tania Magana, 2026; Undergraduate student at Cerritos College

Service Activities

Departmental Committee	**Duration**	**Role**
Alumni Relations Committee	2009	Member
Chemical Safety Committee	2014-2017	Chair
Executive Committee	2014-present	Member
Graduate Student Recruitment Committee	2008 2009-2014 2015-present	Member Chair Member
Inorganic Faculty Search Committee	2010, 2011, 2012	Member
Junior Faculty Mentoring Committees (B. Melot, S. Marinescu, M. Fieser, M. Inkpen)	2013-2026	Member
Open Area Faculty Search Committees	2016 2017	Member Diversity Liaison
Strategic Mission & Planning Committee	2013-2021 2021-present	Chair Member
Theory Faculty Search Committee	2015	Member
Undergraduate Affairs and Curriculum Committee	2008	Member
University Committee	**Duration**	**Role**
Graduate School Advisory Council	2015-2018	Member
Committee on Academic Policies and Procedures	2017-2020	Member
Advisory Committee for Core Center of Excellence in Nano Imaging (CNI)	2019-2022 2022-present	Director Member
Hiring Committees for CNI Staff Microscopists	2021-2022	Chair
Hiring Committee for CNI Staff X-ray Scientist	2024	Member
USC Materials Consortium	2025-present	Co-Director

Additional Service Activities

- Organized inorganic section seminar series, 2008-2009, 2010-2011, 2011-2012, 2015-2016, 2019-2020 & 2025-2026
- Served on *ad hoc* university committee for purchase of a TEM, 2011
- Served on *ad hoc* consultative committee for selection of new department chair, 2011 & 2017
- Served on *ad hoc* departmental NTT faculty merit review committee, 2011 & 2012
- Served on *ad hoc* Dornsife faculty merit review appeals committee, 2013
- Served on *ad hoc* departmental TT faculty merit review committee, 2014
- Served on *ad hoc* third- and fifth-year review committee for B. Melot, 2015 & 2017
- Served on *ad hoc* third-year review committee for S. Marinescu, 2017
- Served on *ad hoc* tenure promotion committee for B. Melot, 2017
- Chaired *ad hoc* tenure promotion committee for S. Marinescu, 2019

• Chaired *ad hoc* second-, third-, and fifth-year review committee for M. Fieser, 2019, 2023, 2024
• Served on *ad hoc* promotion committee for D. Tomkins (Writing Program), 2020
• Chaired *ad hoc* second-, third-, and fifth-year review committee for M. Inkpen, 2021, 2023, 2024
• Chaired *ad hoc* promotion committee for B. Melot, 2022
• Served on *ad hoc* second- and third-year review committee for K. White, 2022 & 2023
• Served on *ad hoc* second-year review committee for E. Picazo, 2023
• Chaired *ad hoc* consultative committee for selection of new department chair, 2024
• Chaired *ad hoc* tenure promotion committee for M. Inkpen, 2025
• Chaired *ad hoc* tenure promotion committee for M. Fieser, 2025