

KIMBERLY A. SEE

Assistant Professor of Chemistry
Division of Chemistry and Chemical Engineering
California Institute of Technology

email: ksee@caltech.edu
website: <https://www.seegroup.caltech.edu>

POSITIONS

Current **Assistant Professor of Chemistry**, Division of Chemistry and Chemical Engineering
California Institute of Technology, Pasadena, CA

2014 - 2017 **St. Elmo Brady Future Faculty Postdoctoral Fellow**, Department of Chemistry
University of Illinois at Urbana-Champaign, Urbana, IL

EDUCATION

2014 **University of California**, Santa Barbara, CA
Ph.D. in Chemistry
Advisors: Professors Ram Seshadri and Galen Stucky
Thesis title: *Hybrid Architectures for Next Generation Batteries*

2009 **Colorado School of Mines**, Golden, CO
B.S. in Chemistry, *cum laude*

RESEARCH EXPERIENCE

2014 - 2017 **St. Elmo Brady Future Faculty Postdoctoral Fellow** University of Illinois, Urbana-Champaign, IL
Advisor: Prof. Andrew A. Gewirth
Characterization of the bulk and surface speciation in Mg and Zn battery electrolytes

2011-2014 **Graduate student researcher** University of California, Santa Barbara, CA
Advisors: Profs. Ram Seshadri and Galen D. Stucky
Synthesis and characterization of materials for use in the Li-S battery; development and understanding of Ca-based battery systems; investigation of charge storage mechanisms in organic electrode materials

2013, Oct-Nov **Visiting researcher** University of Cambridge, Cambridge, UK
Advisor: Prof. Clare P. Grey
In-situ ⁷Li NMR during the discharge of a Li-S battery to evaluate the behavior of the discharge products and gain a fundamental understanding of the discharge mechanism

2010-2011 **R&D Chemist I** NuSil Technology, Carpinteria, CA
Synthesis, characterization, and development of silicone materials for application in photonics devices and implantable inks

2009-2010 **Graduate student researcher** University of Colorado, Boulder, CO
Advisor: Prof. Gordana Dukovic
Synthesis and characterization of oxy(nitride) photocatalytic nanocrystals

2008-2010 **Undergraduate research intern** National Renewable Energy Lab, Golden, CO
Advisors: Drs. John Turner and Todd Deutsch
Characterization of thin film CuGaSe₂ for photoelectrochemical water splitting and development of photo-assisted electrodeposition of catalytic Pt clusters

AWARDS AND RECOGNITIONS

2019 VW/BASF Science Award Electrochemistry

2019 Beckman Young Investigator Award

2018 The Electrochemical Society Toyota Young Investigator Award

2017 The Electrochemical Society Battery Division Postdoctoral Associate Research Award

2017 - 2019 Research Corporation Scialog Fellow, Advanced Energy Storage Program

2014 - 2017 UIUC St. Elmo Brady Future Faculty Postdoctoral Fellowship

2012 - 2014 NSF ConVEne IGERT Fellowship

2013 UCSB Outstanding Service to K-12 Education Outreach Program

2009 CSM Engineering Days Engineer: Chemistry

2005 Colorado School of Mines Medal in Math and Science

PATENTS

1. Kimberly A. Robb (See), Andrew J. Martinolich, "Solid State Ion Conduction in ZnPS₃," application filed January 10, 2020 (#16/740,035).

PUBLICATIONS

- Jacob D. Bagley, Deepan Kishore Kumar, **Kimberly A. See**, Nai-Chang Yeh, "Selective Formation of Pyridinic-Type Nitrogen-doped Graphene and Its Application in Lithium-Ion Battery Anodes," *submitted*.
25. Julia M. Stauber, Josef Schwan, Xinglong Zhang, Jonathan C. Axtell, Dahee Jung, Brendon J. McNicholas, Paul H. Oyala, Andrew J. Martinolich, Jay R. Winkler, **Kimberly A. See**, Thomas F. Miller III, Harry B. Gray, Alexander M. Spokoyny, "A Super-Oxidized Radical Cationic Icosahedral Boron Cluster," *J. Am. Chem. Soc.* *accepted*.
 24. Nicholas H. Bashian, Molleigh B. Preefer, JoAnna Milam-Guerrero, Joshua J. Zak, Charlotte Sendi, Suha Ahsan, Rebecca Vincent, Ralf Haiges, **Kimberly A. See**, Ram Seshadri, and Brent C. Melot, "Understanding the Role of Crystallographic Shear on the Electrochemical Behavior of Niobium Oxyfluorides," *J. Mat. Chem. A* **2020**, *8*, 12623-12632. [DOI]
 23. Charles J. Hansen[†], Joshua J. Zak[†], Andrew J. Martinolich, Jesse S. Ko, Nicholas H. Bashian, Farnaz Kaboudvand, Anton Van der Ven, Brent C. Melot, Johanna Nelson Weker, and **Kimberly A. See**, "Multielectron, Cation and Anion Redox in Lithium-Rich Iron Sulfide Cathodes," *J. Am. Chem. Soc.* **2020**, *142*, 6737-6749. [DOI]
 22. Xiaomei Zeng, Andrew J. Martinolich, **Kimberly A. See**, and Katherine T. Faber, "Dense Garnet-Type Electrolyte with Coarse Grains for Improved Air Stability and Ionic Conductivity," *J. Energy Storage* **2020**, *27*, 101128. [DOI]
 21. Seong Shik Kim, Sarah C. Bevilacqua, and **Kimberly A. See**, "Conditioning-Free Electrolyte by Minor Addition of Mg(HDMS)₂," *ACS Appl. Mater. Interfaces* **2019**, *12*, 5226-5233. [DOI]
 - An invited contribution to the *Young Investigator Forum Issue*.
 20. Sarah C. Bevilacqua, Kim H. Pham, and **Kimberly A. See**, "The Effect of Electrolyte Solvent on Redox Processes in Mg-S Batteries," *Inorg. Chem.* **2019**, *58*, 10472-10482. [DOI]
 - An invited contribution in the *Celebrating the Year of the Periodic Table: Emerging Investigators in Inorganic Chemistry* special issue (<https://pubs.acs.org/toc/inocaj/58/16>).
 19. Andrew J. Martinolich, Cheng-Wei Lee, I-Te Lu, Sarah C. Bevilacqua, Molleigh B. Preefer, Marco Bernardi, André Schleife, and **Kimberly A. See**, "Solid State Divalent Ion Conductivity in ZnPS₃," *Chem. Mater.* **2019**, *31*, 3652-3661. [DOI]
 - Selected as the cover for 2019's Issue 10 of *Chem. Mater.* (<https://pubs.acs.org/toc/cmatex/31/10>).

Prior to Caltech

18. Kim Ta, **Kimberly A. See**, and Andrew A. Gewirth, "Elucidating Zn and Mg Electrodeposition Mechanisms in Nonaqueous Electrolytes for Next-Generation Metal Batteries," *J. Phys. Chem. C* **2018**, *122*, 13790-13796. [DOI]
17. Minjeong Shin, Heng-Liang Wu, Badri Narayanan, **Kimberly A. See**, Rajeev S. Assary, Lingyang Zhu, Richard T. Haasch, Shuo Zhang, Zhengchen Zhang, Larry A. Curtiss, and Andrew A. Gewirth, "Effect of the Hydrofluoroether Cosolvent Structure in Acetonitrile-based Solvate Electrolytes on Li⁺ Solvation Structure and Li-S Battery Performance," *ACS Appl. Mater. Interfaces* **2017**, *9*, 39357-39370. [DOI]
16. **Kimberly A. See**, Yao-Min Liu, Yeyoung Ha, Christopher J. Barile, and Andrew A. Gewirth, "Effect of Concentration on the Electrochemistry and Speciation of the Magnesium Aluminum Chloride Complex Electrolyte Solution," *ACS Appl. Mater. Interfaces* **2017**, *9*, 35729-35739. [DOI]
15. **Kimberly A. See**, Margaret A. Lumley, Galen D. Stucky, Clare P. Grey, and Ram Seshadri, "Reversible Capacity of Conductive Carbon Additives at Low Potentials: Caveats for Testing Alternative Anode Materials for Li-Ion Batteries," *J. Electrochem. Soc.* **2017**, *164*, A327-A333. [DOI]
14. Heng-Liang Wu, Minjeong Shin, Yao-Min Liu, **Kimberly A. See**, and Andrew A. Gewirth, "Thiol-Based Electrolyte Additives for High-Performance Lithium-Sulfur Batteries," *Nano Energy* **2017**, *32*, 50-58. [DOI]
13. **Kimberly A. See**[†], Heng-Liang Wu[†], Kah Chun Lau, Mingjeong Shin, Lei Cheng, Mahalingam Balasubramanian, Kevin G. Gallagher, Larry A. Curtiss, and Andrew A. Gewirth, "Effect of Hydrofluoroether Cosolvent Addition on Li Solvation in Acetonitrile-Based Solvate Electrolytes and Its Influence on S Reduction in a Li-S Battery," *ACS Appl. Mater. Interfaces* **2016**, *8*, 34360-34371 († contributed equally). [DOI]
12. Albert L. Lipson, Sang-Don Han, Baofei Pan, **Kimberly A. See**, Andrew A. Gewirth, Chen Liao, John T. Vaughey, and Brian J. Ingram, "Practical Stability Limits of Magnesium Electrolytes," *J. Electrochem. Soc.* **2016**, *163*, A2253-A2257. [DOI]

11. **Kimberly A. See**, Karena W. Chapman, Lingyang Zhu, Kamila M. Wiaderek, Olaf J. Borkiewicz, Christopher J. Barile, Peter J. Chupas, and Andrew A. Gewirth, "The Interplay of Al and Mg Speciation in Advanced Mg Battery Electrolyte Solutions," *J. Am. Chem. Soc.* **2016**, 138, 328-337. [DOI]
10. Hongmei Zeng, Deyu Liu, Yichi Zhang, **Kimberly A. See**, Young-Si Jun, Guang Wu, Jeffrey A. Gerbec, Xiulei Ji, and Galen D. Stucky, "Nanostructured Mn-Doped V₂O₅ Cathode Material Fabricated from Layered Vanadium Jarosite," *Chem. Mater.* **2015**, 27, 7331-7336. [DOI]
9. **Kimberly A. See**, Stephan Hug, Katharina Schwinghammer, Margaret A. Lumley, Yonghao Zheng, Jaya M. Nolt, Galen D. Stucky, Fred Wudl, Bettina V. Lotsch,* and Ram Seshadri,* "Lithium Charge Storage Mechanisms for Cross-Linked Triazine Networks and Their Porous Carbon Derivatives," *Chem. Mater.* **2015**, 27, 3821-3829. [DOI]
8. Kristin M. Ø. Jensen, Xiaohao Yang, Josefa Vidal Laveda, Wolfgang G. Zeier, **Kimberly A. See**, Marco D. Michiel, Brent C. Melot, Serena A. Corr, and Simon J. L. Billinge, "X-ray Diffraction Computed Tomography for Structural Analysis of Electrode Materials in Batteries," *J. Electrochem. Soc.* **2015**, 162, A1310-A1314. [DOI]
7. **Kimberly A. See**, Michal Leskes, John M. Griffin, Sylvia Britto, Peter D. Matthews, Alexandra Emly, Anton Van der Ven, Dominic S. Wright, Andrew J. Morris,* Clare P. Grey,* and Ram Seshadri,* "Ab initio Structure Search and in situ ⁷Li NMR Studies of Discharge Products in the Li-S Battery System," *J. Am. Chem. Soc.* **2014**, 136, 16368-16377. [DOI]
6. David Vonlanthen, Pavel Lazarev, **Kimberly A. See**, Fred Wudl, and Alan J. Heeger, "A Stable Polyaniline-Benzoquinone-Hydroquinone Supercapacitor," *Adv. Mater.* **2014**, 26, 5095-5100. [DOI]
5. **Kimberly A. See**, Young-Si Jun, Jeffrey A. Gerbec, Johannes K. Sprafke, Fred Wudl, Galen D. Stucky, and Ram Seshadri, "Sulfur-functionalized Mesoporous Carbons as Sulfur Hosts in Li-S Batteries: Increasing the Affinity of Polysulfide Intermediates to Enhance Performance," *ACS Appl. Mater. Interfaces* **2014**, 6, 10908-10916. [DOI]
4. Kyoung Hwan Kim, Young-Si Jun, Jeffrey A. Gerbec, **Kimberly A. See**, Galen D. Stucky, Hee-Tae Jung, "Sulfur Infiltrated Mesoporous Graphene-Silica Composite as a Polysulfide Retaining Cathode Material for Lithium-Sulfur Batteries," *Carbon* **2014**, 69, 543-551. [DOI]
3. Jihee Park, Young-Si Jun, Woo-ram Lee, Jeffrey A. Gerbec, **Kimberly A. See**, and Galen D. Stucky, "Bimodal Mesoporous Titanium Nitride/Carbon Microfibers as Efficient and Stable Electrocatalysts for Li-O₂ Batteries," *Chem. Mater.* **2013**, 25, 3779-3781. [DOI]
2. **Kimberly A. See**, Jeffrey A. Gerbec, Young-Si Jun, Fred Wudl, Galen D. Stucky, and Ram Seshadri, "A High Capacity Calcium Primary Cell Based on the Ca—S System," *Adv. Energy Mater.* **2013**, 8, 1056-1061. [DOI]
1. Luke A. Connal, Nathaniel A. Lynd, Maxwell J. Robb, **Kimberly A. See**, Se Gyu Jang, Jason M. Spruell, and Craig J. Hawker, "Mesostructured Block Copolymer Nanoparticles: Versatile Templates for Hybrid Inorganic/Organic Nanostructures," *Chem. Mater.* **2012**, 24, 4036-4042. [DOI]

PRESENTATIONS

Invited Oral Presentations – Technical

2020 June	Telluride Science Summer Lectureship Series , virtual seminar.
2020 February	The Minerals, Metals & Materials Society (TMS) Meeting , San Diego, CA
2020 February	Department of Chemistry & Biochemistry, California State University, Northridge, CA
2020 February	Department of Chemistry, Colorado School of Mines, Golden, CO
2020 January	Materials Research Outreach Program Symposium , University of California, Santa Barbara, CA
2020 January	Department of Chemistry, University of Southern California, Los Angeles, CA
2019 November	Science Award Electrochemistry & Science Dialogue , Wolfsburg, Germany
2019 August	American Chemical Society National Fall Meeting , ENFL division, San Diego, CA
2019 August	American Chemical Society National Fall Meeting , PHYS division, San Diego, CA
2019 June	Department of Chemistry and Biochemistry, University of Oregon
2019 March	Department of Chemistry and Biochemistry, University of Texas at El Paso
2018 November	Department of Chemistry and Biochemistry, California State University, Los Angeles, CA
2018 October	Materials Development for Automotive Propulsion , Physizkzentrum Bad Honnef, Germany
2018 July	Molecular Chemistry in Electrochemical Energy Storage , Telluride, CO
2017 October	S. California Electrochemical Energy Storage Association Meeting , UC Santa Barbara, CA
2017 October	Electrochemical Society Conference , National Harbor, MD
2017 May	Canadian Chemistry Conference , Toronto, Ontario, Canada
2017 May	Materials & Interfaces Seminar , Weizmann Institute of Science, Rehovot, Israel
2017 January	Division of Chemistry and Chemical Engineering, California Institute of Technology

2017 January	Department of Chemistry, <i>Colorado State University</i>
2016 December	Department of Chemical Engineering and Materials Science, <i>University of Minnesota</i>
2016 December	Department of Chemistry, <i>Columbia University</i>
2016 December	Department of Chemistry & Chemical Biology, <i>Cornell University</i>
2016 December	Department of Chemistry, <i>University of Wisconsin-Madison</i>
2016 December	Department of Chemistry, <i>University of Minnesota</i>
2016 November	Department of Chemistry & Biochemistry, <i>The Ohio State University</i>
2016 July	STFC Batteries Meeting , <i>The Cosener's House, Abingdon, UK</i>
2015 March	Invited Seminar , <i>University of Michigan, Ann Arbor, MI</i>
2014 Feb.	Materials Research Outreach Program Symposium , <i>University of California, Santa Barbara, CA</i>
2012 June	Materials for Catalysis and Energy Applications , <i>Chalmers University, Gothenburg, Sweden</i>

Invited Oral Presentations – Non-technical meetings

2019 February	Break Through on the Road –The Caltech Campaign , <i>Los Angeles, CA</i>
2018 November	CCE Chair's Council Meeting , <i>Pasadena, CA</i>
2018 October	Resnick Sustainably Institute Advisory Council Meeting , <i>Pasadena, CA</i>

Oral Presentations

2019 September	European Congress and Exhibition on Advanced Materials & Processes , <i>Stockholm, Sweden</i>
2016 March	American Chemical Society Spring Meeting , <i>San Diego, CA</i>
2015 December	Pacificchem , <i>Honolulu, HI</i>
2014 April	Materials Research Society Spring Meeting , <i>San Francisco, CA</i>
2013 April	American Chemical Society Spring Meeting , <i>New Orleans, LA</i>
2012 November	Materials Research Society Fall Meeting , <i>Boston, MA</i>

Selected Poster Presentations

2019 September	Israeli-American Kavli Frontiers of Science Symposium , <i>Jerusalem, Israel</i> (invited contr.)
2018 February	Gordon Research Conference: Batteries , <i>Ventura, CA</i>
2016 July	Gordon Research Conference: Solid State Chemistry , <i>Colby-Sawyer College, New London, NH</i>
2016 June	18th International Meeting on Lithium Batteries , <i>Chicago, IL</i>
2016 February	Gordon Research Conference: Batteries , <i>Ventura, CA</i>
2014 March	Gordon Research Conference: Batteries , <i>Ventura, CA</i>
2013 July	North American Solid State Chemistry Conference , <i>Oregon State University, Corvallis, OR</i>
2013 Feb.	Materials Research Outreach Program Symposium , <i>University of California, Santa Barbara, CA</i>
2012 March	Gordon Research Conference: Batteries , <i>Ventura, CA</i>
2012 February	International Workshop on Advanced Materials , <i>Ras Al Khaimah Center for Advanced Materials, United Arab Emirates</i>

AFFILIATIONS AND MEMBERSHIPS

Service	Co-organizer for the 2020 Telluride Science Research Center Workshop “Molecular Chemistry in Electrochemical Energy Storage” Co-organizer for the 2019 European Congress and Exhibition on Advanced Materials and Processes (EUROMAT) Symposium “Batteries: From Materials to Cell” Co-organizer for Spring 2019 Materials Research Society (Phoenix, AZ) Symposium “Next-Generation Intercalation Batteries” Co-organizer for Spring 2018 ACS National Meeting (New Orleans, LA) Symposium “Innovative Chemistry and Materials for Electrochemical Energy Storage”
Advisory Boards	Early Career Advisory Board for <i>Chemical Reviews</i>
Professional Societies	American Chemical Society Materials Research Society Electrochemical Society

COMMUNITY INVOLVEMENT

Caltech	Keynote speaker and lab tour host for Wilson Middle School (2020) Host for Sierra Madre Middle School lab tour (2019) Outreach with Marshall Fundamental High School (hosted by the Agapie group) Pinhead Institute Punk Scientist (outreach for K-12 and community members in Telluride, CO)
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UIUC

Retreat for Graduate Women in Chemistry Planning Committee
Retreat for Graduate Women in Chemistry, Invited Speaker and Mentor
Women Chemists Committee's Girls Day Camp, Volunteer

UCSB

Partnerships for Research and Education in Materials, Materials Science Ambassador
Graduate Students for Diversity in Science, Scheduling Chair
Solar car workshop through the Materials Research Laboratory (MRL), Volunteer
Buckyball and "It's a Materials World" workshop through the MRL, Volunteer