

KIMBERLY A. SEE

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

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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

EDITORIAL ROLES

- 2022** Topic Editor, *ACS Energy Letters*
- 2022** Young Editorial Board Member, *Battery Energy*
- 2020** Early Career Advisory Board, *Chemical Reviews*

AWARDS AND RECOGNITIONS

2022	EPA Green Chemistry Challenge Award
2022	Office of Naval Research Young Investigator Award
2020	Packard Fellowship for Science and Engineering
2019	VW/BASF Science Award Electrochemistry
2019	Beckman Young Investigator Award
2019	Kavli Fellow, selected by the National Academy of Sciences
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

PATENTS

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

PUBLICATIONS

37. Joshua J. Zak, Seong Shik Kim, Forrest A. L. Laskowski, **Kimberly A. See***, "An Exploration of Sulfur Redox in Lithium Battery Cathodes," *J. Am. Chem. Soc.* **2022**, *144*, 10119-10132.
36. Seong Shik Kim, David N. Agyeman-Budu, Joshua J. Zak, Andrew Dawson, Qizhang Yan, Miguel Cában-Acevedo, Kamila M. Wiaderek, Andrey A. Yakovenko, Yiyi Yao, Ahamed Irshad, Sri R. Narayan, Jian Luo, Johanna Nelson Weker, Sarah H. Tolbert, and **Kimberly A. See***, "Promoting Reversibility of Multielectron Redox in Alkali-Rich Sulfide Cathodes through Cyromilling," *Chem. Mater.* **2022**, *34*, 3236-3245. [DOI]
35. Kira E. Wyckoff, Jonas L. Kaufman, Sun Woong Baek, Christian Dolle, Joshua J. Zak, Jadon Bienz, Linus Kautzsch, Rebecca C. Vincent, Arava Zohar, **Kimberly A. See**, Yolita M. Eggeler, Laurent Pilon, Anton Van der Ven, Ram Seshadri, "Metal-Metal Bonding as an Electrode Design Principle in the Low-Strain Cluster Compound LiScMo₃O₈," *J. Am. Chem. Soc.* **2022**, *144*, 5841-5854. [DOI]
34. Zachery W. B. Iton, **Kimberly A. See***, "Multivalent Ion Conduction in Inorganic Solids," *Chem. Mater.* **2022**, *34*, 881-898. [DOI]
33. Wen Zhang, Lingxiang Lu, Wendy Zhang, Jose Mondragon, Skyler D. Ware, Jonas Rein, Neil Strotman, Dan Lehnher, **Kimberly A. See***, Song Lin*, "Electrochemically Driven Transition-Metal-Free Cross-Electrophile Coupling of Alkyl Halides," *Nature*, **2022**, *604*, 292-297. [DOI]
32. Anton Van der Ven*, **Kimberly See**, Laurent Pilon, "Hysteresis in Electrochemical Systems," *Battery Energy*, **2022**, *1*, 20210017. [DOI]
31. Forrest A. L. Laskowski, Steven H. Stradley, Michelle D. Qian, and **Kimberly A. See***, "Mg Anode Passivation Caused by Reaction of Dissolved Sulfur in Mg-S Batteries," *ACS Appl. Mater. Interfaces* **2021**, *13*, 29461. [DOI]
30. Skyler D. Ware, Charles J. Hansen, John-Paul Jones, John Hennessey, Ratnakumar V. Bugga, and **Kimberly A. See***, "Fluoride in the SEI Stabilizes the Li Metal Interface in Li-S Batteries with Solvate Electrolytes," *ACS Appl. Mater. Interfaces* **2021**, *13*, 18865. [DOI]
29. Andrew J. Martinolich, Skyler D. Ware, Brian C. Lee, and **Kimberly A. See***, "From Solid Electrolyte to Zinc Cathode: Vanadium Substitution in ZnPS₃," *J. Phys. Mater.* **2021**, *4*, 024005. [DOI]
28. Seong Shik Kim and **Kimberly A. See***, "Activating Mg Electrolytes through Chemical Generation of Free Chloride," *ACS Appl. Mater. Interfaces*, **2021**, *13*, 671-680. [DOI]
27. Andrew J. Martinolich†, Joshua J. Zak†, David N. Agyeman-Budu, Seong Shik Kim, Nicholas H. Bashian, Ahamed Irshad, S. R. Narayan, Brent C. Melot, Johanna Nelson Weker, and **Kimberly A. See***, "Controlling Covalency and Anion Redox Potentials through Anion Substitution in Li-rich Chalcogenides," *Chem. Mater.* **2021**, *31*, 378-391 († contributed equally). [DOI]
26. 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," *RSC Advances* **2020**, *10*, 39562-39571. [DOI]

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. Spokoiny*, "A Super-Oxidized Radical Cationic Icosahedral Boron Cluster," *J. Am. Chem. Soc.* **2020**, *142*, 12948-12953. [DOI]
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 († contributed equally). [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]
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]
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]

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

2022 May	NanoLytics, <i>Simon Fraser University</i> , virtual
2022 April	StorageX International Symposium, hosted by Stanford, virtual
2022 March	Department of Chemistry & Biochemistry, <i>University of California, Los Angeles</i> , virtual
2022 March	Jacobs School of Engineering, <i>University of California, San Diego</i> , virtual
2022 March	Department of Materials Science and Engineering, <i>University of California, Irvine</i> , virtual
2022 March	Department of Chemistry & Biochemistry, <i>Montana State University, Bozeman, MT</i> , virtual
2022 March	Arkema Inc., <i>King of Prussia, PA</i> , virtual
2022 January	Department of Chemistry, <i>University of Central Florida, Orlando, FL</i> , virtual
2022 February	Department of Chemistry & Biochemistry, <i>University of California, San Diego, CA</i> , virtual
2021 Dec	Jr. Faculty in Battery Research: The Next Generation of Energy Storage , virtual
2021 Dec	Materials Research Society National Fall Meeting , virtual
2021 Sept	School of Molecular Sciences, <i>Arizona State University, Tempe, AZ</i> , virtual
2021 Sept	Department of Chemistry and Biochemistry, <i>Florida State University, Tallahassee, FL</i> , virtual
2021 April	American Chemical Society National Spring Meeting , virtual
2021 March	School of Chemistry, <i>University of Birmingham, UK</i> , virtual
2021 February	<i>Helmholtz-Institute, Ulm, Germany</i> , virtual
2021 February	<i>Max Planck Institute for Solid State Research, Stuttgart, Germany</i> , virtual
2020 November	Materials Science and Engineering, <i>Georgia Tech</i> , virtual
2020 October	Hard Matter Seminar, <i>University of Illinois Urbana-Champaign</i> , virtual
2020 June	Telluride Science Summer Lectureship Series , virtual
2020 February	The Minerals, Metals & Materials Society (TMS) Meeting , <i>San Diego, CA</i>
2020 February	Department of Chemistry & Biochemistry, <i>California State University, Northridge</i>
2020 February	Department of Chemistry, <i>Colorado School of Mines</i>
2020 January	Materials Research Outreach Program Symposium , <i>University of California, Santa Barbara</i>
2020 January	Department of Chemistry, <i>University of Southern California</i>
2019 November	Science Award Electrochemistry & Science Dialogue , <i>Wolfsburg, Germany</i>
2019 August	American Chemical Society National Fall Meeting , ENFL division, <i>San Diego, CA</i>
2019 August	American Chemical Society National Fall Meeting , PHYS division, <i>San Diego, CA</i>
2019 June	Department of Chemistry and Biochemistry, <i>University of Oregon</i>

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*
2018 October **Materials Development for Automotive Propulsion**, *Physikzentrum 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, *Colorado State University*
2016 December Department of Chemical Engineering and Materials Science, *University of Minnesota*
2016 December Department of Chemistry, *Columbia University*
2016 December Department of Chemistry & Chemical Biology, *Cornell University*
2016 December Department of Chemistry, *University of Wisconsin-Madison*
2016 December Department of Chemistry, *University of Minnesota*
2016 November Department of Chemistry & Biochemistry, *The Ohio State University*
2016 July **STFC Batteries Meeting**, *The Cosener's House, Abingdon, UK*
2015 March **Invited Seminar**, *University of Michigan, Ann Arbor, MI*
2014 Feb. **Materials Research Outreach Program Symposium**, *University of California, Santa Barbara, CA*
2012 June **Materials for Catalysis and Energy Applications**, *Chalmers University, Gothenburg, Sweden*

Invited Oral Presentations – Non-technical meetings

2021 November **Caltech Campus-Wide Faculty Meeting**, virtual meeting.
2021 March **Caltech Associates Event**, virtual meeting.
2019 February **Break Through on the Road –The Caltech Campaign**, *Los Angeles, CA*
2018 November **CCE Chair's Council Meeting**, *Pasadena, CA*
2018 October **Resnick Sustainably Institute Advisory Council Meeting**, *Pasadena, CA*

Oral Presentations

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

AFFILIATIONS AND MEMBERSHIPS

Service Co-organizer for the 2022 Telluride Science Research Center Workshop “Molecular Chemistry in Electrochemical Energy Storage”
 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 *Chemical Reviews*
 Youth Editorial Board for *Battery Energy*
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)

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