

Andrew J. Martinolich

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Research Interests

I am a solid state chemist interested in understanding how reactions progress, and how the reaction pathway influences the products that are formed. I hope to exploit these insights into solid state reaction pathways to dictate the barriers to reactivity as well as a handle by which to design new materials with desirable functional properties that are otherwise unreachable via traditional solid state methods. I aim to develop new synthetic pathways for solid state chemistry as well as apply these studies to other dynamic solid state chemical systems (e.g., charging and discharging of a battery electrode).

Professional Experience

California Institute of Technology, Pasadena, CA 91125

Postdoctoral Scholar, October 2017–Present
Department of Chemistry
Area of Research: Materials for Next-Generation Battery Systems
Advisor: [Professor Kim See](#)

Amyris Biotechnologies, Emeryville, CA 94608

Associate Scientist I, October 2012–June 2013
Analytical Operations

Education

2013 – 2017, Colorado State University, Fort Collins, CO USA

Ph.D., Chemistry
Thesis: *Kinetic Control of Solid State Metathesis Reactions*
Advisor: [Professor James R. Neilson](#)

2008 – 2012, Santa Clara University, Santa Clara, CA

B.S., Chemistry
Area of research: Characterization of Silver Nanoparticle–Metalloprotein interactions
Research Advisor: [Professor Korin E. Wheeler](#)

Graduate Awards

2016 Colorado State University Graduate Student Showcase Great Minds in Research, Honorable Mention
2016 ICDD Ludo Frevel Crystallography Scholarship Award
2015 Colorado State University Graduate Student Showcase College of Natural Sciences Graduate Student Research Award

Teaching

Teaching Assistant for *General Chemistry I Recitation* (Fall 2014)

Chemistry Department, Colorado State University

Undergraduate recitation course covering the basics of general chemistry.

Teaching Assistant for *General Chemistry I Laboratory* (Fall 2013–Spring 2014, Spring 2015–Fall 2015)

Chemistry Department, Colorado State University

Undergraduate Laboratory portion of General Chemistry 1. Supervised laboratory sessions, provided guidance and graded lab reports and practicals.

Selected Presentations

American Crystallographic Association 66th Annual Meeting, July 2016

In Situ Synchrotron Powder X-ray Scattering Studies of Kinetically Controlled Solid State Metathesis Reactions

Gordon Research Conference on Solid State Chemistry, July 2016

Circumventing Diffusion in Kinetically-Controlled Solid-State Metathesis Reactions

250th American Chemical Society National Meeting and Exposition, Aug. 2015

Superconducting CuSe₂ Polymorph Selection through Kinetically Controlled Solid State Metathesis

Northern California Undergraduate Research Symposium, Apr. 2011

Biophysico-characterization of Cu(II) Protein–Silver Nanoparticle Interactions

Publications, with DOI links where available.

Appeared:

9. A. J. Martinolich and J. R. Neilson. Towards Reaction-by-Design: Achieving Kinetic Control of Solid State Chemistry with Metathesis. *Chemistry of Materials* **2017**, *29*, 479–489. [doi]
8. A. J. Martinolich, J. A. Kurzman, and J. R. Neilson. Circumventing Diffusion in Kinetically-Controlled Solid-State Metathesis Reactions. *Journal of the American Chemical Society* **2016**, *138*, 11031–11037. [doi]
7. A. J. Martinolich, R. F. Higgins, M. P. Shores, and J. R. Neilson. Lewis Base Mediated Polymorph Selectivity of Pyrite CuSe₂ Through Atom Transfer In Solid State Metathesis. *Chemistry of Materials* **2016**, *28*, 1854–1860. [doi]
6. D. N. Freitas, A. J. Martinolich, Z. N. Amaris, and K. E. Wheeler. Beyond the Passive Interactions at the Nano-Bio Interface: Evidence of Cu Metalloprotein-Driven Oxidative Dissolution of Silver Nanoparticles. *Journal of Nanobiotechnology*, **2016**, *14*, 7. [doi]
5. J. A. Kurzman, A. J. Martinolich, and J. R. Neilson. Influence of interstitial Mn on local structure and magnetism in Mn_{1+δ}Sb. *Physical Review B*, **2015**, *92*, 184414. [doi][arXiv]

4. J. A. Kurzman, K. E. Dettelbach, A. J. Martinolich, C. P. Berlinguette, and J. R. Neilson. Structural Characteristics and Eutaxy in the Photodeposited Amorphous Iron Oxide Oxygen Evolution Catalyst. *Chemistry of Materials*, **2015**, *27*, 3462–3470. [[doi](#)]
3. A. J. Martinolich, J. A. Kurzman and J. R. Neilson, Polymorph Selectivity of Superconducting CuSe₂ Through Kinetic Control of Solid-State Metathesis. *Journal of the American Chemical Society*, **2015**, *137*, 3827–3833. [[doi](#)]
2. A. J. Martinolich and J. R. Neilson, Pyrite Formation via Kinetic Intermediates Through Low-Temperature Solid-State Metathesis. *Journal of the American Chemical Society*, **2014**, *136*, 15654–15659. [[doi](#)]
1. A. J. Martinolich, G. Park, M. Y. Nakamoto, R. E. Gate, and K. E. Wheeler, Structural and Functional Effects of Cu Metalloprotein-Driven Silver Nanoparticle Dissolution *Environmental Science and Technology*, **2012**, *46*, 6355–6362. [[doi](#)]