

Paul Kendrick Todd

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Research Interests

My research focuses on solid-state materials chemistry with an emphasis on synthetic design and development. My interests focus on characterizing and understanding the kinetic factors that underlie a given material synthesis. The goal of my work is to control the outcome of these reactions to make new materials with functional properties and design new guiding principles for solid-state synthesis. I plan to continue to expand my skillset in inorganic materials chemistry with the hopes of developing more high-throughput studies (computational and experimental) and to expand my knowledge to other dynamic non-equilibrium systems (catalysis, batteries).

Education

2015-present Colorado State University, Fort Collins, CO USA

Graduate Student in the Department of Chemistry with Professor James R. Neilson: *Investigating low-temperature solid-state chemistry for functional applications.* GPA: 3.71

2009-2013 Colorado College, Colorado Springs, CO USA

B.A., Department of Chemistry and Biochemistry, December 2013. Research: *Nanomaterials for Analytical Biosensors and Solar Energy Conversion.* Research Advisor: Professor Murphy Brasuel Cumulative GPA: 3.70; Major GPA: 3.70

Supplementary Education

2018 Argonne National Laboratory, Lemont, IL USA

Modern Methods in Rietveld Refinement and Structural Analysis.

2017 The Materials Research Company, LLC, Houston, TX USA

A Short Course on Electrochemical Impedance Spectroscopy: Theory, Applications, and Laboratory Instruction.

Employment

Summer 2016-Present Graduate Research Assistant: Neilson Lab; Colorado State University Fort Collins, CO USA

Department of Chemistry. *Investigating kinetic control in solid-state metathesis reactions for the purpose of synthesizing metastable and new functional materials.* Funding: DOE, NSF, Keck Foundation

Spring 2016 Graduate Teaching Assistant: Laboratory; Colorado State University Fort Collins, CO USA

Department of Chemistry. *Instructed two sections of General Chemistry I Laboratory for the Spring 2016 semester.*

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Fall 2015 Graduate Teaching Assistant: Recitation; Colorado State University Fort Collins, CO USA

Department of Chemistry. *Instructed six sections of General Chemistry I Recitation for the Fall 2015 semester.*

2014-2015 Paraprofessional; Colorado College, Colorado Springs, CO USA

Department of Chemistry and Biochemistry. *Laboratory Courses Instructed: General Chemistry I and II; Organic Chemistry I and II; Biochemistry I. Assisted Courses: Physical Chemistry I; Analytical Chemistry*

Awards and Honors

2018-Present Early Career Team Leader, DOE EFRC: A Next Generation Synthesis Center.

Duties: *Led a group of graduate students and post-doctoral scholars associated with the GENESIS EFRC. Helped develop collaborations and promote social networking opportunities through the DOE Early Career Network.*

Selected Presentations

Fall 2018 International Conference on Ternary and Multinary Compounds, Boulder, CO USA

Presentation title: *Understanding kinetic factors in the metathetical preparation of metastable yttrium manganese oxides*

Fall 2017 Colorado College, Chemistry Department Seminar Series, Colorado Springs, CO USA

Presentation title: *Low-temperature methods for functional solid-state material discovery*

Spring 2014 247th ACS National Meeting and Exposition, Undergraduate Symposium; Dallas, TX USA

Presentation title: *Fabrication and characterization of Cu_2ZnSnS_4 (CZTS) using microwave assisted one-pot synthesis and varying pH for photovoltaic applications.*

Related Skills

Language

Spanish: *Conversational/Fluent*

Publications with available DOI links

3. P. K. Todd, A. M. M. Smith, J. R. Neilson. Yttrium manganese oxide phase stability and selectivity using lithium carbonate assisted metathesis reactions. *Inorganic Chemistry* **2019**, *Under Review*
2. E. Rognerud, C. Rom, P. K. Todd, N. Singstock, C. Bartel, A. Holder, J. R. Neilson. Kinetically-controlled low-temperature solid-state metathesis of manganese nitride Mn_3N_2 . *Chemistry of Materials* **2019**, *Under Review*
1. P. K. Todd, J. R. Neilson. Selective Formation of Yttrium Manganese Oxides through Kinetically Competent Assisted Metathesis Reactions. *Journal of the American Chemical Society* **2019**, *141*, (3), 3652–3661. [DOI]