

Brian T. Sneed

Post-Doctoral Research Associate
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Education

Boston College, Chemistry Dept., <i>Chestnut Hill, MA, USA</i>	Ph.D., Physical Chemistry	2015
Western Carolina University, Honor's College, <i>Cullowhee, NC, USA</i>	B.S., Chemistry	2010

Post-Doctoral Advisor

Dr. Karren L. More, Microscopy Group Leader, Oak Ridge National Laboratory, CNMS

Ph.D. Advisor

Prof. Chia-Kuang (Frank) Tsung, Boston College Chemistry Dept.

Undergraduate Advisor

Prof. Brian Dinkelmeyer, Western Carolina University Chemistry Dept.

Research Interests

Understanding nanoscale phenomena, advanced electron microscopy techniques for characterization of fuel cell materials, STEM/EDS/EELS tomography, atomic-level resolution of structure and composition in multiple dimensions, evolution of nanostructure *in operando*, lattice strain characterization of nanoparticles, effects of strain on catalytic properties of nanomaterials, high resolution powder x-ray diffraction for global strain information of metal nanoparticles, aqueous synthesis of colloidal metal nanoparticle electrocatalysts, development of synthesis methods for novel well-defined and shape-controlled, multi-metallic nanoparticle architectures, anode and cathode materials for electrocatalysis in fuel cells, selective heterogeneous catalysis by hybrid nanocomposites, synthesis of hierarchical nanostructures, tandem catalysis, and applications of plasmonic metal nanoparticles.

Research Experience

2015-present	Post-Doctoral Research Associate, Physical Sciences, Oak Ridge National Laboratory
2010-2015	Research and Teaching Assistant, Chemistry Dept., Boston College
2008-2010	Undergraduate Student Researcher, Chemistry Dept., Western Carolina University

Awards and Honors

2014	Donald J. White Teaching Excellence Award, Boston College GSAS
2014	Alumnus of the GDCh NESACS Student Exchange to Jena, Germany
2013	Best Poster Award, BC Chemistry Graduate Student Symposium
2013	Visiting Scholar, Fukuzumi Lab, Osaka University, Japan
2009	Frank H. Brown Family Scholarship, Western Carolina University
2008	Summer Undergraduate Research Fellowship, Western Carolina University
2006-2010	Friends of Santa Claus Camp Merry Times Counselor Scholarship
2006-2010	Champion Survivor Scholarship, American Cancer Society
2006-2010	Academic Achievement Scholarship, Western Carolina University

Professional Activities

2014	Symposium Assistant, Materials Research Society, Fall Meeting
2013	Exhibitor: "Chemistry Magic" and Ferrofluid Demo., Family Science Days, AAAS
2012	Workshop Assistant, <i>Connections to Chemistry</i> , Burlington H.S., NESACS
2008, 2009	Secretary and Treasurer, Chemistry Club, Western Carolina University

Professional Memberships

Materials Research Society (MRS), American Chemical Society (ACS), American Association for the Advancement of Science (AAAS), Electrochemical Society (ECS), New England Catalysis Society (NECS), Appalachian Regional Electron Microscopy Society (AREMS)

Publications

1. **B.T. Sneed**, M.C. Golden, Y. Liu, H.K. Lee, I. Andoni, A.P. Young, G. McMahon, N. Erdman, M. Shibata, X.Y. Ling, and C.K. Tsung. "Promotion of the Halide Effect in the Formation of Shaped Metal Nanocrystals via a Hybrid Cationic, Polymeric Stabilizer: Octahedra, Cubes, and Anisotropic Growth." *Surface Science*, **2015**. DOI: 10.1016/j.susc.2015.12.012
2. J. Zhuang, L.Y. Chou, **B.T. Sneed**, Y.Z. Cao, P. Hu, L. Feng, and C.K. Tsung. "Surfactant-Mediated Conformal Overgrowth of Core-Shell Metal-Organic Framework Materials with Mismatched Topologies." *Small* 11(41): 5551, **2015**.
3. **B.T. Sneed**, A. P. Young, and C. K. Tsung. "Building Up Strain in Colloidal Metal Nanoparticle Catalysts." *Nanoscale* 7(29):12248, **2015**.
4. P. Scardi, A. Leonardi, L. Gelisio, M. Suchomel, **B.T. Sneed**, M.K. Sheehan, and C.K. Tsung. "Anisotropic Atom Displacement in Pd Nanocubes Resolved by Molecular Dynamics Simulations Supported by X-Ray Diffraction Imaging." *Phys. Rev. B* 91 (15): 155414, **2015**.
5. **B.T. Sneed**, A.P. Young, D. Jalalpoor, M.C. Golden, S. Mao, Y. Jiang, Y. Wang, and C.K. Tsung. "Shaped Pd-Ni-Pt Core-Sandwich-Shell Nanoparticles: Influence of Ni Layers on Electrocatalytic Oxidations." *ACS Nano* 8: 7239, **2014**.
6. C.H. Kuo, L.K. Lamontagne, C.N. Brodsky, L.Y. Chou, J. Zhuang, **B.T. Sneed**, M.K. Sheehan, and C.K. Tsung. "The Effect of Lattice Strain on the Catalytic Properties of Pd Nanocrystals." *Chem. Sus. Chem.* 6: 1993, **2013**.
7. **B.T. Sneed**, C.N. Brodsky, C.H. Kuo, L.K. Lamontagne, and C.K. Tsung. "Nanoscale-Phase-Separated Pd-Rh Boxes Synthesized via Metal Migration: An Archetype for Studying Lattice Strain and Composition Effects in Electrocatalysis." *J. Am. Chem. Soc.* 135 (39): 14691, **2013**.
8. **B.T. Sneed**, C.H. Kuo, C.N. Brodsky, and C.K. Tsung. "Iodide-Mediated Control of Rhodium Epitaxial Growth on Well-Defined Noble Metal Nanocrystals: Synthesis, Characterization, and Structure-Dependent Catalytic Properties." *J. Am. Chem. Soc.* 134 (44): 18417, **2012**.
9. C.H. Kuo, Y. Tang, L.Y. Chou, **B.T. Sneed**, C.N. Brodsky, Z. Zhao, and C.K. Tsung. "Yolk-Shell Nanocrystal@ZIF-8 Nanostructures for Gas-Phase Heterogeneous Catalysis with Selectivity Control." *J. Am. Chem. Soc.* 134 (35): 14345, **2012**.

Conference Presentations (selected)

1. **B.T. Sneed** et al. "Characterization of Catalytic Materials for PEM Fuel Cells by STEM Tomography." Materials Research Society Fall Meeting, Boston, MA, **2015**. (*oral presentation*)
2. **B.T. Sneed**, et al. "Lattice Strain Design of Shaped Pd-Ni-Pt Nanoparticles: Influence of Ni Sandwich Layers on Fuel Cell Electrocatalysis." New England Catalysis Society Winter Meeting, MIT, Boston, MA, **2015**. (*oral presentation*).
3. **B.T. Sneed**, et al. "Shape-Controlled Pd-Ni-Pt Core-Sandwich-Shell Nanoparticles: Synthesis and Influence of Ni Sandwich Layers on Electrocatalytic Oxidation of Methanol and Formic Acid for Fuel Cells." Gordon Research Seminar, Mount Holyoke College, South Hadley, MA, **2014**. (*oral presentation*).
4. **B.T. Sneed**, et al. "Design of Shape and Strain in Metal Nanocrystals for Fuel Cell Electrocatalysis." Jung Chemiker Forum, Frujahsymposium, Gesellschaft Deutscher Chemiker, Jena, Germany, **2014**. (*poster*)
5. **B.T. Sneed**, et al. "Design of Metal Nanocrystals for Energy Conversion Electrocatalysis." BC Chemistry Graduate Student Symposium, Boston, MA, **2013**. (*best poster award*)