Brendan C. Sweeny

EDUCATION

Doctor of Philosophy in Chemistry August 2009 – August 2015
University of Florida, Gainesville, FL

- Specialized in physical chemistry under the direction of Dr. Wei David Wei

Bachelor of Arts in Chemistry – ACS Certified Degree September 2005 – May 2009
Saint Anselm College, Manchester, NH

PROFESSIONAL EXPERIENCE

Department of Chemistry, University of Florida, Gainesville, FL

Research Assistant August 2009 – Present

- Develop novel gold, silver, and metal-oxide nanomaterials that improve visible light photocatalytic chemical transformations
- Devise experiments to elucidate the mechanism through which visible light improves catalytic activity
- Utilize internal facilities (Major Analytical Instrumentation Center, Nanoscale Research Facility) using spectroscopy (UV-Vis, FTIR, XPS, EDS, Raman, PL), microscopy (SEM, TEM, AFM), and diffraction (XRD) to explore the properties of metal-semiconductor photocatalysts
- Collaborate with national labs (BNL, PNNL) to characterize catalysts with electron microscopy (HAADF-STEM) and spectroscopy (XPS, EELS)
- Coauthored two book chapters and preparing four manuscripts in collaboration with seven group members and four external scientists highlighting research results
- Designed, built and currently maintain a custom gas-phase reactor that enables wavelength-dependent characterization of catalysts during reaction
- Modelled individual parts using computer-aided design software and advised machinists on fabrication requirements for custom instrumentation
- Modified FTIR instrumentation for subsequent visible light dependent study
- Communicated research results at conferences through both oral and poster presentations
- Coauthored grant proposals (NSF Career, DOE) using novel ideas

Lab Manager August 2009 – Present

- Organized lab start up and development, including initial equipment procurement
- Consulted on equipment and instrument acquisition and devised standard operating procedures
- Oversaw lab operation including management of chemical inventory/ordering, work orders, maintenance
- Enforce guidelines for hazardous waste management and coordinate proper waste chemical processing and disposal as instituted by university and government regulation
- Familiarized new graduate students with proper safety procedures
- Mentored three undergraduate students and one visiting student through Research Experience for Undergraduates (REU) program
- Serve as laboratory liaison for the chemistry department's IT division and machine shop

Teaching Assistant August 2009 – December 2014

- Taught students general and physical chemistry concepts
- Arranged lesson plans and coordinated undergraduate laboratory experiments
- Created, administered and graded exams, quizzes and lab reports
- Conducted weekly office hours and review sessions

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PUBLICATIONS

- W. D. Wei, J. S. DuChene, **B. C. Sweeny**, J. Wang, and W. Niu. "Current Development of Photocatalysts for Solar Energy Conversion". In: New and Future Developments in Catalysis. S. Suib ed., Elsevier. (2013), 279.
- J. S. DuChene, **B. C. Sweeny**, A. C. Johnston-Peck, D. Su, E. A. Stach, and W. D. Wei. "Prolonged Hot Electron Dynamics in Plasmonic-Metal/Semiconductor Heterostructures with Implications for Solar Photocatalysis" Angew. Chem. Int. Ed., 2014, 53 (30), pp 7887.
- K. Qian, **B. C. Sweeny**, A. C. Johnston-Peck, W. Niu, J. O. Graham, J. S. DuChene, J. Qiu, Y.-C. Wang, M. H. Engelhard, D. Su, and W. D. Wei. Surface-Plasmon-Driven Water Reduction: Gold Nanoparticle Size Matters" J. Am. Chem. Soc., 2014, 136 (28), pp 9842.
- W. D. Wei, **B. C. Sweeny**, J. Qiu, and J. S. Duchene. "Metallic Nanostructures for Catalytic Applications" In: Metallic Nanostructures: from Controlled Synthesis to Applications. Y. Xiong ed., Springer. 2014, pp 243.

ORAL PRESENTATIONS

- **B. C. Sweeny**, K. Qian, J. S. DuChene, J. Qiu, A. C. Johnston-Peck, D. Su, and W. D. Wei. "Plasmon-Enhanced CO Oxidation in Au-$SrTiO_3$ Nanostructures" Florida Inorganic and Materials Symposium 2013.
- J. S. DuChene, **B. C. Sweeny**, A. C. Johnston-Peck, D. Su, E. A. Stach, and W. D. Wei. "Plasmon-Mediated Charge Transfer in Au-TiO_2 Heterostructures for Visible Light Photocatalysis" 64th Southeast Regional Meeting of the American Chemical Society, 2012.
- **B. C. Sweeny**, K. Qian, J. S. DuChene, J. Qiu, A. C. Johnston-Peck, D. Su, E. Stach, and W. D. Wei. "Plasmon-Driven CO Oxidation in Au-$SrTiO_3$ Nanostructures at Room Temperature" 249th ACS National Meeting & Exposition, 2015.

POSTER PRESENTATIONS

- **B. C. Sweeny**, K. Qian, J. S. DuChene, J. Qiu, A. C. Johnston-Peck, D. Su, and W. D. Wei. "Plasmon-Enhanced CO Oxidation in Au-$SrTiO_3$ Nanostructures" NanoFlorida 2013**.**

SKILLS

Technical: Gas Chromatography, Ultraviolet-Visible Spectroscopy, Fourier Transform Infrared Spectroscopy, Electrochemical Workstation, Machine Shop (Lathe, Milling Machine, Drill Press, Bandsaw).
Computer: SolidWorks 2013, LabVIEW, Blender, Photoshop, HTML/CSS, JavaScript, MS Office

AWARDS & HONORS

- UF Department of Chemistry Alumni Research Fellowship (2009 – 2013)
- Outstanding Poster, NanoFlorida 2013 (1 of 5 awarded to group of 60)
- CLAS Spring Travel Award 2015 (1 of 12 awarded to entire College of Liberal Arts and Sciences)
- Graduate Student Council Travel Award Spring 2015

COMMUNITY INVOLVEMENT

Volunteer and Demonstration Organizer, "Molecular Mania – Chemistry Day at Oaks Mall" (2010 – 2013)

- Developed demonstrations at local event that conveys chemistry concepts to the Gainesville community

Volunteer, Tour Guide, Demonstration Organizer, "Chemathon" (2012 – 2014)

- Developed engaging experiments based on nanostructure catalysis for visiting high school students

Demonstration Organizer, "STEM Immersion Experience at UF" (2014)

- Developed and coordinated 90 minute interactive lab experience for visiting high school students