Daniel A. McCurry

Ph.D., Chemistry

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Education

2011–2016 **Doctor of Philosphy in Chemistry**, *University of Illinois at Urbana-Champaign*, Urbana, IL.

- **Thesis:** *Tunable Ionic and Molecular Transport through Nanoporous Gold Membranes*
  - **Advisor:** Professor Ryan C. Bailey
- **Honors and Awards:** National Science Foundation Graduate Research Fellowship, Algernon Gorman Award, G.L. Clark Fellowship, Dow Travel Award

2007–2011 **Bachelor of Science in Chemistry**, *State University of New York at Binghamton*, Vestal, NY.

- **Thesis:** *Fabrication of a Platinized Nanporous Gold Thin Film Catalyst*
  - **Advisor:** Professor Nikolay Dimitrov
- **Honors and Awards:** Summa cum laude, all academic honors, distinguished work in chemistry, Undergraduate Senior ACS Award, Phi Beta Kappa - Psi of New York, Binghamton Scholar

Research Experience

2016–present **Postdoctoral Research Fellow**, *University of Michigan*, Ann Arbor, MI.

Advisors: Bart M. Bartlett and Stephen Maldonado

- Developed and optimized air-stable Pb-halide perovskite solar cell synthesis
- Maintained a Zeiss LEO1455VP scanning electron microscope and trained university users on proper protocol
- Mentored an international undergraduate researcher from China on perovskite preparation in ambient conditions
- Mentored three interested non-chemistry major undergraduate students in solar cell fabrication

2011–2016 **Graduate Researcher**, *University of Illinois at Urbana-Champaign*, Urbana, IL.

Advisor: Professor Ryan C. Bailey

- Pioneered new research direction towards using nanoporous gold for molecular and biomolecular separations applications
- Designed new laboratory devices and custom glassware in AutoCAD for directly coupling UV-visible spectroscopy analysis to flow cells
- Maintained laboratory equipment and wrote new software using LabVIEW for interfacing with potentiostat and microfluidic devices
- Mentored four undergraduate students (international and US citizens) on proper laboratory techniques and protocols
- As group safety officer (2012-2015):
  - Revamped safety inspection procedures and provided safety training for over 20 lab members
  - Maintained up-to-date information about current group procedures, training certifications, and chemical inventory

2009–2011 **Undergraduate Researcher**, *State University of New York at Binghamton*, Vestal, NY.
Advisor: Professor Nikolay Dimitrov
- Optimized the electrodeposition of nickel and gold on copper to improve solder joint strength in electronic circuits
- Examined tin whisker formation using various plating baths and plating conditions
- Investigated methods of electrochemically depositing gold and silver metal alloys and subsequent electrochemical de-alloying
- Developed an all-electrochemical technique for fabricating formic acid catalysts
- Mentored one undergraduate student in scanning tunneling microscopy tip fabrication

2010 **Undergraduate Researcher**, *University of Southern Mississippi*, Hattiesburg, MS.
Advisor: Professor Wujian Miao
- Investigated electrogenerated chemiluminescence from polycyclic aromatic hydrocarbons using a dibutylaminoethanol coreactant
- Developed guidelines and procedures for using a charge-coupled device to measure wavelength of electrogenerated chemiluminescence
- Set up computers to monitor dark room experiments remotely

Teaching Experience

2017 **Teaching Assistant**, *Authentic Research on Perovskite Films - 3rd Generation Photovoltaics*, University of Michigan, Ann Arbor, MI.
- Optimized direct electrochemical deposition of lead oxide precursors for perovskite solar cells for an undergraduate laboratory
- Designed custom apparatus to facilitate student fabrication and characterization methods
- Advised students on suggested experimental procedures and appropriate laboratory techniques
- Lectured students in pre-laboratory exercises

2011–2012 **Head Teaching Assistant (2012), Teaching Assistant (2011)**, *Instrumental Chemical Systems Laboratory*, University of Illinois at Urbana-Champaign, Urbana, IL.
- Prepared and organized syllabus, lectures, quizzes, and assignments for students
- Diagnosed issues with the mass spectrometer, fluorometer, UV-visible spectrometer, HPLC, IR spectrometer, and potentiostat
- Designed and optimized nanoparticle synthesis and a new HPLC experiment
- Taught students during weekly laboratory sections and lectures
- Coordinated meetings and assignments with all other teaching assistants

2011 **Teaching Assistant**, *Chemistry of the Environment*, University of Illinois at Urbana-Champaign, Urbana, IL.
- Guided students through group activities
- Solidifed students' understanding of the course material through extensive review of core material concepts

2009–2011 **Teaching Assistant**, *Introduction to Chemical Principles I & II*, State University of New York at Binghamton, Vestal, NY.
- Proctored and graded exams and quizzes every week
- Taught laboratory sections on concepts discussed in class and proper laboratory techniques
- Evaluated student performance and provided feedback so students could improve
- Ensured a safe lab environment for all students

Publications

2017 **McCurry, D.A.**; Bailey, R.C. *Electrolyte Gradient-Based Tuning of Molecular Transport through Nanoporous Gold Membranes*. Langmuir **2017**, 33 (6), pp 1552-1562. DOI: 10.1021/acs.langmuir.6b04128

2016 **McCurry, D.A.**; Bailey, R.C. *Nanoporous Gold Membranes as Robust Constructs for Selectively Tunable Chemical Transport*. J. Phys. Chem. C. **2016**, 120 (37), pp 20929-20935. DOI: 10.1021/acs.jpcc.6b02759

2011 **McCurry, D.A.**; Kamundi, M.; Fayette, M.; Wafula, F.; Dimitrov, N. *All Electrochemical Fabrication of a Platinized Nanoporous Au Thin Film Catalyst*. ACS Appl. Mater. Interfaces **2011**, 3 (11), pp 4459-4468. DOI: 10.1021/am2011433

Oral Presentations

2015 **McCurry, D.A.**; Bailey, R.C. *Tailored Electroosmotic Flow Through Nanoporous Gold Membranes for Dynamic Selective Separations*. Presented at The Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Chicago, IL, March 12, 2015; Paper 2760-6.

2014 **McCurry, D.A.**; Bailey, R.C. *Transport through Nanoporous Gold Membranes*. Presented at Turkey Run Analytical Chemistry Conference, Marshall, IN, November 15, 2014; Paper O2.

2014 **McCurry, D.A.**; Bailey, R.C. *Dynamically-Tunable Nanoporous Gold Membranes for Size- and Charge-Selective Separations*. Presented at The Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Chicago, IL, March 2, 2014; Paper 260-1.

Poster Presentations

2017 **McCurry, D.A.**; Qian, T.; Bartlett, B.M.; Maldonado, S. *Fabrication of Perovskite Solar Cells under Ambient Conditions*. Presented at The Electrochemical Society of Detroit Poster Session, Ypsilanti, MI, May 18, 2017.

2016 **McCurry, D.A.**; Orlet, J.D.; Bailey, R.C. *Biomolecular Separations through Tunable Nanoporous Gold Membranes*. Presented at The Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Atlanta, GA, March 9, 2016; Paper 1780-12.

2015 **McCurry, D.A.**; Orlet, J.D.; Bailey, R.C. *Tunable Biomolecule Transport using Nanoporous Gold Membranes*. Presented at Turkey Run Analytical Chemistry Conference, Marshall, IN, October 2, 2015.

2013 **McCurry, D.A.**; Bailey, R.C. *Tunable Transport through Nanoporous Gold Membranes for Selective Separations*. Presented at Turkey Run Analytical Chemistry Conference, Marshall, IN, September 27, 2013.

2012 **McCurry, D.A.**; Bailey, R.C. *Towards Dynamically-Tunable Nanoporous Membranes for Size- and Charge-Selective Separations*. Presented at Turkey Run Analytical Chemistry Conference, Marshall, IN, November 2, 2012.

2011 **McCurry, D.A.**; Kamundi, M.; Fayette, M.; Wafula, F.; Dimitrov, N. *Structural Effects of De-alloying the Less Noble Metal from Silver-Gold Thin Films*. Presented at Middle Atlantic Regional Meeting of the American Chemical Society, College Park, MD, May 23, 2011. Paper 313.

2011 **McCurry, D.A.**; Miao, W. *Determination of the 2-(Dibutylamino)ethanol Free Radical Potential in Acetonitrile/Benzene Solutions Using Electrogenerated Chemiluminescence*. Presented at Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Atlanta, GA, March 15, 2011; Paper 1170-15 P.

Technical Skills

Fabrication electrodeposition, soldering, underpotential deposition, nanoparticle preparation, spin-coating, precision machining, plasma cleaning, bipolar electrodes, self-assembled monolayers, PDMS microfluidics, electron beam deposition, sputter coating

Analysis electrogenerated chemiluminescence, fluorescence and UV-Visible spectroscopy, rotating disk electrode, cyclic and linear sweep voltammetry, spectral response, HPLC, FIB, SEM, EDX/EDS, XRD

Computer Certified LabVIEW Associate Developer, Origin, COMSOL, AutoCAD, ImageJ, Linux, LaTeX

Leadership

2014–2015 **Chair (2015), Public Relations (2014)**, *Department of Chemistry Graduate Student Advisory Committee*, University of Illinois at Urbana-Champaign, Urbana, IL.

- Organized and directed regular monthly meetings with committee
- Coordinated with department chair and faculty regarding graduate student events
- Served as ombudsperson for the analytical area graduate students

2009–2011 **President (2010–2011), Vice President (2009–2010)**, *Undergraduate Chemical Society*, State University of New York at Binghamton, Vestal, NY.

- Organized and managed events both on and off campus, such as a student-faculty mixer and demonstrations at the local elementary school and mall
- Tutored students in chemistry courses and hosted events focused on preparing for chemistry exams
- Revived student interest in the Undergraduate Chemical Society by organizing group activities and advertising the group on campus

Volunteering

2016 Presented chemistry demonstrations at the annual Logan Elementary School science fair in Ann Arbor, MI

2011–2015 Performed chemistry-related demonstrations to Urbana Middle School students with *Encouraging Tomorrow's Chemists* in Urbana, IL

2013–2015 Aided experiment setup and group activities during the annual *Women Chemists Committee Bonding with Chemistry Day Camp* in Urbana, IL