

Keith D. Hurley, Ph.D.

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Summary of Qualifications

- **Kinetic and mechanistic investigation of heterogeneous catalysts in solution**
- **Materials characterization and structure -- property correlations**
- **Problem solving using innovation and collaboration**
- **Application of both scientific and engineering approaches to real world problems**

Education

Ph.D. Chemistry

October 2008

University of Illinois at Urbana-Champaign

Thesis Advisor: Prof. J.R. Shapley

Thesis Title: Heterogeneous Catalytic Reduction of Perchlorate in Water

B.S. Chemistry (American Chemical Society certified)

December 2002

Arizona State University

Skills & Techniques

Lab: Inorganic and materials synthesis, wet chemistry, quantitative analysis, vacuum, high pressure, high temperature, reactive gases, hazardous and toxic chemicals, clean room, photo- and soft-lithography, sensor testing, thin films

Instrumental: UV-Vis, FTIR, DRIFTS, XRD, XPS, (S)TEM/ SEM, EDX, SIMS, AFM, chemisorption, ion chromatography, NMR, TGA, MOCVD, GC

Computer: Microsoft Word, Microsoft Excel, Microsoft PowerPoint, CasaXPS, Chromeleon, Mathcad

Experience

Postdoctoral Research Assistant

October 2008 – Present

Department of Chemical and Biological Engineering

Forest Bioproducts Research Initiative

Advisor: Prof. M. Clay Wheeler

- Spearheaded research on multiple projects while simultaneously providing research support for multiple graduate students and PIs
- Current research projects include: high throughput catalyst screening, hydrodeoxygenation catalyst development and characterization, thin film sensor development, high temperature materials testing platform development, quantitative x-ray diffractometry for Fischer-Tropsch catalysts, and carboxylic acid esterification via acid-catalyzed and supercritical techniques

Experience Cont.**Graduate Research Assistant**

Prof. J.R. Shapley Research Group (UIUC)

August 2005 – October 2008

- Developed first heterogeneous catalyst for reduction of perchlorate in water
- Applied kinetic models and chemical techniques to probe reduction mechanisms
- Utilized multiple spectroscopic and microscopic techniques for catalyst characterizations
- Integrated team discussions into practical research plans
- Organized and managed large amounts of data
- Mentored and directed multiple undergraduate researchers

Graduate Research Assistant (cont.)

Prof. R.G. Nuzzo Research Group (UIUC)

January 2003 – 2005

- Coordinated efforts with coworkers in a highly goal-oriented team environment
- Coauthored and published two articles in scientific journals
- Developed extensive experience in photolithography and thin-films processing

Graduate Teaching Assistant

University of Illinois at Urbana-Champaign

- Chem 102P: General Chemistry, 20 undergraduate students Spring 2003
- Chem 315: Instrumental Analysis of Chemical Syst. Lab, 30 undergraduate students Fall 2003
- Chemistry Learning Center: Walk-in tutoring, undergraduate Fall 2005
- Chem 516: Physical Inorganic Chemistry, 12 graduate students Spring 2006
- Chem 202: Accelerated General Chemistry Lab, 18 undergraduate students Fall 2006
- Chem 312: Inorganic Chemistry, 150 undergraduate students Spring 2007

Undergraduate Researcher

Prof. B. Petuskey Research Group (ASU)

2000 – 2002

- Investigated polyamorphism in Nd:YAG glasses

Publications & Abstracts

Hurley, K.; Zhang, Y; Shapley, J. “Ligand Promoted Reduction of Perchlorate in Water with Heterogeneous Re-Pd/C Catalysts,” *J. Amer Chem. Soc.*, **in preparation**.

Hurley, K.; Zhang, Y; and Shapley J. “Heterogeneous Catalytic Reduction of Perchlorate in Water with Re-Pd Catalysts Derived from an Oxorhenium(V) Molecular Precursor,” *Inorganic Chemistry*, **in revision**.

Hurley, Keith D.; Shapley, John R. “Efficient Heterogeneous Catalytic Reduction of Perchlorate in Water,” *Environmental Science and Technology*, **2007**, *41*, 2044.

Hurley, Keith D.; Daleiden, James J.; Shapley, John R. “Heterogeneous Catalytic Reduction of Perchlorate Using Molecular Rhenium(V) Precursors,” *Abstracts of Papers*, 233rd ACS National Meeting, Chicago, IL, March 25-29, **2007**, ENVR-167.

Publications (cont.)

- Guy, Kathryn A.; Xu, Huiping; Yang, Judith C.; **Hurley, Keith D.**; Shapley, John R. "Catalytic Nitrate and Nitrite Reduction with Pd-Cu Colloids: Composition, Structure and Reactivity Correlations," *Abstracts of Papers*, 231st ACS National Meeting, Atlanta, GA, March 26-30, **2006**, ENVR-080.
- Zhu, Z.T.; Menard, E.; **Hurley, K.**; Nuzzo, R.G.; Rogers, J.A.; "Spin On Dopants for High-Performance Single-Crystal Silicon Transistors on Flexible Plastic Substrates," *Applied Physics Letters*, **2005**, 86, 33507.
- Sun, Y.G.; Khang, D.Y.; Hua, F.; **Hurley, K.**; Nuzzo, R.G.; Rogers, J.A.; "Photolithographic Route to the Fabrication of Micro/Nanowires of III-V Semiconductors," *Advanced Functional Materials*, **2005**, 15, 30.

Presentations

- "Ligand Effects on the Catalytic Reduction of Perchlorate with Supported Re(V) Complexes", 235th National Meeting of the American Chemical Society, New Orleans, LA, April 6-10, **2008**, ENVR-177.
- "Catalytic Reduction by Hydrogen of Perchlorate in Water", WaterCAMPWS Interdisciplinary Campus Team II (Decontamination) Seminar, October 5, **2007**
- "Reduction of Drinking Water Contaminants Using Bimetallic Catalysts," WaterCAMPWS Interdisciplinary Campus Team II (Decontamination) Seminar, December 8, **2006**

Affiliations

ASU Alumni Association	2002 – Present
American Chemical Society	2004 – Present
ACS Environmental Division	2007 – Present
American Institute of Chemical Engineers	2008 – Present

Awards

Certificate of Merit, Division of Environmental Chemistry, ACS	2007
Incomplete List of Instructors Rated as Excellent, UIUC	Fall 2006
Incomplete List of Instructors Rated as Excellent, UIUC	Spring 2003
Hypercube Awards, Dept. of Chemistry, ASU	2002
Dean's List, College of Liberal Arts and Sciences, ASU	Fall 2002
Dean's List, College of Liberal Arts and Sciences, ASU	Fall 2001

Related Experience

Mentored and directed the research of Francisco Chapparro, an undergraduate from Puerto Rico, as part of the Graduate College Special Research Opportunity Program (SROP,) which provides research experience to traditionally underrepresented populations.