

Erik J. Menke, Ph. D.

*Curriculum Vitae*  
August 2009

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## **A. Personal Information**

Born: November 29, 1975  
Personal Address: 630 E. 21<sup>st</sup> St.  
Merced, CA, 95340  
Phone: (949) 307-3783  
E-mail: [emenke@ucmerced.edu](mailto:emenke@ucmerced.edu)  
Website: <http://faculty.ucmerced.edu/emenke>

## **B. Academic History**

4. University of California, Los Angeles, 2006-2008.  
Department of Materials Science and Engineering.  
Postdoctoral advisor: Prof. Bruce Dunn.  
Project: Protective layers for lithium metal battery applications.
3. University of California, Irvine, 2000-2006.  
Ph.D. Chemistry, 2006; Thesis Advisor: Prof. Reginald Penner.  
Dissertation title: Advances in nanowire preparation via electrochemical step edge decoration.
2. Colorado State University, Fort Collins, Colorado, 1997-2000.  
B.S. Chemistry (ACS Certified).
1. Fort Lewis College, Durango, Colorado, 1994-1996.

## **C. Professional Appointments**

5. Assistant Professor, UC Merced, 2008-present
4. Postdoctoral Researcher, UCLA, 2006-2008
3. Research Assistant, UC-Irvine, 2001-2006
2. Teaching Assistant, UC-Irvine, 2000-2006
  - General Chemistry Lab
  - General Chemistry Discussion
  - Computational Chemistry Discussion
  - Analytical Chemistry Lab
  - Analytical Chemistry Discussion
1. Teaching Assistant, Colorado State University, 1999-2000
  - Organic Chemistry Lab

## **D. Honors / Awards**

2. UCI Regents Dissertation Fellowship
1. MRS Silver Graduate Student Award

## **E. Professional Affiliations**

3. Materials Research Society, 2004
2. American Chemical Society, 2000
1. American Physical Society, 2000

## **F. Research Interests**

My research interests focus on understanding how manipulating the nanostructure of materials enhances energy collection and storage. I am primarily interested in answering two questions: 1) How can I make a cheaper, more efficient solar cell? 2) How can I efficiently store the energy once it has been collected? Research projects typically go through two phases. Phase 1 involves the synthesis and characterization of the nanostructured material. The synthesis is primarily realized via an electrodeposition process, whereas the characterization of the materials typically involves five methods (SEM, TEM, EDX, SAED, and powder XRD). The goal of phase 1 for most projects is not only to prepare a nanostructured material, but also to elucidate how various electrochemical and chemical processing steps (voltage, time, solution composition, temperature, etc.) affect both the physical and chemical properties of the final material (dimensions, composition/stoichiometry, crystallinity, etc.). Phase 2 involves correlating how the various physical and chemical properties of the nanostructured material affect the material's ability to perform interesting chemistry and/or physics (catalytic rate enhancement, thermoelectric conversion, enhanced photovoltaic efficiency, etc).

## **G. Publications**

12. Chengxiang Xiang, Michael A. Thompson, Fan Yang, Erik J. Menke, Li-Mei C. Yang, Reginald M. Penner, Lithographically Patterned Nanowire Electrodeposition, *Physica Status Solidi (c)*, 5 (2008) 3503.
11. Filippo Marchioni, Kurt Starr, Erik Menke, Thierry Buffeteau, Laurent Servant, Bruce Dunn, and Fred Wudl, Protection of Lithium Metal Surfaces Using Chlorosilanes, *Langmuir*, 23 (2007) 11597.
10. E.J. Menke, M.A. Thompson, C. Xiang, L.C. Yang, and R.M. Penner\*, Lithographically Patterned Nanowire Electrodeposition, *Nature Materials* 5 (2006) 914.
9. E.J. Menke, M.A. Brown, Q. Li, J.C. Hemminger, and R.M. Penner\*, Bismuth Telluride ( $\text{Bi}_2\text{Te}_3$ ) Nanowires: Synthesis by Cyclic

Electrodeposition/Stripping, Thinning by Electrooxidation, and Electrical Power Generation, *Langmuir* 22 (2006), 10564.

8. Yeonho Im, Choonsup Lee, Richard P. Vasquez, Mangesh A. Bangar, Nosang V. Myung, Eric J. Menke, Reginald M. Penner and Minhee Yun\* Investigation of A Pd Single Nanowire For Use as a Hydrogen Sensor\*\* *Small* 2 (2006) 356.
7. M. Thompson, E.J. Menke, R.M. Penner\*, Sub-100 nm Nanowires via Electrochemical Step Edge Decoration/Electrochemical Etching, *Journal of Physical Chemistry B* 110 (2005) 36.
6. B.J. Murray, Q. Li, J.T. Newberg, E.J. Menke, J.C. Hemminger, and R.M. Penner\*, Shape- and Size-Selective Electrochemical Synthesis of Dispersed Silver(I) Oxide Colloids, *Nanoletters* 5 (2005) 2319.
5. E.J. Menke, Q. Li, and R.M. Penner\*, Bismuth Telluride ( $\text{Bi}_2\text{Te}_3$ ) Nanowires Synthesized by Cyclic Electrodeposition/Stripping Coupled with Step Edge Decoration, *NanoLetters* 4 (2004) 2009.
4. Y. Dubowski, A.L. Sumner, E.J. Menke, D.J. Gaspar, J. Newberg, R.C. Hoffman, R.M. Penner, J.C. Hemminger and B.J. Finlayson-Pitts\*, Interactions of Gaseous Nitric Acid with Surfaces of Environmental Interest, *Physical Chemistry Chemical Physics* 6 (2004) 3879.
3. M. Yun\*, N.V. Myung, R.P. Vasquez, E. Menke, and R.M. Penner, Electrochemically-Grown Wires for Individually Addressable Sensor Arrays, *NanoLetters* 4 (2004) 419.
2. A.L. Sumner, E.J. Menke, Y. Dubowski, J.T. Newberg, R.M. Penner, J.C. Hemminger, L.M. Wingen, T. Breuers, B.J. Finlayson-Pitts\*, The Nature of Water on Surfaces of Laboratory Systems and Implications for Heterogeneous Chemistry in the Troposphere, *Physical Chemistry Chemical Physics* 6 (2004) 604.
1. G. Kaltenpoth, P. Schnabel, E. Menke, E.C. Walter, and M. Grunze, R.M. Penner\*, Multi-Mode Detection of Hydrogen Gas Using Palladium Nanoparticle Networks On Silicon, *Analytical Chemistry* 75 (2003) 4756.

## H. Patents

1. "Electrode Compositions and Processes", Erik Menke, Grant Umeda, Brittnee Veldman, Bruce Dunn, Fred Wudl, Monique Nathalie Richard, Kimber Lee Stamm, United States Non-provisional Patent Application

12/395,488, Filed: 02/27/2009, Assignee: Toyota Motor Engineering and Manufacturing North America, Inc, and The Regents of the University of California.

2. "Lithographically Patterned Nanowire Electrodeposition", R. M. Penner, E. J. Menke, M. A. Thompson, C. Xiang, United States Provisional Patent Application 60/823488, Filed: August 24, 2006, Assignee: University of California, Irvine.

## **I. Professional Service**

- Member, University Committee on Academic Freedom, August 2008 – present.
- Member, Materials Chemist Search Committee, AY 2008 - 2009.
- Member, Organic Chemist Search Committee, AY 2008 - 2009.
- Peer Reviewer for Royal Society of Chemistry Journals (Journal of Materials Chemistry, Physical Chemistry Chemical Physics, Chemical Communications, etc.), 2008 - present.
- Review Panel Member, Department of Education GAANN Fellowship Program, April 2009.
- Proposal Reviewer, NSF Department of Materials Research, 2009 - present.

## **J. Oral Presentations**

7. Gordon Research Conference on Electrochemistry, January 14-18, 2007, Ventura, CA
6. Materials Research Society, 2005 MRS Spring Meeting, March 28-April 1, 2005, San Francisco, CA
5. American Physical Society, 2005 APS March Meeting, March 21-25, 2005, Los Angeles, CA
4. American Chemical Society, 228<sup>th</sup> ACS National Meeting, March 13-17, 2005, San Diego, CA

3. American Vacuum Society, 2004 AVS 51st International Symposium, November 14-19, 2004, Anaheim, CA
2. Materials Research Society, 2004 MRS Spring Meeting, April 12-16, 2004, San Francisco, CA
1. American Chemical Society, 227<sup>th</sup> ACS National Meeting, March 27-April 1, 2004, Anaheim, CA

## **K. Poster Presentations**

8. Gordon Research Conference on Electrochemistry, January 14-18, 2007, Ventura, CA
7. International Meeting on Lithium Batteries, June 18-23, 2006, Biarritz, France
6. Gordon Research Conference on Electrochemistry, February 12-17, 2006, Buellton, CA
5. Materials Research Society, 2005 MRS Spring Meeting, March 28-April 1, 2005, San Francisco, CA
4. Gordon Research Conference on Chemical Reactions at Surfaces, February 13-18, 2005, Ventura, CA
3. Gordon Research Conference on Electrodeposition, August 8-13, 2004, New London, NH
2. Gordon Research Conference on Electrochemistry, January 9-14, 2003, Ventura, CA
1. American Association for the Advancement of Science, 2003 Annual AAAS National Meeting, February 13-18, 2003, Denver, CO

## **L. Students Mentored**

### **At UC Merced:**

Justin Hujdic, Graduate student at UC Merced. Project: Synthesis of PbS nanowires.

Somnath Ghosh, Graduate student at UC Merced. Project: Synthesis of CdSe nanowires.

Chau Pham, Undergraduate student at UC Merced. Project:  
Electrodeposition of Chiral Cu<sub>2</sub>O surfaces.

Alan Sargisian, Undergraduate student at UC Merced. Project: Synthesis  
of Copper Inverse Opals.

Ana Arteaga, student at Golden Valley High School. Project:  
Electrodeposition of Copper Indium Diselenide for Solar Cell Applications.

**At UC Irvine:**

Mike Thompson, undergraduate student at UC-Irvine. Project: Synthesis  
of sub-100 nm Sb, Au, and Bi<sub>2</sub>Te<sub>3</sub> nanowires.

Swetha Kambhampati, student at University High School. Project:  
Synthesis of Bi<sub>2</sub>Te<sub>3</sub> nanowires.

## **M. Community Service**

- Project SEED coordinator and mentor, January 2009 - present.
- Judge, Central California Science Fair, March 2009.
- Judge, California State Science Fair, May 2009.

## **N. Courses Taught**

Title	Category	Date	Enrollment	Web site
Quantum Mechanics	Graduate	Fall 2008	4	<a href="http://faculty.ucmerced.edu/emmenke/Chem212_f08">faculty.ucmerced.edu/emmenke/Chem212_f08</a>
Instrumental Analysis	Undergraduate	Fall 2009		<a href="http://faculty.ucmerced.edu/emmenke/Chem115_f09">faculty.ucmerced.edu/emmenke/Chem115_f09</a>