

BIOGRAPHICAL SKETCHES

Michael Zach, PI

(i) Professional Preparation

- B.S., University of Wisconsin-Stevens Point, ACS Chemistry and Chemistry w/polymer option, 1997
- M.S., University of California, Irvine, Chemistry, 2000
- Ph.D., University of California, Irvine, Chemistry, 2002

(ii) Appointments

- Assistant Professor, University of Wisconsin, Stevens Point, 2006-present.
- Guest Faculty Researcher, Division of Educational Programs, Argonne National Laboratory, 2006-present
- Glenn Seaborg Post-doctoral Fellow, Argonne National Laboratory, Superconductivity and Magnetism Group, Materials Science Division, 2004-2006.
- Miller Postdoctoral Fellow, Miller Institute for Basic Research in Science, University of California, Berkeley. 2002 to 2004. Joint Appointment with NASA/Ames Research Center 2003 to 2004.

(iii) Publications [UWSP student authors in boldface.]

(a) Relevant publications using Energy Dispersive X-ray Analysis

1. M.P.Zach, J.Newberg, L.Sierra, J.Hemminger, R.M.Penner*, Chemical Vapor Deposition of Silica Micro- and Nanoribbons Using Step-Edge Localized Water, J. Phys. Chem., B, (2003) 107 (23) 5393-5397.
2. E.C. Walter, M.P. Zach, F. Favier, B.J. Murray, K. Inazu, J.C. Hemminger, and R.M. Penner*, Metal Nanowire Arrays by Electrodeposition, ChemPhysChem (2003) 4 (2) 131-138.
3. M.P.Zach, K.Inazu, K.H. Ng, J.Hemminger, R.M.Penner*, Synthesis of Molybdenum Nanowires with Millimeter-Scale Lengths Using Electrochemical StepEdge Decoration, Chem. Mater. 14 (2002) 3206-3216.
4. E.C. Walter, R.M. Penner, H. Liu, K.H. Ng, M.P. Zach, F. Favier*, Sensors From Electrodeposited Metal Nanowires, Surface and Interface Analysis, 34 (1) 409-412.
5. E.C. Walter, K. Ng, M.P. Zach, R.M. Penner, F. Favier, Electronic devices from electrodeposited metal nanowires, Microelectronic Engineering, 61-2: 555-561(2002).
6. F. Favier, E.Walter, M.P.Zach, T.Benter, R.M.Penner, Hydrogen Sensors and Switches from Electrodeposited Palladium Nanowires, Science, V293, 2227-2231 (2001).
7. H.Liu, F.Favier, K.Ng, M.P.Zach, and R.M. Penner*, A General Method for the Electrodeposition of Dimensionally Uniform Meso-Scale Metal Particles, Electrochimica Acta, 47 (2001) 671.
8. S. Gorer, H. Liu, R.M. Stiger, M.P. Zach, James V. Zoval, and R.M. Penner*, "The Handbook of Metal Nanoparticles: Synthesis, Characterization, and Applications." C.Foss and D. Feldheim, Eds., Marcel-Dekker Inc., (2001).
9. M.P. Zach, K.H. Ng and R.M. Penner*, Molybdenum Nanowires by Electrodeposition, Science, V290, 2120-2123 (2000) (Selected as cover story).

10. M.P. Zach and R.M. Penner, Size-Monodisperse and Nanocrystalline Nickel Nanoparticles, Adv. Mat., 12 (2000) 878.

(b) Other Significant Publications featuring SEM, TEM, AFM or Sub-micron Methods of Analysis

1. A. Rydh, R. Xie, M. Zach, U. Welp, W. K. Kwok, G. W. Crabtree, S. Bending, M. V. Milosevic, F. M. Peeters, Magnetization of a few-fluxoid lead crystal, Physica C, submitted.
2. T. Xu*, M. P. Zach, Z.L.Xiao, D.Rosenmann, U.Welp, W.K.Kwok, G.W.Crabtree, Self-Assembled Monolayer-Enhanced Hydrogen Sensing with Ultrathin Palladium Films, Appl. Phys. Lett. 86, 203104 (2005).
3. E.C. Walter, M.P. Zach, F. Favier, B.J. Murray, K. Inazu, J.C. Hemminger, and R.M. Penner* " Electrodeposition of Portable Metal Nanowire Arrays ", in: Physical Chemistry of Interfaces and Nanomaterials, Proc., Eds. Jin Z. Zhang, Zhong L. Wang, SPIE 2002 (2002) ISBN 0-8194-4575-4.
4. P.D. Markowitz, M.P. Zach, P.D. Gibbons, R.M. Penner, and W. E. Buhro*, Phase Separation in Al_xGa_{1-x}As Nanowhiskers Grown by the Solution-Liquid-Solid Mechanism, J. Am. Chem. Soc., 123 (2001) 4502.

(iv) Synergistic Activities

- (a) **Developing strong research presence at UWSP:** Hiring special research instructor to lead student in cutting edge research projects, acquisition of an atomic force microscope, synthesis instrumentation for electrodeposition, chemical vapor deposition and polymer sphere microencapsulation experiments.
- (b) **Development and/or refinement of research tools:** Created new electrodeposition instruments related to materials research (combinatorial electrodeposition and electrochemical atomic layer epitaxy), discovered new method for peeling away 1-10 layers of graphite for TEM samples.
- (c) **Outreach** to elementary, secondary schools and professional societies. 20 presentations in the last year encouraging students to enter into technical fields.

(v) Collaborations and Other Affiliations:

- (a) **all co-authors on publications during the last 4 years:**
J.Newberg, L.Sierra, J.Hemminger, R.M.Penner
A, Rydh, R. Xie, M. Zach, U. Welp, W. K. Kwok, G. W. Crabtree, S. Bending, M. V. Milosevic, F. M. Peeters
T. Xu*, M. P. Zach, Z.L.Xiao, D.Rosenmann, U.Welp, W.K.Kwok, G.W.Crabtree
E.C. Walter, M.P. Zach, F. Favier, B.J. Murray, K. Inazu, J.C. Hemminger, and R.M. Penner*
- (b) **Thesis and Post-Doc Advisor -**
Thesis Advisor -- Dr. Reginald M. Penner, Professor
Post-Doc Advisor -- Dr. Jill Banfield, Professor
Post-Doc Advisor -- Dr. Wai-Kwong Kwok, Group leader, Superconductivity & Magnetism
- (c) **all graduate students for whom you have been thesis advisor in the last 5 years:** (none)
- (d) **total number of graduate students advised:** (none)