

## Wyatt E. Tenhaeff

### Assistant Professor

Department of Chemical Engineering  
University of Rochester  
249A Gavett Hall  
Rochester, NY 14627  
(585) 275-2110  
wyatt.tenhaeff@rochester.edu

### EDUCATION

Ph.D. Chemical Engineering, Massachusetts Institute of Technology, Cambridge, MA 2009  
B.S. Chemical Engineering, Oregon State University, Corvallis, OR 2004

### ACADEMIC APPOINTMENTS

Assistant Professor, Department of Chemical Engineering, University of Rochester 2013-present

### NON-ACADEMIC POSITIONS

Staff Scientist, Materials Science & Technology Division, Oak Ridge National Laboratory 2009-2013

### FIELDS OF SPECIALIZATION

Electrochemical energy storage, interfacial engineering, polymer thin films/coatings, vacuum deposition techniques

### AWARDS

Oak Ridge National Laboratory Weinberg Fellowship 2009-2011  
National Science Foundation Graduate Research Fellowship 2005-2008  
MIT Presidential T. Haslam Fellowship 2004-2005  
AIChE Donald F. and Mildred Topp Othmer National Scholarship Award 2003  
Oregon State University Presidential Scholarship 1999-2004

### TEACHING

*Instructor, CHE 231, Chemical Reactor Design* Spring semesters, 2014-present  
Review of chemical kinetics; kinetic data analysis; design of chemical reactors. Isothermal, homogeneous reactions are covered initially, and biological (enzymatic) and heterogeneous (catalytic) reactions are covered in the second half of the course. The course ends with a thorough discussion of nonisothermal and unsteady-state effects.

### ADVISED STUDENTS

#### *Graduate*

Yifan Gao 2014 – present  
Marina Ioanniti 2014 – present  
Brian Shen 2014 – present

#### *Undergraduate*

Branden Cole 2013 – present

## PUBLICATIONS

### Peer-reviewed journals

22. W.E. Tenhaeff, O. Rios, K. More, M.A. McGuire. Highly Robust Lithium Ion Battery Anodes from Lignin: An Abundant, Renewable, and Low-Cost Material. *Adv. Func. Mater.* **2014**, *24*, 86.
21. W.E. Tenhaeff, E. Rangasamy, Y. Wang, A.P. Sokolov, J. Wolfenstine, J. Sakamoto, N.J. Dudney. Resolving the grain boundary and lattice impedance of hot-pressed  $\text{Li}_7\text{La}_3\text{Zr}_2\text{O}_{12}$  garnet electrolytes. *ChemElectroChem*, **2014**, *2*, 375.
20. E.R. Klobukowski, W.E. Tenhaeff, J.W. McCamy, C.S. Harris, C.K. Narula. Atmospheric pressure chemical vapor deposition of high silica  $\text{SiO}_2\text{-TiO}_2$  antireflective thin films for glass based solar panels. *J. Mater. Chem. C.* **2013**, *1*, 6188.
19. W.E. Tenhaeff, K.A. Perry, N.J. Dudney. Impedance characterization of Li ion transport at the interface between laminated ceramic and polymeric electrolytes. *J. Electrochem. Soc.* **2012**, *159*, A2118.
18. S. Kalnaus, A.S. Sabau, W.E. Tenhaeff, N.J. Dudney, C. Daniel. Design of composite polymer electrolytes for Li ion batteries based on mechanical stability criteria. *Journal of Power Sources* **2012**, *201*, 280.
17. W.E. Tenhaeff, X. Yu, K. Hong, K.A. Perry, N.J. Dudney. Ionic transport across interfaces of solid glass and polymer electrolytes for lithium ion batteries. *J. Electrochem. Soc.* **2011**, *158*, A1143.
16. S. Kalnaus, A.S. Sabau, S. Newman, W.E. Tenhaeff, C. Daniel, N.J. Dudney. Effective conductivity of particulate polymer composite electrolytes using random resistor network method. *Solid State Ionics* **2011**, *199*, 44.
15. E.G. Herbert, W.E. Tenhaeff, N.J. Dudney, G.M. Pharr. Mechanical characterization of LiPON films using nanoindentation. *Thin Solid Films* **2011**, *520*, 413.
14. W.E. Tenhaeff, L.D. McIntosh, K.K. Gleason. Synthesis of poly(4-vinylpyridine) thin films by initiated chemical vapor deposition (iCVD) for selective nanotrench-based sensing of nitroaromatics. *Adv. Funct. Mater.* **2010**, *20*, 1144.
13. K.L. Sedransk, W.E. Tenhaeff, K.K. Gleason. Grafting CVD of poly(vinyl pyrrolidone) for durable scleral lens coatings. *Chem. Vapor Depos.* **2010**, *16*, 23.
12. A. Asatekin, M.C. Barr, S.H. Baxamusa, K.K.S. Lau, W.E. Tenhaeff, J.J. Xu, K.K. Gleason, Designing polymer surfaces via vapor deposition. *Mater. Today* **2010**, *13*, 26.
11. M.E. Alf, A. Asatekin, M.C. Barr, S.H. Baxamusa, H. Chelawat, G. Ozaydin-Ince, C.D. Petruczok, R. Sreenivasan, W.E. Tenhaeff, N.J. Trujillo, S. Vaddiraju, J.J. Xu, K.K. Gleason. Chemical vapor deposition of conformal, functional, and responsive polymer films. *Advanced Materials* **2010**, *22*, 1993.
10. W.E. Tenhaeff, K.K. Gleason. Crosslinking of copolymer thin films by initiated chemical vapor deposition for hydrogel applications. *Thin Solid Films* **2009**, *517*, 3543.
9. W.E. Tenhaeff, K.K. Gleason. Surface-tethered pH-responsive hydrogel thin films as size-selective layers on nanoporous asymmetric membranes. *Chem. Mat.* **2009**, *21*, 4323.
8. C.H. Lee, W.E. Tenhaeff, K.K. Gleason. Nano-patterning of an iCVD polymer, followed by covalent attachment of QDs. *Thin Solid Films* **2009**, *517*, 3619.
7. S.G. Im, B.S. Kim, W.E. Tenhaeff, P.T. Hammond, K.K. Gleason. A directly patternable click-active polymer film via initiated chemical vapor deposition (iCVD). *Thin Solid Films* **2009**, *517*, 3606.
6. W.J. Arora, W.E. Tenhaeff, K.K. Gleason, G. Barbastathis. Integration of reactive polymeric nanofilms into a low-power electromechanical switch for selective chemical sensing. *J. Microelectromech. Syst.* **2009**, *18*, 97.
5. W.E. Tenhaeff, K.K. Gleason. Initiated and oxidative chemical vapor deposition of polymeric thin films: iCVD and oCVD. *Adv. Funct. Mater.* **2008**, *18*, 979.

4. S.G. Im, B.S. Kim, L.H. Lee, W.E. Tenhaeff, P.T. Hammond, K.K. Gleason. A directly patternable, click-active polymer film via initiated chemical vapor deposition. *Macromol. Rapid Commun.* **2008**, *29*, 1648.
3. W.E. Tenhaeff, K.K. Gleason. Initiated chemical vapor deposition of alternating copolymers of styrene and maleic anhydride. *Langmuir* **2007**, *23*, 6624.
2. W.E. Tenhaeff, K.K. Gleason. Initiated chemical vapor deposition of perfectly alternating poly(styrene-alt-maleic anhydride). *Surf. Coat. Technol.* **2007**, *201*, 9417.
1. K. Chan, L.E. Kostun, W.E. Tenhaeff, K.K. Gleason. Initiated chemical vapor deposition of polyvinylpyrrolidone-based thin films. *Polymer* **2006**, *47*, 6941.

#### *Patents*

2. F.S. Baker, C. Daniel, N.J. Dudney, O. Rios, W.E. Tenhaeff. Lignin-based active anode materials synthesized from low-cost renewable resources. U.S. Patent, pending.
1. W.J. Arora, G. Barbastathis, K.K. Gleason, W.E. Tenhaeff. Electro-mechanical switches and methods of use thereof. U.S. Patent, pending.

## **PRESENTATIONS**

#### *Contributed*

14. W.E. Tenhaeff, K.A. Perry, S. Kalnaus, N.J. Dudney. "Tough Solid Composite Electrolytes to Enable Lithium Metal Anodes." Prime Pacific Rim Meeting on Electrochemical and Solid-State Science. Honolulu, HI, Oct. 2012. (oral)
13. W.E. Tenhaeff, J. Browning, L. Baggetto, J. Keum, N.J. Dudney, G.M. Veith. "Neutron Reflectometry to Study Electrode-Electrolyte Interfaces." Prime Pacific Rim Meeting on Electrochemical and Solid-State Science. Honolulu, HI, Oct. 2012. (oral)
12. W.E. Tenhaeff, G.M. Veith, J. Browning, N.J. Dudney, "Neutron Reflectometry to Understand Electrodeposition and Reoxidation Phenomena of Metallic Anodes." Gordon Research Conference: Batteries. Ventura, CA, March 2012. (poster)
11. N.J. Dudney, W.E. Tenhaeff, C. Liang, A.S. Sabau, "Solid Electrolytes to Enable Lithium, Lithium-Sulfur, and Lithium-Air Batteries." 220<sup>th</sup> ECS Meeting, Boston, MA, Oct. 2011. (poster)
10. W.E. Tenhaeff, E.G. Herbert, G.M. Pharr, X. Yu, K. Hong, S. Kalnaus, C. Daniel, A.S. Sabau, K.A. Perry, K.L. More, N.J. Dudney, "Electrochemical and Mechanical Characterization of Composite Nanostructures of Solid Glass and Polymer Electrolytes." MRS Fall 2010 Meeting, Boston, MA, Nov. 2010. (oral)
9. W.E. Tenhaeff, E.G. Herbert, G.M. Pharr, S. Kalnaus, S. Newman, A.S. Sabau, C. Daniel, A.S. Sabau, X. Yu, K. Hong, N.J. Dudney, "Characterizing the Electrochemical and Mechanical Properties of Glass and Polymer Electrolytes and Predicting the Effective Conductivity of Their Composite Structures by Random Resistor Networks." MRS Fall 2010 Meeting, Boston, MA, Nov. 2010. (poster)
8. W.E. Tenhaeff, E.G. Herbert, G.M. Pharr, S. Kalnaus, S. Newman, A.S. Sabau, C. Daniel, A.S. Sabau, X. Yu, K. Hong, N.J. Dudney. "Understanding the Importance of Interfaces in Composites of Solid Polymer and Glass Electrolytes through Modeling and Electrochemical and Mechanical Characterizations." Beyond Lithium Ion: Materials Perspective, Oak Ridge, TN, Oct. 2010. (poster)
7. W.E. Tenhaeff, E.G. Herbert, K. Hong, S. Deng, J.W. Mays, K.L. More, N.J. Dudney, "Electrochemical and Mechanical Characterization of Composite Nanostructures of Glassy and Polymer Electrolytes." IMLB 2010, Montreal, Canada, June 2010. (poster)

6. W.E. Tenhaeff, W.J. Arora, G. Barbastathis, K.K. Gleason, "Integration of Reactive Polymeric Nanofilms into Low-Power Microelectromechanical Switches." AIChE Annual Meeting, Philadelphia, PA, Nov. 2008. (oral)
5. W.E. Tenhaeff, K.K. Gleason, "Crosslinking of Copolymer Thin Films by Initiated Chemical Vapor Deposition for Hydrogel and Sensor Applications." HWCVD5, Cambridge, MA, Aug. 2008. (oral)
4. W.E. Tenhaeff, K.K. Gleason, "Initiated Chemical Vapor Deposition of Patterned Thin Films of pH-Responsive Hydrogels." MRS Spring 2008 Meeting, San Francisco, CA, March 2008. (oral)
3. W.E. Tenhaeff, K.K. Gleason, "Initiated Chemical Vapor Deposition of Functional Thin Hydrogel Films to Incorporate Quantum Dots." MRS Fall 2007 Meeting, Boston, MA, Nov. 2007. (oral)
2. W.E. Tenhaeff, K.K. Gleason, "Initiated Chemical Vapor Deposition of Perfectly Alternating Poly(styrene-alt-maleic anhydride)." EuroCVD-16, Den Haag, The Netherlands, Sep. 2007. (oral)
1. W.E. Tenhaeff, K.K. Gleason, "Thin films of poly(styrene-alt-maleic anhydride) by initiated chemical vapor deposition." 233<sup>rd</sup> ACS National Meeting, Chicago, IL, March 2007. (oral)

### **PROFESSIONAL ACTIVITIES**

Member, The Electrochemical Society, 2010 – present

Member, Materials Research Society, 2007 – present

Member, American Institute of Chemical Engineers, 2002 – present