Conrad R. Stoldt

Education

- Ph.D. Physical Chemistry, Iowa State University, 1999
- B.A. Chemistry, University of Colorado at Boulder, 1994

Professional Recognition

- Woodward Outstanding Faculty Award, Dept. of Mechanical Engineering, 2012
- Dean's Award for Professional Progress, College of Engineering and Applied Sciences, University of Colorado at Boulder, 2008
- Outstanding Graduate Educator, Department of Mechanical Engineering, University of Colorado at Boulder, 2005
- Alpha Chi Sigma Award for Graduate Research, Department of Chemistry, Iowa State University, 1999
- Union Carbide Innovation Recognition Program Award, Union Carbide Corporation, 1998

Research Interests

- Nanoscale materials synthesis and characterization
- Materials development for MEMS/NEMS
- Electrochemical corrosion in Group IV thin film materials
- Colloid engineering

Professor Stoldt's research interests include the study of material issues in the field of MEMS/NEMS and in the development of new nanoscale materials and their processing methods. The primary research areas currently under investigation in his lab include the effects of electrochemical corrosion on MEMS/NEMS performance/reliability and in the synthesis and characterization of nanoparticulate materials and colloids for medical, energy, and military applications.

Selected Publications

- Collin R. Becker, Steven Apperson, Christopher J. Morris, Shubhra Gangopadhyay, Luke J. Currano, Wayne A. Churaman, and Conrad R. Stoldt, "Galvanic Porous Silicon Composites for High-Velocity Nanoenergetics," Nano Letters, December 2010.
- Collin R. Becker, Luke J. Currano, Wayne A. Churaman, and Conrad R. Stoldt, "Thermal Analysis of the Exothermic Reaction between Galvanic Porous Silicon and Sodium Perchlorate," ACS Applied Materials and Interfaces 2 (2010) 2998–3003.
- James E. Trevey, Kavic W. Rason, Conrad R. Stoldt, and Se-Hee Lee, "Improved Performance of All-Solid-State Lithium-Ion Batteries Using Nanosilicon Active Material with Multiwalled-Carbon-Nanotubes as a Conductive Additive," Electrochemical and Solid-State Letters 13 (2010) A154-A157.

- Conrad R. Stoldt, Michael A. Haag and Brian A. Larsen, “Preparation of Freestanding Germanium Nanocrystals by Ultrasonic Aerosol Pyrolysis,” Applied Physics Letters 93 (2008) 043125.
- David C. Miller, Brad L. Boyce, Ken Gall, and Conrad R. Stoldt, “Galvanic Corrosion Induced Degradation of Tensile Properties in Micromachined Polycrystalline Silicon,“ Applied Physics Letters 90 (2007) 191902.

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Education

Ph.D. in Physical Chemistry from Iowa State University, 1999
B.A. in Chemistry from The University of Colorado at Boulder, 1994

Appointments

2009 to present	*Associate Professor*	University of Colorado at Boulder
2002 to 2009	*Assistant Professor*	University of Colorado at Boulder
2000 to 2002	*Postdoctoral Associate*	University of California at Berkeley

Other Experience and Professional Memberships

- Member, Personnel Committee, 2010 - present
- Member, Undergraduate Committee, 2011 – present
- Member, Graduate committee, 2009 - 2012
- Chair, Student Affairs Committee, Boulder Faculty Assembly (BFA) 2009-2011
- Member, Materials Research Society (MRS)
- Member, The ElectroChemical Society (ECS)
- Visiting Scientist, Department of Chemistry, University of Ulm, Germany 1997

Honors and Awards

- Woodward Outstanding Faculty Award, Dept. of Mechanical Engineering, 2012
- Dean's Award for Professional Progress, College of Engineering and Applied Sciences, 2008
- Outstanding Graduate Educator, Dept. of Mechanical Engineering, 2005
- Postdoctoral Researcher Award, Electronic Materials and Processing Division, American Vacuum Society, 2000
- Alpha Chi Sigma Award for Graduate Research, Iowa State University, 1999
- Union Carbide Innovation Recognition Program Award, Union Carbide Corporation, 1998

Research Interests

- Nanoscale materials design, synthesis and characterization
- Materials development for next generation energy conversion and storage applications
- Electrochemical corrosion in thin film semiconductor materials

Teaching Interests

- Materials Chemistry & Structure (MCEN 5228)
- Materials Science & Engineering (MCEN 2024)
- Statistical Thermodynamics (MCEN 5022)
- Chemistry for Mechanical Engineers (MCEN 1208)
- First Year Engineering Projects (GEEN 1400)

Selected Peer-Reviewed Publications (out of 53 total)

1. H. Alex Macpherson and Conrad R. Stoldt, "Iron Pyrite Nanocubes: Size and Shape Considerations for Photovoltaic Application," *ACS Nano* 6 (2012) 8940-8949.
2. T.A. Yersak, et al., "Solid State Enabled Reversible Four Electron Storage," *Advanced Energy Materials* (2012) DOI: 10.1002/aenm.201200267.
3. Brian E. Francisco, Christina M. Jones, Se-Hee Lee, and Conrad R. Stoldt, "Nanostructured all-solid-state supercapacitor based on Li2S-P2S5 glass-ceramic electrolyte," *Appl. Phys. Lett.* 100 (2012) 103902.
4. Brian A. Larsen, Kendall M. Hurst, W. Robert Ashurst, Natalie J. Serkova and Conrad R. Stoldt, "Mono and dialkoxysilane surface modification of superparamagnetic iron oxide nanoparticles for application as magnetic resonance imaging contrast agents," *J. Materials Research* 27 (2012) 1846-1852.
5. S.A. Sargsyan, et al. "Detection of glomerular complement C3 fragments by magnetic resonance imaging in murine lupus nephritis," Kidney International 81 (2012) 152-159.
6. James E. Trevey, Jeremy R. Gilsdorf, Conrad R. Stoldt, Se-Hee Lee, and Ping Liu, "Electrochemical Investigation of All-Solid-State Lithium Batteries with a High Capacity Sulfur-Based Electrode," *J. Electrochem. Soc.* 159 (2012) A1019-A1022.
7. Collin R. Becker, Steven Apperson, Christopher J. Morris, Shubhra Gangopadhyay, Luke J. Currano, Wayne A. Churaman, and Conrad R. Stoldt, "Galvanic Porous Silicon Composites for High-Velocity Nanoenergetics," *Nano Letters* 11 (2011) 803-807.
8. J.E. Trevey, C.R. Stoldt, and S.H. Lee, "High power nanocomposite TiS_2 cathodes for all-solid-state lithium batteries," *J. Electrochem. Soc.* 158 (2011) A1282-A1289.
9. Collin R. Becker, Luke J. Currano, Wayne A. Churaman, and Conrad R. Stoldt, "Thermal Analysis of the Exothermic Reaction between Galvanic Porous Silicon and Sodium Perchlorate," *ACS Appl. Mater. Interfaces* 2 (2010) 2998-3003.
10. C.R. Becker, D.C. Miller and C.R. Stoldt, "Galvanically coupled gold/silicon on-insulator microstructures in hydrofluoric acid electrolytes: finite element simulation and

morphological analysis of electrochemical corrosion," *J. Micromech. Microeng.* 20 (2010) 085017.
11. James E. Trevey, Kavic W. Rason, Conrad R. Stoldt, and Se-Hee Lee, "Improved Performance of All-Solid-State Lithium-Ion Batteries Using Nanosilicon Active Material with Multiwalled-Carbon-Nanotubes as a Conductive Additive," *Electrochem. Solid-State Letters* 13 (2010) A154-A157.
12. Natalie Serkova, Brandon Renner, Brian A. Larsen, Conrad R. Stoldt, Kendra Hasebroock, Erica L. Bradshaw, V. Michael Holers, and Joshua M. Thurman, "Renal Inflammation: Targeted Iron Oxide Nanoparticles for Molecular MR Imaging in Mice," *Radiology* 255 (2010) 517-526.
13. James Trevey, Jum Suk Jang, Yoon Seok Jung, Conrad R. Stoldt, Se-Hee Lee, "Glass–ceramic Li2S–P2S5 electrolytes prepared by a single step ball milling process and their application for all-solid-state lithium–ion batteries," *Electrochem. Comm.* 11 (2009) 1830–1833.
14. Conrad R. Stoldt, Michael A. Haag and Brian A. Larsen, "Preparation of Freestanding Germanium Nanocrystals by Ultrasonic Aerosol Pyrolysis," *Applied Physics Letters* 93 (2008) 043125.
15. David C. Miller, Brad L. Boyce, Ken Gall, and Conrad R. Stoldt, "Galvanic Corrosion Induced Degradation of Tensile Properties in Micromachined Polycrystalline Silicon", *Applied Physics Letters* 90 (2007) 191902.

Selected Research and Education Support

- Defense Advanced Research Projects Agency (DARPA)
- Army Research Office (ARO)
- Department of Energy
- Center for Revolutionary Solar Photoconversion (CRSP) Shared Research Program
- National Science Foundation (NSF)