Andrew M. Dattelbaum

MS K771
Los Alamos National Laboratory
Los Alamos, NM 87544

Center for Integrated Nanotechnologies
phone: (505) 665-0142
e-mail: amdattel@lanl.gov

PROFESSIONAL BACKGROUND

Technical Staff Member, Los Alamos National Laboratory November 2002 to present
Center for Integrated Nanotechnologies

Postdoctoral Researcher, Los Alamos National Laboratory October 2000 to November 2002
Inorganic Surface Science/Bio-mimetic materials

EDUCATION

Ph.D. Inorganic Chemistry, North Carolina State University, Raleigh, NC September 2000
Minor: Solid State Sciences

Bachelor of Science, Magna Cum Laude with Distinction in Chemistry May 1995
James Madison University, Harrisonburg, VA

RESEARCH EXPERIENCE

Technical Staff Member, Los Alamos National Laboratory, 2002 to Present

Current research interests: Preparation, functionalization and characterization of ordered nanocomposite and nanoporous materials; functionalized luminescent silica nanoparticles for tracking and sensing; structure and dynamics of supported lipid membrane assemblies; functional self-assembled monolayers for bio-sensing; nanocomposite silica films for surface assisted mass spectrometry

Postdoctoral Researcher, Los Alamos National Laboratory, A. P. Shreve, A. N. Parikh 2000 to 2002

- Prepared and functionalized nanocomposite thin film materials
- Characterized nanocomposite films by X-ray diffraction, FT-IR, ellipsometry, and contact angle measurements during deep UV exposure
- Assembled lipid vesicles and supported membranes, which were characterized by fluorescence microscopy
- Assembled an imaging surface plasmon resonance instrument for characterization of UV-patterned nanocomposite films

Doctoral Research, NCSU, James D. Martin 1996 to 2001

- Designed and synthesized transition metal-halide analogs of metal oxides
- Determined single crystal X-ray structure of the synthesized materials
- Performed i*n situ* reactivity studies on powder samples in inert or vacuum environments using the Synchrotron Light Source at Brookhaven National Laboratory
- Performed *in situ* diffuse reflectance studies monitoring ethylene sorption by metal-halide complexes
- Performed Variable Temperature ^{31}P NMR experiments on Metal-Halide-Phosphine complexes
- Performed extended Hückel calculations on metallo-organic materials

Research Assistant, JMU, John Mosbo and Donna Amenta 1992 to 1995

- Prepared 4'-chloromethyl-benzo-15-crown-5 through a multi-step organic synthesis
- Prepared eta^5-C_5H_5)M(CO)$_x$CH$_2$R (M = Mo, Fe;R = $CH_2C_6H_3$-benzo-15-crown-5, $CH_2(C_6H_3)(OCH_3)_2$) and it's acyl complex *via* a migratory insertion reaction upon introduction of a phosphine ligand
- Performed kinetic studies monitoring the formation of the acyl complex both in the presence and absence of sodium cations using ^{1}H NMR

TECHNICAL EXPERTISE

Fluorescence spectroscopy and microscopy, Ellipsometry, X-ray diffraction, Schlenk/Vacuum line syntheses, FT-IR, NMR, UV-Vis

PUBLICATIONS

1. Tuning the Luminescence and Sensing Behavior of Conjugated Polymers by Encapsulation in Nanocomposite Thin Films. A. M. Dattelbaum, M. G. Brown, H. L. Wang, A. N. Parikh, and A. P. Shreve, ***in preparation***.

2. Photoluminescence quenching of a conjugated polyelectrolyte. G. A. Montaño, A. M. Dattelbaum, R. C. Rocha, J. H. Werner, H. L. Wang and A. P. Shreve, ***in preparation***.

3. Surface assisted laser desorption-ionization mass spectrometry on nanoporous silica thin films. A. M. Dattelbaum, R. K. Hicks, J. Shelly, A. T. Koppisch and S. Iyer, *Microporous Mesoporous. Mater.*, ***submitted***.

4. Biocompatible thin films with minimal non-specific binding for waveguide-based assays. Functionalized waveguides for biological assays. A. S. Anderson, A. M. Dattelbaum, G. A. Montaño, J. G. Schmidt, J. S. Martinez, W. K. Grace, K. M. Grace and B. I. Swanson, ***accepted*** *Langmuir*, **2007**.

5. Optical Detection of Ion-Channel Induced Proton Transport in Supported Phospholipid Bilayers. T.-H. Yang, C. K. Yee, M. L. Amweg, S. Singh, A. M. Dattelbaum, A. P. Shreve, C. J. Brinker, and A. N. Parikh, *Nano Letters*, **2007**, *7*, 2446-2451.

6. Surface Assisted Laser Desorption-ionization Mass Spectrometry. A. M. Dattelbaum and S. Iyer, *Expert Rev. Proteomics* **2006**, *3*, 153-161.

7. Benzene and Ethylene Binding to Copper(I)-Ziconium(IV) Chloride Materials: The Crystal Structure and Solid-State Reactivity of $((bz)_2Cu)_2Zr_2Cl_{10}$•bz. A. M. Dattelbaum and J. D. Martin, *Polyhedron* **2006**, *25*, 349.

8. Surfactant Removal and Silica Condensation during the Photochemical Calcination of Thin Film Silica Mesophases. A. M. Dattelbaum, M. L. Amweg, J. D. Ruiz, L. E. Ecke, A. P. Shreve, and A. N. Parikh, *J. Phys. Chem. B* **2005**, *109*, 14551-14556.

9. Phospholipid morphologies on photochemically patterned silane monolayers. M. C. Howland, A. R. S. Butti, S. S. Dixit, A. M. Dattelbaum, A. P. Shreve, and A. N. Parikh. *J. Am. Chem. Soc.* **2005**, *127*, 6752-6765.

10. N-alkyl-N-methylpyrrolidinium salts as templates for ordered mesostructured and mesoporous silica thin films. A. M. Dattelbaum, S. N. Baker, and G. A. Baker, *Chem. Comm.* **2005**, 939-941.

11. Neutron Reflectivity Study of Lipid Membranes Assembled on Ordered Nanocomposite and Nanoporous Silica Thin-Films. D. A. Doshi, A. M. Dattelbaum, E. B. Watkins, C. J. Brinker, B. I. Swanson, A. P. Shreve, A. N. Parikh, J. Majewski. *Langmuir*, **2005**, *21*, 2865-2870.

12. Enhanced photoluminescence from poly(phenylene vinylene):dendrimer polyelectrolyte assemblies in solution. G. A. Montaño, A. M. Dattelbaum, H. L. Wang and A. P. Shreve, *Chem. Comm.* **2004**, 2490-2491.

13. Photochemical Pattern Transfer and Enhancement of Thin Film Silica Mesophases. A. M. Dattelbaum, M. L. Amweg, C. Yee, L. E. Ecke, A. P. Shreve, and A. N. Parikh. *Nano letters*, **2003**, 3, 719-722.

14. Synthesis and Characterization of Cu_2ZrCl_6: A Thermochromic, Van Vleck Paramagnet. A. M. Dattelbaum, P. Ryan, F. Sui and J. D. Martin. *J. Alloys and Compounds*, **2002**, *338*, 173.

15. Templated Synthesis of Cuprous Chloride Networks: The Synthesis and Characterization of $[Hpy]Cu_3Cl_6$ and $\{[H_3NMe]_6Cl\}[H_3NMe]_2Cu_9Cl_{16}$. J. D. Martin, J. Yang, and A. M. Dattelbaum. *Chem. Mater.* **2001**, *13*, 329.

16. Benzene-Copper(I) Coordination in a Bimetallic Chain Complex. A. M. Dattelbaum and J. D. Martin, *Inorg. Chem.* **1999**, *38*, 6200.

17. $(N(CH_3)_2H_2)CuZrCl_6$: Hydrogen Bond Induced Distortions in a Copper Zirconium Chloride Analog of a Thiophosphate. A. M. Dattelbaum and J. D. Martin, *Inorg. Chem.* **1999**, *38*, 2369.

18. Metal Halide Analogs of Oxides: A Building Block Approach to the Rational Synthesis of Solid State Materials. J. D. Martin, A. M. Dattelbaum, T. A. Thornton, R. M. Sullivan, J. Wang, M. T. Peachey, *Chem. Mater.* **1998**, *10*, 2699.

PROCEEDINGS AND NON-PEER REVIEWED PUBLICATIONS

1. Functionalized waveguides for biological assays. A. S. Anderson, A. M. Dattelbaum, G. A. Montaño, J. G. Schmidt, J. S. Martinez, W. K. Grace, K. M. Grace and B. I. Swanson, *MRS Proceeding* **2007**, in press.

2. Mesoporous Silica for Desorption-Ionization Mass Spectrometry, A. M. Dattelbaum and S. Iyer. *NSTI Nanotech Proceedings* **2005**, *1*, 225.

3. Photoluminescence of a Conjugated Polymer-Polyelectrolyte Assembly and Effective Quenching in Aqueous Solution and on Self-Assembled Thin Film Architectures. G. A. Montaño, A. M. Dattelbaum, W. Li, H. L. Wang and A. P. Shreve, *MRS Proceedings*, **2004**, *1*, 359-363.

4. Mechanism of Photochemical Calcination of Surfactant Templated Thin Film Silica Mesophases. A. M. Dattelbaum, M. L. Amweg, J. D. Ruiz, L. E. Ecke, A. P. Shreve, and A. N. Parikh. *MRS Proceedings*, **2004**, *788*, 371-376.

PATENTS

1. Robust, self-assembled biocompatible films, B.I. Swanson, A. A. Anderson, J. S. Schmidt, A. M. Dattelbaum. *Patent application, 2007.*

2. Conjugated polymer doped nanocomposite silica thin films, A. M. Dattelbaum, A. P. Shreve, H.-L. Wang. *Patent application, 2004.*

3. Sample desorption/ionization from mesoporous silica, A. M. Dattelbaum and S. Iyer, *Issued Patent* 6,958,480.

AWARDS AND HONORS

LAAP AWARD (for exceptional commitment to teamwork in CINT)	2006
LAAP AWARD (LANL employee recognition award)	2004
SPOT AWARD (LANL employee recognition award)	2004
Sandia Employee Recognition Award	2003
PLU Travel Award	2000
Preparing the Professoriate Fellowship	1998
American Institute of Chemists Award	1998
Science Applications International Corp. (SAIC) Thesis Award	1995
ACS/Merck Award (Given to outstanding Senior chemistry major)	1995
R. D. Cool Award (Given to outstanding Junior chemistry major)	1994
Presidential Premedical Scholarship	1991 to 1995
Research Experience for Undergraduates (REU) at JMU	1993 and 1994
Elected President Phi Lambda Upsilon	2000
Elected Senior Advisor Phi Lambda Upsilon	1999
Elected Vice President Phi Lambda Upsilon	1998 to 1999
Elected JMU Graduate Student Association Co-Representative	1997 to 1998
Elected President Alpha Chi Sigma, A Professional Chemistry Fraternity	1994 to 1995

PROFESSIONAL EXPERIENCE

Coordinator for *Chemistry: A Quantitative Science* solutions manual	1999
Teaching Assistant in General Chemistry, NCSU and JMU	1993 to 1997

Served on numerous service committees at LANL

Mentor experience:

Mentored summer students 2007, Joshua Hanson (grad. Student) and Jacob Izraelevitz (undergrad)

Mentored Raea Hicks, post-bac student (2006-2007)

Mentored undergraduate Constance A. Rocco, Summer 2006, as part of SULI program. This student was awarded an outstanding poster presentation at SACNAS 2006

Mentored an undergraduate from UC Davis, Agnes Zurek (summer 2003-2006). The student won the outstanding research presentation award for an undergraduate in the Bioscience Division at LANL Symposium 2003, and a Distinguished student performance award in 2006.

Mentored a Research Internships for Science and Engineers (RISE) student, Gary Braun, through a LANL/UC Santa Barbara partnership (summer 2003).

Mentored an undergraduate student, L. E. Ecke (summer 2001 and 2002), published work together in *Nano Letters* 2003 and *J. Phys. Chem. B* **2005**.

Mentor for a ACS-Project SEED student at NCSU	1999
Mentor for a NSF-Research Experience for Undergraduates (REU) program at NCSU	1998
Mentor for a High School Army Research Scholar at NCSU	1997