

Darren L. Williams, Ph.D.
Assistant Professor
Chemistry Department
College of Arts and Sciences

Degrees Earned

Ph.D., Chemistry, Oregon State University, 1997
B.S., Chemistry, University of Texas at Austin, 1992

Professional Licensure and Certifications

1. OSHA 40-hour Hazardous Waste Operations Certification, 2001
2. Secret Compartmentalized Information Security Clearance, DOE, 2003
3. CTM Certification, Toastmasters International, 2003
4. Six-Sigma Blackbelt Certification, DOE, 2002
5. Q Security Clearance, DOE, 2001

Peer-Review Publications and Artistic Performances/Exhibitions

Articles

1. Williams, D. L.*; Kuklenz, K. D. Controlling Energetic Material Particle-Size Distributions via Non-solvent Precipitation Paths, *Proceedings of the 43rd Combustion Subcommittee Meeting of the Joint Army Navy NASA Air Force (JANNAF) Interagency Propulsion Committee*, La Jolla, (2009). (In Press).
2. Williams, D. L.*; Kuklenz, K. D. A QSAR Model for Predicting Solvents and Solvent Blends for Energetic Materials, *Proceedings of the International Annual Conference of ICT, 40th (Energetic Materials)*, Karlsruhe, Germany, 2/1-2/11, (2009).
3. Williams, D. L.*; Kuklenz, K. D., A Determination of the Hansen Solubility Parameters of Hexanitrostilbene (HNS), *Propellants Explosives and Pyrotechnics*, 34(5), 452-457, (2009).
4. Williams, D. L.*; Flaherty, T. J.; Alnasleh B. K., Beyond Lambda-Max Part 2: Predicting Molecular Color, *Journal of Chemical Education*, 86(3), 333-339 (2009).
5. Williams, D. L.*; Kuklenz, K. D. An Evaluation of Modified IMS Swabs for the Screening of Oxidizers and Home-made Explosives, *Texas Journal of Science*, 60(4), 299-308, (2008).
6. White, R. C.*; White J. H.; Williams D. L.; Granic-White M.; White, J. W., Discoveries in Chemistry and Textiles: The Development of a Two-Week Elective Chemistry Course in Germany and Paris, *Chem Educator* 13(6), 392-396 (2008).
7. Williams, D. L.*; Jupe, C. L.; Kuklenz, K. D.; Flaherty, T. J., An Inexpensive, Digital Instrument for Surface Tension, Interfacial Tension, and Density Determination, *Industrial & Engineering Chemistry Research*, 47(12), 4286-4289 (2008).
8. Williams, D. L.*; Flaherty, T. J., Jupe, C. L., Coleman, S. A., Marquez K. A., Stanton J. J., Beyond Lambda-Max: Transforming Visible Spectra into 24-bit Color Values, *Journal of Chemical Education*, 84(11), 1873-1877 (2007)
9. Flaherty T. J., Timmons J.C., Wroblewski D. A., Orler E. B., Langlois D. A., Wurden, K. J., Williams, D. L.*, Infrared and Raman Spectral Signatures of Aromatic Nitration in Thermoplastic Urethanes, *Applied Spectroscopy*, 61(6), 608-612 (2007)
10. Lopez, E. P.*; Moddeman, W. E., Birkbeck, J. Williams, D.L., Benkovich M.G., Solvent Substitution – PART 2: The Elimination of Flammable, RCRA and ODC Solvents for Wipe Application, *CleanTech Magazine*, 4(10), 14-16 (2004)

11. Lopez, E. P.*, Moddeman, W. E., Birkbeck, J. Williams, D.L., Benkovich M.G., Solvent Substitution – PART 1: The Elimination of Flammable, RCRA and ODC Solvents for Wipe Application, *CleanTech Magazine*, 4(9); 16-19 (2004)
12. Williams D. L.*, Timmons J. C., Woodyard J. D., Rainwater K. A., Richardson B. R., Lightfoot J. M., Burgess C. E., and Heh J. L., UV-Induced Degradation Rates of 1,3,5-Triamino-2,4,6-Trinitrobenzene, *Journal of Physical Chemistry A*. 107(44); 9491-9494 (2003)
13. Birkbeck J. C., Kuehler N. L., Williams D. L., Moddeman W. E.*, X-ray Photoelectron Spectroscopic (XPS) Examinations of Beryllium Metal Surfaces Exposed to Chlorinated Solvents, *Surface Interface Analysis* 27, 273-282, (1999)
14. Al-Katahni A., Williams D. L., Nibler J. W.*, Sharpe S. W., High Resolution Infrared Studies of Al(BH₄)₃ and Al(BD₄)₃, *Journal of Physical Chemistry A*, 102(3); 537-544. (1998)
15. Williams D. L.*, Minarik P. R., Nibler J. W., PC Calculations Using Gaussian for Windows -- a Complement to Laboratory Measurements on HCl, *Journal of Chemical Education*, 73(7) 608-611 (1996)

Books

Chapters

Proceedings

1. Williams, D. L.*; Kuklenz, K. D. Controlling Energetic Material Particle-Size Distributions via Non-solvent Precipitation Paths, *Proceedings of the 43rd Combustion Subcommittee Meeting of the Joint Army Navy NASA Air Force (JANNAF) Interagency Propulsion Committee*, La Jolla, (2009). (In Press).
2. Williams, D. L.*; Kuklenz, K. D. A QSAR Model for Predicting Solvents and Solvent Blends for Energetic Materials, *Proceedings of the International Annual Conference of ICT, 40th (Energetic Materials)*, Karlsruhe, Germany, 2/1-2/11, (2009).
3. Williams, D. L.; Kuklenz, K. D.; Doss, S. C.; Mayor, J. H. Computation of Crash-Solvent Precipitation Paths and the Resulting Particle Effects. *Abstracts, 64th Southwest Regional Meeting of the American Chemical Society*, Little Rock, AR, United States, October 1-4 (2008).
4. Kuklenz, K. D.; Williams, D. L.; Doss, S. C.; Mayor, J. H. A Computational Route to Hansen Solubility Parameters through a Quantitative Structure Activity Relationship. *Abstracts, 64th Southwest Regional Meeting of the American Chemical Society*, Little Rock, AR, United States, October 1-4 (2008).
5. Kuklenz, K. D.; Rothlisberger, K. L.; Blaylock, D. R.; Williams, D. L. A Computational Route to Solvent Selection for Recrystallization, *Texas Academy of Science Meeting*, March (2008).
6. Williams, D. L.; Kuklenz, K. D.; Jupe, C. L.; Flaherty, T. J. An Inexpensive, Digital Instrument for Surface Tension, Interfacial Tension, and Density Determination. *Abstracts, 63rd Southwest Regional Meeting of the American Chemical Society*, Lubbock, TX, United States, November 4-7 (2007).
7. Williams, D. L. and Alnasleh, B., Assignment of the UVVIS Spectra of Nitroanilines Using Electron Density Difference Maps, *Texas Academy of Science Meeting*, March (2007).
8. By Williams, D. L.; Flaherty, T. J.; Jupe, C. L.; Coleman, S. A.; Marquez, K. A.; Stanton, J. J. Precise Color Definitions in the Chemistry Laboratory, *Abstracts, 62nd Southwest Regional Meeting of the American Chemical Society*, Houston, TX, October (2006).
9. Koziel J., Spinhirne J, Williams D. L., Parker D. B., Cole N. A., Screening for Volatile Fatty Acids in Agricultural Air Using Solid Phase Microextraction and Gas Chromatography – Mass Spectrometry, *2002 ASAE/CIGR meeting paper*, Chicago, IL July 2002.

10. Parker D. B., Posey J. S., Williams D. L., Cole N. A., Auvermann B. W., Rogers W. J., Dry Nonheated Anaerobic Biogas Fermentation Using Aged Beef Cattle Manure, *2002 ASAE/CIGR meeting paper*, Chicago, IL (2002)
11. Koziel J., Spinhirne J, Williams D. L., Parker D. B., Diffusion-Based Air Sampling with Solid-Phase Microextraction for Indoor and Ambient Air, paper # 1155, *PITTCO 2002*, New Orleans, LA. (2002)
12. Parker D.B., Auvermann B. W., and Williams D. L., Comparison Of Evaporation Rates From Feedyard Pond Effluent And Clear Water As Applied To Seepage Predictions, *Transactions of the ASAE*, 42(4):981-986. (1999)
13. Posey J.S., Parker D.B., Williams D.L., Auvermann B.W., and Cole N.A. Production Of Biogas In Landfill Cells Using Beef Cattle Manure Collected In Open Lots, ASAE Paper No. 99-4084, (1999)

Artistic Performances

Artistic Exhibitions

Research Monographs and Technical Reports

1. Williams, D. L., A Gage Repeatability and Reliability Study on the Use of Two Identical Gas Chromatography Systems to Perform Chemical Reactivity Testing, Pantex Technical Report, (2004)
2. Williams D. L., A Measurement System Evaluation of the Calibration of the Differential Scanning Calorimeter, Pantex Technical Report, (2004)
3. Williams D. L.*, Ashcraft R. W., A Technical Review of the Radiological Characterization of Nuclear Weapons at Pantex, Pantex Technical Report, (2003)

Funded External Grants

1. \$100,000, DOE / BWXT Pantex Grant, Determination of HSPs for Cleaning Applications, July 2008 – August 2010.
2. \$96,000, DOE / BWXT Pantex Grant, Measurement of Constants for Crystalline Explosives, May 2007-August 2008, Develop a model for predicting the solubility of explosives in various solvents.
3. \$30,000, DOE / BWXT Pantex Grant, Surface Tension of Sylgard184 Variations, August 2006, Measure the surface and interfacial tension of various formulations of Sylgard 184..
4. \$25,000, DOE Subcontract Through the University of Texas, Surface and Interfacial Tension Determinations, January 2006, Measure the surface and interfacial tension of water/organic systems.
5. \$15,000, DOE Personal Consulting Contract, Assistance in Research and Development, January 2005, Provide assistance in spectroscopic method development and knowledge preservation.
6. \$156,000, DOE Applied Technology Program Grant, Implementation of Portable Analytical Instrumentation, September 2003, Modify COTS fiber-optic spectrometers to suit DOE needs.
7. \$212,000, DOE Plant Directed Research and Development Grant (Year-2), Establishing a Computational Chemistry Capability for Modeling Organic Compounds, November 2002, Procure and manage a PC Linux Cluster for electronic structure calculations at the Pantex Plant.
8. \$496,000, DOE Plant Directed Research and Development Grant, Establishing a Computational Chemistry Capability for Modeling Organic Compounds, November 2001, Procure and manage a PC Linux Cluster for electronic structure calculations at the Pantex Plant.
9. \$14,000 BWXT Pantex LLC., Surface Reaction Modeling, May 2001. Computational chemistry of the reactions of alkyl halides with beryllium metal surfaces.

10. \$15,800 ANRC Grant, Spectroscopic Computer Modeling of the Aging of TATB, May 2001, Computational analysis of the EPR and UVVIS spectra of aged TATB.
11. \$5,600 Killgore Research Enhancement Grant, Spectroscopic and Computational Analysis of the Degradation Products of 1,3,5-triamino-2,4,6-trinitrobenzene, May 2001.
12. \$90,500 Pantex/Mason & Hangar Grant, Mechanisms of Formation of Trace Decomposition Products in Complex High Explosive Mixtures, January 2000. Pantex picked up the computational chemistry grant that was supported by the ANRCP.
13. \$83,000 ANRCP/Texas Engineering Experiment Station Grant, Mechanisms of Formation of Trace Decomposition Products in Complex High Explosive Mixtures, January 2000. Computational chemistry grant with Pantex and Texas Tech University. Approved for funding prior to the ANRC's loss of DOE research dollars.
14. \$40,000 United States Department of Agriculture and Texas Cattle Feeders Association, Ammonia and other Gaseous Emissions from Beef Cattle Feedyards, January 1999. This grant funded student stipends and equipment for the GCMS such as a 16-place purge and trap auto sampler.
15. \$74,000 Western Regional Biomass Energy Program, Demonstration of Biogas Production Using Low Moisture Content Beef Cattle Manure, January 1, 1999. GCMS of biogas.
16. \$25,000 Mason and Hangar Corporation, Pantex Plant, Upgrade SIMS Data Collection System 1999.
17. \$5,700 Kilgore Research Enhancement Grant, Semi-Empirical Electrostatic-Charge Calculations on Mucin and Mucin Fragments, Summer of 1999.
18. \$57,700 Amarillo National Resource Center for Plutonium/Texas Engineering Experiment Station Grant, Characterization and Formation of Corrosion Precursors on Beryllium and Stainless Steel for Weapons Applications, January 16, 1998, P.I. Dr. Sheldon Landsberger, Department of Mechanical Engineering, University of Texas at Austin.
19. \$38,000 Amarillo National Resource Center for Plutonium/Texas Engineering Experiment Station Grant, Alpha Effects on Encapsulating Materials of Plutonium, January 16, 1998, P.I. Dr. Ron R. Hart, Department of Nuclear Engineering, Texas A&M University. Established a new secondary ion mass spectrometry (SIMS) laboratory in the Kilgore Research Center in collaboration with Dr. Bill Moddeman at Pantex.
20. \$7,500 Kilgore Research Enhancement Grant, Spectroscopic Characterization of Methane Clathrate Hydrates, Summer of 1998.

Peer-Review Presentations/Posters

1. Williams, D. L.*, Kuklenz, K. D., Rothlisberger, K. L., Blaylock, D. R., Measurement of Constants for Crystalline Explosives, Report to B&W Pantex, July 2007.
2. Williams, D. L. Modeling the molecular color of degraded explosives, Invited talk in honor of the retirement of Dr. Joseph W. Nibler, Oregon State University, August 2006.
3. Williams D.L., Orlor B., Wroblewski D., Lightfoot J.M., Russell B., Flaherty T.J., Galusha J., Timmons J.C., Estane Gel Spectral Analysis and Spectral Signatures of NO₂ Attack, invited talk regarding the utility of molecular modeling for polymer aging studies, University of Houston, June, 2005.
4. Pantex Site Presenter for the Lawrence Livermore National Laboratory Energetic Materials Annual Research Review, XTX-8003 Accelerated Aging Studies, Patricia Foster-P.I., April, 2003
5. Pantex Site Presenter for the Sandia National Laboratory Non-nuclear Materials Annual Research Review, XTX-8003 Accelerated Aging Studies, Patricia Foster-P.I., April, 2003
6. Williams D. L., Modeling of the Kinetics and Equilibrium States of Gas-Phase PETN Degradation Products, US-UK Joint Working Group Meeting, Sandia National Laboratory, NM, May, 2003

7. Cates M., McCarty M., Moore M. E., Richardson B. R., Williams D. L., Analysis of HMX Recovered from LX-14, Report to 9501 Working Group, Pantex Plant, June, 2003.
8. Williams D. L., Ab Initio Calculations of DHrxn of Radical Reactions Related to Estane Crosslinking, Report to 9501 Working Group, Los Alamos National Laboratory, March, 2003.
9. Williams D. L., Timmons J. C., Estane Model Compound Spectral Simulations, Report to 9501 Working Group, Pantex, August, 2002
10. Williams D. L., Simulation of Estane IR Spectral Components, Report to 9501 Working Group, Pantex Plant, February, 2002
11. Williams D. L., McCarty M., Giambra A., Dutton T., Molecular Modeling on PETN, JOWOG-9 Working Group Mtg., Sandia National Laboratories-Livermore, February 2002
12. Williams, D.L., Woodyard, J.D., Rainwater, K., Lightfoot, J.M., Timmons, J.C., Aging of TATB—Final Report, DOE 9502 Working Group Meeting, Los Alamos NL, July 2001.
13. Williams, D.L., Woodyard, J.D., Rainwater, K., Lightfoot, J.M., Timmons, J.C., Aging of TATB—Computational and FTIR Results, DOE 9502 Working Group Meeting, Los Alamos NL, January 2001.
14. Williams, D.L., Woodyard, J.D., Rainwater, K., Lightfoot, J.M., Timmons, J.C., Density Functional Theory Calculations and ATR FTIR of Fresh and Aged TATB, DOE Cooperative Research Meeting, Los Alamos National Laboratory, January 2001.
15. Williams, D.L., University Research as an Educational Tool, Sixth Welch Biennial Conference of the Associated Chemistry Teachers of Texas, July 1999
16. Williams D.L., Using Ab Initio Calculations and Normal Coordinate Analysis to Aid Interpretation of Congested Infrared Spectra, The 15th Southwest Theoretical Chemistry Conference, University of North Texas, November 1998.
17. DeFee T., Landsberger S., Iskander F., Li Zhao, Kim J., Manthiram A., Sanchez J.M., Wheat H., Williams D.L., and Carlisle G.O., Characterization and Formation of Corrosion Precursors on Beryllium and Stainless Steel for Weapons Applications, ANRC 1998 Researchers' Conference, July 1998.

Work or Professional Experiences

2004 – present, Sam Houston State University

2001 – 2004, Sectional Scientist, Computational Chemistry, BWXT Pantex LLC

2001 – 2004, Adjunct Professor, Chemistry, West Texas A&M University

1997 – 2001, Assistant Professor, Chemistry, West Texas A&M University

1992 – 1997, Graduate Assistant, Physical Chemistry, Oregon State University

1992, Student Research Director, Young Scholars Program, The University of Texas

1991, Undergraduate Teaching Assistant for Dr. Alan Cowley, The University of Texas

1989 – 1992, Undergraduate Researcher for Dr. Joseph Lagowski, The University of Texas

Honors and Awards

1. “Best Darn Teacher in the World Award” – Phi Sigma Pi National Honor Fraternity, 2008
2. Academic Research Award, DCG Partnership Inc., 2005
3. Milton Harris Teaching Excellence Award, Oregon State University, 1994
4. Outstanding Teaching Assistant Award, Oregon State University, 1993

Other Competencies