

CURRICULUM VITAE OF DAVID A. CARTER

Work Address

Department of Chemistry and Biochemistry
Angelo State University
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Education

Wayland Baptist University, B. S., Chemistry, Biology and Mathematics, 1980.
Southern Illinois University-Carbondale, graduate work in Zoology, 1980-81.
University of New Mexico, Misc. Course work, 1981-86.
University of Arizona, Ph. D., Analytical Chemistry, 1996

Experience

Assistant Professor of Chemistry

Department of Chemistry and Biochemistry, Angelo State University, San Angelo, TX 76909. Courses taught: General Chemistry, Inorganic Quantitative Analysis, Instrumental Analysis and Physical Chemistry Lab. 2000 to present.

Assistant Professor of Chemistry

Div. of Natural Sciences and Mathematics, Oklahoma Baptist University, Shawnee, OK 74801. Courses taught: General Chemistry, Quantitative Analysis, Physical Chemistry, Environmental Chemistry, and Advanced Lab. 1994 to 2000.

Assistant Professor of Chemistry, Dept. of Chemistry, Calvin College, Grand Rapids, MI 49546.

Courses taught: General Chemistry, Quantitative Analysis, Instrumental Analysis. 1992-94.

Chemistry Instructor, Pima Community College, Tucson, AZ, 1992.

Courses taught: General Chemistry Laboratory, General Chemistry Lab for the allied health fields.

Graduate Assistant in Teaching, Dept. of Chemistry, Univ. of Arizona, 1986-91.

Courses: General Chemistry, Honors Chemistry, Analytical Chemistry, and Instrumental Analysis Labs. Includes coordination of analytical chemistry laboratories and course development.

Graduate Research Assistant, Los Alamos National Laboratory, 1984-86 (also intermittently 1978-82)

Uranium processing, metallurgy and non-destructive assay. Atomic absorption and plasma emission analysis. Electrochemical and Surface Analysis

Missionary Journeyman, Mombasa Baptist High School, Mombasa, Kenya, 1982-84.

Taught Chemistry and Mathematics.

Graduate Teaching Assistant, Dept. of Zoology, Southern Illinois Univ., 1980-81.

Courses: General Zoology (lab)

Laboratory Assistant/Instructor, Biology Dept., Wayland Baptist Univ. 1976-80.

Courses: General Biology, Human Biology, and Microbiology

Undergraduate Research Participant, Div. of Biological Sciences, Oklahoma State Univ., Summer, 1979.

NSF funded. Studied the effect of wind on plant gas exchange.

Analytical Instrumentation Experience

Extensive: flame atomic absorption; Ion selective electrodes; NMR: fluorescence; GC; GC/MS; HPLC; IR; FTIR; UV/Vis; Raman spectroscopy, surface enhanced Raman spectroscopy (SERS); cyclic voltammetry; polarography; anodic stripping voltammetry; electrogravimetry; gamma ray spectroscopy; multichannel analyzers; integrators; data acquisition hardware and software, and radiochemical measurements. Gaussian 98 computational Chemistry Software.

Limited: graphite furnace atomic absorption, flame and plasma atomic emission; TLC; electron microprobe (SEM and X-ray fluorescence).

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Honors, Offices and Committee Service

Permian Basin Section, American Chemical Society

Secretary, 2001; Chair-Elect, 2002; Chair, 2003, 2008; and Councilor, 2004-present

American Chemical Society Committee on Environmental Improvement

Committee Affiliate 2005-2006, Committee Member 2007-2009, Liaison to Committee on Community Affairs, 2007-2009, Educational Subcommittee, 2005-2007, Chemist's Celebrate Earth Day Theme Team for CCED 2009 and 2010, International Year of Chemistry Theme Team, 2009-2011.

Admissions Committee, 2009-present

Chemical Inventory System Selection and Implementation Committee, 2009-present

Center for Innovative Teaching and Research Advisory Committee, 2009-present

Library Committee, 2006-2008

Who's Who Among America's Teachers, 2002

Faculty Senate, Angelo State University, 2001-2004

Student Financial Aid Committee, Angelo State University, 2001-2005

Admissions Committee, Oklahoma Baptist University, 1998-present (Chairman, 1999-2000)

Curriculum Committee, Oklahoma Baptist University, 1996-1998

Library Committee, Oklahoma Baptist University, 1995-1996

Library Committee, Dept. of Chem., Univ. of Ariz., 1991-92

Graduated Summa Cum Laude, Wayland Baptist College, 1980

Who's Who in American Colleges and Universities, 1980

National Dean's List, 1980

Outstanding Biology Student, Wayland Baptist College, 1980

Alpha Chi (National Honor Society), Wayland Baptist College Chapter, President, 1979-80

Alpha Phi Omega (National Service Fraternity), Wayland Baptist College Chapter

Secretary, 1977-78, Vice-President, 1979-80

Biology Club, Wayland Baptist College, President, 1979-80

Dean's List, Wayland Baptist College, 1977-80

Professional Affiliations

Council on Undergraduate Research

American Chemical Society

American Scientific Affiliation

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Dissertation Title

The Application of SERS to the Determination of Relative Adsorption Strengths of Nitrogen Heterocycles on Silver Electrodes

Publications

- 1) Raman Spectroscopy Using Charge Coupled Device Detection, Pemberton, J. E., Sobocinski, R. L., Bryant, Mark A., Carter, D. A., *Spectroscopy*, 1990, **5**(2), 26.
- 2) Surface-Enhanced Raman Scattering of the Acid-Base Forms of Imidazole, Carter, D. A. and Pemberton, J. E., *Langmuir*, 1992, **8**, 1218.
- 3) Frequency/Wavelength Calibration of Multipurpose Multichannel Raman Spectrometers. Part I: Instrumental Factors Affecting Precision, Carter, D.A. and Pemberton, J. E., *Appl. Spectrosc.*, 1995, **49**, 1550.
- 4) Frequency/Wavelength Calibration of Multipurpose Multichannel Raman Spectrometers Part II: Calibration Fit Considerations and Calibration Standards, Carter, D.A., Thompson, W.R., Taylor, C. E. and Pemberton, J. E., *Appl. Spectrosc.*, 1995, **49**, 1561.
- 5) Raman Spectroscopy and Vibrational Assignments of 1- and 2-methylimidazole, Carter, D. A.; Pemberton, J. E., *J. Raman Spectrosc.*, 1997, **28** (12), 939.
- 6) Orientation of 1- and 2-Methylimidazole on Silver Electrodes Determined with Surface-Enhanced Raman Scattering, Carter, D. A., Pemberton, J. E., Woelfel, K. J., *The Journal of Physical Chemistry B*; 1998; **102**(49), 9870.
- 7) Companion Website for Chemistry: A Molecular Approach, First Edition, Tro, Pearson Education, Inc., 2008. Companion Website Contributing Authors: Jason Kautz, David Carter, Roy Kennedy Jr.
- 8) Plants—The Energy-Capturing Machines. Article in “Plants—The Green Machines!” American Chemical Society, Chemists Celebrate Earth Day publication, 2010.

Presentations

- 1) Effect of Wind on Plant Gas Exchange, Presented at the Oklahoma and Texas Academies of Science meetings, David Carter and Dr. Glen Todd, Spring 1980.
- 2) Surface Enhanced Raman Scattering of the Acid-Base Forms of Imidazole at Silver Electrode Surfaces, Jeanne E. Pemberton and David A. Carter, Pittsburgh Conference & Exposition on Analytical Chemistry and Applied Spectroscopy, Atlanta, GA, March, 1989.
- 3) Surface Enhanced Raman Scattering of Imidazole: Potential and Excitation Wavelength Dependence, David Carter and Dr. Jeanne Pemberton, Pacific Conference on Chemistry and Spectroscopy, Pasadena, CA, October, 1989.
- 4) Interconversion of Surface Imidazole Species as Observed by Surface Enhanced Raman Scattering, David Carter and Dr. Jeanne Pemberton, Signature Research Materials Characterization Symposium, Tucson, AZ, March 1990.
- 5) Determination of Orientation of Methylimidazole Isomers at Ag Surfaces Using Surface Enhanced Raman Scattering, David Carter and Dr. Jeanne Pemberton, Pittsburgh Conference & Exposition on Analytical Chemistry and Applied Spectroscopy, New Orleans, LA, March, 1992.
- 6) Developing and Validating New Monitoring Methods, David Carter, 1999 U.S. EPA Region 6 Volunteer Monitors Conference, Lake Texhoma, OK, March 1999.
- 7) Adaption of EPA Method 8270 for the Analysis of Chlorpyrifos and Diazinon in Natural Waters, Stephane Rhein (David A. Carter, adviser), 14th National Conference on Undergraduate Research, Missoula, Montana, April 27-29, 2000.
- 8) Analysis of Chlorpyrifos and Diazinon in Natural Waters Using EPA Method 8270, David Carter and Stephane Rhein, Society of Environmental Toxicology and Chemistry, Ozark-Prairie Regional Meeting, Leavenworth, KS, 2000.
- 9) Development of a SPME-GC-MS Method For MTBE Biodegradation Studies, Scott E. Hecox (David A. Carter), 16th National Conference on Undergraduate Research, Whitewater, WI, April 25-27, 2002.

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- 10) Objective Evaluation of Model Gaussian 98 ab initio Chemistries for Studying Energies Along a S_N2 Reaction Pathway. Amanda Fuller and David Carter, 225th American Chemical Society National Meeting, New Orleans, LA, March 23-27, 2003.
- 11) Synthesis and Analysis of (2S,6R)-1,1,3-triethoxycarbonyl-2,6-di(4-methoxyphenyl) cyclohex-3-en-4-ol and its Enantiomer. Finley, Jerrica D.; Stephens, Sarah S.; Carter, David; and Maxwell, Janet L., 227th American Chemical Society National Meeting (Undergraduate Poster Session), Anaheim, CA - Mar. 27 - April 1, 2004.
- 12) A Comparison of Two Models for Designing Online Homework Assignments. David A. Carter, 60th Southwest Regional Meeting of the American Chemical Society, Fort Worth, TX, Sept. 29-Oct. 2, 2004.
- 13) Determination of Arsenic Concentrations in Water Using Anodic Stripping Voltammetry. Esther Njoga and David Carter, Student Research Showcase, Angelo State University, Nov. 23, 2005
- 14) Implications of Conformational Phase Space Determined by Molecular Dynamics and Semiempirical Molecular Orbital Theory on ZINDO Predictions of Cyanine Dye Electronic Spectra II. Peak broadening of -2,2'-cyanine dyes. Estrada, N.L., Freeland, E.G., Grottis, J.D., Hobbs, C.E., Hubbell, M. C., Kinyon, J. S., Nelson, T.H., Preas, A.L., Smallwood, L. R., Truett, K.E. and Carter, D. A., Presented at the Spring 2006 MiniMeeting, Permian Basin Section, American Chemical Society, San Angelo, TX, April 14-15, 2006.
- 15) The Undergraduate Physical Chemistry Lab Course as a Venue for Developing Research, Data Analysis and Scientific Writing Skills. D. A. Carter, Presented at the Spring 2006 MiniMeeting, Permian Basin Section, American Chemical Society, San Angelo, TX, April 14-15, 2006.
- 16) Chemiluminescence Determination Of Bromide In The Laguna Larga, Cameron County, Tx And Associated Wetlands. Barraza, S. and Carter, D. A., Student Research Showcase, Angelo State University, Nov. 20, 2007.
- 17) Ion Analyses Of Saline Samples From The Laguna Atascosa National Wildlife Refuge. Richard Murdoch (presenting), Irene Balderas, Steven Barraza, Ashley Brandon, Kiran Chawla, Sean Coeckelenbergh, Caitlin Cozby, Nubia Estrada, Eeshita Dastidar, Kadye Hill, Eric Hobbs, Colleen Kimme, Jared Kinyon, Kandace Kubat, Leah Lawdermilk, Megan Long, Jeff Masters, Tyler Nelson, Brian Terrell, Kristen Truett, Kelly Usrey, Chris Vela, Mark Warrington, Hitisha Zaveri and Carter, D. A., Student Research Showcase, Angelo State University, Nov. 20, 2007.
- 18) Chemiluminescence analysis of bromide in saline wetland samples. Steven D. Barraza and David Carter, The 235th ACS National Meeting, New Orleans, LA, April 6-10, 2008.
- 19) Brine Ion Baselines For Redhead Ridge Wetlands Restoration Project. Richard Murdoch, Sean Coeckelenbergh, Steven Barraza, Kiran Chawla, Jeff Masters (David A. Carter), 22nd National Conference on Undergraduate Research, Salisbury, MD, April 10-12, 2008.
- 20) Sustainability – To Boldly Go . . . David Carter. Presented as part of Angelo State University Faculty Luncheon Lecture Series, Jan. 2008 and at Green Chemistry Symposium hosted by American Chemical Society Student Affiliates at Angelo State University, April 18, 2008.
- 21) Instrumental analysis, environmental research and course management software. David Carter. The 237th ACS National Meeting, Salt Lake City, UT, March 22-26, 2009.
- 22) Technology enabled skill gateways: Insuring success of General Chemistry students. David A. Carter. The 238th ACS National Meeting, Washington, DC, August 16-20, 2009.
- 23) POGIL activities designed to develop data analysis and mathematical skills in General Chemistry lab. David A. Carter and Evelyn M. Sabino. The 238th ACS National Meeting, Washington, DC, August 16-20, 2009.

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Funded Research and Grants

Work done under the Welch Foundation Departmental Research Grant, Angelo State University. The Welch departmental grant is a \$25,000 per year grant used to supplement research for the entire department. The grant is distributed among the eight faculty members of the department based on ability to involve undergraduates in research. Funding allocated to research activities involving students I have mentored includes student salaries and supplies for the projects listed below, the purchase of a ca \$15k electroanalytical system (ca. 2001) and partial funding (\$25k of \$52k) of a Gas Chromatograph/Mass Spectrometer (2008).

- Biodegradation of MTBE by genetically modified E. coli and development of a SPME-GC-MS method for the analysis of MTBE degradation products, Scott Hecox, 2001-2002. Welch Grant for two semesters.
- Evaluation of ab initio computational methods used in the evaluation of SN2 reactions, Amanda Fuller, 2002-2003. Welch Grant for summer and two semesters.
- Electrochemistry of Spinach Ferredoxin, Ryan Crowson, Summer 2003. Welch Grant.
- Graphite Furnace Atomic Absorption Analysis of Trace Metals in Lake Water, Lisa Veazey, Summer 2003. Welch Grant.
- High Level NMR Analysis of (2S,6R)-1,1,3-triethoxycarbonyl-2-6-di(4-methoxy-phenyl)cyclohex-3-en-4-ol Including Enantiomers and Tautomers, Sarah Stevens, Fall 2003. Welch Grant.
- Analysis of Arsenic by Stripping Voltammetry on Gold Wire Electrode. Esther Njoga, Spring and Summer 2005. Welch Grant.
- Analysis of Organics in North Concho River by SPME-GC-MS. Amanda Preas, Summer 2005, Welch Grant.
- Advanced NMR Methods, Kristen Truett (Dr. Maxwell, principle advisor) Welch Grant.
- Chemiluminescence Analysis of Bromide in Brines. Steven Barraza, Summer 2007. Welch Grant.

Texas Higher Education Coordinating Board – Course Redesign Project Grant, \$ 145,503 (2008-2010).

Research Enhancement Grant, Angelo State University, 2005

Faculty Travel Grant to SWARM of the ACS, Angelo State University, 2004

Technology Development Grant, Angelo State University, 2003

ACS Local Section Grants (Submitted as Chair of Permian Basin Section)

Innovative Project Grant – Science Café \$500 (2008)

Innovative Project Grant–Enhancing Section Leadership Using National Meeting Attendance \$3000 (2008)

Instrumentation Requests Funded by the Texas state Higher Education Assistance Fund (HEAF). HEAF is a allocation of money awarded to the University on a yearly basis. Requests for HEAF funds are made by individuals to the department chair, who prioritizes all departmental requests and forwards them to University administration for final allocation decisions.

- Fiber Optic UV-Vis spectrophotometer ca. \$4500 (2003).
- Analytical Balance, Dual range 0.01 µg/0.1 µg, ca, \$3900 (2004)
- FTIR-ATR Accessory, ca. \$2650 (2004)
- Partial funding (\$15k of \$52k) of a Gas Chromatograph/Mass Spectrometer (2008)