

Michael J. Dorko

HOME ADDRESS

114 Lowery Lane
Summerville, SC 29483
(843) 851-9221
email: mike.dorko@citadel.edu

WORK ADDRESS

Department of Chemistry
The Citadel
Charleston, SC 29409
(853) 953-7475

EDUCATION

Michigan State University, East Lansing, MI, 1997-2003

Ph.D. in Chemistry, April 2003

Thesis Title: "Experimental and Theoretical Studies of the Adsorption and Photochemistry of Dibromodifluoromethane (Halon-1202) on a Model Carbonaceous Aerosol Surface"

Thesis Advisor: Dr. Simon J. Garrett

University of Pittsburgh, Pittsburgh, PA, 1991-1996

M.S. in Chemistry, April 1996

Thesis Title: "Theoretical and Experimental Studies of Penning Ionization"

Thesis Advisor: Professor Peter E. Siska

University of Pittsburgh, Pittsburgh, PA, 1987-1991

B.S. in Chemistry, June 1991

TEACHING EXPERIENCE

Assistant Professor, Department of Chemistry, The Citadel

2005 - present

Instructor, CHEM 151/152: General Chemistry I and II

Prepared and delivered lectures; designed and implemented problem-based and in-class activities; wrote and graded exams.

Instructor, CHEM 161/162: General Chemistry I and II Laboratory

Instructed laboratory sections; graded weekly laboratory reports; wrote and graded quizzes and exams.

Instructor, CHEM 305/306: Physical Chemistry I and II

Prepared and delivered lectures; wrote and graded exams and quizzes; graded student class portfolios; implemented problem-solving sessions for homework problems; wrote and graded homework problem sets.

Instructor, CHEM 315/316: Physical Chemistry I and II Laboratory

Prepared and instructed laboratory exercises; had students give a presentation and write a brief summary of a current journal article; graded laboratory reports (written and oral); designed and employed activities to help students develop scientific writing skills.

Visiting Assistant Professor, Department of Chemistry and Physics, Hood College
2004-2005

Instructor, CHEM 101/102: General Chemistry I and II

Prepared and delivered lectures and facilitated activities in an integrated lecture-laboratory format; wrote and graded exams and quizzes; graded laboratory notebooks and laboratory reports.

Instructor, CHEM 431/531, CHEM 432/532: Physical Chemistry I and II

Facilitated small group, guided-inquiry based lecture; wrote and graded exams and quizzes; graded student class portfolios.

Instructor, CHEM 433/533, CHEM 434/534: Physical Chemistry I and II Laboratory

Prepared and instructed laboratory exercises; had students participate in one P-Chem On-Line (PCOL) laboratory activity; had students give a presentation and write a brief summary of a current journal article; graded laboratory reports.

Visiting Assistant Professor, Department of Physical Sciences, York College of PA
2003-2004

Instructor, CHM 134/135: General Chemistry I Lecture and Laboratory

Prepared and delivered lectures; wrote and graded exams and quizzes; performed demonstrations as in-class learning activities; designed and implemented problem-solving sessions; instructed four laboratory sections; graded laboratory reports; supervised two laboratory teaching assistants; advised 16 undergraduate chemistry majors.

Instructor, CHM 102: Chemistry and Society

Prepared and delivered lectures; wrote and graded exams, quizzes and papers; initiated various in-class learning activities; prepped and instructed two laboratory sections; graded laboratory reports; supervised two laboratory teaching assistants.

Instructor, CHM 137: General Chemistry II Laboratory

Instructed one laboratory section; graded laboratory reports; supervised one laboratory assistant.

Chemistry Laboratory Coordinator

Assured compliance of chemical hygiene and safety in all laboratory sections; assured timely waste removal and stocking of each laboratory section; scheduled laboratory sections for General Chemistry; scheduled laboratory assistants and General Chemistry tutors; supervised undergraduate work-study students in solution preparations and stocking of General Chemistry laboratories; ordered and maintained chemicals and supplies for the stockroom.

Adjunct Faculty, Department of Chemistry, Susquehanna University
2002-2003

Instructor, CHEM 100: Chemical Concepts

Prepared and delivered lectures; wrote and graded exams and quizzes; designed and implemented problem-solving sessions; instructed laboratory exercises; supervised two laboratory teaching assistants.

Instructor, CHEM 210: Organic Chemistry I Laboratory

Instructed laboratory exercises; supervised one laboratory teaching assistant.

Merit Level Teaching Assistant, Department of Chemistry, Michigan State University, 1997- 2002

General Chemistry Laboratory

Graded weekly laboratory assignments.

Quantitative Analysis

Wrote and graded weekly quizzes.

Physical Chemistry (Non-Majors)

Graded computer-based homework problems, graded exams.

Physical Chemistry (Quantum Mechanics and Thermodynamics for Majors)

Wrote and graded weekly quizzes; graded weekly homework problems; wrote solutions to homework problems; graded exams; delivered occasional lecture.

Teaching Assistant, Department of Chemistry, University of Pittsburgh, 1991- 1996

General Chemistry Recitation and Laboratory

General Chemistry Laboratory Development

Designed and implemented new laboratories for the general chemistry curriculum.

RESEARCH EXPERIENCE

Assistant Professor, Department of Chemistry, The Citadel
2005 – present

- Theoretical examinations into the adsorption and destruction of chemical warfare agents (CWA) on metal oxide, mixed metal oxide and semiconductor surfaces for the production of CWA sensors and improved gas mask technology.
- Theoretical investigations of the dissociative adsorption of small hydrocarbon molecules on various metal alloys for the generation and production of hydrogen for use in hydrogen fuel cells.

Independent Contractor, National Institute of Standards and Technology,
Gaithersburg, MD February 2003 – June 2003
Dr. Anne M. Chaka, Supervisor

- Performed *ab initio* calculations to obtain intermolecular potentials for the oxirane-oxirane dimer as part the Virtual Measurement System for Fluid Properties project

Graduate Research Assistant, Department of Chemistry, Michigan State University,
East Lansing, MI 1997- 2003
Dr. Simon J. Garrett, advisor

- Studied the adsorption and photochemistry of CF_2Br_2 adsorbed on highly-ordered pyrolytic graphite (HOPG) using X-ray photoelectron spectroscopy, temperature-programmed desorption, and high resolution electron energy loss spectroscopy. Obtained experience with Scanning Tunneling Microscopy, Low Energy Electron Diffraction/Auger Electron Spectroscopy and refurbished a Questek excimer laser.
- Performed *ab initio* calculations on the model systems CF_2Br_2 /pyrene and CF_2Br_2 /coronene to determine the adsorption energies, adsorption geometries and adsorption sites of CF_2Br_2 and other post-irradiation products on the HOPG surface.
- Performed *ab initio* calculations on two isomers of As_4S_4 to determine atomic charges and core-level binding energy shifts between the two species.

Graduate Research Assistant, Department of Chemistry, University of Pittsburgh,
Pittsburgh, PA, 1991- 1996
Professor Peter E. Siska, advisor

- Studied the angular and energy distributions of Penning ionization reactions between $\text{He}^*(2^{1,3}\text{S}) + \text{H}_2$ and CH_4 using a crossed molecular beam apparatus.
- Performed *ab initio* calculations on the HeNe^+ molecular ion to determine the most accurate description of a three-electron bond and its role in charge-transfer systems.
- Supervised the research efforts of an undergraduate research assistant.

Undergraduate Research Assistant, Department of Chemistry, University of
Pittsburgh, Pittsburgh, PA, 1990- 1991
Professor Peter E. Siska, advisor

- Performed *ab initio* calculations on noble gas charge-transfer systems to determine potential energy surfaces for the interacting species.
- Performed *ab initio* calculations on $\text{Na}^+ + (\text{H}_2)_n$ clusters to determine potential energy surfaces and geometries of the interacting species.

OPERATING SYSTEMS

- Unix/Linux, Windows 95/98/NT/Me/2000/XP, MS-DOS

QUANTUM CHEMISTRY PROGRAMS

- GAUSSIAN 9x/03, GAMESS, MOLPRO, COLUMBUS, MOLCAS, SPARTAN, ACES II, HyperChem, Molden, Molekel, DMOL³

PUBLICATIONS

Ab initio Study of the Potential Energy Surface for the Interaction of Na^+ with H_2 and the Geometries and Energies of $\text{Na}^+(\text{H}_2)_n$, $n = 2-4$. Falcetta, M.F., Pazun, J.L., Dorko, M.J., Kitchen, D. and Siska, P.E. *J. Phys. Chem.* **97**, 1011 (1993).

Adsorption and Photochemistry of CF_2Br_2 (Halon – 1202) on Highly Ordered Pyrolytic Graphite. Dorko, M.J., Bryden, T.R., and Garrett, S.J. *J. Phys. Chem. B* **104**, 11695 (2000).

Ab initio/Spectroscopic Interaction Potential for $\text{He} + \text{Ne}^+$. Falcetta, M.F., Dorko, M.J., and Siska, P.E. *J. Chem. Phys.* **113**, 11044 (2000).

Core Level Binding Energy Shifts in Orpiment, Realgar, and Pararealgar Arsenic Sulfides. Bullen, H.A., Dorko, M.J., Oman, J.K., and Garrett, S.J. *Surf. Sci.* **513**, 319 (2003).

Angle-Energy Distributions of Penning Ions in Crossed Molecular Beams. IV. $\text{He}^*(2^1\text{S}, 2^3\text{S}) + \text{H}_2 \rightarrow \text{He} + \text{H}_2^+ + \text{e}^-$. Gulati, K., Longley, E.J., Dorko, M.J., Bittinger, K.L., and Siska, P.E. *J. Chem. Phys.* **120**, 8485 (2004).

Theoretical Investigation of the Adsorption Sites and Orientation of CF_2Br_2 and CF_2Br on Model Graphite Surfaces, Dorko, M.J. and Garrett, S.J. *in preparation*.

PRESENTATIONS

“Experimental and Theoretical Investigation of the Adsorption and Photochemistry of CF_2Br_2 (Halon – 1202) on Highly Ordered Pyrolytic Graphite”

Michael J. Dorko, Todd R. Bryden, and Simon J. Garrett

223rd National Meeting of the American Chemical Society, Orlando, FL, 2002,

Abstract PHYS 412.

“Theoretical Investigation of the Adsorption Sites and Orientation of CF_2Br_2 and CF_2Br on Model Graphite Surfaces”

Michael J. Dorko and Simon J. Garrett

229th National Meeting of the American Chemical Society, San Diego, CA, 2005

Abstract COLL 375

HONORS AND AWARDS

Michigan Space Grant Consortium (NASA) Fellowship, 1998 (\$5000)

Merit Level Teaching Assistant, 2000

PROFESSIONAL AFFILIATIONS

American Chemical Society
American Vacuum Society

UNIVERSITY AND COMMUNITY SERVICE

Citadel College-Wide Committees:

Research: member (2006)

Citadel Chemistry Department Committees:

Awards: chair (2006)

Assessment and Advising: member (2005, 2006)

Facilities: member (2005)

General Chemistry: (2006)

Introductory Chemistry: member (2006)

Grants

Citadel Foundation New Faculty Grant (2006): \$2,648.68

Citadel Foundation Grant (2006): \$2855.05