VITA

Date: January 2015

Name: Lee S. Sunderlin Rank: Associate Professor

Department: Chemistry and Biochemistry

Date of Birth: March 6, 1962

Education:

Ph. D., 1990, University of California, Berkeley
B. S., 1984, California Institute of Technology, Pasadena, CA

PRESENT RESEARCH INTERESTS:

Mass spectrometry, flowing afterglow techniques, gas-phase ion-molecule reaction kinetics and thermodynamics, hypervalent compounds, main group oxides.

PROFESSIONAL EXPERIENCE:

Director of Graduate Studies, Department of Chemistry and Biochemistry, Northern Illinois University, 2006-2009.
Associate Professor, Northern Illinois University, 2000-present.
Assistant Professor, Northern Illinois University,1994-2000.
Postdoctoral Research Associate, Purdue University, 1990-1994.
Graduate Research Assistant, UC Berkeley, 1985-1990.
Graduate Teaching Assistant, UC Berkeley, 1984-1985.
Chemistry Teacher, CalTech SSSSP, Summer 1983, 1984.
Research Assistant, CalTech Department of Chemical Engineering, Summer 1981,1982.

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

Member American Chemical Society, 1984-present (physical division)
Member American Society for Mass Spectrometry, 1991-present

HONORS

American Society for Mass Spectrometry 1995 Research Award

NSF Predoctoral Fellowship (1985-1988)

Summer Undergraduate Research Fellowship, Caltech

National Merit Scholarship

National Society of Professional Engineers Regional Scholarship

RESEARCH PUBLICATIONS

1. Reaction of Scandium Ions with Ethane. First and Second Hydride-Scandium Ion Bond Energies
   L. Sunderlin, N. Aristov, and P. B. Armentrout.
   J. Am. Chem. Soc. **1987**, *109*, 78-89.

2. Methane Activation by Ti^+: Electronic and Translational Energy Dependence
   L. S. Sunderlin and P. B. Armentrout.
   J. Phys. Chem. **1988**, *92*, 1209-1219.

3. Periodic Trends in Chemical Reactivity: Reactions of Sc^+, Y^+, La^+, and Lu^+ with H_2, HD, and D_2
   J. L. Elkind, L. S. Sunderlin, and P. B. Armentrout.
   J. Phys. Chem. **1989**, *93*, 3151-3158.

4. Periodic Trends in Chemical Reactivity: Reactions of Sc^+, Y^+, La^+, and Lu^+ with Methane and Ethane
   L. S. Sunderlin and P. B. Armentrout.
   J. Am. Chem. Soc. **1989**, *111*, 3845-3855.

5. Guided Ion Beam Studies of the Reactions of Co^+ and Ni^+ with CH_3X (X = Cl, Br, I). Implications for the Metal-Methyl Ion Bond Energies
   Ellen R. Fisher, L. S. Sunderlin, and P. B. Armentrout.
   J. Phys. Chem. **1989**, *93*, 7375-7382.

6. Thermochemistry of Ti^+-hydrocarbon Bonds: Translational Energy Dependence of the Reactions of Ti^+ with Ethane, Propane, and Trans-2-Butene
   L. S. Sunderlin and P. B. Armentrout.
   Int. J. Mass Spectrom. Ion Processes **1989**, *94*, 149-177.

7. Intrinsic Transition Metal-Carbon Double Bond Dissociation Energies: Periodic Trends in M^+-CH_2 Bond Strengths
   P. B. Armentrout, L. S. Sunderlin, and E. R. Fisher.

Inorg. Chem. **1989**, *28*, 4436-4437.

8. Ammonia Activation by V^+: Electronic and Translational Energy Dependence
   D. E. Clemmer, L. S. Sunderlin, and P. B. Armentrout.
   J. Phys. Chem. **1990**, *94*, 208-217.

9. Temperature Dependence of the Reaction of O^+ with HD
   L. S. Sunderlin and P. B. Armentrout
   Chem. Phys. Lett. **1990**, *167*, 188-192.

10. Ammonia Activation by Sc^+ and Ti^+: Electronic and Translational Energy Dependence
    D. E. Clemmer, L. S. Sunderlin, and P. B. Armentrout.
    J. Phys. Chem. **1990**, *94*, 3008-3015.

11. Thermochemistry of C-H and C-C Bond Activation: Translational Energy Dependence of Reactions of Sc^+ with Propane and 2-Butenes
    L. S. Sunderlin and P. B. Armentrout.
    Organometallics **1990**, *9*, 1248-1253.

12. Reactions of Mn^+ with i-C_4H_{10}, neo-C_5H_{12}, $(CH_3)_2CO$, cyclo-C_3H_6, and cyclo-C_2H_4O: Bond energies for Mn^+-CH_2, Mn-H, and $MnCH_3$
    L. S. Sunderlin and P. B. Armentrout.
    J. Phys. Chem. **1990**, *94*, 3589-3597.

13. Reactions of Fourth-Period Metal Ions (Ca^+-Zn^+) with O_2: Metal-Oxide Ion Bond Energies
    Ellen R. Fisher, J. L. Elkind, D. E. Clemmer, R. Georgiadis, S. K. Loh, N. Aristov, L. S. Sunderlin, and P. B. Armentrout
    J. Chem. Phys. **1990**, *93*, 2676-2691.

14. Kinetic Energy Dependence of the Reactions of $C^+(^2P)$ + N_2 from Threshold to 28 eV CM
    J. D. Burley, L. S. Sunderlin, and P. B. Armentrout
    J. Chem. Phys. **1991**, *94*, 1939-1946.

15. Gas Phase Reactivity of Fullerene Anions
    L. S. Sunderlin, Jose A. Paulino, Jason Chow, Bart Kahr, Dor Ben-Amotz, and Robert R. Squires
    J. Am. Chem. Soc. **1991**, *113*, 5489-5490.

16. Metal Carbonyl Bond Strengths in $Fe(CO)_n^-$ and $Ni(CO)_n^-$
    L. S. Sunderlin, Dingneng Wang, and Robert R. Squires

J. Am. Chem. Soc. **1992**, *114*, 2788-2796.

17. Reactions of Protonated Water Clusters With Deuterated Ammonia: $H(H_2O)_n^+$ (n = 1-4) + ND_3
    Kenji Honma, L. S. Sunderlin, and P. B. Armentrout
    Int. J. Mass Spectrom. Ion Processes **1992**, *117*, 237-259

18. Internal and Translational Energy Effects on the Charge Transfer Reaction of CO_2^+ with O_2
    E. E. Ferguson, Jane M. Van Doren, A. A. Viggiano, Robert A. Morris, John F. Paulson, J. D. Stewart, L. S. Sunderlin, and P. B. Armentrout
    Int. J. Mass Spectrom. Ion Processes **1992**, *117*, 261-282

19. Energetics and Mechanism of the Thermal Decarboxylation of $(CO)_4FeCOOH^-$ in the Gas Phase
    L. S. Sunderlin and Robert R. Squires
    J. Am. Chem. Soc. **1993**, *115*, 337-343.

20. Kinetic of Isobaric Ion/Molecule Reactions Determined by the Flowing Afterglow-Triple Quadrupole Technique
    Mark D. Brickhouse, Leonard J. Chyall, L. S. Sunderlin, and Robert R. Squires
    Rapid Comm. Mass Spectrom. **1993**, *7*, 383-391.

21. Guided-Ion Beam Studies of the Reactions of Protonated Water Clusters, $H(H_2O)_n^+$ (n = 1-4), With Acetonitrile
    Kenji Honma, L. S. Sunderlin, and P. B. Armentrout
    J. Chem. Phys. **1993**, *99*, 1623-1632.

22. Determination of the H_2O-NO_2^+ and $CH_3O(H)$-NO_2^+ Bond Strengths and the Proton Affinities of Nitric Acid and Methyl Nitrate
    L. S. Sunderlin and Robert R. Squires
    Chem. Phys. Lett. **1993**, *212*, 307-311.

23. Bond Strengths in First-Row Metal Carbonyl Anions
    Lee S. Sunderlin, Dingneng Wang, and Robert R. Squires
    J. Am. Chem. Soc. **1993**, *115*, 12060-12070.

24. A Tandem Selected Ion Flow Tube-Triple Quadrupole Instrument
    Peter J. Marinelli, Jose A. Paulino, Lee S. Sunderlin, Paul G. Wenthold, John C. Poutsma, and Robert R. Squires
    Int. J. Mass Spectrom. Ion Processes **1994**, *130*, 89-105.

25. Rotational Temperature Dependence of the Reactions of N^+ and C^+ with H_2, HD, and D_2
L. S. Sunderlin and P. B. Armentrout
J. Chem. Phys. **1994**, *100*, 5639-5645.

26. Solvation of Transition Metal Ions by Water. Sequential Binding Energies of $M^+(H_2O)_x$ (x = 1-4) for M = Ti-Cu Determined by Collision-Induced Dissociation.
N. F. Dalleska, Kenji Honma, L. S. Sunderlin, and P. B. Armentrout
J. Am. Chem. Soc. **1994**, *116*, 3519-3528.

27. Gas-Phase Properties and Reactivity of Phospholide and Arsolide Anions.
Lee S. Sunderlin, Dimitra Panu, Dhananjay B. Puranik, Arthur J. Ashe III, and Robert R. Squires
Organometallics **1994**,*13*, 4732-4740.

28. Combining Electrospray Ionization and the Flowing Afterglow Method.
John C. Poutsma, Randal A. Seburg, Leonard J. Chyall, Lee S. Sunderlin, Brian T. Hill, Jun Hu, and Robert R. Squires
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29. A New Flowing Afterglow-Guided Ion Beam Tandem Mass Spectrometer. Applications to the Thermochemistry of Polyiodide Ions
Khanh Do, Timothy P. Klein, Cynthia Ann Pommerening, and Lee S. Sunderlin
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30. The Gas-Phase Basicity of Sulfuric Acid.
Khanh Do, Timothy P. Klein, Cynthia Ann Pommerening, Steven M. Bachrach, and Lee S. Sunderlin
J. Am. Chem. Soc. **1998**, *120*, 6093-6096.

31. The Gas-Phase Thermochemistry of Polyhalide Anions
Katrina Emilia Nizzi, Cynthia Ann Pommerening, and Lee S. Sunderlin
J. Phys. Chem. **1998**, *102*, 7674-7679.

32. Bond Strengths in Cyclopentadienyl Metal Carbonyl Anions
Lee S. Sunderlin and Robert R. Squires
International Journal of Mass Spectrometry **1999**, *182*, 149-161.
(Invited contribution, B. S. Freiser Memorial Issue)

33. The Addition of Protonated Water to SO_3

Cynthia Ann Pommerening, Steven M. Bachrach, and Lee S. Sunderlin
J. Phys. Chem. A **1999**, *103*, 1214-1220.

34. The Thermochemistry of Formic Acid-Halide Anion Clusters
Barry W. Walker and Lee S. Sunderlin
International Journal of Mass Spectrometry **1999**, *184*, 183-189.

35. The Proton Affinity of SO_3
Cynthia Ann Pommerening, Steven M. Bachrach, and Lee S. Sunderlin
J. Am. Soc. Mass Spectrom. **1999**, *10*, 856-861.
(Invited, Biemann Medal Issue for R. R. Squires)

36. The Thermochemistry of $N_3O_2^-$
John W. Torchia, Kelly O. Sullivan, and Lee S. Sunderlin
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37. The Potential Energy Surface of SCl_3^-.
BettyCep D. Gailbreath, Cynthia Ann Pommerening, Steven M. Bachrach, and Lee S. Sunderlin
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38. The Bond Dissociation Energy in Trifluoride Ion.
Alexander Artau, Katrina E. Nizzi, Brian T. Hill, Lee S. Sunderlin, and Paul G. Wenthold
J. Am. Chem. Soc. **2000**, *122*, 10667-10670.

39. Addition of Polarization and Diffuse Functions to the LANL2DZ Basis Set for P-Block Elements.
Catherine E. Check, Timothy O. Faust, John M. Bailey, Brian J. Wright, Thomas M. Gilbert, and Lee S. Sunderlin
J. Phys. Chem. A **2001**, *105*, 8111-8116.

40. Potential Energy Surface of $SOCl_3^-$.
Steven M. Bachrach, Joe M. Hayes, Catherine E. Check, and Lee S. Sunderlin
J. Phys. Chem. A. **2001**, *105*, 9595-9597.

41. The Thermochemistry of Group 15 Tetrachloride Anions.
Barry W. Walker, Catherine E. Check, Kim C. Lobring, Cynthia Ann Pommerening, and Lee S. Sunderlin
J. Am. Soc. Mass Spectrom. **2002**, *13*, 469-476.
(Invited, Biemann Medal Issue for P. B. Armentrout)

42. The Thermochemistry of Phosphorus Tetrahalide Anions.
Terry Heil, Catherine E. Check, Kim C. Lobring, and Lee S. Sunderlin
J. Phys. Chem. A **2002**, *106*, 10043-10048.
(Invited, Festschrift for J. L. Beauchamp)

43. The Fluoride Affinity of SO_2.
Kim C. Lobring, Catherine E. Check, and Lee S. Sunderlin
Int. J. Mass Spectrom. **2003**, *222*, 221-227.
(Invited, Festschrift for J. L. Beauchamp)

44. New Measurements of the Thermochemistry of SF_5^- and SF_6^-.
Kim C. Lobring, Catherine E. Check, Thomas M. Gilbert, and Lee S. Sunderlin
Int. J. Mass Spectrom. **2003**, *227*, 361-372. (Invited, Special Issue on Ion Thermochemistry)

45. The Effect of Substituents on the Strength of Hypervalent Phosphorus-Halogen Bonds.
Catherine E. Check, Kim C. Lobring, Pamela R. Keating, Thomas M. Gilbert, and Lee S. Sunderlin
J. Phys. Chem. A **2003**, *107*, 8961-8967.

46. Bond Strengths in $ChCl_3^-$ and $ChOCl_3^-$ Systems (Ch = S, Se, Te): Experiment and Theory.
Kim C. Lobring, Changtong Hao, Jordan K. Forbes, Michael R. J. Ivanov, Steven M. Bachrach, and Lee S. Sunderlin
J. Phys. Chem. A **2003**, *107*, 11153-11160.

47. The Isozahlic and Additivity Rules: Estimation of Ion Volumes - a Route to the Energetics and Entropics of New and Traditional Ionic Materials.
H. Donald Brooke Jenkins, Leslie Glasser, Thomas M. Klapötke, Margaret Jane Crawford, Joe Lee, Gary J. Schrobilgen, Lee S. Sunderlin, and Joel F. Liebman.
Inorganic Chemistry **2004**, *43*, 6238-6248.

48. Bond Strengths in $POCl_3^-$, $POCl_2^-$, and $PSCl_2^-$.
Kim C. Lobring, Catherine E. Check, Mary L. Boggs, Pamela R. Keating, and Lee S. Sunderlin
Int. J. Mass Spectrom. **2005**, *241*, 75-81.

49. The Dissociation Energy of $Cl_2O_2^+$
John M. Bailey, Changtong Hao, Brian J. Johnson, and Lee S. Sunderlin
Int. J. Mass Spectrom., **2005**, *241*, 143-148.

(Invited, Festschrift for W. Hase)

50. The Effect of Substituents on the Strength of A-Cl^- (A = Si, Ge, and Sn) Bonds in Hypervalent Systems: ACl_5^-, ACl_4F^-, and $A(CH_3)_3Cl_2^-$
Changtong Hao, Jennifer D. Kaspar, Catherine E. Check, Kim C. Lobring, Thomas M. Gilbert, and Lee S. Sunderlin
J. Phys. Chem. A **2005**, *109*, 2026-2034.

51. Measuring Basicities of Amino Acids Using an Ion Trap Mass Spectrometer: A Physical Chemistry Laboratory Experiment.
Lee S. Sunderlin, Victor Ryzhov, Lanea M. M. Keller, and Elizabeth R. Gaillard
J. Chem. Educ. **2005**, *82*, 1071-1073.

52. The Bond Dissociation Energies of $SO_3{-}X^-$ (X = F, Cl, Br and I)
Changtong Hao, Thomas M. Gilbert, and Lee S. Sunderlin
Can. J. Chem. **2005**, *83*, 2013-2019.

53. Bonding and Electronic Structure of XeF_3^-.
Ian H. Krouse, Changtong Hao, Catherine E. Check, Kim C. Lobring, Lee S. Sunderlin, and Paul G. Wenthold
J. Am. Chem. Soc. **2007**, *129*, 846-852.

54. The Gas-Phase Thermochemistry of PCl_4^+: a Test of Lattice Energy Calculations
Changtong Hao, Shaun M. Sharrett, and Lee S. Sunderlin
Int. J. Mass Spectrom. **2007**, *267*, 357-362.
(Invited, Sharon G. Lias Memorial Issue)

55. Dissociation Energies of Tetrahalonium Ions, X_4^+ (X = F, Cl, Br, I)
John M. Bailey, Changtong Hao, Kyle S. Frusolone, Catherine E. Check, Thomas M. Gilbert, and Lee S. Sunderlin
J. Phys. Chem. A., in revision.

56. The Cl_4^+ Cation: A Model System For Exploring Molecular Orbitals and Bonding
Regina M. McEvoy, Kelly M. Nycz, Changtong Hao, and Lee S. Sunderlin
J. Chem. Educ., in revision.

57. Reinvestigation of the Addition of Protonated Water to SO_3
Sara J. Koepke, Robert J. Narofsky, Thomas M. Gilbert, and Lee S. Sunderlin
Manuscript in preparation.

BOOK CHAPTERS

1. Gas Phase Organometallic Chemistry of Transition Metal Hydrides
   P. B. Armentrout and L. S. Sunderlin
   Transition Metal Hydrides, A. Dedieu, ed. (New York: VCH Publishers) **1992**, 1-64.

2. Bond Strengths in Transition Metal Carbonyl Anions
   Lee S. Sunderlin and Robert R. Squires
   NATO ASI Series C, Vol. 367, J. A. M. Simões, ed. (Dordrecht: Kluwer) **1992**, 269-286.

3. Hypervalent Bonding in Gas-Phase Ions
   L. S. Sunderlin
   Advances in Gas Phase Ion Chemistry, Vol. 4, L. Babcock and N. Adams, Eds. JAI/Elsevier Science: Amsterdam, **2001**, 49-84.