

## Publications

### 2013

107. C. Bhardwaj, Y. Cui, T. Hofstetter, S. Y. Liu, H. C. Bernstein, R. Carlson, M. Ahmed, and L. Hanley. "Differentiation of Microbial Species and Strains in Coculture Biofilms by Multivariate Analysis of Laser Desorption Postionization Mass Spectra." [Analyst \(accepted\)](#)
106. K. Urness, Q. Guan, A. Golan, J. Daily, M. Nimlos, J. Stanton, M. Ahmed, and G. B. Ellison, "Pyrolysis of furan in a microreactor". J. Chem. Phys. (accepted)
105. F. Bell, Q.N. Ruan, A. Golan, P. R. Horn, M. Ahmed, S. R. Leone, and M. Head-Gordon. "Dissociative Photoionization of Glycerol and its Dimer Occurs predominantly via a ternary hydrogen bonded ion-molecule complex," [J. Am. Chem. Soc. \(Accepted\)](#)
104. K. Khistyayev, A. Golan, K.B. Bravaya, N. Orms, A. I. Krylov, and M. Ahmed. "Proton Transfer in Nucleobases is Mediated by Water", [J. Phys. Chem. A 117, 6789 \(2013\)](#)
103. S-Y. Liu, M. Kleber, L. K. Takahashi, P. Nico, M. Keiluweit, and M. Ahmed. "Synchrotron based mass spectrometry to investigate the molecular properties of mineral-organic associations," [Anal. Chem. 85, 6100 \(2013\)](#)
102. M. Perera, R. B. Metz, O. Kostko, and M. Ahmed, "Vacuum Ultraviolet Photoionization Studies of PtCH<sub>2</sub> and H-Pt-CH<sub>3</sub>: A Potential Energy Surface for the Pt + CH<sub>4</sub> reaction." [Angew. Chem. Int. Ed. 125, 922 \(2013\)](#)
101. S. Chakraborty, T. Jackson, M. Ahmed, and M. H. Thiemens, "Sulfur Isotopic Fractionation in Vacuum Ultraviolet Photodissociation of Hydrogen Sulfide: Potential Relevance to Meteorite Analysis," [PNAS \(In press\)](#)  
[story on this paper](#)
100. A. Golan, M. Ahmed, A. Mebel, and R.I. Kaiser, "A VUV Photoionization Study on the Formation of Primary and Secondary Products in the Reaction of the Phenyl Radical with 1,3-Butadiene under Combustion Relevant Conditions." [Phys. Chem. Chem. Phys. 15, 341 \(2013\)](#)

### 2012

99. R.I. Kaiser, S. Krishtal, A. Mebel, O. Kostko, and M. Ahmed, "An Experimental

and Theoretical Study on the Ionization Energies of SiC<sub>2</sub>H<sub>x</sub> (x = 0, 1, 2) Isomers in the Interstellar Medium, [Astrophys. J. 761, 178 \(2012\)](#)

98. A. Golan and M. Ahmed, "Molecular beam mass spectrometry with tunable vacuum ultraviolet (VUV) synchrotron radiation", [J. Vis. Exp. 68, e50164, \(2012\)](#).

97. A.G. Vasiliou, K. M. Piech, B. Reed, X. Zhang, M. R. Nimlos, M. Ahmed, A. Golan, O. Kostko, D. L. Osborn, J. W. Daily, J. F. Stanton, and G. B. Ellison, "Thermal Decomposition of CH<sub>3</sub>CHO Studied by Matrix Infrared Spectroscopy and Photoionization Mass Spectroscopy". [J. Chem. Phys. 137, 164308 \(2012\)](#)

96. S. Chakraborty, R. Davis, M. Ahmed, T. L. Jackson, and M. H. Thieme, "Oxygen isotope fractionation in vacuum ultraviolet photodissociation of carbon monoxide: Wavelength, pressure and temperature dependency" [J. Chem. Phys. \(2012\), 137, 024309](#)

95. K.S. Kalogerakis, C. Romanescu, M. Ahmed, K. R. Wilson, T. G. Slanger, "CO prompt emission as a CO<sub>2</sub> marker in comets and planetary atmospheres". [Icarus \(2012\), 220, 205](#)

94. F. Zhang, R.I. Kaiser, A. Golan, M. Ahmed and N. Hansen, "A VUV Photoionization Study of the Combustion-Relevant Reaction of the Phenyl Radical (C<sub>6</sub>H<sub>5</sub>) with Propylene (C<sub>3</sub>H<sub>6</sub>) in a High Temperature Chemical Reactor" [J. Phys. Chem. A \(2012\)116, 3541](#)

93. A. Golan, K. B. Bravaya, R. Kudirka, O. Kostko, S. R. Leone, A. I. Krylov, and M. Ahmed, "Ionization of stacked dimethyluracil dimers leads to facile proton transfer in the absence of H-bonds". [Nature Chem. \(2012\), 4, 323](#)  
[story on this paper](#)

92. A. Golan and M. Ahmed, "Ionization of water clusters mediated by exciton energy transfer from argon clusters", [J. Phys. Chem. Lett. \(2012\) 3, 458](#)

91. M. J. Berg, K. R. Wilson, C. Sorensen, A. Chakrabarti, and M. Ahmed, "Discrete Dipole Approximation Model for Low-Energy Photoelectron Emission from NaCl Nanoparticles" [J. Quant. Spectrosc. Radiat. Transfer \(2012\) 113,259](#)

90. D. Ghosh, A. Golan, L. Takahashi, A.I. Krylov and M. Ahmed "An experimental and theoretical determination of the ionization energy of deoxyribose" , [J. Phys. Chem. Lett. \(2012\) 3, 97](#)

## 2011

89. O. Kostko, L. K. Takahashi, and M. Ahmed. "Desorption Dynamics, Internal Energies and Imaging of Molecules from Surfaces with Laser Desorption and

Vacuum Ultraviolet (VUV) Photoionization” , [Chem. Asian. J. \(2011\)6, 3066](#)

88. F. Zhang, R.I. Kaiser, V.V. Kislov, A.M. Mebel, A. Golan and M. Ahmed, “A VUV Photoionization Study of the Formation of the Indene Molecule and Its Isomers” [J.Phys. Chem. Lett. \(2011\) 2, 1031](#)

87. A.G. Vasiliou, K. M. Piech, X. Zhang, M. R. Nimlos, M. Ahmed, A. Golan, O. Kostko, D. L. Osborn, J. W. Daily, J. F. Stanton, and G. B. Ellison, “The Products of the Thermal Decomposition of CH<sub>3</sub>CHO”. [J. Chem. Phys. \(2011\) 135, 014306](#)

86. M. T. Blaze, L.K. Takahashi, J. Zhou, M. Ahmed, F. D. Pleticha, and L. Hanley, “Brominated Tyrosine and Polyelectrolyte Multilayer Analysis by Laser Desorption VUV Postionization and Secondary Ion Mass Spectrometry”. [Anal. Chem.\(2011\) 83, 4962](#)

85. C.L. Liu, J. D. Smith, D. L. Che, M. Ahmed, S. R. Leone, and K. R. Wilson, “The Direct Observation of Secondary Chemistry in the Heterogeneous Reaction of Chlorine Atoms with Submicron Squalane Droplets” [Phys. Chem. Chem. Phys. \(2011\) 13, 8993](#)

84. K. Khistyev, K. B. Bravaya, E. Kamarchik, O. Kostko, M. Ahmed, and A. I. Krylov, “The effect of microhydration on ionization energies of thymine” [Faraday Disc. \(2011\) 150, 313](#)

83. G. L. Gasper, L.K. Takahashi, J. Zhou, M. Ahmed, J. F. Moore, and L. Hanley, “Comparing Vacuum and Extreme Ultraviolet Radiation for Postionization of Laser Desorbed Neutrals from Bacterial Biofilms and Organic Fullerene” [Nuclear Instruments and Methods in Physics Research Section A \(2011\) 649,222](#)

82. L.K. Takahashi, J. Zhou, O. Kostko, A. Golan, S. R. Leone and M. Ahmed, “VUV Photoionization and Mass Spectrometric Characterization of the Lignin Monomers Coniferyl and Sinapyl Alcohol” [J. Phys. Chem. A \(2011\) 115, 3279](#)

81. P. Croteau, J. B. Randazzo, O. Kostko, M. Ahmed, M.C. Liang, Y. L. Yung and K. A. Boering, “Experimental determination of isotope effects in the non-dissociative photoionization of molecular nitrogen and implications for Titan's atmosphere” [Astrophys. J. Lett. \(2011\) 728, L32](#)

## 2010

80. K. B. Bravaya, O. Kostko, S. Dolgikh, A Landau, M. Ahmed, and A. I. Krylov “Electronic structure and spectroscopy of nucleic acid bases: Ionization energies, ionization-induced structural changes, and photoelectron spectra” [J. Phys. Chem. A \(2010\) 114, 12305](#)

79. M. Sleiman, H. Destailats, J.D. Smith, Chen-Lin Liu, M. Ahmed, K. R. Wilson

and L. A. Gundel, "Secondary organic aerosol formation from ozone-initiated reactions with nicotine and secondhand smoke" [Atmos. Environ. \(2010\) 44, 4191](#)

78. R. I. Kaiser, P. Maksyutenko, C. Ennis, F. Zhang, X. Gu, A. Mebel, O. Kostko, M. Ahmed, "Untangling the Chemical Evolution of Titan's Atmosphere and Surface: From Homogeneous to Heterogeneous Chemistry" [Faraday Disc. \(2010\) 147, 429](#)

77. K. R. Wilson, H. Bluhm, M. Ahmed, Aerosol Photoemission, in Fundamentals and Applications in Aerosol Spectroscopy, edited by J.P. Reid and R. Signorell, Taylor and Francis, [\(2010\) pp 367-417](#)

76. G. L. Gasper, L. K. Takahashi, J. Zhou, J. Moore, M. Ahmed, L. Hanley. "Laser Desorption Postionization Mass Spectrometry of Antibiotic-Treated Bacterial Biofilms using Tunable Vacuum Ultraviolet Radiation" [Anal. Chem. \(2010\) 82, 7472](#)

75. R. I. Kaiser, B. J. Sun, H. M. Lin, A. H. H. Chang, A. Mebel, O. Kostko and M. Ahmed "An Experimental and Theoretical Study on the Ionization Energies of Polyynes (H-(C<sup>o</sup>C)<sub>n</sub>-H; n = 1 - 9)" [Astrophys. J. \(2010\) 719 1884.](#)

74. O. Kostko, J. Zhou, A. Chang, B. J. Sun, J. S. Lie, A. H. H. Chang, R. I. Kaiser and M. Ahmed "Determination of ionization energies of C<sub>n</sub>N (n=3-12) clusters: Vacuum-ultraviolet (VUV) photoionization experiments and theoretical calculations" [Astrophys. J. \(2010\) 717, 674](#)

73. S. R. Leone, M. Ahmed and K. R. Wilson, "Chemical Dynamics, Molecular Energetics, and Kinetics at the Synchrotron" [Phys. Chem. Chem. Phys., \(2010\) 12, 6564](#)

72. E. Kamarchik, J. M. Bowman, O. Kostko, M. Ahmed, and A. I. Krylov, "Spectroscopic signatures of proton transfer dynamics in the water dimer cation". [J. Chem. Phys. \(2010\) 132, 194311](#)

71. J. Zhou, L. Takahashi, K. R. Wilson, S. R. Leone and M. Ahmed, "Determination of Internal Energies of Ion Desorbed Neutral Organic Molecules with Tunable Vacuum Ultraviolet Photoionization" [Anal. Chem. \(2010\) 82, 3905](#)

70. O. Kostko, K. Bravaya, A. I. Krylov, and M. Ahmed, "Ionization of cytosine monomer and dimer studied by VUV photoionization and electronic structure calculations." [Phys. Chem. Chem. Phys., \(2010\), 12, 2860.](#)

69. O. Kostko, S. R. Leone, M. A. Duncan and M. Ahmed, "Determination of ionization energies of small silicon clusters with vacuum-ultraviolet (VUV) photoionization." [J.Phys. Chem. A \(2010\), 114, 3176](#)

68. K. Bravaya, O. Kostko, M. Ahmed, and A. I. Krylov, "*The effect of pi-stacking, h-bonding, and electrostatic interactions on the ionization energies of nucleic acid*

bases: adenine-adenine, thymine-thymine and adenine-thymine dimers" [Phys. Chem. Chem. Phys. 12, \(2010\) 2261](#)

67. D. Strasser, F. Goulay, L. Belau, O. Kostko, C. Koh, S. D. Chambreau, G. L. Vaghjiani, Z.H. Loh, M. Ahmed and S. R. Leone, "Tunable wavelength soft photoionization of ionic liquid vapors" [J. Phys. Chem. A 114, \(2010\) 879](#)

66. R. I. Kaiser, A. Mebel, O. Kostko and M. Ahmed, "On the ionization energies of C<sub>4</sub>H<sub>3</sub> Isomers" [Chem. Phys. Lett. 485, \(2010\) 281](#)

## 2009

65. O. Kostko, S.K. Kim, S.R. Leone, and M. Ahmed, "Mass-Analyzed Threshold Ionization (MATI) Spectroscopy of Atoms and Molecules using VUV Synchrotron Radiation" *J. Phys. Chem. A* **113**, (2009) 14206

64. D.L. Che, J. D. Smith, S. R. Leone, M. Ahmed and K. R. Wilson, "Quantifying the Reactive Uptake of OH by Organic Aerosols in a Continuous Flow Stirred Tank Reactor" *Phys. Chem. Chem. Phys.* **11** (2009) 7885

63. S. Chakraborty, M. Ahmed, T. L. Jackson and M. H. Thiemens. "Response to the Comment on "Experimental Test of Self-shielding in Vacuum Ultraviolet Photodissociation of CO" *Science* **324**, (2009) 1516-d

62. J. Zhou, O. Kostko, C. Nicolas, X. Tang, L. Belau, M. S. de Vries, and M. Ahmed, "The direct observation of guanine tautomers using VUV photoionization" *J. Phys. Chem. A* **113**, (2009) 4829

61. J. D. Smith, J. H. Kroll, C. D. Cappa, D. L. Che, M. Ahmed, S. R. Leone, D. R. Worsnop, and K. R. Wilson. "The heterogeneous reaction of hydroxyl radicals with sub-micron squalane particles: a model system for understanding the oxidative aging of ambient aerosols" *Atmos. Chem. Phys.* **9**, (2009) 3209

60. L. Takahashi, J. Zhou, K. R. Wilson, S. R. Leone and M. Ahmed, "Imaging with Mass Spectrometry: A Secondary Ion and VUV-Photoionization Study of Ion-Sputtered Atoms and Clusters from GaAs and Au" *J. Phys. Chem. A* **113**, (2009) 4035

59. O. Kostko, M. Ahmed, and R. B. Metz, "A VUV photoionization measurement and ab-initio calculation of the ionization energy of gas phase SiO<sub>2</sub>" *J. Phys. Chem. A* **113**, (2009) 1225

## 2008

58. D. L. Osborn, P. Zou, H. Johnsen, C. C. Hayden, C. A. Taatjes, V. D. Knyazev, S. W. North, D. S. Peterka, M. Ahmed, and S. R. Leone. "The multiplexed chemical kinetic photoionization mass spectrometer: a new approach to isomer-resolved chemical kinetics." *Rev. Sci. Instrum.* **79**, (2008) 104103

57. M. Citir, R.B. Metz, L. Belau, and M. Ahmed. "Direct determination of the ionization energies of PtC, PtO and PTO<sub>2</sub> with VUV radiation" J. Phys. Chem. A **112**, (2008) 9584

56. O. Kostko, L. Belau, K.R. Wilson and M. Ahmed. "Vacuum-ultraviolet (VUV) photoionization of small methanol and methanol-water clusters" J. Phys Chem. A **112**, (2008) 9555

55. S. Chakraborty, M. Ahmed, T. L. Jackson and M. H. Thiemens. "Experimental Test of Isotopic Self-Shielding in VUV photodissociation of CO" Science **321**, (2008) 1328

## 2007

54. L. Belau, K. R. Wilson, S. R. Leone, and M. Ahmed. "Vacuum Ultraviolet (VUV) photoionization of small water clusters." J. Phys. Chem. A **111** (2007) 10075

53. L. Belau, S.E. Wheeler, B.W. Ticknor, M. Ahmed, S.R. Leone, W.D. Allen, H.F. Schaefer III, M.A. Duncan. "Ionization Thresholds of Small Carbon Clusters: Tunable VUV Experiments and Theory." J. Am. Chem. Soc. **129** (2007) 10229

52. K. R. Wilson, S. Zou, J. Shu, E. Rühl, S. R. Leone, G. C. Schatz and M. Ahmed. "Size-Dependent Angular Distributions of Low Energy Photoelectrons emitted from NaCl Nanoparticles." Nano Lett. **7** (2007) 2014

51. L. Belau, K. R. Wilson, S. R. Leone, and M. Ahmed. "Vacuum-Ultraviolet photoionization studies of the micro-hydration of DNA bases (Guanine, Cytosine, Adenine and Thymine)" J. Phys. Chem. A **111** (2007) 7562

50. R. I. Kaiser, L. Belau, S. R. Leone, M. Ahmed, Y. Wang, B. J. Braams, and J. M. Bowman. "A Combined Experimental and Computational Study on the Ionization Energies of the Cyclic and Linear C<sub>3</sub>H Isomer" ChemPhysChem **8** (2007) 1236

## 2006

49. M. Ahmed. "Photoionization of neutrals desorbed from surfaces". Encyclopedia of Mass Spectrometry, Volume 6, Elsevier (2007)

48. G. Meloni, P. Zou, S. J. Klippenstein, M. Ahmed, S. R. Leone, C. A. Taatjes, and D. L. Osborn. "Energy-resolved photoionization of alkyl peroxy radicals and the stability of their cations" J. Am. Chem. Soc. **128** (2006) 13567

47. E. F. Gloaguen, E. R. Mysak, S. R. Leone, M. Ahmed and K. R. Wilson. "Investigating the chemical composition of mixed organic-inorganic particles by "soft" VUV photoionization: the reaction of ozone with anthracene on sodium chloride particles." Int. J. Mass. Spectrom. **258** (2006) 74

46. J. Plenge, C. Nicolas, A. Caster, M. Ahmed, and S. R. Leone. "Two-color vacuum ultraviolet/visible photoelectron imaging dynamics of Br<sub>2</sub>." J. Chem. Phys. **125** (2006) 133315

45. J. Shu, K. R. Wilson, M. Ahmed, and S. R. Leone. "Coupling a versatile aerosol apparatus to a synchrotron: vacuum ultraviolet light scattering, photoelectron imaging, and chemistry of fine particles." *Rev. Sci. Instr.* **77** (2006) 043106

44. K. R. Wilson, D. S. Peterka, M. Jimenez-Cruz, S.R. Leone, and M. Ahmed. "VUV photoelectron imaging of biological nanoparticles: Ionization energy determination of nanophase glycine and phenylalanine-glycine-glycine." *Phys. Chem. Chem. Phys.* **8** (2006) 1884

43. K. R. Wilson, L. Belau, M. Jimenez-Cruz, C. Nicolas, S. R. Leone, and M. Ahmed. "Direct determination of the ionization energy of histidine with VUV synchrotron radiation". *Int. J. Mass Spectrom.* **249-250**, (2006) 511

42. T. Zhang, X. N. Tang, C.Y. Ng, C. Nicolas, D. S. Peterka, M. Ahmed, M. L. Morton, B. Ruscic, R. Yang, L. X. Wei, C. Q. Huang, B. Yang, J. Wang, X. B. Shan, L. S. Sheng, and F. Qi. "Direct identification of propargyl radical in combustion flames by VUV photoionization mass spectrometry". *J. Chem. Phys.* **124** (2006) 074302

41. C. Nicolas, J. Shu, D. S. Peterka, M. Hochlaf, L. Poisson, S. R. Leone, and M. Ahmed. "Vacuum ultraviolet photoionization of  $C_3$ ". *J. Am. Chem. Soc.* **128** (2006) 220

40. J. Shu, K. R. Wilson, M. Ahmed, S. R. Leone, C. Graf, and E. Ruhl. "Elastic light scattering from free nanoparticles in the vacuum- ultraviolet regime." *J. Chem. Phys.* **124** (2006) 34707

39. K. R. Wilson, M. Jimenez-Cruz, C. Nicolas, L. Belau, S. R. Leone, and M. Ahmed. "Thermal Vaporization of Biological Nanoparticles: Fragment-Free VUV Photoionization Mass Spectra of Tryptophan, Phenylalanine-Glycine-Glycine and  $\beta$ -carotene," *J. Phys. Chem A.* **110** (2006) 2106

## 2003-2005

38. T.A. Cool, A. McIlroy, F. Qi, P.R. Westmoreland, L. Poisson, D.S. Peterka, and M. Ahmed. "A photoionization mass spectrometer for studies of flame chemistry with a synchrotron light source" *Rev. Sci. Instr.* **76** (2005) 94102

37. R. B. Metz, C. Nicolas, M. Ahmed, and S. R. Leone. "Direct determination of ionization energies of FeO and CuO with vacuum ultraviolet radiation." *J. Chem. Phys.* **123** (2005) 114313

36. E. R. Mysak, K. R. Wilson, M Jimenez-Cruz, M. Ahmed, and T. Baer. "Synchrotron radiation based aerosol time-of-flight mass spectrometry for organic constituents". *Anal. Chem.* **77** (2005) 5953

35. J. Shu, K. R. Wilson, A. N. Arrowsmith, M. Ahmed and S. R. Leone. "Light scattering of ultrafine silica particles by VUV synchrotron radiation" *Nano Lett.* **5** (2005) 109

34. D. S. Peterka and M. Ahmed. "Atoms to Aerosols- the chemical dynamics beamline". *Synchrotron Radiation News.* **18** (2005) 35

33. F. Davis, J. Shu, D.S. Peterka, and M. Ahmed. "A crossed beams study of the reaction:  $^1CH_2 + C_2H_2 \rightarrow$

$C_3H_3 + H$ ” J. Chem. Phys. **121** (2004) 2546

32. J. Shu, D.S. Peterka, S. R. Leone, and M. Ahmed. “Tunable synchrotron vacuum ultraviolet ionization, time-of-flight investigation of the photodissociation of trans-crotonaldehyde at 193 nm” J. Phys. Chem, A **108** (2004) 7895

31. W. Li, L. Poisson, D.S. Peterka, M. Ahmed, R.R. Lucchese, A.G. Suits. “Dissociative photoionization dynamics in ethane studied by velocity map imaging” Chem. Phys. Lett. **374** (2003) 334

30. D.S. Peterka, A. Lindinger, L. Poisson, M. Ahmed, and D.N. Neumark. “Photoelectron imaging of helium droplets” Phys. Rev. Lett. **91** (2003) 43401

29. T.A. Cool, T.A. Mostefaoui, F. Qi, A. McIlroy, P.R. Westmoreland, M.E. Law, L. Poisson, D.S. Peterka, and M. Ahmed. “Selective detection of isomers with photoionization mass spectrometry for studies of hydrocarbon flame chemistry” J. Chem. Phys. **119**, (2003) 8356

28. X. Qian, A. H.Kung, T. Zhang, C.Y. Ng, and M. Ahmed. “Two-color photoionization spectroscopy using vacuum ultraviolet synchrotron radiation and infrared optical parametric oscillator laser.” Rev. Sci. Instrum. **74** (2003) 2784

## Photodissociation, Photoionization, and Crossed Molecular Beams (1997-2002)

27. F. Qi, L. Sheng, M. Ahmed, D. S. Peterka and T. Baer. “Exclusive production of excited-state sulfur ( $^1D$ ) atoms from 193 nm photolysis of thietane”, Chem. Phys.Lett. **357** (2002) 204

26. E.R. Wouters, M. Ahmed, D.S. Peterka, A.S. Bracker, A.G. Suits and O.S. Vasyutinskii. “Imaging the atomic orientation and alignment in photodissociation.” Imaging in Chemical Dynamics, A.G. Suits and R. E. Continetti, eds., ACS Symposium Series 770, American Chemical Society, Washington DC, pp 238

25. M. Ahmed, D.S. Peterka, and A.G. Suits. “New directions in reaction dynamics using velocity map imaging.” Imaging in Chemical Dynamics, A.G. Suits and R.E. Continetti, eds., ACS Symposium Series 770, American Chemical Society, Washington DC, pp 167

24. M. Ahmed, D.S. Peterka, and A.G. Suits. “Photodissociation of  $NO_2$  near 225 nm by Velocity Map Imaging.” Atomic and Molecular Beams – The State of the Art 2000. ed. R Campargue, Springer –Verlag Berlin Heidelberg 2001, pp 343

23. M Ahmed, D S. Peterka, P Regan, X Liu and A. G. Suits. “Ion Pair Imaging Spectroscopy:  $CH_3Cl \rightarrow CH_3^+ + Cl^-$ ” Chem. Phys. Lett. **339** (2001) 203

22. M. Ahmed, D. S. Peterka, and A. G. Suits. “Crossed Molecular Beam Reactive Scattering in Conjunction With Velocity Map Imaging and Single Photon Ionization” Lambda Highlights, No 56, (2000)

21. M. Ahmed, D.S. Peterka, and A.G. Suits. “Imaging H abstraction dynamics in crossed molecular beams:  $Cl + ROH$  reactions” Phys. Chem. Chem. Phys. **2** (2000) 861



20. M. Ahmed, D.S. Peterka, and A.G. Suits. "H abstraction dynamics by crossed-beam velocity map imaging:  $Cl + CH_3OH \rightarrow CH_2OH + HCl$ ." Chem. Phys. Lett. **317** (2000) 264
19. M. Ahmed, D.S. Peterka, and A.G. Suits. "The photodissociation of the vinyl radical ( $C_2H_3$ ) at 243 nm studied by velocity map imaging." J. Chem. Phys. **110** (1999) 4248
18. M. Ahmed, D.S. Peterka and A.G. Suits. "Velocity map imaging of the  $O(^1D) + D_2 \rightarrow OD + D$  reaction." Chem. Phys. Lett. **301** (1999) 372
17. D.S. Peterka, M. Ahmed, C.Y. Ng and A.G. Suits. "Dissociative photoionization dynamics of  $SF_6$  by ion imaging with synchrotron undulator radiation." Chem. Phys. Lett. **312** (1999) 108
16. M. Ahmed, E.W. Wouters, D.S. Peterka, O.S. Vasutinski, and A.G. Suits. "Atomic orbital alignment and coherence in  $N_2O$  photodissociation at 193.3 nm." Faraday Discuss. **113** (1999) 425
15. D.S. Peterka, M. Ahmed, A.G. Suits, K.J. Wilson, A. Korokin, M. Noojen, and R.J. Bartlett. "Unravelling the mysteries of metastable  $O_4^*$ . (vol 110, pg 6095, 1999)" J. Chem. Phys. **111** (1999) 5279
14. D.S. Peterka, M. Ahmed, A.G. Suits, K.J. Wilson, A. Korokin, M. Noojen, and R.J. Bartlett. "Unravelling the mysteries of metastable  $O_4^*$ ." J. Chem. Phys. **110** (1999) 6095
13. M. Ahmed, D.S. Peterka, A.S. Bracker, O.S. Vasutinski, and A.G. Suits. "Coherence in polyatomic photodissociation: Aligned  $O(^3P)$  from photodissociation of  $NO_2$  at 212.8 nm." J. Chem. Phys. **110** (1999) 4115
12. W.M. Jackson, R.J. Price, D.D. Xu, J.D. Wrobel, M. Ahmed, D.S. Peterka and A.G. Suits. "Velocity map imaging studies of the Lyman- $\alpha$  photodissociation mechanism for H atom production from hydrocarbons." J. Chem. Phys. **109** (1998) 4703
11. H.M. Bevesek, M. Ahmed, D.S. Peterka, F.C. Sables and A.G. Suits. "Direct detection and spectroscopy of  $O_4^*$ ." Faraday Discuss. **108** (1997) 131
10. M. Ahmed, D. Blunt, D. Chen and A.G. Suits. "UV photodissociation of oxalyl chloride yields four fragments from one photon absorption." J. Chem. Phys. **106** (1997) 7617

## Graduate and Postdoctoral work (1989-1997)

9. M. Ahmed, C.J. Apps, M.J. Bramwell, J.L. Cooper, C. Hughes, K. Reinhardt, J.C. Whitehead, F. Winterbottom and A. Hopkirk. "Fluorescence excitation spectroscopy of some haloethenes,  $CF_2=CXY$  ( $XY \equiv FCl, Cl_2, FH$ ), excited in the vacuum ultraviolet (70-180 nm)." Chem. Phys. **219** (1997) 333
8. M. Ahmed, C.J. Apps, R. Buensel, C. Hughes, N.E. Watt, I.H. Hillier and J.C. Whitehead. "Adsorption of  $N_xO_y$ -based molecules on large water clusters: An experimental and theoretical study." J. Phys. Chem. A **101** (1997) 1254
7. M. Ahmed, C.J. Apps, C. Hughes, N.E. Watt and J.C. Whitehead. "Adsorption of organic molecules on

*large water clusters.*" J. Phys. Chem. A **101** (1997) 1250

6. M. Ahmed, C.J. Apps, C. Hughes, and J.C. Whitehead. "*The adsorption of methanol on large water clusters.*" Chem. Phys. Lett. **240** (1995) 216

5. M. Ahmed, P. Potzinger and H.Gg. Wagner. "*Photolysis of tetramethylsilane near the absorption onset: Mechanism and Photophysics.*" J. Photochem. Photobiol. A-Chem. **86** (1995) 33

4. M. Ahmed, C.J. Apps, C. Hughes, and J.C. Whitehead. "*Vacuum ultraviolet excitation of large water clusters.*" J. Phys. Chem. **98** (1994) 12530

3. M. Ahmed, I.M.T. Davidson, G.H. Morgan and T. Simpson. "*Mechanism of pyrolysis of 2,2-Diethylhexamethyltrisilane.*" Organometallics. **10** (1991) 3772

2. M. Ahmed and A.B. Callear. "*Mercury photosensitised excitation of SO<sub>2</sub> - Formation of triplet states in termolecular collisions.*" Chem. Phys. Lett. **157** (1989) 556

1. M. Ahmed and A.B. Callear. "*Rate coefficients for reaction of C<sub>2</sub>H<sub>2</sub> (*a*<sup>3</sup>B<sub>2</sub>).*" Chem. Phys. Lett. **156** (1989) 35