

Musahid Ahmed, Ph.D

MS 6R-2100, LBNL
1 Cyclotron Road
Berkeley, CA-94720

510-486-6355(PH)
510-486-5311 (FAX)
Mahmed@lbl.gov

Researcher ID: <http://www.researcherid.com/rid/A-8733-2009>

Research Interests

Imaging Mass Spectrometry, Biomolecule Energetics, Laser Ablation and Cluster Science, Vacuum Ultraviolet Photoionization Dynamics, Gas-phase Spectroscopy, Aerosol and Combustion Chemistry, Nanoparticle Physics, Synchrotron Radiation and Chemical Applications.

Academic Qualifications

PhD Physical Chemistry, 1989, University of Cambridge, U.K.
Thesis Adviser: Dr. A.B. Callear

BSc (Hons) Chemistry, 1985. University of Delhi, India.

Professional Experience

Acting Beamline Director. Chemical Dynamics Beamline, Advanced Light Source, Lawrence Berkeley National Laboratory. Berkeley, CA, Jan-June 2009, Jan-June 2010.

Visiting Scholar. College of Chemistry, University of California, Berkeley, CA, Jan 2008-present.

Principal Investigator. Chemical Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA, 2006-present.

Technical Expert. International Atomic Energy Agency, Vienna, Austria. September 2006

Staff Scientist. Chemical Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA, 2000-present

Scientist. Chemical Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA, 1995-2000

Post-doctoral Research Fellow. University of Manchester. UK 1993-1995 (Prof. J. C. Whitehead);
Max Planck Institute for Strömungsforschung, Göttingen, Germany. 1991-1993 (Prof. P. Potzinger);
University of Leicester UK and British Petroleum, Sunbury, UK. 1989-1991 (Prof. I. M. T. Davidson)

Awards and Funding

Visualizing Functional Surfaces with Molecular Nano-imaging, DOE grant, 2006

The Camille and Henry Dreyfus Foundation Grant for Environmental Chemistry, 2005

Laboratory Directed Research Funding, Lawrence Berkeley National Laboratory, 2003-2006

Outstanding Performance Award, Lawrence Berkeley National Laboratory, 2003

Overseas Research Scholarship, Cambridge University, U.K. 1986-1988

Publications

76. E. Kamarchika, J. M. Bowman, O. Kostko, M. Ahmed, and A. I. Krylov, "Spectroscopic signatures of proton transfer dynamics in the water dimer cation". (Submitted)
75. 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_nN ($n=3-14$) clusters: Vacuum-ultraviolet (VUV) photoionization experiments and theoretical calculations" *Astrophys. J.* (Accepted)
74. 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.* (In press)
73. 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.* (Accepted)
72. S. R. Leone, M. Ahmed and K. R. Wilson, "Chemical Dynamics, Molecular Energetics, and Kinetics at the Synchrotron" *Phys. Chem. Chem. Phys.* (In press)
71. 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, (Accepted)
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_4H_3 Isomers" *Chem. Phys. Lett.* **485**, (2010) 281
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 SiO₂" J. Phys. Chem. A **113**, (2009) 1225
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 PTO₂ 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
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
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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 C₃H Isomer" ChemPhysChem **8** (2007) 1236

49. M. Ahmed. "Photoionization of neutrals desorbed from surfaces". Encyclopedia of Mass Spectrometry, Volume 6, Elsevier (2007)
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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
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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. Inst. **77** (2006) 043106
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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
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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
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