Aaron Wiegel, Ph.D.

Postdoctoral Fellow
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Education

University of California - Berkeley
PhD, Physical Chemistry, Atmospheric Chemistry, Expected graduation: Dec 2013
GPA: 3.92/4.00

University of Wisconsin - Madison
BS, Chemistry, Technical Japanese, 2006
GPA: 3.93/4.00

Research Experience

Lawrence Berkeley National Laboratory: Berkeley, CA, USA January 2014 - Present
Postdoctoral Fellow

- Used stochastic kinetics models to understand the mechanisms of organic aerosol oxidation
- Measured the rheological properties of organic aerosol

University of California – Berkeley: Berkeley, CA, USA October 2007 - December 2013
Graduate Student Researcher

- Made significant advances in the understanding of the origins of the ^{17}O isotope anomaly in ozone and stratospheric carbon dioxide through photochemical kinetics experiments and modeling
- Developed chemical kinetics simulations of various photochemistry experiments
- Used the linear Boltzmann equation to demonstrate how the non-thermal distribution of species in photochemistry experiments can create non-mass-dependent isotope effects in isotope exchange reactions
- Maintained and used several high-vacuum glass lines and a dual inlet isotope ratio mass spectrometer
- Developed experimental methods for cryogenic separations of O_3, CO_2, O_2, and other gases.
- Worked on international collaborations, mentored new graduate and undergraduate students, organized research group meetings, and maintained research group website

Utrecht University – IMAU: Utrecht, the Netherlands April 2010 - July 2010
Visiting Graduate Student Scholar

- Initiated an ongoing collaboration to increase the available ^{17}O measurements of stratospheric CO_2
- Resolved differences between two sets of laboratory measurements of the same process.
- Worked and communicated in an international and multicultural workplace

University of California – Berkeley: Berkeley, CA, USA October 2006 - May 2007
Graduate Student Researcher

- Organometallic reaction development

University of Wisconsin - Madison: Madison, WI, USA April 2005 - May 2006
Undergraduate Research Assistant

- Organic synthesis of aromatic ketones for use in photochemistry experiments

Teaching Experience

Prison University Project: San Quentin, CA, USA January 2013 - Present
Volunteer Instructor

- Lead instructor of Introduction to Statistics through Patten University
- Gave lecture and organized class room discussions once a week
- Wrote and graded homework assignments and exams
- Coordinated discussions for other college math classes

University of California – Berkeley: Berkeley, CA, USA June 2006 - May 2008
Graduate Student Instructor

- GSI (TA) for three different courses in three semesters and 2 summer sessions teaching general chemistry, organic chemistry, and atmospheric chemistry
- Gave lecture and review sessions, supervised students in the lab, gave oral exams, evaluated student work
- Developed a new laboratory assignment measuring column ozone above Berkeley and its seasonal cycle

University of Wisconsin – Madison: Madison, WI, USA August 2005 - May 2006
Academic Coach

- Mentored and tutored first generation college students in Japanese and chemistry courses

Publications and Recent Presentations

A. A. Wiegel, A. S. Cole, K. A. Boering, **Apparent non-mass-dependent isotope effects in non-thermal isotope exchange reactions in UV irradiated mixtures of O_2 and CO_2,** under preparation, to be submitted to J. Geophys. Res., 2014.

A.L. Van Wyngarden, K.A. Mar, S.-Y. Lin, **A.A. Wiegel**, J. Quach, A.P.Q. Nguyen, G. Lendvay, H. Guo, Y.T. Lee, J.J. Lin, and K.A. Boering, **The non-statistical dynamics of the $^{18}O + {}^{32}O_2$ isotope exchange reaction at two energies,** under preparation, to be submitted to J. Chem. Phys., 2014.

A. A. Wiegel, A. S. Cole, K. J. Hoag, E. L. Atlas, S. M. Schauffler, K. A. Boering, **Unexpected variations in the triple oxygen isotope composition of stratospheric carbon dioxide,** PNAS 110 (44), 17680-17685, 2013.

K. L. Feilberg, **A. A. Wiegel**, K. A. Boering, **Probing the unusual isotope effects in ozone formation: Bath gas and pressure dependence of the non-mass-dependent isotope enrichments in ozone,** Chem. Phys. Lett. Frontiers Article 556, 1-8, 2013, doi: j.cplett.2012.10.038

A. A. Wiegel and K. A. Boering, **Measurements and kinetics modeling of the O_2/CO_2 dependence of the oxygen-17 isotope anomaly in carbon dioxide,** Geophysical Research Abstracts Vol. 14, EGU2012-935, (European Geoscience Union General Assembly, Vienna, Austria), April 2012.

A. A. Wiegel, K. J. Hoag, A. S. Cole, E. L. Atlas, S. Schauffler, K. A. Boering, **The non-mass-dependent oxygen isotopic composition of CO_2 in the stratosphere and laboratory: Evidence for another anomalous kinetic isotope effect beyond ozone formation?** Abstract V31B-2319 presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 December, 2010.

A. A. Wiegel, K. Feilberg, C. Janssen, T. Röckmann, and K.A. Boering, **Measurements and kinetics modeling of the pressure and bath gas dependence of the mass-independent oxygen isotopic composition of ozone and carbon dioxide at photochemical equilibrium,** Fifth International Conference on Isotopomers, Amsterdam, The Netherlands, 22-25 June 2010.

A. A. Wiegel, K.J. Hoag, A.S. Cole, E.A. Atlas, S. Schauffler, and K.A. Boering, **The anomalous oxygen isotopic composition of CO_2: Photochemical kinetics experiments and stratospheric observations,** Fifth International Conference on Isotopomers, Amsterdam, The Netherlands, 22-25 June 2010.

A. A. Wiegel, A.S. Cole, K.J. Hoag, K.A. Boering, **Oxygen isotopic composition of CO_2 in the stratosphere and laboratory: Evidence for another anomalous kinetic isotope effect?**, Spring 2010 American Chemical Society Meeting, San Francisco, CA, 21-25 March 2010.

L. Y. Yeung, H. P. Affek, K. J. Hoag, W. Guo, **A. A. Wiegel**, E. L. Atlas, S. M. Schauffler, M. Okumura, K. A. Boering, and J. M. Eiler, **Large and unexpected enrichment in stratospheric $^{16}O^{13}C^{18}O$ and its meridional variation,** Proc. Nat. Acad. Sci. 106 (28), 11496-11501, doi: 10.1073/pnas.0902930106, 2009.

Honors and Awards

Utrecht University Short Stay Fellowship North America 2010

Professional Associations

American Chemical Society

American Geophysical Union