

Chemical Characterization of Ambient Aerosols at T0 during the MILAGRO field campaign using Aerosol Mass Spectrometry. Comparison with the MCMA-2003 field campaign results.

Dara Salcedo, Centro de Investigaciones Químicas, Universidad Autónoma del Estado de Morelos; Allison C. Aiken, Department of Chemistry & Biochemistry and CIRES, University of Colorado; Timothy B. Onasch, Aerodyne Research, Inc.; Donna Sueper, CIRES, University of Colorado and Aerodyne Research, Inc.; Katja Dzepina, Department of Chemistry & Biochemistry and CIRES, University of Colorado

J. Alex Huffman, Department of Chemistry & Biochemistry and CIRES, University of Colorado; Kenneth Docherty, CIRES, University of Colorado; Ingrid Ulbrich, Department of Chemistry & Biochemistry and CIRES, University of Colorado; Michael Cubison, Department of Chemistry & Biochemistry and CIRES, University of Colorado; Doug Worsnop, Aerodyne Research, Inc.; Manjula R. Canagaratna, Aerodyne Research, Inc.; Qi Zhang, CIRES, University of Colorado (now at Atmospheric Science Research Center, University at Albany, SUNY); Peter F. DeCarlo, Program in Atmospheric and Oceanic Sciences and CIRES, University of Colorado; John T. Jayne, Aerodyne Research, Inc.

Phil Mortimer, Aerodyne Research, Inc. (now at John Hopkins University); Charles E. Kolb, Aerodyne Research, Inc.; Luisa T. Molina, Department of Earth, Atmospheric and Planetary Sciences and Department of Chemistry, MIT and Molina Center on Energy and Environment; Mario J. Molina, Department of Earth, Atmospheric and Planetary Sciences and Department of Chemistry, MIT (now at Department of Chemistry and Biochemistry, UCSD); Jose L. Jimenez, Department of Chemistry & Biochemistry and CIRES, University of Colorado

Dara Salcedo, Centro de Investigaciones Químicas - UAEM, dara@ciq.uaem.mx

A Quadrupole-based Aerodyne Aerosol Mass Spectrometer (Q-AMS) was deployed at the CENICA Supersite during the Mexico City Metropolitan Area 2003 (MCMA-2003) field study from April 3 to May 4, 2003 (Salcedo et al. 2006). From March 1 to March 31, 2006 a High Resolution Time-of-Flight Aerosol Mass Spectrometer (HR-ToF-AMS) was deployed at the Instituto Mexicano del Petróleo (IMP) "T0" Supersite during the MILAGRO campaign in the MCMA (also as part of the MCMA-2006 campaign). This instrument was operated in the electron impact ionization (EI) mode. Observed time trends and size distributions of non-refractory total aerosol mass as well as speciated aerosol mass at IMP during the MILAGRO field campaign will be presented and compared with the MCMA-2003 data. Differences between the two datasets will be discussed in terms of the different locations of the sites and sources near the sites. The HR-ToF-AMS has the advantage of a high m/z resolution, which allows the separation of fragments with different elemental compositions. This capability, will be used to quantitatively determine the presence of toxic aerosol components such as PAHs and heavy metals (for example lead). Besides measuring the average mass concentration and ensemble mass spectrum of the non-refractory ambient aerosol components, the ToF-

AMS is capable of determining size distributions for every single m/z , unlike the quadrupole AMS (Q-AMS) that could only determine these for a small subset of m/z 's (10-20) (Drewnick et al., 2005; DeCarlo, 2006). Given the significant variations in time and size of particle species in Mexico City, the ToF-AMS holds promise for further separation of sources and components of ambient aerosols, over what is achievable with Q-MS instrument.

References:

- D. Salcedo et al., Characterization of ambient aerosols in Mexico City during the MCMA-2003 campaign with Aerosol Mass Spectrometry: results from the CENICA Supersite. *Atmospheric Chemistry and Physics*, 6, 925-946, 2006. <http://www.atmos-chem-phys.net/6/925/2006/acp-6-925-2006.pdf>
- Drewnick, F., Hings, S. S., DeCarlo, P., Jayne, J. T., Gonin, M., Fuhrer, K., Weimer, S., Jimenez, J. L., Demerjian, K. L., Borrmann, S., and Worsnop, D. R. (2005). A New Time-of-Flight Aerosol Mass Spectrometer (TOF-AMS) - Instrument Description and First Field Deployment, *Aerosol Sci. Technol.*, 39,637-658.
- P.F. DeCarlo, J.R. Kimmel, A. Trimborn, J.T. Jayne, A.C. Aiken, M. Gonin, K. Fuhrer, T. Horvath, K. Docherty, D.R. Worsnop, and J.L. Jimenez. A Field-Deployable High-Resolution Time-of-Flight Aerosol Mass Spectrometer. *Analytical Chemistry*, in press, Sep. 2006.