



Home

Online Library ACP

- Recent Final Revised Papers
- Volumes and Issues**
- Special Issues
- Library Search
- Title and Author Search

Online Library ACPD

Alerts & RSS Feeds

General Information

Submission

Review

Production

Subscription

Comment on a Paper

Impact
Factor
4.927

ISI
indexed



▣ Volumes and Issues ▣ Contents of Issue 18 ▣ Special Issue

Atmos. Chem. Phys., 9, 6849-6863, 2009
www.atmos-chem-phys.net/9/6849/2009/

© Author(s) 2009. This work is distributed
under the Creative Commons Attribution 3.0 License.

Oxygenated organic functional groups and their sources in single and submicron organic particles in MILAGRO 2006 campaign

S. Liu¹, S. Takahama¹, L. M. Russell¹, S. Gilardoni^{1,2}, and
D. Baumgardner³

¹Scripps Institution of Oceanography, Univ. of California, San Diego, La Jolla, California, USA

²Joint Research Centre, European Commission, Ispra, Italy

³Centro de Ciencias de la Atmósfera, Univ. Nacional Autónoma de México, México City, -México

Abstract. Fourier Transform Infrared (FTIR) and X-ray Fluorescence (XRF) were used to measure organic functional groups and elements of submicron particles collected during MILAGRO in March 2006 on three platforms: the Mexico City urban area (SIMAT), the high altitude site at 4010 m (Altzomoni), and the NCAR C130 aircraft. Scanning Transmission X-ray Microscopy (STXM) and Near-Edge X-ray Absorption Fine Structure (NEXAFS) were applied to single particle organic functional group abundance analysis of particles simultaneously collected at SIMAT and C130. Correlations of elemental concentrations showed different groups of source-related elements at SIMAT, Altzomoni, and C130, suggesting different processes affecting the air masses sampled at the three platforms. Cluster analysis resulted in seven distinct clusters of FTIR spectra, with the last three clusters consisting of spectra collected almost exclusively on the C130 platform, reflecting the variety of sources contributing to C130 samples. Positive Matrix Factorization (PMF) of STXM-NEXAFS spectra identified three main factors representing soot, secondary, and biomass burning type spectra. PMF of FTIR spectra resulted in two fossil fuel combustion factors and one biomass burning factor, the former representative of source regions to the northeast and southwest of SIMAT. Alkane, carboxylic acid, amine, and alcohol functional groups were mainly associated with combustion related sources, while non-acid carbonyl groups were likely from biomass burning events. The majority of OM and O/C was attributed to combustion sources, although no distinction between direct emissions and atmospherically processed OM could be identified.

▣ [Final Revised Paper](#) (PDF, 9307 KB) ▣ [Discussion Paper](#) (ACPD)

Citation: Liu, S., Takahama, S., Russell, L. M., Gilardoni, S., and Baumgardner, D.: Oxygenated organic functional groups and their sources in single and submicron organic particles in MILAGRO 2006 campaign, Atmos. Chem. Phys., 9, 6849-6863, 2009. ▣ [Bibtex](#) ▣ [EndNote](#) ▣ [Reference Manager](#)



Search ACP

Library Search

Author Search

News

- ▣ New Alert Service available
- ▣ Sister Journals AMT & GMD
- ▣ Financial Support for Authors
- ▣ Public Relations & Background Information

Recent Papers

01 | ACPD, 23 Sep 2009: Comparison of aromatic hydrocarbon measurements made by PTR-MS, DOAS and GC-FID in Mexico City during the MCMA 2003 field experiment

02 | ACPD, 23 Sep 2009: Acetaldehyde in the Alaskan subarctic snow pack

03 | ACPD, 22 Sep 2009: Estimates of biomass burning emissions in tropical Asia based on satellite-derived data

