

Interactive comment on “Oxygenated organic functional groups and their sources in single and submicron organic particles in MILAGRO 2006 campaign” by S. Liu et al.

Anonymous Referee #1

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This paper investigates the sources of major organic functional groups measured in submicron particles on 3 platforms during the Milagro campaign. The measurements performed on the 3 platforms are presented in a companion paper submitted for publication in ACP. This paper focus on a systematic analysis on the data collected during the campaign. Chemometric techniques and statistical analysis are used to sort the data into specific category and identify their sources. The analysis is based on correlations between elements and organic functional groups, a clustering technique applied to FTIR spectra and PMF applied to NEXAFS-STXM and FTIR spectra. The approach allows to identify different patterns in the time evolution of functional groups at the 3 platform and to identify chemical signature that can be attributed to specific

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sources. The contribution of 3 major sources to the organic particles is quantified: fossil fuel combustion, biomass burning and “ atmospherically processed ” sources. The manuscript is generally well written and the results of the analyses are illustrated by a set of very useful and suitable figures. I am not an expert of the chemometric technique used in the paper and, therefore, I can not assess the relevance of this approach in detail. However, the paper provides many interesting outcomes regarding the variability of functional groups found in organic matter and their likely sources. Thus I recommend this paper for publication in ACP.

Minor comments:

Scatter plots shown in the Figures 1a - 1c can not be analyzed, owing to the size of the figure. The figures must be magnified by at least a factor 2. Same problem for the Figures 3a-c.

The label (i)-(iv) in the caption of figure 3 must be changed to (a)-(d).

Figures 3a-c show both the results of cluster analysis and PMF factors of FTIR spectra. No direct comparison between the information provided by these 2 techniques is discussed in the text. Information about cluster does not seem necessary and could be removed from the figure to increase its readability.

Caption of figure 6 is misleading. I understand figure 6b to be the fraction of each "type" shown in figure 6a. The "secondary type" does not appear in the 0.1-0.2 and 5-10 micrometer range in figure 6a but a significant fraction is attributed to the "processed type" in figure 6b for the same size ranges.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 4567, 2009.

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