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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Determination of particulate lead during MILAGRO/MCMA-2006 using Aerosol Mass Spectrometry" *by* D. Salcedo et al.

Anonymous Referee #2

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General comments: This manuscript reports on detail of determinations of Pb particles using aerosol mass spectrometry and addresses the effects of evaporation temperature of different Pb species. It also attempts to evaluate the sources of Pb in Mexico City. The field measurement, experiment, and theory are well organized. I have following suggestions and questions that could improve the paper.

Specific comments:(P-page, L-line)

Comment 1: As described in *Introduction* (first paragraph), Pb is important issue for human health. Can authors suggest anything about this issue from the results of this study?

Comment 2: Pb has a similar diurnal cycle to that of black carbon (P2599/L21) but does not correlate to black carbon (P2600/L6). Is this correct? If so, some explanation would be helpful to understand their relation.

Comment 3: If Pb has a similar diurnal cycle to that of HOA because of meteorological condition (section 3.6, first paragraph; P2599/L21), Pb may not need to be coemitted or emitted near by the HOA sources (P2600/L16); i.e., the correlation between Pb and HOA could be explained by their diurnal cycle.

Comment 4: Fig.13 suggests that the sources of $PbCl^+$ differ from those of PbS^+. However, Figs.10, 12, and S11 suggest they have similar sources or time series. Although authors mentioned that *"This is because the CFA result for $PbCl^+$ is highly affected by 3 or 4 large peaks, while RWP roses are more sensitive to the median (P2602/L2)"*, it is not clear for me where is the most likely sources of $PbCl^+$ and PbS^+.

Comment 5: (P2598/L17) *"It is also interesting to note that, although the times series of $PbCl^+$ and PbS^+ are similar, they are not identical; the differences are probably caused by differences in lead speciation depending on the source."* This sentence is not clear. Please explain the exact meaning of *"differences in lead speciation depending on the source."*

Comment 6: (P2599/L6) *"This result implies that lead species that generate $PbCl^+$ and PbS^+ ions (and/or species that are co-emitted with those), account for most, but not all of the variability of the Pb during this period."* If $PbCl^+$ and PbS^+ account for most (although not all) of variability of the Pb, why are the source regions of Pb, PbS^+, and $PbCl^+$ quite different in Fig. 13?

Comment 7: PbCl has melting points of 934°C but the AMS has 600°C of vaporizer. Although PbCl and $PbCl^+$ may not be identical, can $PbCl^+$ be ionized so quickly?

Comment 8: P2600/ L16; "does not" typo

Comment 9: Table 1. What does "m" mean?

Comment 10: Fig.1. Size range of PIXE is not shown properly.

Comment 11: Fig.7. It will be better to have panel number (e.g., A, B, ..) and caption for each image. Relation between *""open" or "closed" Pb signal = sum of both fraction"* and the arrow below the text is unclear.

Comment 12: Fig.12. In panel B, the date starts from "15/09/06", although caption says 14, March.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 2581, 2010.