Atmos. Chem. Phys. Discuss.,
https://doi.org/10.5194/acp-2017-683-RC2, 2017

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Insights into organic-aerosol sources via a novel laser-desorption/ionization mass spectrometry technique applied to one year of PM_{10} samples from nine sites in central Europe" *by* Kaspar R. Daellenbach et al.

Anonymous Referee #2

Received and published: 30 October 2017

Mass spectrometrical methods are in widespread use to characterize the organic composition of particulate matter. Aerosol mass spectrometers, despite their drawbacks with respect to hard ionization, are often drawn upon for source apportionment studies in combination with PMF. Here, the authors applied a LDI technique for an extensive study of ambient aerosol samples. Measurements and data analysis have been conducted meticulously, also reflecting on uncertainties, and source apportionment results have been compared to AMS data. The work should be published in ACP after some

minor revisions.

1) There is not much detail on the experimental setup of the mass spectrometrical experiment. Some hints are given, such as "ion extraction is not orthogonal to the ablation plume", then how is it performed?, or information about mass resolution. In the introduction, the adjustment of laser power is mentioned as one of the advantages of LDI-MS compared to ATOF-MS, but information on the laser power in this experiment is missing save the fact that it is adjustable. Therefore, the authors are encouraged to give more details on the laser/mass spectrometer system.

2) The mass resolution is low in this experiment, so it is understandable that the authors did not assign their signals to actual compounds. But I wonder, is there not the possibility to assign at least some prominent peaks relating to past experience or literature data? In this respect, there are many odd mass numbers in the spectra, hinting at the formation of fragment ions. This should be discussed briefly.

3) Figure 3 reveals, if there are a lot of signals resulting from a sample, a big unresolved hump is visible (as can be seen from the wood burning in comparison to the clean, well structured spectrum from tunnel weekend). Can this be improved/targeted by reducing the laser power, or will this lead to a severe and unacceptable loss in sensitivity?

4) What is the gain in spiking with silver nitrate? In the end, you have to calibrate the spectra without showing peaks from silver ions with an independent calibration procedure, as is mentioned in the manuscript. Why then not apply the second procedure, for which obviously no spiking is necessary, in general and omit the silver nitrate solution?

5) What is the difference between WSOM and WSOC?

6) Page 2, line 2: Omit the impact with EI, call it just electron ionization.

7) Please use "such as" instead of "like" in elaborating insertions.

8) Page 8, line 28: Please do not use Thompson as unit of m/z differences. Maybe Dalton or stay with m/z.

9) Page 13, line 6: In the first sentence of the conclusion, I would not call it a novel method, rather the utilization of a known method in use since approx. 2000 with some new developed novel aspects.

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