

Review of “Organic aerosol composition measurements with advanced offline and in-situ techniques during the CalNex campaign” by J. Timkovsky et al.

The submitted manuscript presents the comparison between two aerosol composition measurement techniques co-located during the CalNex field campaign. The effectiveness of the TD-PTR-MS at detecting and quantifying various classes of organic species in both field samples and standards are referenced to a GC×GC/TOF-MS. The researchers find a positive correlation between mass measured by the TD-PTR-MS and GC×GC/TOF-MS through a matching algorithm. Reasons for low recovery and poor quantitative agreement of some compound classes are described. The manuscript is well written and very relevant to AMT. Its conclusions provide helpful comparisons to the increasing variety of aerosol composition measurement techniques being used by researchers today and I recommend publication after the following concerns are addressed.

Major Comments:

1. Since this manuscript describes the characterization of the TD-PTR-MS technique to the GC-GC-MS technique rather than the science behind the compounds detected in the LA Basin, I suggested changing the title to reflect that. Something like “Comparison of advanced offline and in-situ techniques of organic aerosol composition measurement during the CalNex Campaign” or something similar I think would be more appropriate.
2. I find section 2.3.3, particularly the second paragraph hard to follow. I do like the inclusion of several examples but perhaps these examples could be better illustrated as figure as well as in the text? Some related questions:
  - a. The authors state that “The mass value of the ion with the lowest m/z value in the group, i.e. fragmented ion, was chosen to represent this group of ions” and they provide an example. In the example, why isn’t 6H-Indolo[3,2,1-de][1,5]naphthyridin-6-one represented by the mass 221.089? Wouldn’t it make more sense to group with the non-fragmented ion?
  - b. Are the 22 alkanes the authors refer to structural isomers of the same chemical formula? Or are they different compounds that fragment similarly in the TD-PTR-MS so they are all grouped as “alkanes”? Please elaborate.
3. Since standards in the TD-PTR-MS were done in replicate, errors in the fraction recovered should be presented, particularly in Table 1 and/or Figure 2.
4. The second paragraph of 3.2.2 is hard to follow. It’s unclear what “stated accuracy” and “real accuracy” mean.
5. The size of each panel in Figure 5 needs to be enlarged. The text is too small to read

Page 12452 Line 11: This paragraph should be combined with the previous paragraph

Page 12453 Line 15: remove “done”

Page 12454 Line 22: How is the H<sub>3</sub>O<sup>+</sup> (m/z 19) ion detected at 21.023? Are you referring to an isotope?

Page 12456 Line 5: When the authors are referring to brackets, do they mean parentheses? Perhaps the sentence could be rewritten to read “Compound class nicknames or abbreviations are presented in parentheses above and are hereby used as shorthand.”

Page 12456 Line 24: Please briefly elaborate what a blank filter was. Hopefully the authors mean that an aliquot of ethanol without a dissolved standard was placed on the filter, dried and subsequently measured. This would allow for subtraction of any contaminants in the solvent.

Page 12457 Line 3: Why was deuterated acetone used as a solvent? Was this to filter out detected ions that could react with the solvent? Why wasn’t deuterated acetone (or deuterated ethanol for that matter) used for the individual acid filters?

Page 12457 Line 5: Again, elaborate on the filters.

Page 12457 Line 19: Are primary ions the same as reagent ions?

Page 12457 Line 21: What are the identities of the ions at mass-to-charge 31.017 and 33.033? Why were they kept in?

Page 12458 Line 16: Please include the units of  $A_T$ .

Page 12460 Line 1:  $M_r$  isn't defined in the text.

Page 12460 Line 5: insert "the" between "with" and "lowest"

Figure 3: The red and pink traces are hard to distinguish. Please consider changing one to a more different color. Increase the font size for all text a little more.