Dear authors. Please fix the following minor issues (the ones you agree with) before the final publication.

L136: There is an issue with the section heading

L154, L186, L257, L699: missing space after the period

L314: Figures S13 and S14 are mentioned before earlier SI figures. Along the same lines, Table S9 is mentioned before tables S4, S5, S6, S7 on page 10. I am not sure whether it is easy to fix the order of appearance with the current organization of the SI section. I encourage you to think how you can reorganize the SI section to avoid (or at least minimize) jumping up and down through it while reading the manuscript.

L320: missing period and space after the subsection title

L337: It is not clear to me how this can even be done: "the compound structure was inferred by retention time and manually evaluating possible fragmentation patterns". A more specific description would help. Have you tried running the molecules you came up with as standards?

Figure 3: the text in the legend is too small.

Figures 4, 5, 9, 10: some of the text label are too small and will be hard to see in the final version

Most of the figures: the image quality appears to be too low in the PDF file. I would increase the dpi in the final images produced for the final paper.

Points raised by the reviewer 3: I tend to agree with the comment by reviewer 3 that matrix effects could affect the interpretation of the results, and that using internal standards added to the sample would help avoid such matrix effects. While it is not going to be possible to address this in this paper, I think it would be good if you make it happen for your future papers of this sort.

Supporting Information (SI) section:

Figures S6/S7 and Tables S4/S5:

- Structure 19 is unlikely, allenes are quite uncommon in the atmosphere. Perhaps it is an alkyne?
- Structure 23 is also unlikely, its saturation vapor pressure is way too low for this compound or its decomposition products to be detectable by GC or TAG without derivatization. This could be a library mismatch.
- Does it make sense to split one figure (images of your molecules) in two S6 and S7? Same question for the table? I understand that they stretch over 2 pages; you can say "Figure S6 continued" in the caption

Figure S9: the step with the four-membered ring is probably incorrect. The classical RO2 -> RO -> CC bond fission reaction sequence is much more likely.

Figure S14: was there an issue with H/C analysis? How is it possible to end up with unphysical H/C around 0 or above 3? I would add a clarification on the atomic ratio measurements.

Figure S15: calling sulfate (SO4+) is going to be misleading. Even though SO4+ may be the ion measured by AMS (I do not actually know how AMS does it), the calibrated axis actually refers to SO4(2-). I would fix it.

Table S2: too many significant figures in the reported results. The general rule is that the error bar should have 1 or at most 2 significant digits. Therefore, 314.20 +/- 78.59 should be 314 +/- 79, etc.

Tables S10, S11 – the same issue with significant digits.