Response to reviews

Reviewer comments are in **bold**. Author responses are in plain text labeled with [R]. Line numbers in the responses correspond to those in the revised manuscript (the version with all changes accepted).

Editor

I would like to ask the authors to expand on their discussion of RO2 fate. In l. 86 of the revised manuscript with track changes, they write: "Because the HO2 concentrations were 2-18 times greater than the OH concentrations in the OFR, we expect that the RO2 termination was dominated by RO2 + HO2 reactions in most of the OFR experiments herein." Please give more details on what leads you to that expectation. Were the RO2 fates calculated? If yes, please show these results. If not, I recommend performing a simple calculation of RO2 fates under the conditions in the OFR.

[R0] Thanks for the suggestion. The modeled HO_2 concentrations were typically 10 times greater than the OH concentrations in most of our OFR experiments. The rate coefficient for RO_2 + HO_2 was typically an order of magnitude smaller than that for RO_2 + OH (i.e., ~1.5×10^{-11} vs. ~1.0×10^{-10} cm^3 $molecules^{-1}$ s^{-1}) (Peng et al., 2020, and references therein). Therefore, we expect that RO_2 + HO_2 plays the dominant role in RO_2 fate in most of the OFR experiments herein. We have modified text in Lines 84-87.

References:

Peng, Z., et al., Radical chemistry in oxidation flow reactors for atmospheric chemistry research. *Chem. Soc. Rev.* **2020,** *49*, (9), 2570-2616.

Reviewer #1

I appreciate that the authors expand the discussion of CIMS calibration. However, it needs to be pointed out that the transmission of instruments vary from one to another, depending on the tuning of each instrument. Therefore, it is not fair to justify the "good tuning" by the results of previous studies. In Cheng et al., 2021, the authors did show that the transmission appeared to be stable between sulfuric acid (97 and 160 m/z) and 4NPh (201 m/z). But the authors should be aware of the closeness between these signals, which does not guarantee a flat transmission on a wider range of mass-to-charge. With this said, it is perhaps difficult for the authors to evaluate the transmission during their experiments a while ago. Therefore, I think it necessary to mention the potential uncertainty introduced by transmission in the manuscript.

[R0] We thank the reviewer for the suggestion. We have clarified the potential uncertainty introduced by transmission efficiency in the main text as shown in Lines 108-114.