

Response to the editor:

Thank you for your suggestions. We have done our best to address every comment and have made all appropriate changes to the manuscript. The author's responses are in bold font.

Major comment:

Thank you for your careful consideration of the referee comments. I believe that the manuscript is improved and that nearly all of the referee comments have been sufficiently addressed. However, I think that the consideration of wall-loss of the gas-phase species needs further elaboration. Currently, the wall-loss for the gas-phase species is discussed via reference to a previous publication (Rindelaub et al). Given the community conversation around this topic currently, I think a brief discussion is warranted here as well.

Thank you for this suggestion. We have carefully reviewed the detailed analysis of the corrections for wall loss, along with all other corrections, including those for dilution. While we had corrected for dilution during sampling this had not been done for the time frame of the photochemistry experiment. A complete reanalysis of all results with corrections has led to a revised total organic nitrate yield (and slightly larger uncertainty) of $38\pm 9\%$. Page 6 line 162-174 of the revision has been edited to include a more detailed discussion of the experiments leading to our understanding of the appropriate gas-phase wall loss rate constant, and our experiments showing no detectable desorption of organic nitrates from previous experiments, as indicated below.

“Additionally, the particle-phase RONO_2 yields were corrected for wall loss from a second set of control experiments ($k_{\text{wall SOA}} = 4.3(\pm 0.3)\times 10^{-5} \text{ s}^{-1}$). The gas-phase wall loss rate constant for organic nitrates was determined based on observation of the first-order loss of the CIMS-determined monoterpene hydroxynitrate ($M = \text{C}_{10}\text{H}_{17}\text{NO}_4$) signal in the dark ($[M + 1]^-$; $m/z = 342$; $k_{\text{ONG}} = 8.8(\pm 2.2)\times 10^{-6} \text{ s}^{-1}$). These experiments were conducted at varying relative humidities and the wall loss rate constants ($k_{\text{wall SOA}}$, k_{ONG}) were determined from the loss in particle mass concentration and gas-phase concentration over time after the chamber lights were turned off. Blank experiments involving sampling from a cleaned chamber reveal no detectable degassing of organic nitrates from the walls, likely due to hydrolytic loss of adsorbed organic nitrates on the acidic walls (e.g. from uptake of HNO_3). All experimental data were corrected for dilution for both the photochemistry experiments, and for the post-experiment sampling, based on the sampling time, flow rate, and makeup gas flow rate utilized during each experiment ($k_{\text{avg. dilution}} = 1.4(\pm 0.1)\times 10^{-5} \text{ s}^{-1}$ during the experiments, and $4.6(\pm 0.5)\times 10^{-5} \text{ s}^{-1}$ during sampling).”

Additionally, Table 1 has been updated with dilution and wall-loss corrected yields. Figure 1 has been updated to report wall-loss corrected hydroxy nitrate (CIMS determined) yields. Figures 3 and 4 have been replaced with wall-loss corrected yield values as well.

Minor comments:

Additionally, please address the minor comments below. Line numbers are from the track changes version of the manuscript.

Line 60: remove "in forests" as the Rollins et al study was not in a forest.

This has been removed from line 59 in the revised version of the manuscript.

Line 319: change to "discussed in Rindelaub et al. (2015)."

This has been changed in line 306 of the revised manuscript.

Figure 2: I suggest replacing (A) with Compound A and likewise with (B) to increase visibility of the labels.

Thank you for this suggestion. This figure has been replaced with the changes suggested.

Figure 3: Please improve image quality particularly for the equations. The text in light green is particularly difficult to read.

Thank you for this observation. This figure has been replaced with a higher quality image and the font size has been increased for each line label. The yields reported in this figure have also been updated.

Figure 8: Image quality could also be improved here.

This figure has been replaced with a higher quality image.