Dear Authors,

Thanks for addressing the reviewers and my comments. I just have one additional minor comment with respect to the question regarding Experiments #1 and #3 appeared to be conducted under identical conditions but with very different maximum SOA. It was noted that the short duration of N2O5 injection might have caused inhomogeneities in the chamber and possibly differences in the yields of formation. But it was also noted that since the mass spectra are similar, this suggested that the overall reaction pathway is similar. It is not clear how the yields of formation can be different but with similar overall reaction pathway? Perhaps while it was intended to have Experiments #1 and #3 conducted under identical conditions, for all practical purposes (and interpretation of the data, which show different results for these two experiments), one shall consider them as different experiments taking place under different conditions? I think it would be very helpful to include a short description in the experimental section to clarify these for the readers. Once this is addressed, the manuscript can be accepted for publication in ACP.

Best,
Sally

Dear Sally, (our response in blue, and the changed text is shown in orange)

Thank you for your careful reading and consideration of the experiments that we have conducted and presented in our manuscript.

We agree that the experimental conditions were intended to be identical, but as pointed out, the difference in SOA yields between the experiments means that they should not be considered to be exactly the same.

We have added the following lines to address your comment and to be consistent with this thread in the manuscript when discussing experiments 1 and 3 in the first results section:

Line 87: It was intended that Experiments 1 and 3 would be identical repeats since the α-pinene and N_2O_5 additions were effectively identical, however there was large differences in the mass loading observed. The reason for the difference in yield is not clear, and may result from inhomogeneities in the chamber during the short burst of N_2O_5. Therefore, even though experiments 1 and 3 were intended to be conducted under similar conditions, we cannot state unequivocally that they are identical.

And Line 227: Overall, the similarity in the measured composition in experiments 1 and 3 suggests these conditions were relatively similar, though they should not be considered exact replicates because of the difference in the SOA yield between the experiments (Table 1).