Comment reply to Co-Editor

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The authors thank the Co-Editor for providing prompt and thorough advise for the revised paper. We agree that a few more changes and clarification would improve the manuscript. We propose to make the revisions outlined below for submission to Atmospheric Chemistry and Physics. Each item starts with the Co-Editor comment in bold followed by our response in plain text and blue color.

1) The colorbars in some of the supplementary figures is pretty bad. I am referring to the ones where zero values are black (e.g. S9). Can you use the colorbar used in e.g. S10 instead? Also, for the figures using the S10 colorbar, the saturated colors on both sides are almost the same, can you make them a bit more distinct?

We acknowledge the thoughtful suggestion from the Co-Editor. We have changed the color-bar in the SI accordingly.

2) If I understand correctly your answer to the major comment of reviewer 2 (and some of the specific comments come back to this), your statement added in page 4 line 18 "Although, the NH3 uptake process does not directly impact the mass of SOA, it can affect the SOA mass indirectly as particle acidity is altered due to this process, which will be discussed in section 3.2.3. " means that part of NH3 is lost so less is available to form NH4+ which is why acidity is affected. This should be clearly stated here, since a couple sentences later you say that "The ability of NOCs to neutralize inorganic acids is not considered (see Figure S1.)", which is the opposite of what you say in the previous statement, as a standalone sentence. I had to dig deeply in the text of section 3.2.3 to figure this out, can you make it more visible here instead of simply referring to the section?

We acknowledge the thoughtful suggestion from the Co-Editor. It is correct that the particle acidity is altered as part of NH_3 is lost so less is available to form NH_4^+. However, it does not actually contradict the statement "The ability of NOCs to neutralize inorganic acids is not considered (see Figure S1.)". This statement is meant to clarify why NOCs themselves do not affect particle acidity, because they are assumed to be much less basic than ammonia in this study. So, the reasoning behind the science is that the loss of NH_3 makes NOCs (which cannot neutralize acids) instead of NH_4^+. As less NH_4^+ is formed and the NOCs that replaceNH_4^+ are not ionized, the particle acidity increases.

To further clarify this point, we have rewritten the statement on page 4 line 18 as follows:

Although, the NH_3 uptake process does not directly impact the mass of SOA, the conversion of NH3 into NOCs can affect the SOA mass indirectly due to particle acidity changes. The particle acidity is altered because strongly basic NH_3, which is converted into weakly-basic NOCs, is no longer available to form inorganic salts of NH_4^+. As the extent of neutralization of inorganic acids with NH_3 is reduced the particle acidity may increase.