Atmospheric Chemistry and Physics Discussions

Atmos. Chem. Phys. Discuss., referee comment RC1
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Comment on acp-2022-554

Anonymous Referee #1

Referee comment on "New particle formation and growth during summer in an urban environment: a dual chamber study" by Spiro D. Jorga et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2022-554-RC1, 2022

This work investigates the NPF and growth with a dual chamber. The manuscript fits well to the scope of ACP. The role of ammonium in particle nucleation and growth is widely reported, however, it is very hard to conclude the innovation and new findings. This paper might be worth to be published, but not in its current form. Thus I recommend it to be resubmitted after the following comments listed below have been adequately addressed.

Comments:

- The major comment is about the conclusion or innovation of this study. NPF and growth processes involving ammonium have been intensively investigated. So what is the aim or new findings of this study? If the authors introduce a new method to investigate NPF, which is good, then I would suggest more description should be included to characterize the dual chamber system.
- The injected ammonia concentration is 20-200 ppb, what is the ambient ammonia concentration in this area? I am worried about the high concentration could not represent the ambient condition.
- What is the difference between the reference chamber and ambient measurement? The UV light?
- Line 120-121: I do not understand the connection between wind speed and UV light.
- Line 125-126: how long you flush the chamber and how to make sure there are no pollutants stick to the wall?
- Line 221-222: I do not understand this sentence.
- Line 240-241: Have you calculated the nucleation rate (J_9) ? How about the correlation?
- Line 272-280: How about the ammonium concentration from AMS measurements? Is there any difference between Class A and Class B experiments?
- Line 290-291: I do not understand why.
- Line 339-340: The estimated nucleation rate is too high, is this due to the high injected ammonia concentration? Then how could we connect the chamber study with the real ambient event?
- Line 369: what do you mean ammonium nitrate formation?