

Atmos. Chem. Phys. Discuss., referee comment RC1
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Comment on acp-2021-301

Anonymous Referee #1

Referee comment on "Mapping gaseous dimethylamine, trimethylamine, ammonia, and their particulate counterparts in marine atmospheres of China's marginal seas – Part 2: Spatiotemporal heterogeneity, causes, and hypothesis" by Yating Gao et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2021-301-RC1>, 2021

This paper presents measurement results of gaseous ammonia, amines and their particulate counterparts in marine atmospheres of China. The work analyzed their concentrations as well as the conversions. The paper is general well written. As amines are found to be increasingly important, this work, in particular, determined the concentrations in gas and particle phase together, provide useful knowledge to understand its role in atmosphere. This reviewer overall recommends its acceptance in ACP, with a few issues listed below to be addressed first:

- There are many amines in the air, although TMA and DMA might be relatively abundant, but why other amines were not measured here and these two are the most important, this point needs clarification.
- Section 2: Although the measurement uncertainty or detection limits might have been mentioned in your companion paper, a brief summary with key points can be described here for clarity.
- Section 3.1: What is the PM_{2.5} levels? It might be better to include it in the figures for comparison
- Line 135: It is not very clear to the reviewer, how to reach this conclusion.
- Line 186: I am sure this is correct, however, have you tried any back trajectory analysis to confirm it? Why NH₄⁺ concentration can be significantly influenced by continental transport as you mentioned later but not NH₃gas?
- Line 187: Is there any recent measurement results of TMAgas or NH₃gas for comparison and to confirm the results in this study?
- Overall, what are the differences between TMAgas and DMAgas, and TMAH⁺ and DMAH⁺, regarding their sources etc? It is not very clear in the conclusion and Figure 6. Can you summarize it?