

Atmos. Chem. Phys. Discuss., author comment AC3
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Reply on RC3

Dihui Chen et al.

Author comment on "Mapping gaseous dimethylamine, trimethylamine, ammonia, and their particulate counterparts in marine atmospheres of China's marginal seas – Part 1: Differentiating marine emission from continental transport" by Dihui Chen et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2021-258-AC3>, 2021

(1) The data presented in this paper could add to our understanding of TMA and DMA in gas and in particulate phase, in China's marginal seas. This should be also reflected in the title since the word "amines" is misleading because it is discussed only two compounds. Furthermore, some technical details, especially in the analytical protocol, are not presented adequately.

Response: Agree. The title has been changed to "Mapping gaseous dimethylamine, trimethylamine, ammonia, and their particulate counterparts in marine atmospheres of China's marginal seas: Part 1 - Differentiating marine emission from continental transport".

The technical details of our analytical protocol have been added in the revised experimental section.

(2) The different sections have not the correct numbers e.g. the section "4. Conclusions" should be 5, while the sections "Introduction" and "Experimental" do not have numbers.

Response: Sorry for this. It has been corrected in the revision.

(3) In the Experimental section: I propose to split it into the sampling and analysis part.

Response: Agree. Done.

(4) The introduction is focused on the biogenic sources of amines. What about anthropogenic emissions? Is there any information from the literature, especially for the area?

Response: Ge et al.(2011) reviewed anthropogenic emissions of DMA and TMA such as animal husbandry, fishing processing, manufacturing, industry, etc. This has been added in the revision. Anthropogenic sources of DMA and TMA in the continental atmosphere upwind of the Yellow sea, Bohai sea and Eastern China sea are poorly understand. This has been also added in the revision.

(5) Lines 114-118. More details regarding the analysis should be added here, such as the

eluent, the type and time of elution, injection volume, the detection limit for anions.

Response: Agree. Done.

(6) Line 123. What exactly the author means by the term contamination of K^+ ? Is it related to the overlapping of the peaks? If yes, the term "interference" is more appropriate. I propose to present a chromatograph in the supplement material with and without K^+ interference.

Response: Thanks. The word "interference" should be better and changed accordingly. Figures with and without K^+ interference have been added in the supplement material.

(7) Line 174. What are those values?

Response: Those values are referred to "The observed concentrations of TMA_{gas} ", which have been clarified in the revision.

(8) Line 187. "Negatively correlated" please refer r^2 and p .

Response: R^2 and p value have been given in the revision.

(9) Line 221. SO_4^{2-} anions are non-sea salt? If not, it should be clarified for continental sources.

Response: $Nss-SO_4^{2-}$ instead of SO_4^{2-} has been used for the tracer of continental sources in the revised Figure 2(d).

(10) Line 223. Na is sea salt Na? If not it should be for marine sources.

Response: We had no additional data to confirm sea-salt Na. However, Na^+ in $PM_{2.5}$ over the marine atmosphere far away from the continents should be mainly derived from marine sources, especially the increased concentrations of Na^+ in $PM_{2.5}$ with increasing wind speeds at 10 m s^{-1} . In the revision, the sentence has changed to "while accompanying with high concentrations of Na^+ under high wind speeds as commonly assumed to be indicators of sea spray aerosols (Feng et al., 2017)."

(11) It would be nice to change the order of Figures 1 and 2, in order to help the reader to follow the discussion.

Response: Agree. Done.

(12) Fig. 2 (b) where is wind speed? Please explain how the direction of arrows is connected with the wind direction.

Response: Agree. The length of arrows was superimposed on the top of (a) represents wind speed. We have added a legend for reference in Fig. 2(a) to show the speed and direction of wind.

(13) Fig.3. The legends are missing from the graph.

Response: Added in the revision.

(14) Fig.3. "only some data were used in (e) and (f) to avoid clustering". Which was the criterion of "some data"?

Response: In the revision, we added "to better show spatiotemporal distributions of

TMAH⁺ and NH₄⁺ during Peak 1, Peak 2 and Peak 4, only data during periods shaded in (a-d) were used in (e) and (f) to avoid clustering.”

(15) *Fig.4. Remove the single bracket.*

Response: Sorry. We can't get the point.