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Atmospheric Measurement Techniques Discussions



# *Interactive comment on* "Quantifying amine permeation sources with acid neutralization: calibrations and amines measured in coastal and continental atmospheres" *by* N. A. Freshour et al.

**Anonymous Referee #2**

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The manuscript describes the test of an amine permeation source and the measurement of gas-phase amines from two field campaigns. This is certainly an interesting topic given the importance of low molecular weight amines in new particle formation and the lack of field measurements. Accurate quantification of gas-phase amines is a challenging analytical task because these species are very sticky and typically present at ppt level. Therefore, the present paper will be a useful addition to the literature. My judgment is that it does, however, require substantial revision and major modification (see comments below) before it could be considered for publication in AMT.

Major comments: 1. Quality control is missing in this manuscript, which in my opinion



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is very important info especially for quantifying sticky species at low concentration. The authors should include an estimate for reproducibility and accuracy of both the amine permeation source and the AmPMS measurement, as well as the limits of detection for AmPMS.

2. The wall loss: a very long sampling line was used in this study (30-100 cm for laboratory study and up to 6 m in the field). Given amines are notoriously sticky compounds, significant wall loss may occur in the sampling line, instrument inlet, ionization source etc. The extent of wall loss may also be affected by the temperature and relative humidity. More important, those amine lost to the wall may randomly re-emit back to the sampled air leading to cross-interference. I wonder if the authors consider this issue. Why did they use such long sampling line? What material is the sampling line made of? The authors should clarify these points.

3. The manuscript is not well organized, and the results are not discussed logically and properly. For example, 1) the 'title' does not properly reflect the main work discussed in the manuscript; 2) in the 'abstract', the major focus should be amines instead of e.g., DMSO; 3) in the 'introduction', the authors should at least discuss briefly AmPMS; 4) in the 'experimental', a separate part describing AmPMS and the field campaign is definitely needed.

Specific comments:

1. Page 3836, line 26, 'short'→highly.

2. Page 3837, line 4, 'apparati'→apparatus.

3. In the introduction part, I am not sure if the authors would like to focus more on the permeation generator? But I think a brief summary of the measurement techniques including AmPMS would certainly be useful for the readers to understand why they develop this approach.

4. Page 3838, line 8-12, the amines are very volatile and sticky. How constant are



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the amine calibration vapors generated without careful temperature control? (They were generated at room temperature. I think temperature changes from daytime to nighttime will significantly change the equilibrium of amines in the permeation device and therefore the permeation/diffusion rate. Once the equilibrium is interrupted, it may take hours to reach new equilibrium).

5. Page 3841-3842, from what I understand, the major focus of this work is about amines. However, the authors mislead the readers by spending too many efforts on other species. For example, Figure 1 and 2 discuss NH3, why not amines??

6. Page 3844-3846, for field measurements, did the authors calibrate their AmPMS in the field with the permeation sources? The influence of RH on the field measurements should also be included.

7. Page 3859, figure 3, 'before, during and after addition..' should be clearly marked in the figure. I assumed this temporal plot was from laboratory study, this should be clear in the figure caption.

8. Page 3860-3861, figure 4 and 5, these two figures are not readable at all.

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Interactive comment on Atmos. Meas. Tech. Discuss., 7, 3835, 2014.



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