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## ***Interactive comment on “Secondary organic aerosol formation from primary aliphatic amines with NO<sub>3</sub> radical” by Q. G. J. Malloy et al.***

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I have a brief comment about one of the responses by the authors to Referee 1. On page S6387 of their response they state the following:

*A reference has been added and discussion is given to the support the conclusion that large NO and NO<sub>2</sub> signals are associated with ammonium salts (page 10 line 19). "Additionally, using the high resolution capabilities of the AMS, we can exclude the corresponding salts as a significant portion of the aerosol formed due to the small contribution of NO<sup>+</sup> and NO<sub>2</sub><sup>+</sup> to the total aerosol signal (Fig. 15), which are expected to be present during the presence of ammonium salts (Murphy et al 2007)."*

This statement is incorrect. Ammonium does not produce a signal at NO<sup>+</sup> and NO<sub>2</sub><sup>+</sup>

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in the AMS, rather it produces signals at  $\text{NH}^+$ ,  $\text{NH}_2^+$ , and  $\text{NH}_3^+$ , as the authors can easily verify by sampling atomized ammonium chloride or ammonium sulfate aerosols with their instrument. These  $\text{NH}_x^+$  ions are resolved by the HR-ToF-AMS and thus the authors should be able to evaluate whether ammonium is present in their system. A more detailed discussion of this topic is given by Allan et al. (2004), and I recommend that the authors read this paper and use it as their basic reference for the response of the AMS to the main non-refractory species (sulfate, nitrate, chloride, ammonium, and organics). This has also been discussed in many other AMS publications.

The reference cited concerns a different instrument, the PALMS laser-ablation instrument developed by Dan Murphy at NOAA, and not the AMS. The PALMS uses a high-fluence laser in which  $\text{NO}^+$  ions are indeed formed from ammonium, but this process is not observed in the AMS where the vaporization and ionization energies used are much lower. The authors should be careful about not mixing up the detection characteristics of the AMS and those of other instruments.

- A separate small comment. On p. 16590 "The AMS was operated in the scanning mode in the mass range between  $m/z$  10 to  $m/z$  500." The term "scanning mode" was used for the quadrupole AMS (Q-AMS) where the quadrupole is actually scanned across different  $m/z$ 's. However for the ToF-AMS this term is not appropriate. The correct term, which is standard in the AMS community and appropriate for all types of AMSs, is the "mass spectrum (MS) mode" (which incidentally was first described in Jimenez et al., 2003, already cited in the paper).

- I have not had time to think about the chemical discussion in the paper carefully and thus I offer no opinion in favor or in opposition of publication or about the scientific quality of the paper beyond these technical points.

## Reference

J.D. Allan, H. Coe, K.N. Bower, M.R. Alfarra, A.E. Delia, J.L. Jimenez, A.M. Middlebrook, F. Drewnick, T.B. Onasch, M.R. Canagaratna, J.T. Jayne, and D.R. Worsnop.



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