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Atmospheric Chemistry and Physics Discussions

Interactive comment on "The Pasadena Aerosol Characterization Observatory (PACO): chemical and physical analysis of the Western Los Angeles Basin aerosol" *by* S. P. Hersey et al.

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(1)It is indeed possible that long-chain amines can be present in the particle phase based on our review (Ge et al., Atmos. Environ., 2011,45,524-546.). And those longchain amines also have low vapor pressure that possibly favor their partitioning into the particle phase (Ge et al., Atmos. Environ., 2011,45,561-577.). I am wondering if presence of long chain amines in the particle is possible, is it possible to identify some high molecular nitrogen-containing ions in the high m/z range of AMS spectra?

We have referenced the Ge et al. (2011) paper as support for the evidence of amines in the particulate phase, and are grateful for the suggestion. We were not able to identify

any high-m/z nitrogen-containing compounds in our C-ToF-AMS data during PACO.

(2)Amino compounds had been identiïňĄed in the Pasadena aerosols early in 1970s (Novakov et al., 1972, Journal of Colloid and interface Science, 39, 225-234), probably the ïňĄrst evidence of the particle presence of amino compounds based on our review.

Noted. We have opted not to cite this paper, as the Ge et al. (2011) review paper is sufficient support for the presence of amines in aerosol particles.

(3)Is PMF be able to separate a factor rich in Nitrogen? (a factor with a relative high N/C ratio?). recently, Sun et al. (Atmos. Chem. Phys., 11, 1581–1602, 2011) identiïňĄed a nitrogen-enriched OA factor from NYC aerosols (5.8I understand this might be difiňĄcult if the amines are with long-chain high m/z range, and the mass fraction is low.

PMF analysis from the PACO study did not resolve a nitrogen-rich factor. Even when increasing to 4- and 5- factor solutions there was no factor that was obviously rich in nitrogen.

(4)It is a bit strange to me, that a hot, dry regime III is possibly rich in amines, since probably a wet and cold conditions should favor the partitioning of amines into the particle phase based on our thermodynamic estimations (Ge et al., Atmos. Environ., 2011,45,561-577.). Very recently, Rehbein et al.(Environ. Sci. Technol. dx.doi.org/10.1021/es1042113) also observed the similar condition for presence of TMA.

It is unclear why the hot, dry regime III would have a greater abundance of amines. This is somewhat counter-intuitive. One possible explanation is that the "excess" NH4+ may be associated with organic anions during regime III. An enhancement in acidic organic species, which would not be unexpected in a hot, dry, photochemically active regime, may lead to a corresponding enhancement in neutralizing NH4+. Since the AMS does not specifically quantify organic anions, such an enhancement in both or-

ganic acids and associated NH4+ would lead to an increased ammonium ratio. This alternate explanation is now included in the text, after line 9 on page 5884 of the original manuscript.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 5867, 2011.