

Interactive comment on “Volatility of mixed atmospheric Humic-like Substances and ammonium sulfate particles” by Wei Nie et al.

Anonymous Referee #4

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General Comments

Here the authors report results of a laboratory study of the volatility of HULIS extracted from aerosol samples collected at a rural site in eastern China. Samples were atomized, four different sizes were selected with a DMA, and then aerosol was passes through a thermal denuder to measure changes in size with increasing temperature. Extracts were also mixed with ammonium sulfate prior to atomization to investigate the effects of salt-organic interactions on volatility. The volatility profiles were analyzed using a model in which various parameters (heat of vaporization, molecular weight, etc.) were assigned based on previous studies and the aerosol was distributed among three volatility bins (SVOC, LVOC, ELVOC) using the model-measurement comparison. The results of AMS measurements indicate that HULIS is highly oxidized (O/C ~ 1 or greater) and the volatility measurements show that most of the HULIS is low and

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extremely low volatility material, consistent with the high degree of oxidation. Small decreases in volatility were also observed when ammonium sulfate was added that indicate chemical interactions between the organic and inorganic materials. The explanations for the general trends observed in the data and model results are reasonable, and overall there are no real surprises. This is a pretty straightforward study, the experimental and modeling components are well done, and the data interpretation is reasonable. The paper is a useful contribution to the literature and is worthy of publication in ACP. I have only a few minor comments that should be addressed.

Specific Comments

1. Line 194–197: What is the fraction of HULIS in the organic component of the samples?
2. Line 199–201: Is auto-oxidation a potential source for these HOMs?
3. What are the effects of assumed model parameters on the interpretation of experimental results? Were sensitivity studies conducted? For example, there is ongoing debate about the appropriate value of the mass accommodation coefficient, which may range from about 1 to 0.001. Couldn't changes in these parameters with organic and inorganic composition be responsible for the observations rather than changes in the SVOC, LVOC, and ELVOC fractions? Some discussion of these issues is needed.

Technical Comments

Line 61: “Abortion” should be “absorption”.

Line 128: “An- alyzer” should be “Analyzer”.

Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2016-839, 2016.

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