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Atmospheric Chemistry and Physics Discussions



# *Interactive comment on* "The ozonolysis of primary aliphatic amines in single and multicomponent fine particles" *by* J. Zahardis et al.

**Anonymous Referee #1**

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This manuscript describes laboratory experiments aimed at elucidating the oxidation of primary amines in single component and mixed aerosol particles. Particles were exposed to a range of ozone concentrations in an aerosol flow tube and particle composition was measured using Photoelectron Resonance Capture Ionization (PERCI) mass spectrometry.

The work presents new results on particle phase oxidation chemistry that are appropriate for ACP readers. Some potentially interesting results are the formation of gaseous NOx, and confirmation that oxidation of mixed particles can cause phase changes/separations that impact further oxidation. However, little effort is made to quantitatively determine whether these processes would be important in an atmospheric context. The authors instead conclude more work is necessary.

The manuscript, while dense, is well written and should be published in ACP after some comments are addressed.

1. The authors state that a fraction of their NO2- and NO3- ion signal arised from production of gaseous NO2 and NO3 during the ozonation of primary amine particles. That these gas phase signals are detected by the PERCI-MS implies the aerodynamic lens is not adequately separating gas and particle phases. Doesn't this co-detection of gas and particle composition impact conclusions about the mechanisms of how some of the other products might be produced?

2. Another possible source of HNO3 for the NO3-(HNO3) cluster would be via N2O5 formation in the flow tube. If NO3 is being produced in the flow tube with NO2 present, hydrolysis of N2O5 on tube walls could lead to HNO3 perhaps more efficiently than the NO2 mechanism provided.

3. The use of acronyms for the various oleic acid ozonolysis products causes confusion and makes the manuscript an unnecessarily dense read.

4. Figures 7 and 8 don't seem terribly instructive to me. Either there's too much happening (i.e. too many different data points) or nothing happening versus ozone exposure. Its hard to tell. I recommend focusing on the most important aspect needed to convey and choose those data points to use for the figure.

5. Should "multicomponent" be used in the title when the particles used are only binary mixtures at most?

6. How did the authors insure all the residual ethanol was removed from the particles before exposure to ozone?

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Interactive comment on Atmos. Chem. Phys. Discuss., 7, 14603, 2007.