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Interactive comment on “Volatility of secondary organic aerosol during OH radical induced ageing” by K. Salo et al.

Anonymous Referee #2

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General comments:

This manuscript reports the observation about the changes in volatility from OH radical induced alpha-pinene and limonene SOA aging experiments. The experiments were performed in the framework of the MUCHACHAS campaign that took place in two large chamber facilities, one with aluminium housing and the other with Teflon chamber with access to natural sunlight. A wide variety of instruments were used to characterize the aging of the SOA in this study. Among those, the authors mainly use the data from a Volatility Tandem DMA (VTDMA) to characterize the OH aging process of the SOA. The authors state that gas-phase oxidation of semi-volatile and intermediate volatile organic compounds plays a much more important role in the OH induced SOA aging than condensed phase oxidation. In fact, the authors did not see evidence for frag-

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mentation or volatilization of the condensed phase from aging in their experiments, suggesting that the condensed phase reactions are not as important as the gas-phase oxidation (at least under the experimental conditions used by the authors). Overall, I found the manuscript meets the scope of the journal and should be published in ACP. However, I have a few minor specific remarks that the authors may address in the revised manuscript.

Specific comments:

I feel the authors need to clearly define a term SOA aging used in this study. What the authors demonstrate here is the importance of the gas-phase aging. It is not clear from the manuscript if the authors mean the gas-phase aging, particle-phase aging or a combination of the both.

Page 19515, line 4: Can the particle bounce off the sole reason for this discrepancy? Is ionization efficiency the same for ammonium nitrate and organics? Collection efficiency and ionization efficiency are two separate properties. One expects ionization efficiency (or collection efficiency) to change as the composition (i.e. the volatility) of SOA changes. How does the discrepancy between the SMPS derived mass and AMS organics change when SOA is more volatile or less volatile?

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 19507, 2011.

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