

Atmos. Chem. Phys. Discuss., referee comment RC2
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Comment on acp-2022-575

Anonymous Referee #1

Referee comment on "Impact of aging on the sources, volatility, and viscosity of organic aerosols in Chinese outflows" by Tingting Feng et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2022-575-RC2>, 2022

Quantifications of the physicochemical properties, particularly volatility and viscosity, of OA are vital to understanding its environmental and climate effects. Feng et al. deployed HR-AMS coupled with a TD to investigate the aging impact on sources, volatility, and viscosity of OA in a regional receptor site of metropolitan emissions in North China Plain. They find that the volatility of OA in this receptor site is generally lower than those in previous field studies, indicating the large impact of atmospheric aging on the OA oxidation levels during transport. As well, the phase state of ambient OA is investigated from the estimated viscosity. The results have important implications for the understanding of the aging impact on OA volatility and viscosity. The methods are solid and the manuscript is well written. It can be recommended for publication after addressing the following minor comments.

Specific comments:

Section 2.2.1 HR-ToF-AMS: Which mode is the AMS running at? Only V mode? What's the time resolution?

Lines 159-163: I would suggest describing a bit more details on why four factors were chosen, in particular, one aged-HOA factor was chosen instead of two HOA factors in this study.

Line 173: The sampling flow was switched between TD and bypass every 4 min while the time resolution of SMPS measurement is 5 min. Will this lead to a mixed bypass and TD sample for each measurement of SMPS? Please clarify.

Lines 295-299: It is surprising that the O:C of aged-HOA can be that large during transport from surrounding urban areas. How long would it take for the vehicle emissions transport to this site? Is it possible that HOA undergoes aqueous oxidation and leads to a large increase of the O:C?

Lines 438-440: Is there any other evidence that oligomers are formed? For example, is there a significant increase of the larger ions ($m/z > 150$) in the AMS spectra?

Lines 454-455: Can the authors provide more details on how the dilution is performed?

Technical comments:

Line 205: The font of the website is inconsistent with the main text.