Atmos. Chem. Phys. Discuss.,
https://doi.org/10.5194/acp-2020-867-RC2, 2020

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Measurement report: Aerosol hygroscopic properties extended to 600 nm in the urban environment" *by* Chuanyang Shen et al.

Anonymous Referee #2

Received and published: 31 October 2020

Review for "Measurement report: Aerosol hygroscopic properties extended to 600 nm in the urban environment" by Shen et al.

The manuscript by Shen et al. report size-resolved aerosol hygroscopicity measurements over an extended size range of 50-600 nm. This size range covers the mode diameter of ambient aerosol particles, and can thus provide more useful information about the optical properties and the climate impact of aerosol hygroscopic growth. They show that on average the number fraction of more hygroscopic mode particles decreases with increasing particle size for 400 nm or larger. However, the more hygroscopic mode in the larger size range is dominant during the polluted events, consistent

Printer-friendly version

Discussion paper

with the general consensus that aqueous production of secondary species plays an important role in the formation of winter haze in Beijing. I think the measurement data and analysis are solid. The paper is overall clearly written but could be further improved in English. I, therefore, recommend publication in ACP once the authors address a few issues:

1. In Line 16, the authors mention “unexpected low hygroscopicity”; however, in line 18 they say “this result is supported by previous chemical composition analysis”. These two statements seem to be contradictory. Also, the authors should briefly discuss why the hygroscopicity decreases with particle size for large particles, based on previous chemical analysis (inorganic/organic fraction, dust, etc).

2. It might be helpful to explain why the TDMA used in this study can extend the measurements to larger particle sizes. Is this because of a lower sheath flow rate or different geometry of the DMA?

3. What does the red line in Fig. 1c mean?

4. The citation and bibliography styles should be consistent with the ACP format.

Interactive comment on Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2020-867, 2020.