

Interactive comment on “Effect of mixing structure on the water uptake of mixtures of ammonium sulfate and phthalic acid particles” by Weigang Wang et al.

Anonymous Referee #1

Received and published: 3 August 2020

Wang et al investigated the effect of mixing structure on the water uptake of mixtures of ammonium sulfate and phthalic acid particles by taking homogeneously internal mixture and core-shell structure into account. The aerosol water uptake is an important factor to determine many atmospheric processes, such as multiphase reactions and visibility reduction. The hygroscopicity of inorganic and organic mixtures is not well-understood. The authors emphasized the importance of the particle morphology and mixing structure for inorganic-organic mixture water uptake. I would like to recommend it to publish to ACP after some minor revisions.

Comments: 1. Regarding the core-shell structure, the particle morphology may change

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when the particles are exposed to a high relative humidity condition. This could attribute to both core and shell take up enough water and get mixed together. Thus, the core-shell structure could be ambiguous. 2. The kinetic limitation has been referred for explaining the effect of core-shell structure on particle water uptake. In HTDMA system, the residence time of particles passing through the conditioned part may be short and lead to a kinetic limitation. This could not be the case when RH exceeds the DRH and particles are liquefied. We should also note that the particles with core-shell structure may have enough time to eliminate such kinetic limitation in the real atmosphere, different from the situation in the HTDMA system. 3. In addition, if the phthalic acid is surface active? The reduction in surface tension may be closely related to the hygroscopicity of core-shell particles. 4. There are numerous English grammar errors, especially in the summary and conclusion section (Line 354-360).

Interactive comment on *Atmos. Chem. Phys. Discuss.*, <https://doi.org/10.5194/acp-2020-632>, 2020.

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