

Atmos. Chem. Phys. Discuss., referee comment RC2  
<https://doi.org/10.5194/acp-2021-763-RC2>, 2021  
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## Comment on acp-2021-763

Anonymous Referee #1

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Referee comment on "Technical note: Real-time diagnosis of the hygroscopic growth micro-dynamics of nanoparticles with Fourier transform infrared spectroscopy" by Xiuli Wei et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2021-763-RC2>, 2021

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In this study, the FTIR spectroscopy and two-D correlation analysis were used to investigate the hygroscopic behavior of typical aerosols. It demonstrated that the method is good at qualifying and quantifying the interaction between water and aerosol. In particular, the 2-D correlation analysis can provide more detail information about the hydration process. Thus, this method is helpful to understand the hygroscopicity of aerosols and it is suitable for publication as a technical note. However, the comments of referee #2 are also my concerns, and I have some other concerns as following.

- Since the samples were deposited on a ZnSe plate in stacking state, can they also be considered as nanoparticles? Further experiments using samples prepared by deposited solution with further dry process were recommended. Then the results of these two different preparation methods would be compared.
- Line 305, what's "surface-limited process"? Since all the initial step of particle hydration could be water adsorption on surface, surface limited process should always determine the hygroscopic behavior.
- In the previous study of wang et al. (2017), the formation of ammonium hydrogen oxalate ( $\text{NH}_4\text{HC}_2\text{O}_4$ ) and ammonium hydrogen sulfate ( $\text{NH}_4\text{HSO}_4$ ) from interactions between OA and AS in aerosols during the dehydration process were observed. Did you detect these species in the present study? Could the 2-D correlation analysis confirm this reaction?