

# ***Interactive comment on “Distinct diurnal variation of organic aerosol hygroscopicity and its relationship with oxygenated organic aerosol” by Ye Kuang et al.***

**Anonymous Referee #2**

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Measurements with a humidified nephelometer system and an ACSM were made during the winter on the North China Plain and were used to investigate the hygroscopicity of organic aerosol. The use of  $f(RH)$  and bulk chemical composition to calculate kappa for organics is novel. It was found that variability in  $\kappa_{org}$  was significantly correlated with the degree of oxidation of the organics. The paper should be published after the concerns below have been addressed. In addition, there is a need for grammatical corrections.

I found the discussion in Section 3.3 to be a little confusing given all of the definitions of kappa. Perhaps a table that lists the different kappas and measurements they are

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based on would be helpful.

Line 105: Explain why this diameter range (200 to 800 nm) is represented by the dependence of light scattering on RH.

Figure 1: The text says that the ACSM measured PM2.5 but the figure indicates an upstream cut-off diameter for PM1. Please clarify.

Line 182: Please provide a brief description of the CV and how it allows for the collection of particles as large as 2.5 um.

Lines 185 – 187: Is the CE for the capture vaporizer dependent on chemical composition? Has a unit CE been observed for the composition of the aerosol sampled here?

Figure 4 caption: "...distributions shown in Fig. 4". Should this be Fig. S4?

Lines 449 – 450: Why is the reported maximum PM2.5 concentration less than the PM1 concentration? Same for the PM10 and PM1 light scattering coefficients.

Lines 475 – 478: Does this statement (hygroscopicity of aerosol particles larger than 800 nm is typically lower than for accumulation mode particles) assume uniform composition with size?

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