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Atmospheric Chemistry and Physics Discussions

Interactive comment on "The importance of aerosol mixing state and size-resolved composition on CCN concentration and the variation of the importance with atmospheric aging of aerosols" *by* J. Wang et al.

Anonymous Referee #1

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Wang et al. calculate the number concentration of cloud condensation nuclei (CCN) from observed size distribution and chemical composition. The results are evaluated against a direct CCN count. Five different assumptions on aerosol mixing are cleverly set and clearly presented. Implications on modeling CCN concentration are discussed in a well-organized manner. The discussion provides useful information on both a realistic way of CCN modeling and a simplified one. I recommend publication of this manuscript after the following minor comments have been addressed.

Abstract. In the sentence beginning with "The rapid mixing also indicates", replace "a

substantially shorter" with "the", and insert "is substantially shorter" before "than".

Page 11755, line 11. "reduced" from what?

Page 11758, line 20. "the uncertainty of calibrations". Suggest giving an estimate of the uncertainty.

Page 11760, line 18. Rephrase the remark on black carbon: "light absorption coefficient is relatively constant over a broad spectral region". It is true that the spectral dependence is lower for black carbon than for some absorbing organic material and dust. But the term "constant" is misleading (even with "relatively"), because it means an Angstrom exponent of 0, not $\sim$1.

Page 11769, line 8. How about "We note that the broad unimodal distribution of the growth factor suggests. . .."?

Page 11776, line 25. Replace "homogenous" with "homogeneous".

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 11751, 2010.