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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.

J. Wang et al.

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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 Received and published: 28 May 2010

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.

Thank you for your encouraging review.

Abstract. In the sentence beginning with "The rapid mixing also indicates", replace "a substantially shorter" with "the", and insert "is substantially shorter" before "than".
** Response***
Done.

Page 11755, line 11. "reduced" from what?
** Response***
The sentence has been rephrased to: " ...for internally mixed aerosols, predicted N_{CCN} is often insensitive to hygroscopicity of organics as the CCN activation is..."

Page 11758, line 20. "the uncertainty of calibrations". Suggest giving an estimate of the uncertainty.
** Response***
The uncertainty of calibration is estimated as 8%.

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 1.
** Response***
We agree with the referee on this. The sentence is rephrased as “Black carbon is a strongly absorbing component whose light absorption coefficient has weaker spectral dependence than those of some absorbing organic material and dust.”

Page 11769, line 8. How about “We note that the broad unimodal distribution of the growth factor suggests....”?
** Response***
Done.

Page 11776, line 25. Replace “homogenous” with “homogeneous”.
** Response***
Corrected.

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