

Interactive comment on “A combined particle trap/HTDMA hygroscopicity study of mixed inorganic/organic aerosol particles” by A. A. Zardini et al.

Anonymous Referee #3

Received and published: 24 April 2008

Review of acpd-2008-0034 Title: A combined particle trap/HTDMA hygroscopicity study of mixed inorganic/organic aerosol particles

This manuscript investigates the hygroscopic properties of mixed organic-inorganic particles using an electrodynamic balance (EDB) and hygroscopicity tandem differential mobility analyzer (HTDMA). The combination of the two techniques provides additional information and confirms the importance of particle morphology and structure on water uptake. The hygroscopicity of mixed organic-inorganic particles is of considerable importance since it has implications for the aerosol direct and indirect effect on climate. In short, the paper is significant and appropriate for ACP. The paper is also

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very clear and concisely written. The authors should be complimented for writing a very nice manuscript. I recommend the paper for publication after the authors have had a chance to address the following minor comments:

1. Page 5237, line 15-16. The authors may want to consider adding more references here, as the deliquescence of mixed organic-inorganic particles has been studied by several groups.

For example: Brooks, S. D.; Wise, M. E.; Cushing, M.; Tolbert, M. A. *Geophys. Res. Lett.* 2002, 29, art. no. 1917, doi: 10.1029/2002GL014733. Brooks, S. D.; Garland, R. M.; Wise, M. E.; Prenni, A. J.; Cushing, M.; Hewitt, E.; Tolbert, M. A. *J. Geophys. Res.* 2003, 108, art. no. 4487, doi: 10.1029/2002JD003204. Wise, M. E.; Surratt, J. D.; Curtis, D. B.; Shilling, J. E.; Tolbert, M. A. *J. Geophys. Res.* 2003, 108, art. no. 4638, doi: 10.1029/2003JD003775. Brooks, S. D.; DeMott, P. J.; Kreidenweis, S. M. *Atmos. Environ.* 2004, 38, 1859. Salcedo, D. *Journal of Physical Chemistry A* 2006, 110, 12158. Parsons, M. T.; Knopf, D. A.; Bertram, A. K. *Journal of Physical Chemistry A* 2004, 108, 11600. Hämeri, K.; Charlson, R.; Hansson, H.-C. *Aiche Journal* 2002, 48, 1309.

2. Page 5246, line 8-10. Parsons et al. *JGR*, [2004] measured DRH for glutaric acid as a function of temperature. How does the DRH value determined in the current study compare with Parsons et al. [2004]?

3. Page 5246, line 15-18. I assume here that the authors are referring to a soluble impurity that changes the DRH (since an insoluble impurity should have no effect). Please clarify. Also, how much impurity would be needed to cause this shift in DRH?

4. Page 5247. The reproducibility for pure glutaric acid was shown in Figure 5. What was the reproducibility of Figure 7?

5. Figure 7. A big difference was observed between the results from the current study and Choi and Chan [2002]. Please comment on the reasons for the apparent discrep-

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Interactive comment on Atmos. Chem. Phys. Discuss., 8, 5235, 2008.

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