

***Interactive comment on “Inferring thermodynamic properties from CCN activation experiments: a) single-component and binary aerosols” by L. T. Padró et al.***

**Anonymous Referee #1**

Received and published: 7 May 2007

General Comments: The authors have presented a new technique (Kohler Theory Analysis, KTA) to infer thermodynamic quantities from CCN experiments. This method has been tested for single-component and binary aerosols with moderate success but continues to show substantial errors. Even with these errors, this tool is clearly and important step in better obtaining information from real and complex aerosol particles in order to better constrain models. The paper is clearly written and the method well-explained and analyzed for error. The importance and conclusion, however, are overstated in light of the limited and mixed results obtained from this one study. This paper is an important early step in working to better understand organic aerosols and improving their modeling; it should be of interest to the readers of ACP.

Specific Comments: The conclusion that KTA predicts “molar volume to within 18% of expected value” (P3820 L10) is misleading. Only the average of the high organic fractions come to 18% - individual errors were reported up to 83% for Azelaic Acid. Total Uncertainty (Table 6) actually averages to 51% for these same mixtures.

While total uncertainty increases with decreasing organic content (Table 6), the pattern for Molar Volume error (Table 5) is much less clear and should be explained. For instance, Succinic Acid error first decreases and then increases for decreasing organic fraction while Azelaic Acid shows no pattern at all.

The high CCN activity of Leucine is in disagreement with other published data showing Leucine to have minimal CCN activity: Huff Hartz, et al. (2006) “Cloud condensation nuclei activation of limited solubility organic aerosol” Atmospheric Environment, v40 and Raymond and Pandis (2002) “Cloud activation of single-component organic aerosol particles” Journal of Geophysical Research, v107. The authors should address this important difference.

Technical Notes: P3806 L10 - should read “and provides” with a ‘s’.

P3807 L15 - would be better to read “but this is not the subject of the current study.”

P3814 L12 - should be Kr-85 instead of Kr-35.

P3820 L12 - “powerful” seems an overstatement - replace with “useful”?

P3820 L14 - should read “and provides” with a ‘s’.

P3829 Table 6 - please add lines to separate compounds in table.

P3831 Fig. 2 - KR85 does not show up well

P3832 Fig. 3 - the multiply-charged particle peak seems significantly larger than other experimental activation curves published in the literature - is there something special about the authors equipment that leads to such high levels of multiply-charged particles?

---

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 3805, 2007.

ACPD

7, S1634–S1636, 2007

---

Interactive  
Comment

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

S1636

EGU