

Interactive comment on “A curved multi-component aerosol hygroscopicity model framework: 2 – Including organics” by D. O. Topping et al.

Anonymous Referee #3

Received and published: 26 January 2005

General comments: The paper by Topping et al. describes how organic substances are included in the model ADDEM. The inorganic and the organic model parts are combined additively to calculate the water content. To treat the non-ideality of the solution an improved version of UNIFAC is applied. The comparison to the model results with a variety of published bulk data and with a thermodynamically coupled model by Ming and Russel (2002) shows good agreement. As in the companion paper, which only treats the inorganic portion of the aerosol, the Kelvin effect is included. The authors address a very current topic where lots of open questions still need to be solved. Throughout their paper they clearly point out the difficulties and the uncertainties and

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summarize nicely the state-of-knowledge. In my opinion the paper represents an important contribution and is suitable for publication. The remarks below should be addressed.

Specific remarks: As in the companion paper I suggest that the authors comment on the computational effort that the model requires. In particular: How much more computer time is needed to include the organic species versus just treating inorganics? Does the iterative scheme as indicated in Fig. 1 always converge quickly or are there regimes with problems to expect? What temperature and relative humidity ranges can be considered?

P. 8685, l.5: "Eq. 1" should read "Eq. 3"

P. 8694, l. 20: Write [P] instead of P.

P. 8696, l. 17: Typo in reference "Sprow and Prausnit.Jm".

P. 8696: Eq. (9) What does symbol A_i mean?

p. 8697, l. 10: Typo in reference "Sprow and Prausnit.Jm".

l.12: Symbol A should be in italics.

P. 8698, l. 17: It is Figure 8b instead of 8a that shows malic and maleic acid.

P. 8699, l. 14/15: Skip text in parentheses.

Fig. 2: Typo in the captions: "Composition2" is written twice. The second time it should read "Composition 3".

Fig. 4 is not referred to in the text. Please add some comment or leave the figure out.

Fig. 6: the labels (a), (b), (c), (d) are missing.

In three of the figures the molality is monotonic in increasing or decreasing with increasing RH whereas in the bottom right hand figure the dependence is oscillating. Is there an explanation for this behavior?

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The reference “Marcolli et al.” is written in lower case twice.

Missing reference: Washburn (2003).

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 8677, 2004.

ACPD

4, S3436–S3438, 2004

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