

Interactive comment on “Influence of non-ideality on aerosol growth” by S. Compernelle et al.

Anonymous Referee #1

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General comments

Compernelle et al. investigate the effect of non-ideality on secondary organic aerosol (SOA) formation by simulating smog chamber experiments. Activity coefficients were calculated by using five previously published UNIFAC parameterizations for different types of organics. Unlike UNIFAC versions used in some previous studies, some of the parameterizations are optimized for multifunctional compounds. In order to cover all the organic species in the oxidation model, the authors defined new functional groups. Parameters were fitted to activity coefficient data generated by a computational model (SPARC). The results show that non-ideality has the biggest effect on water uptake and for experiments with low concentrations of volatile organic carbon. They also saw that the magnitude of the effect of non-ideality depend on activity coefficient parameterization. The paper is compact and mostly well written. Therefore, I recommend this paper for publication after a few corrections.

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Specific Comments

Section 2.3: The fitting to the SPARC data produced a complete set of UNIFAC parameters which could have been used in the comparison. Why was this not done?

Page 17072, eq. 17: Why is total molar concentration of the particulate organics not in this equation? If equation 3 is used, partitioning coefficients should be multiplied by the total concentration.

Page 17072, eq. 18: Why is the non-volatility fraction not defined as the ratio of total particulate concentration and total gas and particulate concentration?

Technical Corrections

All pages: The usage of term vapor pressure should be checked or at least explained. Saturation vapor pressure is better term for most of the cases in this paper.

Page 17062, lines 7 and 11: Sentences starting in these lines should be clarified

Page 17063, line 11: Sentence starting in this line should be clarified

Page 17068, line 26: Case should be cases

Page 17071, Section 3.2: This section is quite long and partly not well organized. For example, sentences in the first paragraph have rather loose connections. Fourth paragraph (page 17072, line 20) is not clear by itself; it could be combined with the previous one. There are no clear connections between the short paragraphs in page 17073; some of these could be combined.

Page 17077, line 32: Title of the article and journal abbreviation should be checked

Page 17078, line 7: No space before comma

Page 17078, line 25: Mixtures should be written by lower case letters

Page 17079, line 20: UNIFAC in should be in capital letters, journal abbreviation

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Page 17079, line 23: AICHE should be AIChE

Page 17080, line 21: Should HuffHartz be Huff Hartz?

Page 17087, Table 6: Reference should be to Table 5

Page 17093, Fig. 3: Different colors should be used for the ideal and UNIFAC-Hansen mass yield lines

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 17061, 2008.

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