

Interactive comment on “Secondary organic aerosol formation from *m*-xylene, toluene, and benzene” by N. L. Ng et al.

Anonymous Referee #2

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This is a revisit of SOA formation from substituted benzenes, which are in the atmosphere of anthropogenic origin. Judged by the emission of biogenic and anthropogenic VOC, until recently anthropogenic SOA was thought to be of minor importance. However recent observations show that the role of anthropogenic SOA was probably underestimated. This careful study here which highlights the role of NO_x regime and mechanistic consideration for anthropogenic SOA formation is interesting, important and timely. It should be published in ACP.

I have two points regarding the NO_x regime.

p. 4088, line 5ff I find the formulation that the “NO_x level in chambers constantly changes”, misleading. The NO_x family is used because it is a “conserved” quantity

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(in the atmosphere). I guess, the NO/NO₂ ratio is the important quantity that changes (even if there are some overall wall losses of NOX.). Throughout the manuscript the authors always refer correctly explicitly to NO or NO₂ where needed. So, it is sufficient to make a more precise statement of what is meant here.

p. 4088, line 25 and p 4090, line 22. The low NOX regime of <1ppb. Do I understand correctly that the used air was NOX free but the instrumentation does only allow to measure values larger than 1 ppb. Or is there a chance that there is indeed some NOX ? This should be clarified. (1 ppb NOX can be a high NOX regime under some instances.)

p. 4093, line 6-12, benzene and figure 5. There is a kink in the high NOX benzene growth curve. This is neither mentioned in the result section nor specifically commented in the discussion section. Is the bent connected to the increasing density of data points? Please, comment in the manuscript.

p.4099f, line 16ff My idea would be that here the smaller source of non-volatiles at same sink - wall loss -, suppresses the formation of nuclei or their growth to critical sizes. If this is the case seed aerosols should suppress some of the effect. Do you have “classical” seeded experiments/results, which could help here.

p.4102, line 7f, Only the growth curves at the largest concentrations deviate, the systems with smaller initial concentration look pretty similar. Is there a threshold concentration or may be another parameter, which induces this type of deviation ?

p.4090, line 16. I hope, that 1 ppm is the upper range of your NOX monitor and not the detection limit ?!

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 4085, 2007.

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