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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Ozonolysis of α-pinene: parameterization of secondary organic aerosol mass fraction" *by* R. K. Pathak et al.

Anonymous Referee #2

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Pathak et al. present an application of the vapor pressure basis set model of Donahue et al to a series of chamber data of ozonlysis experiments of a pinene. The used data include a limited set of new measurements. The goal of the paper is to provide a parameterization that predict the aerosol mass fraction (AMF) from a-pinene oxidation for several reaction regimes. Focus is the prediction of SOA formation on close to atmospheric a-pinene concentration and aerosol mass concnetration. In the sense of "prediction before speciation" this paper is very interesting and important and should be published after some revisions in ACP.

Section 2, p. 1946, Section 2.3, p.1947, Section 2.4, p. 1948 I have difficulties to accept the notation "ozonolysis at high NOX" for the reaction of a-pinene with NO3. In many of the high NOX cases NO3 will clearly dominate the a-pinene consumption, and

the reaction products contribute to the SOA mass (Presto et al. 2005b). The potential role of NO3 (and its potential effect on the ai compared to ozonolysis products) must be discussed.

Section 3.1, p. 1951 To me the start condition and the use of the ΔHv vector is not quite clear. In principle with changing temperature the set of ai should be shifted left/right over the basis set ?! Why is DHV=70 kj/mol so large for low NOX, high RH ?

Section 3.2 and Table 3 Can we learn something from the systematics of the ai e.g. of 7-basis set for the processes in the regimes ? Why is the 7-basis set of low NOX, dry so similar to the high NOX, dry and high NOX, wet cases, although the AMF is much larger. Why is it so different from the low NOX, wet case, although the yields are similar (Fig. 6). What is the role of the ΔHv = 70 in the latter case?

Section 3.2 and Fig 4 a) b) d) There are some systematic deviations of groups of data (probably) from the 1:1 line, always in direction of overestimation by the model. Do these reveal aspects not catched by the chosen initial conditions? Do they contain helpful information? A representation and discussion of the quality of the reproduction of temperature dependence is missing.

Figure 1,2,4 are to small and should be color coated. The fonds in all Tables are to small, in Table 3 it is much to small

References

Koo et al. 2003 is missing

Pathak et al. 2007: title is wrong

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 1941, 2007.