Atmos. Chem. Phys. Discuss., 7, S9573–S9575, 2008
www.atmos-chem-phys-discuss.net/7/S9573/2008/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Particle mass yield in secondary organic aerosol formed by the dark ozonolysis of α-pinene" *by* J. E. Shilling et al.

J. E. Shilling et al.

Received and published: 4 March 2008

We thank A. Chan and J.H. Seinfeld for their comments and for sharing their latest data with us. In our revised manuscript, we include the new results from the CIT group in Figure 4. These new results agree well with the yield measurements made in the Harvard chamber, as shown in the figure posted by A. Chan. The agreement between these new measurements and the data presented in this paper is very encouraging. We have updated the presentation of the manuscript to reflect that our measurements agree with the latest results of Song et al. (2007) and Chan and Seinfeld (2007) [both unavailable at the time of the original ACPD submission], which were carried out for intermediate concentrations of > 5 μg m^{-3}. We then focus our analysis on the lower concentrations of our study and compare-and-contrast to Pathak et al. (2007a,b) in this regime, as well as include some general comments on the differences among the

Full Screen / Esc
Printer-friendly Version
Interactive Discussion
Discussion Paper

11 literature studies available for the higher concentrations.

Our laboratory has no data on the temperature-dependence of SOA yield. Pathak et al. (2007a) have suggested 1.6% K^{-1} and Chan and Seinfeld (2007) suggest an enthalpy of vaporization of 100 kJ mol^{-1}. For purposes of our presentation, what is important is that the new laboratory measurements of Chan and Seinfeld (2007) are under similar conditions as our experiments and are in good agreement with our results. We have added these data points in the updated Figure 4. For consistent treatment of the other data sets, however, and in the absence of our own measurements of temperature-corrected yields, we have maintained a uniform temperature correction of 1.6% K^{-1}. We highlight in the text that a temperature correction using 100 kJ mol^{-1} can shift the CIT data into agreement with our results.

References

Chan, A. and Seinfeld, J.H.: Interactive Comment on "Particle mass yield in secondary organic aerosol formed by the dark ozonolysis of α-pinene" by J. E. Shilling et al., Atmos. Chem. Phys. Discuss., 7, S77258212;S7726, 2007.

Pathak, R. K., Stanier, C. O., Donahue, N. M., and Pandis, S. N.: Ozonolysis of α-pinene at atmospherically relevant concentrations: Temperature dependence of aerosol mass fractions (yields), J. Geophys. Res, 112, D03201, doi:10.1029/2006JD007436, 2007a.

Pathak, R. K., Presto, A. A., Lane, R. E., Stanier, C. O., Donahue, N. M., and Pandis, S. N.: Ozonolysis of α-pinene: Parameterization of secondary organic aerosol mass fraction, Atmos. Chem. Phys., 7, 3811–3821, 2007b.

Song, C., Zaveri, R. A., Alexander, M. L., Thorton, J. A., Madronich, S., Ortega, J. V., Zelenyuk, A., Yu, X.-Y., Laskin, A. and Maughan, D. A.: Effect of hydrophobic primary organic aerosols on secondary organic aerosol formation from ozonolysis of α-pinene, Geophys. Res. Lett., 37, L20803, doi:10.1029/2007GL030720, 2007.

ACPD

7, S9573–S9575, 2008

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 17927, 2007.

ACPD

7, S9573–S9575, 2008

Interactive Comment