Atmos. Chem. Phys. Discuss., 4, S2434–S2436, 2004
www.atmos-chem-phys.org/acpd/4/S2434/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Evaluation of detailed aromatic mechanisms (MCMv3 and MCMv3.1) against environmental chamber data" *by* C. Bloss et al.

Anonymous Referee #1

Received and published: 9 November 2004

This paper is of high quality and is very important in order to show that major VOC degradation pathways that are important for the ozone production are not understood. Aromatics are very important for the ozone production at least on a regional scale. To some extent it is surprising that after so many years of research concerning aromatic degradation pathways obviously huge uncertainties concerning the major degradation pathways remain. Certainly more research is needed in this field especially if one also thinks about the even larger uncertainties concerning the pathways to secondary aerosols.

Specific comments (mostly minor)

- Some of the measurement quality should be discussed a little bit more in order to

assess if the discrepancies between model and measurements are really due to deficiencies in the model or if they could be attributed to measurement uncertainties.

- Page 5688 : Only the measurement methods of ozone, NO and NO2 are mentioned at this point.

- Page 5689 : ozone production is NOx sensitive in southern Europe. This is certainly not true for Milano and for other larger urban plumes (several papers published) and will not be true for the colder seasons in large areas.

- Page 5691 : The average loss rate could be mentioned.

- Probably it is mentioned somewhere, but the humidity could be added in Table 1.

- Page 5692: The net ozone production would strictly be the conversion of NO to NO2 by reaction with peroxy radicals minus the chemical losses (O1D + H2O; O3+OH; O3+HO2; O3 + alkenes, Ě)

- Page 5695: In the p-xylene case, a problem with the UV-ozone instrument is postulated. Why is then not the FTIR-data used for all cases for comparison with the model.

- Page 5695: It could be mentioned how well the LIF OH measurements compared to OH calculated from decays of compounds where OH degradation is the only important pathway. This is also important for the companion paper as OH from LIF measurements are compared to the model.

- Page 5697 line 8/9: 'not completely eliminate the ozone prediction'. In the high NOx case the ozone prediction is still very high.

- Page 5698: the year of the reference Zador and Pilling should be 2004.

- Page 5700: concerning the gloxal discussion : how important might be a pathway to the aerosol phase?

- Page 5708 line 18: Only MCMv3 is mentioned but not MCMv3.1 for this point.

ACPD

4, S2434–S2436, 2004

- In the discussion, the new findings on secondary aerosols from aromatics including polymerization reactions could be mentioned. As was shown in the paper of Kalberer et al. (2004), also low molecular weight molecules and rather recative molecules like HCHO could be incorporated into the aerosol and might influence also the gas phase reaction scheme even if the total aerosol produced might not seem so high.

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 5683, 2004.