

Interactive comment on “Measurement and interpretation of gas phase formaldehyde concentrations obtained during the CHABLIS campaign in coastal Antarctica” by R. A. Salmon et al.

Anonymous Referee #2

Received and published: 31 March 2008

The paper presents the first year-round measurements of formaldehyde (HCHO) at the British Antarctic station Halley. The research was part of the CHABLIS campaign contributing greatly to the research on photochemistry in the Antarctic troposphere. The paper presents new and interesting results and raises some questions by showing discrepancies to previous HCHO measurements performed at the German base Neumayer. Title and abstract are sufficient. The paper is well structured and clear and important conclusions are reached. The paper should be published in ACP with minor revisions.

Some questions that arose during reading the paper:

1. The authors performed very thorough calibration and sampling efficiency tests after the field season, which is great. I wonder if there could be a temperature effect during the gas phase calibration (Method A), being carried out in England or Antarctica? Temperature gradients will be very different.

2. Page 2348, line 7: The rate constants vary a lot, why did you use $2 \times 10E-12$? Also this constant is for room temperature while the one cited by Enami et al. is given for 269K.

3. In their calculations of HCHO fluxes from the snow they assume a boundary layer height of 100 m. Where does that value come from? If that is based on earlier acoustic radar measurements please state this.

4. Table 1 gives potential HCHO production from VOCs, are the authors aware of the HCHO production potential as given in Wert et al., 2003, Signatures of terminal alkene oxidation in airborne formaldehyde measurements during the Texas Air Quality Study (TexAQS) 2000, J. Geophys. Res., 108(D3), 4104, doi:10.1029/2002JD002502?

5. The figures are hard to read, please could you increase font size in both figures?

6. Figure 2: I see that you want to show the variability of HCHO, but this figure is hard to read and has to be blown up a lot to be deciphered. Could you try to make it easier readable? Maybe remove lines between daily averages, or bring dark blue spots to the front, or present daily averages of the detection limit?

Technical corrections:

Page 2338, line 14, HO_x, subscript x

Page 2339, line 7-9, citation of references in order of year of publication

Page 2339, line 22, Frey et al., 2005 is not listed in the reference list

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page 2340, footnote 1, change submitted status of Jones et al., 2008 to reference in ACPD

Page 2341, line 8: should be probably Jones et al., 2008

Page 2341, line 4 and 10: Can you use either ppt or ppb?

Page 2342, line 11 and 14: You give the error as 15% and 12%, would it make sense to give the actual number, too?

Page 2346, line 20: Reaction R4 has no products

Page 2347, line 5: Equation, remove line from under [HCHO]ss

Page 2352, line 10: add and in front of last author

Page 2352, line 14, Cavity Ring Down

Page 2352, line 20, please tidy up initials in Grannas et al., 2002 reference

Page 2353, line 19, NO_y, subscript y

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 2337, 2008.

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