

Interactive  
Comment

## ***Interactive comment on “Distribution of VOCs between air and snow at the Jungfraujoeh high alpine research station, Switzerland, during CLACE 5 (winter 2006)” by E. Starokozhev et al.***

**E. Starokozhev et al.**

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We thank the referee for his/her detailed and constructive comments, pointing out additional references for Background Theory and we will try to address his/her points as far as possible.

Some responses to Specific remarks

Remark : Abstract The second sentence is misleading. Do authors mean the flux between the air and the snow instead of the flux in ambient air? Then please say so.  
Response: The sentence is correct, it was meant, that the concentrations of organic compounds had been measured in the air and snow samples, and then based on the measured concentrations in the air samples were calculated the flux values in the

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ambient air.

Remark: Introduction P. 14349, L. 2, P. 14349, L. 5: there are newer publications from Atkinson: e.g. Evaluated kinetic and photochemical data for atmospheric chemistry: Volume II 211; gas phase reactions of organic species, R. Atkinson, D. L. Baulch, R. A. Cox, J. N. Crowley, R. F. Hampson, R. G. Hynes, M. E. Jenkin, M. J. Rossi, J. Troe, and IUPAC Subcommittee, Atmos. Chem. Phys., 6,3625-4055, 2006. Response: Thanks for pointing out additional references for gas reaction by Atkinson et al 2006, where he considered the kinetic of gas phase reactions. We accept the remark and we will add that reference.

Remark: Groellert and Puxbaum have been published in 2000. They only make a vague indication that compounds which are scavenged by aerosols can be transported upwards. Li et al. do not say that VOCs are adsorbed to particles. Response: The referee is correct, this Paper received and accepted in revised form in 1998. We can express this point by means of other references (e.g. J. Cozic et al.: Chemical composition of the Jungfraujoch aerosol. Atmos. Chem. Phys., 8, 407-423, 2008 ; S. Fuzzi et al.: State of knowledge and research needs on organic aerosols. Atmos. Chem. Phys., 6, 2017-2038, 2006). We agree that Li do not say that VOCs are adsorbed to particles. We used the reference to Li to point that gases can be transported over long distances.

Remark: P. 14349, L. 29ff: Can you specify more precisely what will be the outline of the paper. Response: In this paper, we aim to investigate quantitative characteristics of VOCs distribution between atmospheric gas/snow phases during precipitation formation at Jungfraujoch.

Remark: P. 14352: L. 1: Here only the K air/snow is defined in the equation. Either make a more specific statement or use a more general equation Response: We accept the remark and make a more specific statement to the equation.

Remark: Experimental section: P. 14352: L. 21: Is the station 40% in the clouds or just

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40% in the free troposphere? Response: It is not obvious from the stylistical point of view that the station is 40 % in the clouds (in-cloud conditions about 40% of the time (Baltensperger et al., 1997a)), because of it we are going to correct the statement. Remark: P. 14353: L. 7: The integration time was 60 min, but everything added up at the description of the temp. programme (L. 20-21) adds up to 71 min, not included the cooling time. What was the frequency of the measurements? One per 2 hours? Response: The new description of the programme is: In operation, the temperature program for the chromatographic separation starts at 30 °C, remains isothermal for 8 minutes, then rises up to 150 °C at a rate of 11 °C per minute and remains isothermal at 150 °C for the last 3 minutes. We will change it in the article.

Remark: Results and discussion P. 14354: L. 25: Table 2, not Table 3 P. 14355: L. 14ff and Table 2: OH radicals of  $10E6$  red/cm<sup>3</sup> are normally believed to be yearly averages. Can you extract a text book annual distribution (considerably lower in winter) and correct you values?

Response: We have chosen for the calculation of life time of organic compounds in the atmosphere yearly averages concentration of OH radicals because OH rate constants were taken at  $T=25^{\circ}\text{C}$ . We can correct our values for winter too.

Remark: P. 14355: L. 28 Is the flux information included in the table 3? Where do authors show this? In Fig. 3 it is not shown in a straightforward way, as the labelling of the substances (x-axis) is not identical Response: The flux information is not included in the table 3 but in the Fig. 3. The labelling of the substances (x-axis) in Fig. 3 can not be identical because the initial flux values are shown in decreasing order and do not show the same pattern.

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Interactive comment on Atmos. Chem. Phys. Discuss., 8, 14347, 2008.

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