

Interactive comment on “n-Aldehydes (C₆–C₁₀) in snow samples collected at the high alpine research station Jungfraujoch during CLACE 5” by K. Sieg et al.

Anonymous Referee #1

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1 General Comments

The presented manuscript presents data from measurements of n-aldehydes in an Alpine setting. Methodological aspects and data are presented in a clear and concise fashion. Fresh snow samples were obtained from Jungfraujoch station during a larger sampling campaign and analysed using headspace extraction followed by gas chromatography and mass spectrometric analysis. The discussion tries to establish source regions and precursors for n-aldehydes detected using complementary and ancillary data. Biogenic sources were established as primary source of aldehydes investigated. Uptake into snow via the particulate phase is suggested as the major pathway.

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2 Specific Comments

From my point of view, parts of the introduction and especially the discussion could benefit from streamlining and an improved focus leading to an improved and more concise manuscript. Subsections with hypotheses stated at the beginning followed by analysis and discussion of the data would help to increase readability.

P8072/L4: Explain relevance of the Sphinx platform in the text or remove from abstract.

P8072/Line 9: Give numerical examples for “wide range of concentrations” in abstract.

P8073/L15: In the discussion section, authors demonstrate that anthropogenic sources are not likely to be the source of the aldehydes detected. It would still be useful to have more information on anthropogenic sources available in the introduction with additional references.

P8073/L25-P8074/L23: Information from this section is descriptive and in part duplicated in Table 1. I suggest that authors delete this paragraph, and instead expand Table 1 with information on the environment sampled, analytical technique and species/concentrations detected and highlight differences in the manuscript text.

P8076/L9: More information or a reference should be provided about the custom-made snow sampling scissors.

P8076/L11: “Snow sampling occasions” should be replaced by “Snow sampling events”

P8076/L15: Additional information on snow properties would be useful for assessing since these potentially play an important role on retention and photochemical conversion of chemical species. Large blank values indicate that most of the aldehydes could actually be found in the interstitial air. These aspects of snow properties should also be discussed as part of the results.

P8079/L8079: A discussion on snow properties and their impact on aldehyde con-

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centrations should be added as indicated above. If compounds mostly reside in the interstitial air, no phase transition is occurs.

P8080/L7: "heterogeneous composition": Do the authors mean "concentrations".

P8081/L3: While the authors provide a good discussion on sources for aldehydes, their fate is not discussed. An addition of this aspect and relevance for sampled snow would be useful.

P8081/L11-L23: This description of aerosol measurements carried out during the campaign should be removed since no data is available for discussion.

P8081/L23-8082/L17: Rewrite for conciseness and discuss (incl. references to figures and tables) aspects pertaining to the measured data set.

P8083/L9: Rewrite for conciseness and discuss (incl. references to figures and tables) aspects pertaining to the measured data set.

Table 1: Expand as suggested Figure 4: Move to Appendix since it is cited work Figure 5: Display own (B) and previous (A) data in a single figure. Remove connecting lines or explain their significance.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 8071, 2009.