

## ***Interactive comment on “A compilation of tropospheric measurements of gas-phase and aerosol chemistry in polar regions” by R. Sander and J. Bottenheim***

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We thank Markus Frey very much for his helpful comments. Replies to the suggestions are embedded below.

*p.586 As this compilation will represent for some a starting point of their re-search it is important to establish more context. In the introduction, I would at least point explicitly to the individual AICI review papers 2007 and 2012 (this work is part of the joint ACP/ESSD special issue ‘New perspectives on Air-Ice Chemical Interactions (AICI)’), i.e. Grannas et al. (2007), Simpson et al. (2007), Dominé et al. (2008), Anderson and Neff (2008), Abbatt et*

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*al. (2012) etc.*

We agree and have added these references to the introduction.

*p.588 While it is sensible to limit the size of the data compilation, references to gas phase measurements in polar firn and ice cores need to be mentioned here. They both require more interpretation, but are the only means of going beyond the modern observational period of the past 50 years. Cite for example*

- *ACP Special issue 'Firn air: archive of the recent atmosphere', Editor(s): W. T. Sturges, T. Blunier, R. van de Wal, and V. Petrenko, ACP, 2011*
- *Polar ice core records of greenhouse gases e.g. from the Global Change Master Directory (<http://gcmd.nasa.gov>) or the National Snow & Ice Data Center (<http://nsidc.org>)*

We have added these references to Section 2.

*p.609 Include reference of Kerbrat et al. (2012), cited on p.644.*

The reference is already included.

*Include data from the following studies & update the references accordingly:*

- *surface O3 in Antarctica from the 1960s (Oltmans et al., 1976)*
- *surface O3 in Draunning Maud Land/Antarctica (Bauguitte et al., 2011)*

- *H<sub>2</sub>O<sub>2</sub> and CH<sub>3</sub>OOH from Summit (summer 2003, spring 2004) and South Pole (summer 2003) (Frey et al., 2009a)*
- *NO and NO<sub>2</sub> from Concordia/Antarctica (Frey et al., 2012a)*
- *Mercury (Hg) from Concordia/Antarctica (Dommergue et al., 2012)*
- *year-round atmospheric particulate nitrate (NO<sub>3</sub>-) from Concordia/Antarctica in 2007 (Frey et al., 2009b)*

*Note also that Slusher et al. (2012) measured a number of chemical species on the ANTCI 2005 airborne campaign across the East Antarctic Plateau, which should also be included.*

We apologize that we missed these references so far. They have all been added now.

*Figure 1 & Table 3. This is confusing: East Antarctic Plateau is commonly referred to as a region, it's not a station! data in tables should be annotated rather with 'ant'?*

We admit that the current text is confusing. The coordinates mentioned in Table 3 for the East Antarctic Plateau refer to only one publication that presented measurements in that region. As suggested, we renamed the annotation to “ant”.

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Interactive comment on Earth Syst. Sci. Data Discuss., 5, 585, 2012.

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