

***Interactive comment on* “Small HONO emissions from snow surfaces at Browning Pass, Antarctica” by H. J. Beine et al.**

Anonymous Referee #1

Received and published: 28 February 2006

Authors presented measurement results of HONO flux in Antarctica, which was surprisingly small from sunlight-exposed snowpack containing significant levels of nitrate and mostly at acidic pH. Interpretations have been attempted by considering the forms of nitrate in different types of snowpack and the availability of organics that would further react with NO₂, the assumed primary product of nitrate photolysis. In the aged snowpack, reaction and neutralization of produced HONO by sea salt components may, at least in part, explain the lack of observable HONO flux. However, the interpretation based on NO₂-photosensitized organic interaction for the fresh snow is highly speculative and is not consistent with some laboratory and field observations. In fact, the production of HONO from nitric acid/nitrate photolysis does not require the presence

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of organic compounds (e.g., Zhou et al., 2003; Ramazan et al., 2004). Furthermore, relatively high HONO concentrations were observed at South Pole (Dibb et al., 2004), where organic contents were expected to be low. The lack of satisfactory explanation for the field observations really calls for laboratory investigations into HONO formation mechanisms in snowpack, as suggested by the authors in the last sentence.

The Anonymous Referee #2 has done a great job in pointing out many mistakes and inconsistencies that I found. There is no need to repeat the specific comments.

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 615, 2006.

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