

Home

Online Library ACP

- ▣ Recent Final Revised Papers
- ▣ [Volumes and Issues](#)
- ▣ Special Issues
- ▣ Library Search
- ▣ Title and Author Search

Online Library ACPD

Alerts & RSS Feeds

General Information

Submission

Review

Production

Subscription

Comment on a Paper

Impact
Factor
4.865

ISI
indexed



▣ [Volumes and Issues](#) ▣ [Contents of Issue 9](#)

Atmos. Chem. Phys., 6, 2569-2580, 2006

www.atmos-chem-phys.net/6/2569/2006/

© Author(s) 2006. This work is licensed under a Creative Commons License.

Surprisingly small HONO emissions from snow surfaces at Browning Pass, Antarctica

H. J. Beine¹, A. Amoroso¹, F. Dominé², M. D. King³, M. Nardino⁴, A. Ianniello¹, and J. L. France³

¹C.N.R. – IIA, Via Salaria Km 29,3, 00016 Monterotondo Scalo (Roma), Italy

²CNRS – LGGE, BP 96, 54 rue Molière, 38402 Saint Martin d'Hères, France

³Department of Geology, Royal Holloway University of London, Egham, Surrey, TW20 0EX, UK

⁴C.N.R. – IBIMET, Sezione di Bologna, via Gobetti 101, 40129 Bologna, Italy

Abstract. Measured Fluxes of nitrous acid at Browning Pass, Antarctica were very low, despite conditions that are generally understood as favorable for HONO emissions, including: acidic snow surfaces, an abundance of NO_3^- anions in the snow surface, and abundant UV light for NO_3^- photolysis. Photochemical modeling suggests noon time HONO fluxes of 5–10 $\text{nmol m}^{-2} \text{h}^{-1}$; the measured fluxes, however, were close to zero throughout the campaign. The location and state of NO_3^- in snow is crucial to its reactivity. The analysis of soluble mineral ions in snow reveals that the NO_3^- ion is probably present in aged snows as NaNO_3 . This is peculiar to our study site, and we suggest that this may affect the photochemical reactivity of NO_3^- , by preventing the release of products, or providing a reactive medium for newly formed HONO. In fresh snow, the NO_3^- ion is probably present as dissolved or adsorbed HNO_3 and yet, no HONO emissions were observed. We speculate that HONO formation from NO_3^- photolysis may involve electron transfer reactions of NO_2 from photosensitized organics and that fresh snows at our site had insufficient concentrations of adequate organic compounds to favor this reaction.

▣ [Final Revised Paper](#) (PDF, 1198 KB) ▣ [Discussion Paper](#) (ACPD)

Citation: Beine, H. J., Amoroso, A., Dominé, F., King, M. D., Nardino, M., Ianniello, A., and France, J. L.: Surprisingly small HONO emissions from snow surfaces at Browning Pass, Antarctica, Atmos. Chem. Phys., 6, 2569-2580, 2006. ▣ [Bibtex](#) ▣ [EndNote](#) ▣ [Reference Manager](#)

Search ACP

Library Search

Author Search

News

- ▣ [Sister Journals AMT & GMD](#)
- ▣ [Financial Support for Authors](#)
- ▣ [Journal Impact Factor](#)
- ▣ [Public Relations & Background Information](#)

Recent Papers

01 | ACPD, 12 Jan 2009:
Mobile mini-DOAS
measurement of the
emission of NO_2 and HCHO
from Mexico City

02 | ACP, 12 Jan 2009:
Spatial distribution of $\Delta^{14}\text{CO}_2$
across Eurasia:
measurements from the
TROICA-8 expedition

03 | ACP, 12 Jan 2009:
Cloud's Center of Gravity – a
compact approach to analyze
convective cloud
development