Geophysical Research Abstracts, Vol. 8, 04105, 2006
SRef-ID: 1607-7962/gra/EGU06-A-04105

OH and halogen atom influence on the variability of non-methane hydrocarbons in the Antarctic Boundary Layer

K.A. Read (1), **R.A. Salmon** (2), A.C. Lewis (1), A.E. Jones (2), S. Bauguitte (2)

1. Department of Chemistry, University of York, York, UK
2. British Antarctic Survey (BAS), Cambridge, UK

km519@york.ac.uk

Measurements of C_2-C_7 non-methane hydrocarbons (NMHC) and dimethyl sulphide (DMS) have been made *in situ* at Halley Base, Antarctica (75˚35'S, 26˚19'W) from February 2004 to February 2005 as part of the Chemistry of the Antarctic Boundary Layer and the Interface with Snow (CHABLIS) experiment. The data show long and short term variability in NMHCs and DMS controlled by the seasonal and geographic dependence of emissions and variation in atmospheric removal rates and pathways. Ethane, propane, *iso*-, n-butane and acetylene abundance followed a general OH-dependent sinusoidal seasonal cycle. The yearly averages were 186 pptV, 31 pptV, 3.2 pptV, 4.9 pptV, and 19 pptV respectively, lower than reported in some previous studies. Superimposed on a seasonal cycle were shorter term variability that could be attributed to both synoptic air mass variability and localised loss processes due to other radical species. Hydrocarbon variability during periods of hour-to-day long surface O_3 depletion in late winter/early spring indicated active halogen atom chemistry estimated to be in the range 1.7 x 10^3 to 3.4 x 10^4 atom cm^{-3} for Cl and 1.4 x 10^6 to 2.9 x 10^7 atom cm^{-3} for Br. Longer term negative deviation from sinusoidal behaviour in late August were indicative of NMHC reaction with a persistent [Cl] of 2.3 x 10^3 atom cm^{-3}.). DMS was present in the atmosphere at Halley all year (average 38.1 pptV) with maximum values of 418 pptV coinciding temporally with a minimum in sea ice and maximum in alkenes abundance and with short term variability strongly dependent on air mass origin and trajectory pressure height.