Geophysical Research Abstracts, Vol. 8, 06564, 2006
SRef-ID: 1607-7962/gra/EGU06-A-06564

Seasonal variability of selenium and iodine in an Antarctic ice core

R. Chambers (1), P. Liss (1), S. Turner (1), R. Mulvaney (2)

(1) School of Environmental Sciences, University of East Anglia, Norwich, NR4 7TJ, UK, (r.chambers@uea.ac.uk) (2) British Antarctic Survey, High Cross, Madingley Road, Cambridge, CB3 0ET, UK

Ice core records of chemical species concentrations are invaluable as they provide insights into past atmospheric composition, and in some cases an indirect indication of ocean productivity. For example, the emissions of dimethyl sulphide (DMS) from seawater into the atmosphere and the DMS oxidation product methane sulphonic acid (MSA) in ice cores have been interpreted in terms of marine palaeoproductivity. We hypothesised that selenium and iodine, which are emitted from seawater as methylated compounds in a similar way to DMS, might have a similar record in the ice core.

However, analysis of selenium at low environmental concentrations is very challenging particularly when analysing very clean samples, such as ice cores, due to high contamination risk. Using hydride generation-atomic fluorescence spectrometry, a technique not used on ice cores before, a high-resolution selenium record has been achieved. The samples were also analysed for iodine using inductively coupled plasma-mass spectrometry. The ice core is a pre-industrial section (spanning the years 1585 to 1615) from Berkner Island, Antarctica, a near-coastal site with a high accumulation rate. We were able to analyse the samples at a resolution of six to eight samples a year, therefore producing a dataset with which to analyse seasonal variability.

We will present the results for selenium and iodine, and show how they relate to the records of MSA, non-sea-salt sulphate, sodium, and magnesium from the same ice core.