Geophysical Research Abstracts, Vol. 9, 04531, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-04531

Magnetic properties of terrestrial moss samples (*Hylocomium splendens*) along a south-north profile crossing the city of Oslo, Norway

K. Fabian (1), C. Reimann (1), S. McEnroe (1)
(1) NGU ,Geological Survey of Norway, Trondheim, Norway

Terrestrial mosses are commonly used to map and monitor airborne heavy metal contamination via geochemical analysis of element concentrations in air-dried moss samples. While this method results in quantitative net values of the elemental composition, it cannot distinguish whether elements are bound in organic or inorganic compounds, or trace further details of their source(s). Here we present results from magnetic measurements on forty terrestrial moss (*Hylocomium splendens*) samples, which were collected along a 120 km long south - north transect running through Norway's largest city, Oslo. Magnetic measurements are very specific, in that they focus on iron minerals. They allow for a more detailed interpretation in terms of intrinsic properties of these minerals. To show this, we measured magnetic susceptibility as a net value comprising concentrations of dia-, (anti)ferro-, ferri-, and paramagnetic minerals. In addition, we determined the isothermal magnetic remanence (IRM) after applying a 700 mT external field, and its alternating field (AF) demagnetization curve. Both concentration-dependent measurements, magnetic susceptibility, and IRM(700 mT), closely resemble the elemental Fe distribution and display a clear peak in the urban environment. Surprisingly, also the concentration-independent ratio $\mathrm{IRM}_{25}/\mathrm{IRM}_{60}$, where IRM_x denotes the x mT AF demagnetization step of the IRM, displays higher values in the urban environment. This indicates that: 1) the iron signal from *Hylocomium splendens* is mostly related to remanence-bearing minerals and less to organic iron compounds; 2) the magnetic properties of these minerals change between urban and remote environments. Together these observations strongly support the assumption that the iron signal in mosses is due to adsorbed dust, which then will also contribute to other elemental signals. Magnetic measurements thus help to separate antropogenic from geogenic signals in geochemical analyses of moss samples.