Assessment of organic sulfur species in forest soils using NEXAFS and an ion-sensitive electrode. (S02-prietzel033125-Poster)

Authors:

- J.Prietzel* - *Chair of Soil Science, TU Muenchen*
- J.Thieme - *Institute of X-ray Physics,University Goettingen*
- U.Neuhaeusler - *European Synchrotron Radiation Facility (ESRF)*
- J.Susini - *European Synchrotron Radiation Facility (ESRF)*
- C.Strehl - *Chair of Soil Science, TU Muenchen*
- I.Koegel-Knabner - *Chair of Soil Science, TU Muenchen*

Abstract:

Sulfur speciation in bulk soil as well as in soil particles and colloids from O and B horizons of two German forest soils was investigated using (i) X-ray microscopy, (ii) Near Edge X-ray Absorption Fine structure Spectroscopy (NEXAFS) at the K-adsorption edge of S (2472 eV), and (iii) a wet-chemical S fractionation procedure with a Ag/S-sensitive electrode. The partitioning among different S species as determined on bulk samples of Oh horizons by X-ray spectromicroscopy agreed reasonably well with the results of the wet-chemical S speciation. NEXAFS analyses on distinct soil particles revealed a strong enrichment of the particles in thiols and organic monosulfides compared to the bulk soil for the Schluchsee Oh (low S deposition environment), and an enrichment in sulfate for Rotherdbach Oh (high atmospheric S deposition). The combination of X-ray transmission and sulfur fluorescence images with unfocussed and focussed NEXAFS spectra taken at defined

locations allows the comparison of the S speciation in bulk soil with that of distinct soil particles and colloids on the sub-micron scale and thus significantly contributes to a better understanding of soil microstructure.

Corresponding Author Information:

Joerg Prietzel
Technische Universitaet Muenchen
Am Hochanger 2
Freising D-85354
Germany

phone: 0049 8161 71 4734
fax: 0049 8161 71 4738
e-mail: prietzel@wzw.tum.de

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