## 1b/P001 - Are nitrogen isotope ratios in barks suitable as indicators of N emissions from anthropogenic sources?

Schulz H.[1], K. Jung[1], M. Gehre[2] and G. Schüürmann[1], [1]Department of Chemical Ecotoxicology, [2]Department of Analytical Chemistry, UFZ Centre for Environmental Research, Leipzig, Germany. Natural isotope ratios ($^{15}N$ values) of specific nitrogen compounds were analysed in the bark of adult Scots pines (*Pinus sylvestris* L.) and in canopy throughfall using C-IRMS. The investigations were performed between 1991 and 1997 at three differently polluted field sites (Rösa>Taura>Neuglobsow) in Eastern Germany with the aim of characterising atmospheric inputs of $NH_4^+$ and $NO_3^-$ in forests from local anthropogenic nitrogen sources. The mean $^{15}N$ values of total nitrogen in bark have exhibited seasonal variations at all sites since 1991. Although the long-term means of natural $^{15}N$ abundances do not differ significantly in bark from the two high-polluted sites Rösa (-12.3‰) and Taura (-11.2‰), substantial site-dependent differences were observed between the $^{15}N$ values of the two sites and the less polluted site Neuglobsow (-8.3‰). Corresponding site-dependent differences were detected for ammonium and nitrate nitrogen in bark. It can therefore be concluded that the $^{15}N$ values of total nitrogen in the barks are the result of a mixture of isotopically different N compounds, mainly $NH_4^+$ and $NO_3^-$. This conclusion is supported by the natural isotope composition of ammonium determined in bark and throughfall, which is similar and negative, whereas nitrate indicates positive $^{15}N$ values in both matrices. The findings are discussed with nitrogen isotope signatures from agricultural sources.

## 1b/P002 - The isotope structure of carbon of organic and inorganic matter in Kraternaya Bay

Namsaraev B.B. and V.T.Tarasov, Lab. of Microbiology, Institute of General and Experimental Biology, Ulan-Ude, Russia. The isotope structure of carbon, carbonates, methane, organic matter of biota and sediments in water, sediments and microbial mats is determined in Kraternaya Bay (Yankich Island, Kurils) located in the region of shallow vulcanise. The isotope composition of carbon of vulcanogenous $CO_2$ and $CH_4$ varies from -5,5 to -7,6 % and from -13 to -16,3% accordingly. Phototrophic and chemoautotrophic components of microbial mats use these gases for synthesis of organic matter actively. The maximal rate of organic matter production is 3,7 g $C/m^{-2}*day^{-1}$. The organic matter is formed as a result of their activity, $^{13}C$ are -21,9 : -22,1%. Aerobic and anaerobic geterotrophic bacteria participate in destruction of organic matter, rate of destruction reaches 2,0 g $C/m^{-2}*day^{-1}$. The carbonates are formed as a result of decomposition of biomass of microbial mats; they have isotope composition from -23,3 % to -27,9%. Begonias and marine carbonates are substrates for phytoplankton and macrophytes. The rate of primary production reaches 3 g $C/m^3*day$ in waters of the Bay. The isotope composition of carbon of organic matter of phytoplankton varies from –19,7 to –22,2, of macrophytes – from –22,2 to –23,2. The results of determination of isotope structure of carbon and rates of microbial processes show that the high degree of division of carbon isotopes in Kraternaya Bay correlates with intensive processes of production and destruction of organic matter in the zone of influence of hydrothermal activity.

## 1b/P003 - Determination of nitrogen stable isotope ratios of plant amino acids

Kornexl B.E. and K. Jung, Department of Analytical Chemistry and Department of Chemical Ecotoxicology, UFZ Centre for Environmental Research Leipzig-Halle, Leipzig, Germany. The natural abundance 15N/14N stable isotope ratios of proteinogenic amino acids give information's on metabolic changes in plants and can thus help to elucidate the mechanism of damaging caused by various kinds of pollutants. The free amino acids are extracted from homogenised plant leaves and subsequently derivatized in a two-step reaction to their n-propyl trifluoroacetyl esters. All reaction steps have been checked to proceed without isotope fractionations. The derivatives are separated using capillary gas chromatography followed by an on-line combustion/reduction to produce N2 as the measuring gas for the 15N/14N isotope ratio determination. To facilitate the identification of unknown peaks in the chromatogram, part of the GC effluent is introduced into an electron impact mass spectrometer. With this GC-C-IRMS/GC-MS coupling 17 proteinogenic amino acids can be analysed for their d15N values with a precision of ±1 ‰ or better. For one measurement, ~1 µg N per compound is necessary. The reliability and applicability of the method in the natural abundance range is demonstrated for a standard mixture and a plant extract.

## 1c/P001 - Long term kinetics of PAH binding on humic acids

Balcke G.U., N. Kulikova, F.-D. Kopinke, Dept. of Remediation Research, Centre for Environmental Research Leipzig, Germany. This contribution is focussed on the long term binding behaviour of PAH molecules towards humic acids under strictly anoxic and sterile conditions. Two aqueous humic acid solutions of different origin and a number of $^{14}C$-labeled PAH and their metabolites were enclosed in ampoules for a period of time with a maximum of 180 days. The influence of time and humic acid concentration was studied with respect to the formation of humic bound residues. The results were related to the PAH's structure, indicating that A) the formation of bound residues is a rather quick process under abiotic conditions, B) it is related to the structure of the PAH, and C) we conclude, PAH must become functionalysed before they can form bound residues. This, however, assumes the presence of particular microorganisms or abiotic oxidising reagents.

## 1c/P002 - Investigation of heavy metal pollution by sequential leaching

Bogdevich, O.P.., V.B. Botnaru, V.S.Bureatinskaea., Lab.Environmental Geochemistry, Institute of Geophysics and Geology, Academy of Science, Chisinau, Moldova. The aim of this study is to determine characteristics of the heavy metal mobility from soils by the sequential leaching method. This procedure gives a possibility to distinguish six bound forms in the solid phase with different migration levels. Soils from territories of Chisinau with the different level pollution were investigated. Nature and laboratory experiments about study of the mobility of principal pollution elements were carried out. The fact, that soils with middle and high level of the total heavy metal pollution cover 50 % territory of Chisinau has been established. The principal spectra of the town soil pollution is presented following elements: Pb, Zn, Cu, Mn, Fe, Ni, Cd, Cr, Co. The biggest part of mobile element forms is observed for territories with the intensive industrial and road influence. The presence of the tie between element bound forms in the solid phase