Geophysical Research Abstracts,
Vol. 10, EGU2008-A-00509, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-00509
EGU General Assembly 2008

Effect of soil moisture content on the metal concentration measured by diffusive gradients in thin films technique (DGT)

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In situ measurement were performed by means of the diffusive gradients in thin films technique in order to characterize the sewage sludge amended soil from one representative sampling site in the Czech Republic, included in the monitoring investigations. This technique reflects actual metal ion concentrations in soil solution, the rate of metal resupply from soil solids to soil solution, and the transport rate of metal ions through the soil. The DGT technique is likely to provide a good surrogate for a metal pool in contaminated soils, which might be available for a metal uptake by a plant root system.

Impact of soil moisture content on the DGT metal uptake of cadmium, copper, nickel and lead was studied in this work. The DGT devices were deployed in the soil aliquots with various moisture content from 33% to 100% and fluxes of individual selected metals were measured. Results of the mathematical method of regression used for calculation of distribution coefficient K_d, which is in this instance a ratio of the equilibrium concentration of metal ion in the soil pore water solution and the equilibrium concentration of the same metal in soil together with the calculation of the pool concentration of the metal in soil are discussed in the contribution.