Geophysical Research Abstracts
Vol. 12, EGU2010-4722, 2010
EGU General Assembly 2010


# Coarse fraction of soils from building rubble (WWII)

Beate Mekiffer (1), Gerd Wessolek (), Traugott Scheytt (), Robert Bussert (), and Thomas Nehls ()

(1) Soil protection group, Berlin Institute of Technology , Dept. of Ecology , Salzufer 12, D-10587 Berlin , (2) Head Soil protection group, Berlin Institute of Technology , Dept. of Ecology , Salzufer 12, D-10587 Berlin , (3) Geochemical Lab, Berlin Institute of Technology, Dept. of Geology, Ackerstraße 76, 13355 Berlin, (4) X-Ray-Lab, Berlin Institute of Technology, Dept. of Geology, Ackerstraße 76, 13355 Berlin, (5) Soil protection group, Berlin Institute of Technology , Dept. of Ecology , Salzufer 12, D-10587 Berlin

Soils, resulting from building rubble of WWII are wide spread in whole Europe. The parent material for pedogenesis originates from different kinds of buildings, which where destroyed of different ways. Also the kind of sorting and disposing was varying for this material.
So the most important feature of soils, resulting from building rubble of WWII, is their heterogeneity.
We investigated samples of soils developed from building rubble to answer the following questions:
What are the amounts of coarse fraction and what are their main components?
What are the chemical properties and what is the crystalline mineral composition of technogenic components?
What is the release of ions from coarse technogenic components?
We sieved and hand sorted the materials, used the X-ray diffractometry and X-ray fluorescence spectroscopy and measured the ions released in 1:2-extract.
In most cases, the soils have a high amount of coarse fraction (> 2mm) (median 25% w/w, N=52). Dominating components in the coarse fraction are in the order of decreasing abundance: bricks, mortar (incl. plaster and stucco), slag, ashes and unburned coals.
The analyzed components show alkalescent to alkaline pH-values. 75% of the samples show low electrical conductivities of up to 141 $\mu$S/cm.
Bricks mainly consist of Si oxides, followed by oxides of Al, Ca, Fe, Mg and K.
X-Ray-diffractometry of bricks showed, that most common minerals are clay minerals (Kaolinit, Illit, Montmorillonit and Chlorit), Quarz, and Carbonates (Calcite and Dolomite, Siderite). Bricks contain Fe-Oxides (Hematite, Goethite), Sulphates and Sulfides (Gypsum, Pyrite, Markasite) in lower amounts. 5-20 % of the minerals are x-ray-amorphous.
Mortar is characterized by a high amount of silicates (nearby 80%). The samples showed a lower percentage of Al- and Ca-compounds than bricks.
Chemical composition of ashes and slag varies in wide ranges, depending on their genesis. We found mainly ashes from stove heating. They contained oxides of Si (40 – 55%), Al (23-35%), Fe (4-17%), Ca (1-8%), Mg (0,8 – 4,8), K (1,5-4,5%), Na (0,1-3,5), Titane (0,5-1,3%) and S (0,1-2%). Most important minerals are Quarz, Mullite, Illite, Hematite and Magnetite, sometimes Carbonates and Sulphates.