



## **Sulphate release from construction and demolition material in soils**

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In Berlin and many other cities soils are heavily influenced by anthropogenic activities and deposited substrates. A widespread technical substrate in technosols is construction and demolition material from residential and industrial buildings. Existing rubble landfills without sealing facilities pose threats to ground water quality.

In the central city of Berlin rising sulphate concentrations of groundwaters (up to 1200 mg/L) are measured since more than two decades. Previous studies point out that the high sulphate concentrations are mainly attributed to World War II rubble. The major part of debris was deposited in form of landfills and contains approximately 0.3 wt% gypsum.

The scope of our research is to determine mechanisms of sulphate release from debris material, interactions between sulphate release, soil hydraulic properties and potential sinks of sulphur. To estimate equilibrium concentration and kinetics of sulphate release of various debris components batch and column experiments are conducted. The same method is applied to determine potential adsorptive character of common debris components.

To analyse the impacts of soil hydraulic properties on sulphate leaching we carry out soil column experiments with defined upper and lower boundary conditions, varying water flow velocity and induced preferential flow. Simultaneously we monitor sulphate concentration of soil leachate in a 2 m<sup>3</sup> lysimeter.

First results of the batch experiments show that gypsum from broken stucco is the main source of sulphate in the observed technosols. Other components as mortar and slag show a quite low sulphate release. Similar results are found within the column experiments. For brigs medium and strongly time dependent sulphate release is determined. Concentrations up to 1500 mg/L are measured in the soil leachate from the lysimeter.