



Investigating the effect of different minerals on biogeochemical interface formation in soil using artificial soil incubations

G. Pronk, K. Heister, and I. Kögel-Knabner

Technische Universität München, Lehrstuhl für Bodenkunde, Freising, Germany (pronk@wzw.tum.de, +49 (0)8161 / 71-4466)

The formation of soil interfaces is controlled by the type of particle surface(s) present and the assemblage of organic matter and mineral particles. We consider clay minerals, iron oxides and charcoal as major components controlling the formation of interfaces relevant for sorption of organic chemicals because they exhibit high surface area and microporosity. In order to study the formation of biogeochemical interfaces, batch incubation experiments were started with artificial soils consisting of model compounds (quartz, clay minerals, iron oxide and charcoal), stall manure as a carbon source and inoculated with soil bacteria derived from a Eutric Cambisol. The model materials were characterised and used to compose artificial soils with 8 different compositions. Samples were taken at the start of the incubation and pH, C and N content and specific surface area are measured. At regular time intervals, the water content is adjusted and carbon dioxide production is measured. Samples for determination of specific surface area and microporosity, surface morphology and elemental distribution, speciation of iron, characterisation of the organic material, sorption experiments with organic chemicals and microbial community analysis will be retrieved after 3, 6, 12 and 18 months. The duration of the incubation experiments is planned to be at least 18 months.