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## Soil development on a mofette site near Hartoušov (NW Czech Republic)

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### Abstract

Geogenic CO<sub>2</sub> may evolve on mofette sites into the top soil. We studied effects of CO<sub>2</sub> on the characteristics of soil constituents along a transect on a mofette site in the NW Czech Republic near the village of Hartoušov. The soil atmosphere showed a large variability of the CO<sub>2</sub> partial pressures up to unity. Chemical analyses revealed an increase in the C:N ratio with increasing CO<sub>2</sub> partial pressure indicating that CO<sub>2</sub> diminishes the decomposition of organic matter. This was confirmed by infrared spectroscopic analyses, which showed that preferential association of microbial organic matter with the clay fraction of the soils does not occur. The analyses also showed accumulation of mostly unaltered, likely particulate soil organic matter. With increasing CO<sub>2</sub> partial pressure, formation of pedogenic Fe oxides is small, and these are poorly crystalline. X-ray absorption near-edge spectroscopy corroborated this finding and helped to identify Fe(II)-bearing minerals such as green rust and vivianite, the presence of which is commonly restricted to hydromorphic soils. Summarized, we consider geogenic CO<sub>2</sub> in soils on mofette sites a soil-forming factor.