Inorganic carbon and fossil organic carbon are source of bias for quantification of sequestered carbon in mine spoil

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Carbon sequestration in mine soils has been studied as a possibility to mitigate the rising atmospheric CO_2 levels and to improve mine soil quality (Vindušková and Frouz, 2013). Moreover, these soils offer an unique opportunity to study soil carbon dynamics using the chronosequence approach (using a set of sites of different age on similar parent material).

However, quantification of sequestered carbon in mine soils is often complicated by fossil organic carbon (e.g., from coal or kerogen) or inorganic carbon present in the spoil. We present a methodology for quantification of both of these common constituents of mine soils. Our recommendations are based on experiments done on post-mining soils in Sokolov basin, Czech Republic. Here, fossil organic carbon is present mainly as kerogen Type I and II and represents 2-6 wt.% C in these soils. Inorganic carbon in these soils is present mainly as siderite ($FeCO_3$), calcite ($CaCO_3$), and dolomite ($CaMg(CO_3)_2$). All of these carbonates are often found in the overburden of coal seams thus being a common constituent of post-mining soils in the world.

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