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Impact of Mn oxides on Fe mobilization during podzolization

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Podzolization is one of the major pedogenic processes on earth which can thus influence the soil solution chemistry of a large worldwide area through mobilization and precipitation of dissolved organic carbon together with metals. Although podzolisation is largely studied, the fundamental mechanisms involved in the formation of podzol are poorly understood. Several theories underscore the key role of metals and DOC components and the interactions between them. These interactions can be better understood by considering the soil solution chemistry. In three months controlled laboratory column experiment, we therefore compare the leachate signature of several soil showing different podzolization stages. Results were not significantly different between soils except for Fe, Mn, SO_4^{2-} and DOC. We notice that concentrations of these components evolve with podzolization process: on the one hand, Fe and DOC concentrations increase from the acid brown earth to the podzol soil while Mn and SO_4^{2-} ones decrease on the other hand. In the podzolization development from an acid-brown earth, Mn evolution is of particular interest since Mn oxides will prevent Fe mobilization and thus control the start of podzolization.