



Does pH influence soil hydro-mechanical properties?

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Structure of soils and its dynamic, physico-chemistry of the interface are of a great importance in the fate of organic pollutants because it governs the accessibility of pollutants to micro-organisms. The soil structure of soils is related to physical parameters (texture, density, water content) but the physico-chemical properties of the interface is not considered. In this study we performed hydro-mechanical measurements on soil samples taken from the 42-plot long-term experiment in Versailles. Indeed six plots were selected to cover a large range of pH values from acid (3.5) to alkaline (8.2) due to the repeated application of fertilizers. Soils were taken in the 0-20 cm and in the 30-35 cm layer out of the ploughed zone. All soils had similar texture and composition with low organic carbon. Therefore pH changes the surface charges and hydrophobicity that are implied in aggregation process. The two layers had the same pH values. The precompression stress P_c and the compression index C_c were derived from confined compression tests performed on remoulded soil samples (density 1.45 g/cm³) at saturation. Results shows that the precompression stress increased at pH lower than 4. In acid case, precompression stress was higher in subsoil. This increase of P_c was attributed to the hydrophobicity due in part to the condensation of charges probably sensitive to the humectation/dessication processes.