



## **Saturated Hydraulic Conductivity and Swelling Properties of Clay Soils**

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Active clays exhibit distinct shrink-swell behavior in response to changes in water content and chemical composition of the pore fluid. While associated changes in hydraulic and mechanical properties cause a myriad of agricultural management problems and damage to engineered structures, clays are utilized for construction of hydraulic caps and barriers for hazardous waste containment and other environmental isolation tasks. Measurement of shrink-swell and hydraulic properties of clayey soils presents great experimental challenges due to excessively long time requirements for sample saturation and complex experimental setup. New models for clay pore space evolution and saturated hydraulic conductivity require new and more complete data sets that link basic soil properties with measurable macroscopic hydraulic behavior under well-controlled boundary conditions. We will present a modified saturation and measurement procedure using a fully automated flexible wall permeameter and illustrate effects of solution concentration, confining pressure and clay content on swelling behavior and saturated hydraulic conductivity. Shortcomings of commonly applied methods and potential improvements will be discussed.