Evolution of Textural Pore Space of Clay-Sand Mixtures Under Variable Water Potential: Experimental Studies on Water Retention and Saturated Flow Behavior. (S01-tuller211214-Oral)

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Abstract:

A new physically based approach for predicting pore-space evolution and hydraulic behavior of clay-sand mixtures form physical and electrochemical medium and solution properties is evaluated with experimental data on liquid retention and saturated hydraulic conductivity. We use a state-of-the-art flexible wall triaxial test system to measure volume expansion and saturated hydraulic conductivity of initially dry sand-bentonite mixtures with sand contents ranging from 5 to 95 percent. To illustrate the effects of ionic soil solutions we conduct experiments with de ionized water and mono- and bivalent (NaCl and CaCl2) solutions with molarities ranging from 0.1 to 0.0001 mol per liter. Model predictions based on physical (e.g., sand content, and bulk density) and electrochemical (e.g., surface charge, ion valence, and molarity) input parameters are compared with measured data. Experimental procedures and sample preparation techniques are discussed.

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