Cr(VI) Migration in Variably-Saturated Soils. (S02-hutchison131946-Oral)

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Abstract:

Most subsurface contamination passes through the unsaturated zone before reaching an aquifer; however, many solute transport studies are conducted under saturated conditions that may not always approximate the natural system under which solute transport occurs. Chromate migration was measured in sediment obtained from the Savannah River Site, SC under different water contents using both vacuum and centrifuge techniques to obtain a steady-state flow regime. Leaching solutions contained 1.0 or 0.5 mM Cr(VI) and tritium (conservative tracer) in artificial groundwater. Breakthrough curves were modeled using CXTFIT assuming equilibrium conditions. Dispersion increased with decreasing water content and increasing pore water velocity. In general, retardation increased with decreasing water content, ranging from 2.6 to 15.3, with no trend evident when the distribution coefficient, Kd, was calculated from R. Chromate sorbed per unit soil increased with increasing water content and experiment time, ranging from 11 to 44 mg/kg. Though results in both systems were similar, experiment times in the vacuum system were 4 to 23 times longer than in the centrifuge system at comparable water contents.

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