

Examining competitive sorption of copper and nickel in London Clay with centrifuge leaching tests

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ABSTRACT

Sorption of contaminants on to soil constituents often has a significant effect on contaminant transport. The sorption equilibrium distribution coefficient, K_d , is often used in solute transport models when predicting the movement of a hazardous material in the ground, to calculate a retardation factor, R_f , for the contaminant. Centrifuge leaching tests were conducted to directly study the transport of Cu and of Ni, both singly and in combination, through compacted London Clay. The study used a falling head permeameter-style leaching apparatus in a laboratory centrifuge, simulating the migration of these heavy metals from landfill leachate through this low permeability clay. R_f was estimated from the breakthrough curves. Competitive sorption was found to have an important effect on the transport, causing the mobility of Ni in the London Clay to be significantly higher when present with Cu than when present on its own. The mobility of Cu was also higher when present with Ni, but the difference was less significant.