

Effect of MSW leachate on soil consistency under influence of electrochemical forces induced by soil particles

ABSTRACT

Investigations on the effect of leachate from municipal solid waste on the soils in landfill sites usually focus on the effect of leachate compounds on the engineering properties of the soil. Leachate chemical composition and its effect on the consistency of soil are important factors for designing liner systems. Soil samples from the bottom of the Esfahan, Iran, landfill were collected. Leachate samples were collected within the a landfill and a composting factory leachate lagoon. Effects the leachates on cation exchange capacity, electrical conductivity, pH, and consistency of the soil samples were investigated. The chemical property of leachate showed that leachate from the compost factory was contaminated by higher concentrations of heavy metals (Cu, Zn, Pb, Cd, Ni, and Hg); higher concentrations of Na⁺, Ca²⁺, Mg²⁺, and K⁺; and higher EC; and were more acidic than the landfill leachate. Liquid limits and plastic limits of the soil were higher from the effect of the compost factory leachate in comparison with the values for landfill leachate.

Keyword: Consistency; Landfills; Leachate