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ABSTRACT

One of the basic human needs is to have good-quality water resources. In burial pits wherein there are no drainage and wastewater treatment systems, leachate produced from solid waste threatens surface and groundwater quality. Soil capability in absorption of leachate heavy metals can help prevent some of groundwater pollution. Accordingly, soil capability in absorption of heavy metals including Pb, Cd, Co, Ni, Mn, Zn and Fe was investigated in Kahrizak municipal landfill. After remolding the soil specimen in a column with 1 meter height and 10 cm diameter, leachate produced from solid waste in Kahrizak municipal landfill has passed out through the soil column for three months and infiltrated leachate has been collected. After three months the soil column was divided into five equal parts of length 20 cm and heavy metals of soil sample were analyzed. Also heavy metals and physical and chemical properties of initial leachate and infiltrated leachate samples were analyzed.

The obtained results indicated that soil has good ability to absorb all metals except for Cd. After about one month, soil ability in removal of all heavy metals was decreased except for Zn. Moreover, the adsorbed metals are found as loosely and sulfide bonds in soil column. These chemical bonds can be released into the environment and lead to water pollution due to slight changes in the physico-chemical characteristics of soil. The I_{geo} and EF show that the pollution of Cd in soil sample before leachate passed is significant. So the soil capability in absorption of Cd of initial leachate is less than other heavy metals. The result shows that anthropogenic fraction of Pb, Co, Ni and Zn is less than lithogenic fraction. The anthropogenic fraction of Mn and Cd is approximately equal to the lithogenic fraction and the anthropogenic fraction of Fe is minimal.