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### Leachate performance of silica fume-modified compacted clayey soil

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Clayey soils containing smectites are widely used to reduce the hydraulic conductivity in geotechnical applications because of their low permeability and high cation exchange capacity. Both the landfill liner and cover systems are the most important part on a waste disposal landfill site. These systems are generally constructed using compacted clayey soils. However, the compacted clayey soils deformate under varying atmospheric conditions, and their leachates increase. To solve this problem, it is essential to modify the clayey soils using additive materials. In this study, silica fume was added to clayey soils to obtain modified compacted clayey soils. In order to determine the effect of leachate on hydraulic conductivity and swelling pressure of silica fume-modified compacted clayey soil samples, leachate, containing Cu, Zn, Pb, Cd, Cr, and Fe metal ions, from municipal landfill area in Erzurum city (Turkey) was used in hydraulic conductivity and swelling pressure tests. From these tests, subjected to the neat water and leachate, it was seen that the samples of silica fume-modified compacted clayey soils had low hydraulic conductivity and swelling pressure as compared with raw clayey soil samples. The results show that silica fume decreases the effect of leachate on the hydraulic conductivity and swelling pressure. Consequently, it is concluded that silica fume material can be successfully used to reduce the effect of leachate on the hydraulic conductivity and swelling pressure in compacted clayey liner and cover systems.

#### Biography

Ekrem Kalkan has completed his PhD in 2003 from Ataturk University, Turkey. He continues to work as a Professor at Ataturk University, Oltu Earth Sciences Faculty, Geological Engineering Department in Erzurum in Turkey. He has published many papers in reputed journals.

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