

Effect of Gas Oil on Geotechnical Properties of Illite Soil

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Development of the oil industry has increased the possibility of oil spillage into the soil. Oil pollution not only has serious environmental damages, but also it can change the physical, chemical and mechanical properties of soils. Clayey soils have complex behavior in the presence of petroleum products. In order to better understand the complicated behavior of oil-contaminated clayey soils, different laboratory tests were conducted on gas oil-contaminated illite soil. The amounts of gas oil were between 0 to 20% by soil dry weight. In this study, standard compaction and one-dimensional consolidation tests were performed to evaluate the effect of gas oil on the compaction and consolidation properties of illite. Also, direct shear and unconfined compression tests were done to investigate the strength parameters of contaminated illite. In addition, scanning electron and atomic force microscopes were utilized to study the effect of gas oil on microscopic properties of illite. The results showed a decrease in maximum dry density and an increase in optimum fluid content and compressibility of illite in presence of gas oil. The cohesion, internal friction angle and unconfined compressive strength of the soil reduced when it was exposed to the organic fluid. The results revealed that gas oil has adverse impacts on the geotechnical behavior of illite.

Biography:

Hossein Safehian is an MSc graduate in the field of geotechnical engineering. His research interest is in the area of oil-contaminated soils. He has some publications in the mentioned area.