Thesis Title	A Study of Solidification of Oily Sludge
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Abstract

The objective of this research was to study the treatment of oily sludge by solidification method. The oily sludge used in this work is waste from distillation process in petroleum industries. It is hazardous waste since the components include oil and heavy metals that cannot be destroyed or altered by chemical or thermal methods, and must be converted into the most insoluble form preventing their leaching to the environment. In this work we study physical and chemical characteristics of oily sludge, the solidification processes of oily and deoily sludge, compressive strength of the mortar, oil and heavy metal leaching from the mortar and economic cost of solidification.

First, physical and chemical characteristics of oily sludge were determined as follows : 33.83 percent solid content, 35.61 percent moisture content, 30.56 percent oil content, pH of 6.8-7.2 and heavy metals content such as Zn of 9.27 ppm, Pb of 18.55 ppm, Cd of 0.20 ppm, Ni of 5.46 ppm, Cr of 21.20 ppm. A potential problem with solidification technology involves chemical interference with the hydration reactions of portland cement and pozzolan processes. Since oil affected the setting and the development characteristics of concrete so we had to extract oil from oily sludge by using hexane as extraction fluid. The result showed that deoily sludge has oil content 15.21 percent and the oil that extracted from oily sludge can be used as fuel. Second we studied the solidification of oily sludge and deoily sludge. Portland cement (P), fly ash (F), lime (L) and diatomaceous earth (D) were used as solidifying materials. The results showed that the compressive strength of PF, PFL, PLD and PFLD were higher than the minimum requirement of mortar for sanitary landfill. The leaching of oil and heavy metal from mortar

were lower than the EPA standard. Third, we studied the economic cost of solidification of oily sludge and deoily sludge. The result showed that the cost of solidification of sludge by using PFLD as solidifying materials was the lowest and those by using PLD, PF and PFLD was higher respectively. In comparison the cost of solidification of deoily sludge was higher than that of oily sludge due to the additional cost of hexane.

Keywords : Solidification / Oily Sludge / Deoily Sludge / Solidifying Materials / Compressive Strength / Leaching