Green Solvents on the Treatment of Oil Spill Contaminated Soil

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The problem of oil spills into the environment arises for several reasons, whether from natural disasters or human activities such as transportation accidents, terrorism in the oil storage tank, etc. However, oils are considered to be complex and diverse hydrocarbon compounds such as benzene, polycyclic aromatic hydrocarbons (PAHs), and these constituents are extremely detrimental to health and the environment. When contaminated within the soil, the area becomes unusable and may affect the food security of the household. Therefore, it is necessary to find methods for treating oil-contaminated soil so that the soil can be reused in a variety of ways. But there is one interesting way, take fast low power consumption, effective in high oil treatment, can be used with many groups of contaminants, and can bring the soil back to use. The method is called soil washing. It is a combination of physical and chemical processes by using solutions to separate contaminated substances from soil particles, although highly effective solutions have been used in the past for treating soil, many substances are harmful to health and the environment. Therefore, this research uses environmentally friendly solutions, namely tap water, 7 concentrations of synthetic seawater, and 5 concentrations of ethyl lactate as a green solvent that is biodegradable. Study the oil treatment efficiency of each solution. The oil content was analyzed with a gas chromatography flame ionized detector (GC-FID). From the result of the soil washing experiment's various solutions, it was found that 100% ethyl lactate solution had the highest oil treatment efficiency of more than 90% due to the properties that can be dissolved in oil well and 3.5% synthetic seawater has a treatment efficiency of more than 85%. This is thought to be due to the various salt ions present in the solution and affect the adhesion between the oil and soil particles, causing the oil to loosen. Based on these results, it is expected that in the future these solutions may be an alternative to the treatment of oil-contaminated soil in the event of an oil spill in various areas.

Keywords: Soil washing, Oil spill, Oil-contaminated soil