Bioremediation of petroleum hydrocarbon in contaminated soils: comparison of compost and WWTP sludge residual addition / Cut Nanda Sari and Lina Lubnah

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ABSTRACT
Crude oil's processing into energy continue to increase, hence treatment for its environmental impact is needed. The objectives of the study is to determine the differences in bacteria growth rate and removal efficiency of Total Petroleum Hydrocarbon (TPH) between compost and WWTP sludge addition at 5% and 10% concentration levels. Those effects were acknowledge through experiments in laboratory scale using oil contaminated 5,5% TPH within 5 weeks until it reach less than 1% as the requirement. The soil comes from Marunda Beach, compost from UPS Merdeka, WWTP sludge from Jababeka, and bacteria isolated from soil contaminated in the area surrounding refining. The treatment used in this experiment was landfirming with nutrition addition and the main variable analyzed was TPH and the microorganism population. Result of this study show that bacteria growth rate in compost and WWTP sludge at 5% and 10% concentration each are 0,7567/weeks and 1,154/week for compost and also 0,8783/week and 1,1109/week for WWTP sludge. The TPH removal efficiency obtained was95,32% and 96,85% for the addition of compost as well as 91,15% and 91,02% for the addition of WWTP sludge at 5% and 10% concentrations. Base on a t-Test, the differences between all the variation of concentrations are not significant. The correlation test between TPH degradation to bacteria growth showed that there is a week downward (negative) linear relationship.