UNIVERSITI TEKNOLOGI MARA

EFFECT OF LIPASE ADDITION IN OILY WATER CLEAN UP

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ABSTRACT

The marine environment is open to large sources of toxic organic waste in the form of accidental oil spills.Lipase as we know is class of enzymes that break down dietary fats into smaller molecules which is called fatty acids S.Thakur (2005).Thus In this experimental study, the main objective is to see the effects of lipase towards the oily water and to observe the time period during the effects of lipase and the degree of hydrolysis.The oil for this experiment that used was olive oil since olive oil easily to have high reaction compare with other oil that meet with required.The preparation of the lipase solution were done at different concentration which at 2.0, 2.5 and 3.0 mg/ml.After that, 0.05 M concentration of olive oil was prepared and mix with isooctane as solvent at 50 ml.The time period taken for the sample were at 2, 4 and 6 hours.Then using the titration method which to find the degree of hydrolysis by using 0.01 N of NaOH.The result show at the different concentration of lipase which were at 2, 2.5 and 3 mg/ml give a slightly difference value of the amount of NaOH used.This show the sample was more acidic.From the result at period of 2 hours from the concentration of 2.0 mg/ml, the amount of the NaOH used was 0.5 ml while for 2.5 and 3 mg/ml were 1.1ml and 1.3 ml respectively .The result for time period also prove to be the main criteria to maximize the activity of lipase where as at 2 mg/ml with the time period at 6 hours the value of hydrolysis higher which was 2.26% follow by at 3 and 2.5 mg/ml the value of hydrolysis were 2.11% and 1.78% respectively.From there, the increase of time period cause the degree of hydrolysis to increase. The overall results indicate that lipase could be a promising toward the method to overcome the oil contaminant in near future.

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INTRODUCTION

1.1   Research Background

Petroleum industrial well known for generates large volumes of oily waste water.The environmental been taken for the disposal of oily waste water is a new concern and problem to the petroleum industry.In the moment,the focused is on what the best to overcome the treatment of oily water.Furthermore,oil water treatment has growing towards a big concern, and it must be observed and resolved on all oil field and petroleum industry..Lipase was a known enzyme that can degrade oil but the possible to use on the oil that contain high hydrocarbon still developing.If proven,many lipase producing organisms(bacteria,fungi) can further be use to help degrading oil in the oily water.This study will look into addition of lipase in a free flow system.

Lipase is a category of hydrolased that catalyzed the hydrolysis of triglycerides to glycerol and free fatty acids over an oily water interface.The capability of the lipase to been apply and transform a specific chemical biotransformation has make them increasingly popular among research uses which further the focus in the food, detergent, cosmetic, and organic synthesis. Lipases have evolved as one of the leading biocatalysts with prove the potentially to overcome the oil containment that increasingly demand for the oil and gas industry to been use for the purpose of cure the oil spill. This show the result of the huge achievements made in the cloned and expression of enzymes from microorganisms and also had increased the demand for these biocatalysts with novel and specific characteristic such as specificity, pH value, stability, including the temperature .

Lipases create from the bio metric of the animals, plants, and microorganisms. Microbial lipases have gaining special industry attraction due to their ability that can give a selectively, stability, and broad substrate specificity. Thus,for this experiment we focus on the ability of lipase on handling the oily water that contain high hydrocarbon such as heavy oil and light oil.Furthermore , to observe the effect of it and does it can be used for the purpose of degradation in oil and gas industry.If the