

3937058 PHES/M : MAJOR : ENVIRONMENTAL SANITATION :

M.Sc. (ENVIRONMENTAL SANITATION)

KEY WORDS : ADSORPTION / ADSORBENT / EMULSION OIL / GAS STATION

WASTEWATER

SIRIPARN SAHAIRAKSA : COMPARISON OF EMULSION OIL REMOVAL EFFICIENCY IN GAS STATION WASTEWATER WITH DIFFERENT ADSORBENTS.

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The objectives of the study were to compare the removal efficiency of the emulsion oil in gas station wastewater by adsorbing with granular activated carbon (GAC), resin, and straw, and to determine the optimum adsorbing condition for the oily wastewater disposal in terms of types and heights of packing adsorbents. The tested column-adsorption system in the study was made from a glass tube with a diameter of 2.54 cm, a length of 75 cm and packed with GAC, resin, or straw at the packing heights of 30 and 45 cm. The continuous downflow wastewater from the column at the rate of 10 ml/min was tested. The observation of the influent and effluent from the column-adsorption system in terms of oil & grease was made and recorded. Data analysis of the emulsion oil removal efficiency was undertaken and analyzed by t-test, one-way Anova, and Least Significant Difference Test (L.S.D).

The results indicated that the mean percentage of oil removal efficiencies in the wastewater with the columns of GAC, straw, and resin averaged  $87.49 \pm 6.82$ ,  $79.35 \pm 10.23$ , and  $79.75 \pm 10.25$ , respectively. In addition, the greatest oil removal efficiency was observed when the GAC was used as the adsorbent. The mean percentage of oil removal efficiency when the heights of packing adsorbent in the column were 30 and 45 cm were  $76.64 \pm 10.19$  and  $87.75 \pm 5.48$ , respectively. The mean percentage of oil removal efficiency in the column with the packing height of 45 cm was significantly greater than that with 30 cm packing height. The study suggests that the optimum adsorbing condition for oily wastewater disposal is the use of GAC as adsorbent. In addition, the height of packing adsorbent of wastewater in the column system should be 45 cm.