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AKUAR BOONYASIRI: TREATMENT OF DISTILLERY SLOPS BY THERMOPHILIC UASB PROCESS. THESIS ADVISOR: DR. SUMETH CHAVADEJ,Ph.D. 130 pp.
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The purpose of this experimental study was to determine the optimum operating conditions for treating distillery waste in a thermophilic UASB system. The studied UASB reactor was made from stainless steel with 34.7 litre (working volume), 172 cm. in height and 15 cm. inside diameter, with a water jacket to maintain the reactor temperature at 55°C.. The studied waste was distillery slops containing of high contents of organic (113,280 mg.COD/1) and toxic substances (K^+=10,000mg./1, Na^+=5,000 mg./1 SO_4^{2-}=5,525 mg./1). From the experimental results, it was concluded that the optimum organic loadings were 5.2 and 7.1 kg.COD/$m.^3$d. for maximum COD removal and maximum biogas production, respectively. Under maximum organic loading of 10.1 kg.COD/$m.^3$d., the UASB system yielded 0.225 $m.^3$/kg.CODremoved, 0.099 $m.^3$/kg.CODapplied or 1.003 $m.^3/m.^3$d.. The biogas produced contained 39% carbon dioxide and 61% of methane and other gases. At this maximum COD loading, the studied system yielded a COD removal of 44%. By comparison with the full-scale UASB operated at 30°C., which had a maximum COD loading of 3-4 kg.COD/$m.^3$d., it could be concluded that the thermophilic UASB provided better treatment for distillery waste than the UASB system operated at ambient temperature.