SOMCHAI JEAMTEERASAKUL : PRODUCTION OF METHANE GAS FROM SOLID WASTES BY A TWO-STAGE ANAEROBIC PROCESS. THESIS ADVISOR : ASSISTANT PROFESSOR SUTHIRAK SUJARITTANONTA, Ed.D., ASSOCIATE PROFESSOR WEERAWAN PATTAMAPIRAT, 201 pp.

The objective of this study is to investigate the possibility of conversion of garbage to methane gas by a two-stage anaerobic digestion. Biogas product can be used as an energy source. The efficiency of the process is compared to the single-stage anaerobic digestion of garbage which was studied.

The results of the study at various hydraulic retention time of 3.49, 5.17, 11.39 and 15.91 days and the substrate concentration between 0.18 to 0.80 kg VS added/m^3-day indicated that the total value of gas yield expressed in litter of gas per gram of volatile solids added were between 0.052 to 0.228 and the composition of methane gas were between 58.98 to 66.91%. For hydraulic retention time of 8.47 days, the gas yield was optimum at 0.300 lCH4/gmVS added and also the composition of methane gas was also high.

It was found that the efficiency of the two-stage anaerobic digestion was higher than the single-stage anaerobic digestion process. The percentage of total COD removal were between 56.98 to 94.38 % and the total solid removal were between 86.67 to 97.79 %.