

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The hydrogen and methane production from cassava wastewater with added cassava residue by using a two stage upflow anaerobic sludge blanket (UASB) system was investigated under thermophilic temperature (55 °C). At a cassava residue concentration of 1,200 mg/l, the system gave the best hydrogen and methane production performance with a maximum SHPR of 130 ml H₂/g MLVSS and SMPR of 311 ml CH₄/g MLVSS d and also gave the highest hydrogen and methane yields of 15 ml H₂/g COD removed and 259 ml CH₄/g COD removed, respectively. In addition, 48 % COD removal in hydrogen bioreactor and 76 % COD removal in methane bioreactor were obtained. The thermophilic operation used in this work was found to be suitable for applying to convert lignocellulosic materials to hydrogen and methane production. The degradation performance of cellulose and hemicellulose were 42.1 % and 20.7 %, respectively for the hydrogen production step and 35.2 % and 17.8 %, respectively for the methane production step.

5.2 Recommendations

It is interesting to study two-stage UASB system operated at mesophilic temperature in order to compare to the results of the thermophilic operation. Moreover, the other types of bioreactor should be study for both hydrogen and methane production.