



CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The biohydrogen production from alcohol wastewater by using upflow anaerobic sludge blanket reactors (UASB) was investigated under mesophilic temperature (37°C) and pH 5.5. From the results, the maximum hydrogen production was achieved at a COD loading rate of 46 kg/m³d. At this condition, the highest hydrogen content (27%), hydrogen yield (125.1 ml H₂/g COD removed and 95.1 ml H₂/g COD applied), hydrogen production rate (18 l/d), specific hydrogen production rate (1080 ml H₂/g MLVSS d and 4,430 ml H₂/ L d), and COD removal (24%) were obtained. For methane production, the effluent from the hydrogen production step operated (at the optimum conditions) was fed into the UASB system without pH control and without recycling. In this step, the highest methane content (66.41%), methane yield (1,172.96 ml CH₄/g COD removed and 581.43 ml CH₄/g COD applied), methane production rate (20.37 l/d), specific methane production rate (1,720.32 ml CH₄/g MLVSS d and 5,091.91 ml CH₄/ L d), and COD removal (50.41%) were also obtained at a COD loading rate of 8.8 kg/m³d.

5.2 Recommendations

In many literatures have illustrated the simultaneous integration of acidogenic hydrogen production process with methanogenic process was feasibility. The adapted process parameter by simultaneous integration of acidogenic hydrogen production step and methanogenic step without using NaOH for pH control had also significant parameters to study for improving the efficiency of the simultaneous integration process.