



CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

This study investigated the effects of number of cycles per day (4 and 6 cycles per day), COD loading rate and nitrogen supplementation on the biohydrogen production from cassava wastewater using anaerobic sequencing batch reactors under the mesophilic temperature of 37°C and a controlled pH of 5.5. For any given COD loading rate, the system operated at 6 cycles per day showed higher process performance in terms of hydrogen production rate and yield than that operated at 4 cycles per day. The systems operated under the optimum conditions of a COD loading rate of 30 kg/m³d and 6 cycles per day gave the maximum specific hydrogen production rate and hydrogen yield of 388 ml H₂/g VSS d (3,800 ml H₂/L d) and 186 ml H₂/g COD removed, respectively. The effect of nitrogen supplementation was further investigated at the optimum COD loading rate of 30 kg/m³d and 6 cycles per day since the cassava wastewater is lack of nitrogen. The system was operated at a COD:N ratio of 100:2.2 (the theoretical ratio) was found to provide the maximum specific hydrogen production rate and hydrogen yield of 524 ml H₂/g VSS d (5,680 ml H₂/L d) and 438 ml H₂/g COD removed, respectively.

5.2 Recommendations

It would also be interesting to study the two-stage anaerobic fermentation for both biohydrogen and methane production from cassava wastewater in the ASBR system. Moreover, other kinds of organic wastewaters, i.e. sugar wastewater and paper wastewater, are interesting to be used as a carbon source.