Batch process for bio-hydrogen production on small scale bioreactor from palm oil mill effluent (POME)

*A. Fakhrul'l-razi, N. K. Nik Norfadilah and Razif M. Harun

Department of Chemical and Environmental Engineering, Universiti Putra Malaysia 43400 Serdang

**Corresponding author.Tel.:+603 8946304; email address: fakhrul@upm.edu.my*

In this study, treatment of palm oil mill effluent (POME) was carried out under anaerobic fermentation process to produce bio-hydrogen by micro flora. Experiment was investigated in 500mL bioreactor under mesophilic operation at and different pH values. Raw POME was collected from cooling pond which is final discharge of effluent from the mill and POME sludge was collected from the anaerobic pond of a POME treatment plant at Labu palm oil mill. The source of inoculum used was POME sludge as hydrogen producing bacteria. A batch reactor was set up producing hydrogen at an optimum parameter of pH 5.5 and 10% POME sludge (w/v) with a maximum hydrogen production yield of 5988.96 mL H2/ L-med. The maximum hydrogen percentage in the biogas was 36% obtained at pH 5.5. Throughout the study, there no methane gas was observed in the evolved gas mixture.

Keywords: Bio-hydrogen, POME sludge, raw POME, microflora