ABSTRACT

Hydrogen gas can be produced by anaerobic bacteria from carbohydrate-rich substrate into an organic acid, H_2 and CO_2 ***[4]****. Some environmental factor affecting production of biohidrogen in anaerobic digester are pH, temperature, HRT, and the partial pressure* ***[6]****. In this study, organic waste such as stale rice is used as a substrate to produce biohidrogen in anaerobic digester which has capacity of ± 11 liter and by conditioning the temperature and the internal pressure of the digester. With focus on the changes of internal pressure during the biohidrogen production and the control range of internal pressure to increase the production of hydrogen gas in an anaerobic digester.*

Based on this research: 1. The maximum pressure during the production of biohidrogen without control of temperature and pressure was 9 psi which reached at the 38th hour, by thermophilic control (55 °C) is 6 psi at the 58th hour, and 10.21 psi that achieved at the 38th hour for the production of biohidrogen by mesophilic control (35 °C). 2. The production of biohidrogen by mesophilic conditioning and the internal pressures, in the range of 0-2 / 3 (0-6 psi) resulted in total gas production of 8.4 liters more than the pressure control range of 0-1/3 (0-3 psi) , 10.39 liters more than the pressure control range of 0-3/3 (0-10 psi), and 19.05 liters more than the biohidrogen production with pressure control on the range of 0-0/3 (small as possible) of the maximum pressure of biohidrogen production on mesophilic conditioning.

Key Words: Biohydrogen, Pressure Control, Anaerob Digester.