Abstract

Biogas is one of alternative energy sources and fuel oil as a renewable energy that obtained from animal manure or waste by anaerobic processes. One of the potential waste for biogas production is the ethanol plant wastewater. In making biogas anaerobic process that occurs in the reactor were performed with volume of 5000 L.

The purpose of this research is to increase biogas production from ethanol plant wastewater (vinasse) greater than 0.37 m$^3$/kg COD removal by adjusting the COD influent concentration and circulation. With 4 days HRT, the COD influent concentration that being used is 4.000 mg/L, 4.500 mg/L, 5.000 mg/L and 6.000 mg/L. Feed neutralized by adding NaOH crystals. It also added urea to meet the nutritional needs metane producing bacteria with a ratio C: N = 1000:12,5. After the feed is inserted into the reactor, performed sirkulais 1:0,5 and 1:1 circulation.

For circulation performed on 1:1 variable biogas production increased by 10,3 % than the treatment of circulation 1: 0.5. From the research, the maximum biogas production was obtained at the concentration of 6000 mg/L that is equal to 0.38% m$^3$/kg COD removal with COD removal of 66%.

Keywords : Hydraulic Retention Time (HRT), Circulation, Anaerobic Bioreactor