DESIGN OF MONITORING SYSTEM ON PERFORMANCE OF THE ANAEROBIC DIGESTION SIMULATOR

Name : Ardi Guritno  
NRP : 2408 100 509  
Department : Engineering Physics Department  
Supervisor : Dr. Ir. Totok Soehartanto, DEA.

Abstract

Anaerobic digestion is a very effective reactor to process the organic waste substrate. Microorganism which is in anaerobic digestion is very sensitive on the change of waste concentration and environment temperature, because it can provoke the death of microorganism. That is why the monitoring system is needed to monitor the process variables, such as pH, waste concentration ($S_2$), environment temperature ($T_\infty$), and the biogas which is returned ($Q_{CH_4}$). However, the monitoring system of those variables will not inform whether the system is stable, and whether the production of biogas returned is optimize. For that reason, in this research, it will be designed the monitoring system of anaerobic digestion based on database. Database which will be used is static and dynamic database. From the dynamic database (comes from recording data of online simulation) will be found pairs of input-output data from static database (made by offline simulation) using inference engine as data execution medium. Those pairs of data are such information of bicarbonate and dilution increasing so that the system becomes optimize and the information of the pH data which will express whether the system is stable. Validation was done by changing the input of substrate and temperature to get the information of bicarbonate and dilution adding from the static database in order to optimize the $CH_4$. The result of it shows that the $CH_4$ gained become more optimal. This monitoring system is very influenced by the number of the data recorder on the dynamic database.

Keyword : anaerobic digestion, database monitoring, inference engine