

Nittaya Sukaram 2011: The Influence of Dewatering Wastewater Treatment Sludge from Pulp and Paper Mill Industry on Biogas Produced from Anaerobic Composting Process. Master of Engineering (Environmental Engineering), Major Field: Environmental Engineering, Department of Environmental Engineering.
Thesis Advisor: Mr. Suchat Leungprasert, Ph.D. 120 pages.

The dewatering sludge produced from the wastewater treatment system of pulp and paper industry was approximately 10 tons per day. This sludge is usually discarded in spite of its components contain high amount of organic substance that can be decomposed and reused. However, to reuse the sludge as the energy, the appropriate procedures are required. This study aimed to determine the effects of sludge before and after dewatering on the biogas production as well as to determine the suitable operational parameters of the system. In this research, the characteristics of both types of sludge were analyzed. The sludge was then mixed with the sawdust to obtain the desirable condition for the system. The C:N ratio was 30:1 whereas the humidity was controlled at 50-60%. The sludge was left under the anaerobic condition for 90 days.

The results showed that the sludge before dewatering produced biogas more than sludge after dewatering. The biogas produced was 4.46 L/kg TVS-d with the concentration of methane approximately 46.39%. The sludge after dewatering produced biogas about 0.02 L/kg TVS-d with the concentration of methane to be 40.69%. The evaluation of leachate from the anaerobic process indicated that the volatile fatty acid of sludge before dewatering was 2,604 mg/l and pH of 6.86 while the volatile fatty acid of sludge after dewatering was 2,028.54 mg/l and pH of 6.84. In conclusion, the sludge after dewatering affects the biogas production. This result may occur due to chemical added to the sludge in the process of dewatering. However, there is no evident related to support it.

Student's signature

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