Hubungan antara karakteristik slurry dengan produksi biogas dalam digester anaerobik menggunakan substrat sampah makanan dan co substrat starter limbah ikan = Relationship between characteristics of slurry and biogas production in anaerobic digester using substrate of food waste and co substrate starter of fish waste / Himawan Novianto

Himawan Novianto, author

Abstrak

ABSTRAK
Penelitian ini membahas mengenai pemanfaatan limbah sebagai bahan uji dalam digester anaerobik. Percobaan dilakukan dengan pengujian di laboratorium, meliputi karakteristik awal substrat (Feedstock), seperti rasio C/N, konsentrasi Total Solids (TS) dan Volatile Solids (VS), serta pH dan suhu. Penelitian dilakukan sebanyak tiga kali secara batch. Karakteristik slurry yang ditinjau meliputi pH, suhu, konsentrasi TS dan VS, dan efisiensi Volatile Solids Destruction (VSD). Konsentrasi awal VS/TS substrat dari digester A dan B (komposisi substrat sampah makanan : limbah ikan masing-masing 70 : 30 dan 50 : 50) dalam percobaan ketiga masing-masing adalah sebesar 57.720/62.500 dan 52.140/59.100 mg/L. Efisiensi VSD hari ke-32 dari digester A dan B dalam percobaan ketiga masing-masing sebesar 29,23 dan 39,01%. Korelasi antara efisiensi VSD terhadap laju produksi biogas kumulatif dari digester A dan B dalam percobaan ketiga didapatkan korelasi positif masing-masing sebesar 0,814 dan 0,962. Hasil perhitungan dengan pendekatan model first order reaction menunjukkan konstanta (k) kecepatan degradasi substrat VS dalam percobaan ketiga dari digester A adalah 0,0078/hari dan digester B adalah 0,0209/hari.
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ABSTRACT
This experimental research discusses the utilization of waste as substrate in anaerobic digesters. Research methods were conducted by laboratory testing, included baseline characteristics of the substrate (Feedstock), such as C/N ratio, Total Solids (TS) and Volatile Solids (VS) concentration, as well as pH and temperature. The research was conducted three times in a batch. The characteristics of slurry that were reviewed included pH, temperature, TS and VS concentration, and Volatile Solids Destruction (VSD) efficiency. Initial VS/TS concentration of substrate of the digester A and B (substrate compositions of food waste : fish waste were 70 : 30 and 50 : 50, respectively) in the third trial, respectively, were 57,720/62,500 and 52,140/59,100 mg/L. VSD efficiency on the 32nd day of the digester A and B in the third trial were 29.23 and 39.01%, respectively. The correlation between VSD efficiency and cumulative biogas production rate of the digester A and B in the third trial found a positive correlation, respectively, were 0.814 and 0.962. The calculation results with the first order reaction model approach showed the VS substrate degradation rate constant (k) in the third trial of the digester A was 0.0078/day and digester B was 0.0209/day.