

ANALISIS PARAMETER SUHU, KADAR AIR, RASIO C/N, DAN SELULOSA AKIBAT VARIASI DEBIT UDARA PADA PROSES *BIODRYING* SAMPAH PERKOTAAN DENGAN PENAMBAHAN MIKROORGANISME *BIODRIED*

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Abstrak

Sampah di Indonesia didominasi oleh sampah yang memiliki kadar air tinggi. Dampak negatif sampah tersebut berpotensi mengganggu lingkungan sekitar dan harus segera ditangani dengan teknologi yang tepat. Salah satu solusi untuk menangani sampah berkadar air tinggi adalah biodrying. Biodrying merupakan teknik pengeringan yang bergantung pada aktivitas biologis mikroorganisme. Biodrying bertujuan untuk mengurangi kadar air sampah dengan bantuan aerasi. Sehingga dilakukan penelitian mengenai pengaruh variasi debit udara (0 l/m, 2 l/m, 4 l/m, 6 l/m) terhadap suhu, kadar air, rasio C/N dan selulosa. Penelitian ini dilaksanakan selama 30 hari menggunakan sampah perkotaan berupa daun, plastik, kertas, sisa makanan, dan ditambahkan mikroorganisme biodried. Penambahan mikroorganisme biodried dapat meningkatkan degradasi selulosa dan tingkat penurunan kadar air lebih besar. Dampak dari degradasi selulosa diharapkan mampu menyumbang energi selama proses biodrying, sehingga tujuan utama dari biodrying dapat tercapai. Berdasarkan hasil penelitian, peningkatan debit udara tidak sebanding dengan efisiensi biodrying. Semakin besar debit udara tidak menjamin efisiensi biodrying, sedangkan semakin kecil debit belum tentu baik dalam proses biodrying. Debit optimal yang dicapai pada penelitian ini sebesar 4 liter/menit yang mampu menurunkan kadar air sebesar 58,29%, penurunan rasio C/N sebesar 1,07%, penurunan kadar selulosa sebesar 49,34% dengan suhu yang dapat dicapai sebesar 41 °C.

Keywords: Biodrying, debit udara, kadar air, rasio C/N, selulosa

Abstract

[Analysis of Temperature, Water Content, C/N Ratio and Cellulose Due To Air Flowrate Variation on Biodrying Municipal Solid Waste With Addition Biodried Material]. In Indonesia, solid waste is dominated by high moisture. The negative impact of wet solid waste potentially pollute the environment and must be handled with the right solution. One of solutions for wet solid waste is biodrying. Biodrying is drying technique that relies on the biological microorganism. Biodrying aims to reduce moisture content of wet solid waste achieved by microbial activity coupled with enhanced aeration. This research focused on the effect of air flow rate (0 l/m, 2 l/m, 4 l/m, 6 l/m) to temperature, water content, C/N ratio and cellulose were conducted. This research hold for 30 days using leaf litter, plastic, paper, kitchen waste and biodried-material was added. The addition of biodried material can increase cellulose degradation and decrease level of moisture content. The impact of cellulose degradation is expected to contribute energy during the biodrying process, so the main goal of biodrying can be achieved. Based on the research results, the increase of air flow rate was not linearly proportional to biodrying efficiency. The higher air flowrate does not guarantee the efficiency biodrying, while the smaller air flowrate is not necessarily good in the biodrying process. The optimum of air flowrate in this study is 4 liter/minute with decreasing of moisture content level 58,29%, decreasing of the ratio C/N 1,07%, decreasing of the cellulose level 49,34% with temperatures that can be achieved at 41 °C.

Keywords: Biodrying, air flowrate, temperature, moisture content, C/N ratio, cellulose