KARAKTERISTIK BRIKET ARANG LIMBAH POTONGAN ROTAN DENGAN TEKANAN KEMPA DAN UKURAN PARTIKEL YANG BERBEDA

Elmara Nugra Ristia[1], Johanes Pramana Gentur Sutapa[2]

INTISARI

Produksi furniture rotan menghasilkan potensi limbah sebanyak 38% dari jumlah bahan baku yang digunakan. Penelitian ini menggunakan limbah potongan rotan yang berasal dari CV. Dua Putra Mandiri Cirebon, Jawa Barat. Model rancangan penelitian ini menggunakan Pola Acak Lengkap (*Completely Randomized Design*) dengan 2 faktor pengujian, yaitu tekanan kempa (1.500 psi, 2.000 psi, dan 2.500 psi) dan ukuran partikel (lolos 10 *mesh*, tertahan 20 *mesh*; lolos 20 *mesh*, tertahan 40 *mesh*; dan lolos 40 *mesh*, tertahan 60 *mesh*). Proses karbonisasi limbah potongan rotan menggunakan *retort* listrik dengan suhu 400°C selama 3 jam. Briket arang dibuat dengan kempa hidrolik selama 15 menit dan dikeringkan selama 10 hari. Evaluasi kualitas briket dilakukan dengan mengukur kadar air, kadar abu, kadar zat mudah menguap, berat jenis, kadar karbon terikat, dan nilai kalor.

Berdasarkan hasil penelitian ini nilai kalor limbah potongan rotan berkisar antara 3.888 kal/g - 3.983 kal/g dan rendemen arang limbah potongan rotan sebesar 28,67%. Kombinasi faktor tekanan kempa & ukuran partikel saling berinteraksi, serta hasil pengujian parameter yang telah dilakukan yaitu sebagai berikut: kadar abu berkisar antara 5,66% - 7,93%, kadar zat mudah menguap berkisar antara 21,92% - 26,61%, kadar karbon terikat berkisar antara 66,34% - 72,33%, kadar air berkisar antara 8,20% - 13,66%, berat jenis berkisar antara 0,63 - 0,71, dan nilai kalor berkisar antara 5.998,33 kal/g - 6.377,33 kal/g. Hasil briket arang limbah potongan rotan terbaik berdasarkan sifat fisika terbaik yaitu kombinasi tekanan kempa 2.000 psi dan ukuran partikel lolos 40 *mesh* tertahan 60 *mesh* dengan hasil kadar air (8,40%), berat jenis (0,64), dan nilai kalor (6.377 kal/g). Hasil pengujian briket arang limbah potongan rotan telah memenuhi standar dari berbagai negara, yaitu SNI, standar dari Inggris, Jepang, dan Amerika.

Kata Kunci: Briket arang 1, Limbah potongan rotan 2, Potensi 3, Sifat fisika 4, Sifat kimia 5

[1] Mahasiswa Fakultas Kehutanan UGM
[2] Staff Pengajar Fakultas Kehutanan UGM

CHARCOAL BRIQUETTE CHARACTERISTICS OF RATTAN PIECES WASTE WITH DIFFERENT PRESSURE AND PARTICLE SIZE

Elmara Nugra Ristia[3], Johanes Pramana Gentur Sutapa[4]

ABSTRACT

Rattan furniture production provide abundant of waste 38% of the amount of raw material. The research material in form of rattan pieces waste sourced by CV. Dua Putra Mandiri, Cirebon, West Java. This research design model used was *Completely Randomized Design* with 2 test factors, namely compression pressure (1,500 psi, 2,000 psi, and 2,500 psi) and particle size (passing 10 *mesh*, retained 20 *mesh*; passed 20 *mesh*, retained 40 *mesh*; and passed 40 *mesh*, retained 60 *mesh*). The carbonization process of rattan pieces waste used an electric *retort* at a temperature of 400°C for 3 hours. Charcoal briquettes were made using a hydraulic press for 15 minutes and dried for 10 days. Quality evaluation was done by measuring the moisture content, ash content, volatile matter content, specific gravity, carbon content, calorific value.

Based on the results of this research, the calorific value of rattan waste ranged from 3,888 cal/g to 3,983 cal/g, and the charcoal yield from rattan waste was 28.67%. The combination of compression pressure and particle size factors interacted with each other. The results of the parameter tests conducted are as follows: ash content ranged from 5.66% to 7.93%, volatile matter content ranged from 21.92% to 26.61%, fixed carbon content ranged from 66.34% to 72.33%, moisture content ranged from 8.20% to 13.66%, specific gravity ranged from 0.63 to 0.71, and calorific value ranged from 5,998.33 cal/g to 6,377.33 cal/g. The best results of charcoal briquettes from rattan pieces waste based on the best physical properties are achieved with a combination of a compression pressure of 2,000 psi and particle size passing 40 *mesh* and retained on 60 *mesh* are moisture content (8.40%), specific gravity (0.64), and calorific value (6,377 cal/g). The quality parameters of the briquettes of rattan pieces waste produced followed standards such as SNI, British, Japanese, and American.

Keywords: *Charcoal briquettes 1, Rattan pieces waste 2, Potential 3, Physical properties 4, Chemical properties 5*

[3] Student of Faculty of Forestry UGM
[4] Lecturer of Faculty of Forestry UGM