

**PENGARUH SUHU KARBONISASI DAN TEKANAN KEMPA
TERHADAP SIFAT FISIKA KIMIA BRIKET ARANG LIMBAH UJUNG
BAMBU PETUNG (*Dendrocalamus asper* (Schultes f.) Backer ex Heyne)**

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INTISARI

Kabupaten Sleman Daerah Istimewa Yogyakarta memiliki tanaman bambu seluas 525 hektar ekuivalen 125.000 rumpun, produksi mencapai 800.000-850.000 batang per tahun. Pemanfaatan bambu petung oleh masyarakat setempat memberikan dampak berupa limbah yang dihasilkan dari kegiatan penebangan bambu untuk industri kerajinan bambu, mebel, maupun konstruksi. Limbah bambu petung yang belum dimanfaatkan secara optimal antara lain ujung bambu petung dari diameter (≤ 8 cm) sampai diameter atas terkecil. Penelitian ini bertujuan untuk memanfaatkan ujung bambu petung menjadi briket arang sebagai alternatif energi terbarukan.

Penelitian ini menggunakan rancangan acak lengkap (*Completely Randomized Design*) dengan dua faktor perlakuan yaitu suhu karbonisasi (300°C, 400°C, dan 500°C) dan tekanan kempa (2000 psi, 2500 psi, dan 3000 psi) dengan masing-masing 3 ulangan. Proses pembuatan briket arang dilakukan dengan cara mencampurkan serbuk arang di masing-masing suhu dengan perekat (dibuat dengan perbandingan (pati:air = 1:16) sebanyak 5% dari 27 g serbuk arang, kemudian campuran serbuk arang dan perekat dicetak menggunakan kempa hidrolik dan dikeringkan. Briket arang yang dihasilkan diuji kualitasnya dengan parameter sifat fisika (kadar air, berat jenis, dan nilai kalor) dan sifat kimia (kadar abu, kadar zat mudah menguap, dan kadar karbon terikat)

Hasil penelitian kualitas briket arang yang dihasilkan memiliki sifat-sifat sebagai berikut: kadar air 4,814%-5,515%; berat jenis 0,817-0,958, nilai kalor 5698,035 kal/g-6908,170 kal/g, kadar zat mudah menguap 27,304%-49,870%, kadar abu 12,210%-18,990%, dan kadar karbon terikat 36,793%-53,864%. Briket arang dengan kualitas terbaik diperoleh dari kombinasi perlakuan suhu karbonisasi 500°C dan tekanan kempa 2000 psi dengan nilai kadar air 5,262%, berat jenis 0,817, nilai kalor 6908,170 kal/g, kadar abu 18,832%, kadar zat mudah menguap 27,304%, dan kadar karbon terikat 53,864%. Dari hasil pengujian briket arang yang dihasilkan telah memenuhi standar Indonesia, Inggris, Jepang, dan Amerika untuk parameter kadar air, berat jenis, dan nilai kalor.

Kata kunci: briket arang, bambu petung, limbah, suhu, tekanan kempa

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**THE EFFECT OF CARBONIZATION TEMPERATURE AND
COMPACTING PRESSURE ON PHYSICAL CHEMICAL PROPERTIES
CHARCOAL BRIQUETTES FROM BAMBOO SHOOTS WASTE OF
PETUNG (*Dendrocalamus asper* (Schultes f.) Backer ex Heyne)**

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ABSTRACT

Sleman Regency, Special Region of Yogyakarta has 525 hectares of bamboo plants equivalent to 125,000 clumps, production reaches 800,000-850,000 stems per year. The use of petung bamboo by the local community has an impact in the form of waste generated from bamboo logging activities for the bamboo craft industry, furniture, and construction. Petung bamboo waste that has not been used optimally includes the tip of petung bamboo from diameter (≤ 8 cm) to the smallest top diameter. This study aims to utilize the tip of petung bamboo into charcoal briquettes as an alternative renewable energy.

This study used a completely randomized design with two treatment factors, namely carbonization temperature (300°C, 400°C, and 500°C) and compacting pressure (2000 psi, 2500 psi, and 3000 psi) with 3 replications each. The process of making charcoal briquettes is done by mixing charcoal powder at each temperature with an adhesive (made with a ratio of (starch:water = 1:16) as much as 5% of 27 g of charcoal powder, then the mixture of charcoal powder and adhesive is printed using hydraulic compacting and charcoal briquettes produced are tested for quality with parameters of physical properties (moisture content, specific gravity, and calorific value) and chemical properties (ash content, volatile matter content, and fixed carbon content)

The results of the research on the quality of the charcoal briquettes produced had the following properties: moisture content 4.814%-5.515%; specific gravity 0.817-0.958, calorific value 5698.035 cal/g-6908.170 cal/g, volatile matter content 27.304%-49.870%, ash content 12.210%-18.990%, and fixed carbon content 36.793%-53.864%. Charcoal briquettes with the best quality were obtained from a combination of carbonization temperature 500°C and compacting pressure 2000 psi with a moisture content value of 5.262%, specific gravity 0.817, calorific value 6908.170 cal/g, ash content 18.832%, volatile matter content 27.304%, and fixed carbon content of 53.864%. From the test results, the charcoal briquettes produced have met Indonesian, British, Japanese and American standards for parameters of moisture content, specific gravity, and calorific value.

Key words: charcoal briquette, petung bamboo, waste, temperature, compacting pressure

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