

**PENGARUH VARIASI KOMPOSISI BAHAN DAN JUMLAH PEREKAT TERHADAP KUALITAS BRIKET ARANG CAMPURAN LIMBAH PELEPAH SALAK (*Salacca edulis*) DAN TEMPURUNG KELAPA (*Cocos nucifera*)**

Oleh :

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**Abstrak**

Penelitian ini bertujuan untuk memanfaatkan limbah pelepah salak (*Salacca edulis*) dan tempurung kelapa (*Cocos nucifera*) menjadi salah satu sumber energi alternatif berupa briket arang. Penelitian ini mencoba mengetahui pengaruh komposisi bahan dan jumlah perekat terhadap sifat fisika briket arang (kadar air, berat jenis, nilai kalor) dan sifat kimia briket arang (kadar zat mudah menguap, kadar abu, dan kadar karbon terikat).

Bahan penelitian limbah pelepah salak didapat dari kebun salak di Kecamatan Turi, Kabupaten Sleman sedangkan limbah tempurung kelapa diperoleh dari industri pengolahan buah kelapa di Kecamatan Kalasan, Kabupaten Sleman. Proses karbonisasi pelepah salak dan tempurung kelapa dengan kadar air  $\pm 12\%$  menggunakan retort listrik dengan suhu  $400^{\circ}\text{C}$  selama tiga jam. Penelitian ini menggunakan rancangan acak lengkap (*Completely Randomized Design*) dengan dua faktor perlakuan yaitu komposisi bahan pelepah salak : tempurung kelapa (80% : 20%; 70% : 30%; dan 60% : 40%) dan jumlah perekat pembuatan briket arang (4%, 6%, dan 8%) dengan masing-masing perlakuan lima kali ulangan. 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 menunjukkan briket arang yang dihasilkan memiliki parameter kualitas sebagai berikut : kadar air 8,11% – 14,02%; berat jenis 0,76 – 0,84; nilai kalor 6.215,39 kal/g - 6.569,39 kal/g; kadar abu 9,17% - 13,00%; kadar zat mudah menguap 23,53% - 32,78%; dan kadar karbon terikat 42,09% - 56,22%. Briket arang terbaik diperoleh dari kombinasi komposisi bahan perbandingan pelepah salak : tempurung kelapa 60% : 40% dan jumlah perekat 4% yang menghasilkan briket arang dengan spesifikasi sebagai berikut : kadar air 8,11%; berat jenis 0,83; nilai kalor 6.569,84 kal/g; kadar abu 9,17%; kadar zat mudah menguap 26,93%; dan kadar karbon terikat 55,78%. Briket arang yang dihasilkan telah memenuhi sebagian parameter standar Jepang, Amerika, dan Indonesia.

**Kata kunci** : salak, kelapa, briket arang, sifat fisika, sifat kimia

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## THE EFFECT OF MATERIALS COMPOSITION AND ADHESIVE AMOUNTS ON CHARACTERISTICS OF CHARCOAL BRIQUETTE FROM SALACCA FROND (*Salacca edulis*) AND COCONUT SHELL (*Cocos nucifera*)

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### Abstract

The main purpose of this research is to utilize salacca frond (*Salacca edulis*) and coconut shell (*Cocos nucifera*) to be one of renewable energy in the form of charcoal briquette. This research try to investigate the effect of materials composition and adhesive amounts on physical characteristics (moisture content, specific gravity, heating value) and chemical characteristics (volatile matter, ash content, and carbon fixed).

Research material are Salacca frond was taken from Turi, Sleman and coconut shell was taken from coconut industry in Kalasan, Sleman. The carbonisation process (moisture content  $\pm 12\%$ ) was done by using an electrical retort at  $400^{\circ}\text{C}$  temperature for three hours. This study used a completely randomized design with two factors: materials composition of salacca frond and coconut shell (80% : 20%; 70% : 30%; 60% : 40%); and adhesive amounts on briquette making process (4%; 6%; 8%) with five replications for each treatment. The quality of charcoal briquettes produced was evaluated by physical properties (moisture content, specific gravity, and heating value) and chemical properties (ash content, volatile matters content, and fixed carbon content).

The results showed that charcoal briquettes made from the mix of salacca frond and coconut shell: 8.11 – 14.02% of moisture content; 0.76 – 0.84 of specific gravity; 6,215.39 – 6,569.39 cal/g of heating value; 9.17 – 13.00% of ash content; 223.53 – 32.78% of volatile matters content; and 42.09 – 56.22% of fixed carbon content. The best charcoal briquette was obtained from the combination of materials composition salacca frond : coconut shell (60% : 40%) and 4% of adhesive amounts. The best results were: 8.11% of moisture content; 0.83 of specific gravity; 6,569.39 cal/g of heating value; 9.17% of ash content; 26.93% of volatile matters content; and 55.78% of fixed carbon content. The charcoal briquettes produced meet some parameters of Japan, United States, and Indonesian standards.

**Keywords** : salacca, coconut, charcoal briquette, physical properties, chemical properties

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