

**PENGARUH PERIODE WAKTU KARBONISASI DAN JUMLAH
PEREKAT PATI TERHADAP SIFAT BRIKET ARANG DARI LIMBAH
SERBUK GERGAJI KAYU MERBAU (*Intsia bijuga*)**

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INTISARI

Limbah dari industri penggergajian berupa serbuk gergaji kayu merbau belum dimanfaatkan secara optimal. Jumlah limbah serbuk gergaji kayu merbau semakin meningkat seiring dengan tingginya permintaan terhadap kayu merbau. Penelitian ini bertujuan untuk mengolah dan memanfaatkan limbah serbuk gergaji kayu merbau menjadi salah satu energi terbarukan berupa briket arang.

Limbah serbuk gergaji kayu merbau (*Intsia bijuga*) didapat dari CV Indojadi Semarang, Jawa Tengah. Penelitian ini menggunakan rancangan acak lengkap (*Completely Randomized Sampling*) dengan dua faktor perlakuan yaitu lama waktu karbonisasi (2 jam, 3 jam, dan 4 jam) dan jumlah perekat (4%, 6%, dan 8%) dengan masing-masing lima kali ulangan. Proses karbonisasi limbah serbuk gergaji kayu merbau dilakukan menggunakan *retort* dengan suhu 400°C kemudian pembuatan briket arang dilakukan menggunakan kempa dingin dengan tekanan 3000 psi selama 15 menit dan dikeringkan. Briket arang yang dihasilkan diuji kualitasnya dengan parameter sifat fisik (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 sifat-sifat sebagai berikut: kadar air 5,129%-6,857%; berat jenis 0,717-1,066; nilai kalor 6.240,979 kal/g-6.629,286 kal/g; kadar abu 1,130%-1,843%; kadar zat mudah menguap 36,617%-44,807%; dan kadar karbon terikat 48,895%-56,428%. Briket arang dengan kualitas terbaik didapatkan pada kombinasi waktu karbonisasi 4 jam dan jumlah perekat 4% yang menghasilkan spesifikasi: kadar air 5,129%; berat jenis 0,738; nilai kalor 6.629,286 kal/g; kadar abu 1,826%; kadar zat mudah menguap 36,617%; dan kadar karbon terikat sebesar 56,428%. Hasil pengujian menunjukkan briket arang yang dihasilkan telah memenuhi standar SNI, Jepang, dan Amerika.

Kata kunci: limbah kayu merbau, briket arang, sifat fisika, sifat kimia

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THE EFFECT OF CARBONIZATION TIME PERIOD AND AMOUNT OF STARCH ADHESIVE ON CHARCOAL BRIQUETTE PROPERTIES FROM SAWDUST WASTE OF MERBAU WOOD (*Intsia bijuga*)

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ABSTRACT

Sawdust of merbau wood waste which was resulted as by product of sawmilling process was not used optimally. The amount of merbau sawdust waste is increasing along with the high demand for merbau wood. This study aims to process and utilize merbau sawdust waste into renewable energy in the form of charcoal briquettes.

Merbau (*Intsia bijuga*) sawdust was obtained from CV Indojati Semarang, Central Java. This study used a completely randomized sampling design with two treatment factors, namely the length of carbonization time (2 hours, 3 hours, and 4 hours) and the amount of adhesive (4%, 6%, and 8%) with five repetitions on each treatment. The carbonization process of merbau sawdust was carried out using a *retort* with a temperature of 400°C then charcoal briquettes were made using cold pressing with a pressure of 3000 psi for 15 minutes and dried off. Charcoal briquettes produced were tested for its quality with physical parameters (moisture content, specific gravity, and calorific value) and chemical properties (ash content, volatile matter content, and bound carbon content).

The results showed that the charcoal briquettes produced had the following properties: moisture content 5.129%-6.857%; specific gravity 0.717-1.066; heating value 6,240.979 cal/g-6,629.286 cal/g; ash content 1.130%-1.843%; volatile matter content 36.617%-44.807%; and fixed carbon content is 48.895%-56.428%. Charcoal briquettes with the best quality were obtained at a combination of 4 hours carbonization time and 4% adhesive amount which resulted in the following specifications: moisture content 5.129%; specific gravity 0.738; heating value 6,629,286 cal/g; ash content 1.826%; volatile matter content 36.617%; and fixed carbon content is 56.428%. The test results show that the charcoal briquettes produced have met SNI, Japanese, and American standards.

Keywords: merbau waste, charcoal briquettes, physical properties, chemical properties

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