

PENGARUH SUHU DAN WAKTU AKTIVASI TERHADAP KUALITAS ARANG AKTIF KAYU GUBAL JATI CEPAT TUMBUH (*Tectona grandis* Linn. f.)

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INTISARI

Arang aktif merupakan salah satu diversifikasi produk yang berasal dari hasil hutan kayu, arang aktif dapat dibuat dari semua bahan organik atau anorganik yang mengandung karbon. Dalam skala industri arang aktif dibutuhkan sebagai adsorben, pemisah cairan dan gas serta bahan pendukung katalis. Oleh karena peningkatan kebutuhan arang aktif dibutuhkan alternatif bahan baku. Kayu gubal jati cepat tumbuh yang dianggap memiliki kualitas kurang baik dibandingkan kayu terasnya dipilih untuk dijadikan bahan baku arang aktif.

Penelitian ini menggunakan metode rancangan acak dengan faktor suhu aktivasi (750, 850, dan 950°C) dan faktor waktu aktivasi (30,60, dan 90 menit) dengan 3 kali pengulangan pada tiap faktor. Sebelum dilakukan aktivasi termal menggunakan *furnace*, bahan baku kayu gubal jati cepat tumbuh diubah menjadi arang dengan proses karbonisasi pada suhu 500°C selama 4 jam menggunakan *retort*. Pengujian kualitas arang aktif pada penelitian ini dibandingkan dengan SNI 06-3730-1995 meliputi beberapa parameter seperti rendemen, kadar air, kadar zat mudah menguap, kadar abu, kadar karbon terikat, daya serap terhadap benzena, iodium, dan metilen biru.

Hasil penelitian menunjukkan arang aktif terbaik dengan perlakuan suhu aktivasi 850°C dan lama aktivasi 90 menit dengan rendemen sebesar 75,18%; kadar air 1,22%; kadar zat mudah menguap 10,32%; kadar abu 5,49%, kadar karbon terikat 84,19%; daya serap terhadap benzena 8,57%; iodium 946,51 mg/g; dan metilen biru 90,92 mg/g. Dibandingkan dengan SNI 06-3730-1995 arang aktif kayu gubal jati cepat tumbuh memenuhi standar pada parameter rendemen, kadar air, kadar zat mudah menguap, kadar abu, kadar karbon terikat, dan daya serap terhadap iodium

Kata kunci: arang aktif, kayu gubal, aktivasi termal

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EFFECT OF ACTIVATION TEMPERATURE AND DURATION ON THE QUALITY OF ACTIVATED CHARCOAL FROM FAST GROWING TEAK SAPWOOD (*Tectona grandis* Linn. f.)

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ABSTRACT

Activated charcoal is one of the diversified products derived from wood forest products, activated charcoal can be made from all organic or inorganic materials containing carbon. On an industrial scale activated charcoal is needed as an adsorbent, a separator of liquids and gases, and catalyst support materials. Due to the increasing need for activated charcoal, alternative raw materials are needed. Fast growing teak sapwood which is considered to be of poor quality compared to its heartwood was chosen to be used as raw material for activated charcoal.

This study used a Completely Randomized Design method with activation temperature factors (750, 850, and 950°C) and activation time factors (30, 60, and 90 minutes) with 3 repetitions on each factor. Before thermal activation using a furnace, the raw material for fast growing teak sapwood is converted into charcoal by carbonization process at a temperature of 500°C for 4 hours using a retort. Quality testing of activated charcoal compared with SNI 06-3730-1995 includes several parameters such as yield, moisture content, volatile matter, ash content, fixed carbon content, absorption of benzene, iodine, and methylene blue.

The results showed that the best treatment was obtained on samples with an activation temperature of 850°C and an activation duration of 90 minutes with a yield of 75.18%; moisture content 1.22%; volatile matter 10.32%; ash content 5.49%, fixed carbon content 84.19%; absorption to benzene 8.57%; iodine 946.51 mg/g; and methylene blue 90.92 mg/g. Compared to SNI 06-3730-1995, activated charcoal of fast growing teak sapwood meets the standards on the parameters of yield, moisture content, volatile substance content, ash content, fixed carbon content, and absorption of iodine

Keywords: activated charcoal, sapwood, thermal activation

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