PENGARUH SUHU DAN LAMA WAKTU AKTIVASI SECARA FISIKA TERHADAP KUALITAS ARANG AKTIF LIMBAH SERBUK GERGAJIAN BAMBU PETUNG (*Dendrocalamus asper)*

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INTISARI

Bambu petung merupakan salah satu jenis bambu yang banyak dibudidayakan di Sleman, Yogyakarta. Bambu petung di Sleman dimanfaatkan sebagai bahan konstruksi ringan, mebel, dan kerajinan. Pada proses pengolahannya kurang lebih menyisakan 20% limbah dalam bentuk serbuk, potongan ujung bambu, dan sebagainya. Untuk meningkatkan nilai ekonomi limbah bambu petung tersebut, salah satu pemanfaatannya dengan mengolahnya menjadi arang aktif. Tujuan penelitian ini adalah untuk mengetahui pengaruh suhu dan lama waktu aktivasi terhadap kualitas arang aktif limbah serbuk gergaji bambu petung.

Bahan baku penelitian yang digunakan merupakan limbah serbuk gergaji bambu petung. Limbah serbuk gergaji bambu petung diarangkan menggunakan *retort* pada suhu karbonisasi 400℃ selama 60 menit. Penelitian ini menggunakan metode rancangan acak lengkap (*Completely Randomized Design*) dengan faktor uji berupa suhu aktivasi (600 dan 700℃) dan lama waktu aktivasi (60, 90, dan 120 menit) dengan tiga kali ulangan pada masing-masing perlakuan. Pengujian kualitas arang aktif dilakukan pada masing-masing perlakuan sesuai SNI 06-3730-1995 berupa uji kadar air, kadar zat mudah menguap, kadar abu, kadar karbon terikat, daya serap terhadap benzena, daya serap terhadap metilen biru, dan daya serap terhadap iodium.

Hasil penelitian menunjukkan nilai rendemen arang aktif 64,472–72,455%; kadar air 1,191–3,288%; kadar zat mudah menguap 16,987–27,688%; kadar abu 3,567–11,057%; kadar karbon terikat 60,704–78,215%; daya serap benzene 4,378–11,819%; daya serap metilen biru 128,867–131,98 mg/g; dan daya serap iodium 685,26–892,53 mg/g. Berdasarkan penelitian yang sudah dilakukan didapatkan kombinasi perlakuan yang optimal dan nilai arang aktif terbaik adalah pada suhu aktivasi 700℃ dan lama waktu aktivasi 120 menit.

Kata kunci: Arang Aktif, Limbah Serbuk Gergaji Bambu Petung, Waktu Aktivasi, Suhu Aktivasi, Aktivasi Fisika.

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THE EFFECT OF ACTIVATION TEMPERATURE AND TIME IN PHYSICS ON THE QUALITY OF ACTIVATED CHARCOAL FROM PETUNG BAMBOO (*Dendrocalamus asper)* SAWDUST WASTE

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ABSTRACT

Petung bamboo is one type of bamboo that is widely cultivated in Sleman, Yogyakarta. Petung bamboo in Sleman is used as a light construction material, for furniture, and crafts. In the processing process, approximately 20% of the waste is left in the form of powder, pieces of bamboo ends, and so on. To increase the economic value of the petung bamboo waste, one of the uses is to process it into activated charcoal. The purpose of this study was to determine the effect of temperature and activation time on the quality of activated charcoal waste from petung bamboo sawdust waste.

The research raw material used is petung bamboo sawdust waste. Petung bamboo sawdust waste was charred using a *retort* at a carbonization temperature of 400℃ for 60 minutes. This study used a completely randomized design method with test factors in the form of activation temperature (600 and 700℃) and activation time (60, 90, and 120 minutes) with three replications for each treatment. The quality test of activated charcoal was performed on each treatment according to the SNI 06-3730-1995 by testing the water content, volatile substances, ash content, bound carbon content, benzene absorption, and methylene blue absorption, and iodine absorption.

The results showed that the yield of activated charcoal was 64.472–72.455%; water content 1.191–3.288%; volatile matter content 16.987–27.688%; ash content 3.567–11.057%; bound carbon content 60.704–78.215%; benzene absorption 4.378–11.819%; absorption of methylene blue 128.867–131.98 mg/g; and iodine absorption 685.26–892.53 mg/g. Based on the research that has been done, it was found that the optimal combination of treatments and the best-activated charcoal value was at an activation temperature of 700℃ and an activation time of 120 minutes.

Keywords: Activated Charcoal, Petung Bamboo Sawdust Waste, Activation Time, Activation Temperature, Physical Activation.

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