

**PENGARUH WAKTU DAN SUHU AKTIVASI
TERHADAP KUALITAS ARANG AKTIF DARI LIMBAH KAYU MANII
(*Maesopsis eminii* Engl.) UNTUK PENJERNIHAN AIR SUMUR**

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INTISARI

Arang aktif merupakan salah satu produk yang dikembangkan dengan menerapkan pola keberlanjutan hasil pemanfaatan kayu maupun limbah kayu. Produk ini dibuat dalam rangka peningkatan kualitas lingkungan hidup. Kebutuhan arang aktif dari tahun ke tahun menunjukkan peningkatan sehingga diperlukan riset terhadap sumber-sumber bahan yang berpotensi sebagai bahan baku arang aktif. Bahan baku pada penelitian ini dipilih dari kayu manii (*Maesopsis eminii* Engl), karena sampai saat ini belum begitu dikenal oleh masyarakat padahal pembudidayaannya mudah dan kecepatan pertumbuhannya cukup tinggi.

Penelitian ini menggunakan rancangan acak lengkap yang disusun secara faktorial dengan dua faktor yaitu waktu aktivasi 30 menit, 60 menit dan 90 menit serta suhu aktivasi yaitu 800 °C, 900 °C dan 1000 °C. Penelitian dilakukan dengan mengarang limbah kayu manii (*Maesopsis eminii* Engl), dalam *retort* listrik pada suhu 450 °C selama 3 jam. Proses aktivasi dilakukan secara fisika / *thermal* (tanpa kemikalia). Nilai rata-rata dianalisis dengan analisis varians dan apabila berbeda nyata, diuji lanjut dengan uji HSD. Pengujian kualitas arang aktif kayu manii berdasarkan Standar Nasional Indonesia.

Hasil penelitian menunjukkan bahwa rendemen berkisar antara 68,30% - 86,27%, kadar air 5,9% - 8,56%, kadar zat mudah menguap 40,26% - 52,59%, kadar abu 1,833% - 2,723%, kadar karbon terikat 44,995% - 57,150%, daya serap uap benzena 3,12% - 8,12%, daya serap iodium 1587,60 mg/g - 1963,44 mg/g, daya serap metilen biru 43,80 mg/g - 81,30 mg/g. Kualitas arang aktif terbaik dihasilkan dari perlakuan aktivasi pada suhu 1000 °C selama 90 menit. Arang aktif ini diaplikasikan sebagai penjernih air sumur. Hasil analisis terhadap air sumur setelah diperlakukan dengan arang aktif kualitasnya menjadi lebih baik dan memenuhi kriteria sebagai air bersih menurut standar baku mutu No. 416/Menkes/Per/1990. Peningkatan kualitas tersebut ditunjukkan dengan adanya penurunan kekeruhan 83,34%, penurunan warna 96,43%, penurunan kadar besi (Fe) 98,67%, penurunan kadar mangan (Mn) 50%, sedangkan kadar pH air nilainya tidak berubah yaitu 7.

Kata kunci : Arang aktif, *Maesopsis eminii* Engl., waktu aktivasi, suhu aktivasi, air sumur

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**THE INFLUENCES OF TIME AND ACTIVATION TEMPERATURE
TOWARD THE ACTIVATED CHARCOAL QUALITY
FROM THE WASTE OF MANII WOOD (*Maesopsis eminii* Engl.)
AS THE WATER PURIFIER**

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ABSTRACT

Activated charcoal is one of forest product which developed by applying the continuous pattern of wodden's profit result in spite of the wood waste. This product made in the frame work to increase the living space quality. By the years, the activated charcoal's necessity show the increasing so it needed some research to the material resources which potentials as an activated charcoal raw material. Manii wood (*Maesopsis eminii* Engl.) was choosed in this experiment because it's unwell-known by the society so far, whereas the cultivation is easy and the growth's speed is quite high.

This experiment was conducted with Completely Randomized Designed (CRD) which stacked factorially consist of two factors, those are 30 minutes activation time, 60 minutes and 90 minutes and also activaton temperature such as 800°C, 900°C dan 1000°C. At first, the manii wood was carbonized into charcoal in the electric retort, temperature at 450°C for 3 hours. The activation process conducted as a physics/thermal (without using the chemically material). The average value was analyze with variance analysis and if it 's significant on the differentiation, continued by HSD test. The Manii wood activated charcoal quality tested was based on Indonesian National Standart.

The result showed that activated charcoal has following characteristics obtained yield revolve at 68,30% - 86,27%, moisture content 5,9% - 8,56%, volatile matter content 40,26% - 52,59 %, ash content 1,833% - 2,723%, fixed carbon content 44,995% - 57,150%, benzene adsorption 3,12% - 8,12%, iodium adsorption 1587,60 mg/g - 1963,44 mg/g, methylene blue adsorption 43,80 mg/g - 81,30 mg/g. The best activated charcoal quality was produced from the activation treatment on the temperature 1000°C for 90 minutes. This activated charcoal was applied as the water purifier. The analysis result showed that the water after purified by activated charcoal has better quality and met the Clean Water Standard according Health Minister Regulation number 416/IX/1990. The quality increasing was showed from the turbidity's decreasing 83,34%, colour's decreasing 96,43%, Fe content's decreasing 98,67%, Mn content's decreasing 50%, while the pH value wasn't change.

Keywords : activated charcoal, *Maesopsis eminii* Engl., activation time, activation temperature, water

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