

**THE INFLUENCE OF NaOH CONCENTRATION
TO THE QUALITY OF ACTIVATED CARBON
FROM TWO TYPES OF THE SAWMILL WASTE
OF COCONUT TRUNK (*Cocos nucifera*)**

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ABSTRACT

The application of activated carbon in industrial evolves rapidly along with food industrial development and the awareness of environment. The development of activated carbon industry is currently hampered by the decreasing of raw material supply. Alternative source of raw material needs to be developed to keep the activated carbon industry remains well by using non timber wood as alternative choice such as waste of coconut trunk from sawmill. This research aimed to determine the influence of the shape of sawmill waste, concentration of NaOH activator, and interaction of those two factors towards the quality of activated carbon made from waste of coconut trunk.

This research used Completely Randomized Design arranged in factorial using two factors, the form of waste (dust and chip) and concentration of NaOH activator (1%, 1,25%, and 1,5 %) where each treatment have 5 replications. The research carried out by processing the waste of coconut trunk into carbon in an electrical retort at 150°C for 3 – 4 hours. The carbon activated chemically by soaked in the activator solution (NaOH) with concentration 1%, 1,25%, and 1,5 % for 24 hours then filtered, washed and dried respectively. The testing of the quality of activated carbon based on Indonesian National Standard (SNI).

The result of showed that yield ranged from 76,39% – 83,22%; Moisture content 1,20 – 5,45%; volatile content 4,35 – 10,23%; ash content 5,14 – 9,845%; fixed carbon 83,43 – 87,25%; the absorptive capacity of benzene 14,76-22,41%; the absorptive capacity of Iodium 725,76-1406,48 mg/g and the absorptive capacity of Methylene blue 121,47-124,22 mg/g. The best quality of activated carbon made from waste best chip which are activated with NaOH 1%. After the well water was purified with the best activated carbon resulting in the colour degradation up to 72,73%; turbidity 45,45%; iron content (Fe) 72,73%; Mangan content (Mn) 90%; CaCO₃ hardness 28,94% and the increase of pH from 7,0 to 9,0.

Key words: Activated carbonl, *Cocos nucifera*, forms of waste, NaOH concentration

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**PENGARUH KONSENTRASI BAHAN PENGAKTIF NaOH
TERHADAP KUALITAS ARANG AKTIF
DARI DUA MACAM LIMBAH PENGGERGAJIAN
BATANG KELAPA (*Cocos nucifera*)**

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INTISARI

Penggunaan arang aktif sebagai absorben dalam bidang industri semakin berkembang seiring dengan laju pembangunan industri pangan dan peningkatan kesadaran terhadap bahaya pencemaran lingkungan hidup. Pengembangan industri arang aktif saat ini terhambat oleh pasokan bahan baku yang semakin menurun. Alternatif sumber bahan baku diupayakan agar industri arang aktif dapat terus berjalan, yaitu dengan pemanfaatan hasil hutan non kayu salah satunya adalah limbah penggergajian batang kelapa. Penelitian ini bertujuan untuk mengetahui pengaruh bentuk limbah, konsentrasi bahan pengaktif NaOH dan interaksi antara keduanya terhadap kualitas arang aktif dari limbah penggergajian batang kelapa.

Penelitian ini menggunakan Rancangan Acak Lengkap yang disusun secara faktorial dengan dua faktor yaitu bentuk limbah (serbuk dan sebetan) dan konsentrasi bahan pengaktif NaOH (1%; 1,25% dan 1,5%) dengan masing-masing perlakuan 5 ulangan. Penelitian dilakukan dengan mengarangkan limbah penggergajian batang kelapa dalam retort listrik pada suhu 450°C selama 3-4 jam. Arang diaktivasi secara kimia dengan direndam dalam larutan bahan pengaktif NaOH 1%; 1,25% dan 1,5% selama 24 jam, kemudian disaring lalu dicuci dan dikeringkan. Pengujian kualitas arang aktif limbah penggergajian batang kelapa berdasarkan Standar Nasional Indonesia.

Hasil penelitian menunjukkan bahwa rendemen berkisar antara 76,39-83,22%; kadar air 1,20-5,45%; kadar zat mudah menguap 4,35-10,23%; kadar abu 5,14-9,845%; kadar karbon terikat 83,43-87,25%; daya serap terhadap benzen 14,76-22,41%; daya serap terhadap iodium 725,76-1406,48 mg/g dan daya serap terhadap metilen biru 121,47-124,22 mg/g. Kualitas arang aktif terbaik dibuat dari limbah sebetan yang diaktivasi dengan bahan pengaktif NaOH 1%. Air sumur setelah dimurnikan dengan arang aktif terbaik menghasilkan penurunan warna sebesar 72,73%; kekeruhan sebesar 45,45%; kadar besi (Fe) sebesar 72,73%; kadar Mn (Mangan) sebesar 90%; kesadahan CaCO₃ sebesar 28,94% serta kenaikan pH dari 7,0 menjadi 9,0.

Kata kunci : Arang aktif, *Cocos nucifera*, Bentuk Limbah, Konsentrasi NaOH, Air Sumur

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