

PENGARUH SUHU AKTIVASI DAN KONSENTRASI NH_4HCO_3 TERHADAP KUALITAS ARANG AKTIF DARI CANGKANG KELAPA SAWIT (*Elaeis guineensis* Jacq) SEBAGAI PENJERNIH AIR SUMUR

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INTISARI

Indonesia merupakan salah satu negara pengeksport arang aktif terbesar di dunia. Mengingat jumlah kayu yang ada tiap tahunnya terus menyusut serta ekspor arang aktif tiap tahun terus meningkat, maka harus diusahakan bahan baku alternatif. Bahan baku alternatif haruslah tersedia dalam jumlah yang besar dan berkesinambungan. Salah satu bahan baku yang berpotensi cukup besar ditinjau dari kualitas hasil ialah cangkang kelapa sawit. Penelitian ini bertujuan untuk mengetahui pengaruh interaksi antara suhu aktivasi dan konsentrasi NH_4HCO_3 terhadap rendemen dan kualitas arang aktif dari cangkang kelapa sawit. Arang aktif dengan kualitas terbaik diaplikasikan untuk penjernihan air sumur.

Penelitian menggunakan dengan dua faktor yaitu bahan pengaktif (NH_4HCO_3) dengan konsentrasi (0;0,025;0,05;0,075 dan 0,1%) dan suhu aktivasi (750°C dan 850°C) dengan masing-masing perlakuan 5 ulangan. Penelitian dilakukan dengan mengarangkan cangkang kelapa sawit pada suhu 450°C selama 3 jam. Arang diaktivasi secara kimia, direndam dalam larutan NH_4HCO_3 selama 24 jam, selanjutnya diaktivasi pada suhu 750°C dan 850°C selama 1 jam.

Interaksi antara suhu aktivasi dan konsentrasi NH_4HCO_3 berpengaruh sangat nyata terhadap kadar air, kadar zat mudah menguap dan karbon terikat, serta memberikan pengaruh nyata terhadap kadar abu dan daya serap biru metilen. Interaksi terbaik dihasilkan pada suhu aktivasi 750°C dan konsentrasi NH_4HCO_3 0,05 % dengan Rendemen sebesar 85,769% dan daya serap iodium sebesar 1583,268 mg/g yang menghasilkan bilangan iodium 1357,953 mg/g Air sumur setelah dijernihkan dengan arang aktif terbaik (750°C , NH_4HCO_3 0,05%) menghasilkan penurunan warna sebesar 18,89%; kadar besi sebesar 96,67%; kadar mangan sebesar 31,82% serta kesadahan 11,38%. Kualitas air sumur yang dihasilkan dapat memenuhi kriteria sebagai air bersih menurut standar baku mutu No.416/Menkes/Per/1990 dan No. 907/Menkes/SK/2002 kecuali kadar mangan.

Kata kunci: Arang aktif, *Elaeis guineensis*, Konsentrasi NH_4HCO_3 , suhu aktivasi, air sumur

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**THE EFFECT OF ACTIVATION TEMPERATURE AND NH_4HCO_3
CONCENTRATION ON ACTIVATED CARBON QUALITY
FROM PALM SHELL (*Elaeis guineensis* Jacq)
AS WELL WATER PURIFIER**

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ABSTRACT

Indonesia is one of the major exporters of activated carbon in the world. Though the number of woods is decreasing, the demand of activated carbon is rapidly increasing. In order to meet the increasing demand of activated carbon, an alternative raw material to make it must be discovered. The raw material of activated carbon must widely and continuously available. One potential raw material that meets the above criteria is palm shell. This research is conducted to determine the effect of interaction between both activation temperature and NH_4HCO_3 concentration toward yield and activated carbon quality made from palm shell. The best quality activated carbon is then applied to purifying well water.

This research used two factor; the first is activator NH_4HCO_3 using concentration (0;0.025;0.05;0.075 and 0.1%) and the second is activation temperature (750°C dan 850°C) each 5 repetitions. This research is done by charcoaling palm shell in 450 °C for 3 hours and then activate it chemically by soaking in NH_4HCO_3 solution for 24 hours. It is further activated by heat for 750°C and 850°C an hour respectively. The data is analyzed using variance analysis, if the results were different HSD test is conducted.

The interaction between activation temperature and concentration of NH_4HCO_3 have highly significance influence to moisture content, volatile matter, fixed carbon, and have significance influence ash carbon, adsorbtive capacity of metilen blue. The best interaction is achieved at temperature of 750 °C and NH_4HCO_3 concentration of 0.05% which yield of 85.769% and adsorbtive capacity of iodine of 1583.268 mg/g relusted iodine value of 1357.953 mg/g. Well water purified by the best activated carbon (750 °C, NH_4HCO_3 0.05%) result in normalizing color of 18.89%; decreasing iron content of 96.67%; Mangan content of 31.82%; water hardness of 11.38%. After purify, well water quality produced met the criteria of clean water according to standard quality No. 416/Menkes/Per/1990 and No. 907/Menkes/SK/2002 except for manganese content.

Keywords : Activated carbon, *Elaeis guineensis*, NH_4HCO_3 concentration, activation temperatures, well water

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