

PENGARUH SUHU DAN LAMA AKTIVASI TERHADAP KUALITAS ARANG AKTIF DARI SERBUK GERGYAJI LIMBAH KAYU KELAPA (*Cocos sp.*)

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INTISARI

Salah satu potensi bahan baku yang cukup besar yang bisa dimanfaatkan untuk pembuatan arang aktif di Indonesia adalah limbah serbuk gergaji kayu kelapa, yang dihasilkan dari suatu industri penggergajian. Penelitian ini bertujuan untuk mengetahui pengaruh interaksi antara suhu dan lama aktivasi terhadap kualitas arang aktif dari serbuk gergaji kayu kelapa. Arang aktif dengan kualitas terbaik diaplikasikan sebagai penjernihan air sumur.

Penelitian dilakukan dengan mengarangkan serbuk gergaji kayu kelapa dalam *retort* listrik pada suhu 400°C selama 2 jam. Arang diaktivasi secara *thermal* yaitu dengan dipanaskan pada suhu 700°C dan 800°C selama 30 menit, 60 menit, dan 90 menit. Nilai rata-rata dianalisis dengan analisis varian dan apabila berbeda diuji lanjut dengan HSD.

Hasil penelitian arang aktif serbuk gergaji kayu kelapa menghasilkan kisaran rendemen antara 83,61%-93,44%, kadar air 0,40%-1,66%, kadar zat mudah menguap 23,00%-37,20%, kadar abu 3,20%-4,80%, kadar karbon terikat 59,40%-73,20%. Daya serap terhadap uap benzena 6,47%-10,65%, daya serap terhadap iodium 1215,51 mg/g-1898,49 mg/g, dan daya serap terhadap metilen biru 124,01 mg/g-125,15 mg/g. Nilai kadar air, kadar abu, daya serap terhadap iodium, dan daya serap terhadap metilen biru memenuhi SNI 06-3730-1995. Interaksi antara kedua faktor berpengaruh sangat nyata terhadap rendemen, kadar zat mudah menguap, kadar karbon terikat, dan daya serap terhadap uap benzena tetapi tidak berpengaruh nyata terhadap kadar air, kadar abu, daya serap terhadap iodium, dan daya serap terhadap metilen biru. Aplikasi arang aktif dengan kualitas tertinggi pada suhu aktivasi 800°C dan lama aktivasi 90 menit untuk peningkatan kualitas air sumur dari pemukiman sekitar sungai Code menghasilkan penurunan warna 30%, kekeruhan 46,7%, kesadahan 17,1%, kadar besi 100%, kadar mangan 100% serta kenaikan pH 7,1%. Kualitas air sumur yang dihasilkan dapat memenuhi kriteria sebagai air bersih menurut standar baku mutu No. 416/Menkes/Per/IX/1990.

Kata kunci : Arang aktif, serbuk gergaji kayu kelapa, suhu aktivasi, lama aktivasi, air sumur

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THE INFLUENCE OF TEMPERATURE AND ACTIVATION TIME ON THE QUALITY OF ACTIVATED CHARCOAL FROM COCONUT WOOD SAWDUST WASTE

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ABSTRACT

One of potential raw material for activated charcoal making in Indonesia is coconut wood sawdust waste from sawmill. This research is aiming for figuring out the influence of interaction between temperature and activation time to the quality of activated charcoal from coconut wood sawdust waste. Best quality activated charcoal can be used as water purifier.

Firstly coconut wood sawdust was carbonized in an electrical retort at 400°C for 2 hours. Coconut wood sawdust charcoal was activated at 700°C and 800°C for 30 minutes, 60 minutes and 90 minutes. The average value was analyzed by ANOVA, if significantly difference tested by HSD test.

The result of coconut wood sawdust activated charcoal show that the yield is respectively 83,61%-93,44%, moisture content 0,40%-1,66%, volatile matter 23,00%-37,20%, ash content 3,20%-4,80%, fixed carbon 59,40%-73,20%, benzene adsorption 6,47%-10,65%, iodine adsorption 1215,51 mg/g-1898,49 mg/g, and methylene blue adsorption 124,01 mg/g-125,15 mg/g. Moisture content, ash content, iodine adsorption, and methylene blue adsorption met SNI 06-3730-1995. Its interaction highly significant influence to yield, volatile matter, fixed carbon, and benzene adsorption but not significant influence to moisture content, ash content, iodine adsorption, and methylene blue adsorption. The application of the highest quality of activated charcoal at 800°C for 90 minutes from neighbourhood around Code river well water are reducing of colour 30%, turbidity 46,7%, hardness of water 17,1%, iron content 100%, manganese content 100% and also increase pH 7,1%. Quality well water can meet criterion as clean water according to standard quality No. 416/Menkes/Per/IX/1990.

Keywords : Activated charcoal, coconut wood sawdust, temperature activation, time activation, well water

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