

**PEMBUATAN ARANG AKTIF DARI LIMBAH PEMBALAKAN
KAYU PUSPA DENGAN TEKNOLOGI PRODUKSI
SKALA SEMI PILOT**

(The Manufacture of Activated Charcoal from Logging Waste of Puspa Wood
Implementing Production Technology in Semi Pilot Scale)

Oleh/By :
Djeni Hendra

ABSTRACT

The research on activated charcoal manufacture from puspa (*Schima wallichii*) wood logging wastes intended to identify the product characteristics, and obtain the optimum of H₃PO₄ concentration and of activation duration. The manufacturing activation process was performed in an electrically heated retort with the capacity up to 100 kg of coal per batch, and the resulting activated charcoal with the most satisfactory qualities was applied for the purifying of fresh and used frying oils. Analysis on activated charcoal characteristics revealed that changes in H₃PO₄ concentration and activation duration affected significantly the yield, and adsorption capacities of iodine solution, of benzene vapor, and of chloroform vapor. The treatment level that afforded the most satisfactory activated charcoal was 5% H₃PO₄ concentration and 120 minute activation duration. In that level, the activated charcoal characteristics were as follows the yield at 74.21%, moisture content 4.17%, volatile matters 9.40%, ash content 4.37%, and fixed carbon 86.23%, and adsorption capacities of iodine, of benzene vapor, and of chloroform vapor consecutively 938.54 mg/g, 18.81%, 33.53%. Such as, the activated charcoal was able to decrease free fatty acid content and peroxide number, and increase the purity degree of fresh as well as used frying oils. The best condition to purify both frying oil types was employing 1% activated charcoal with 1 hour contact duration, and in this way, it could increase the purity of both fresh and used frying oils (i.e. 90.95%, respectively), and decrease free fatty acid and peroxide number in fresh oil (0.12% and 10.00 mg O₂/100 g, respectively) and used oil (0.37% and 17.60 mg O₂/100 g).

Keywords : Logging waste of puspa wood, activated charcoal, most satisfactory qualities, fresh and used frying oils.2

ABSTRAK

Penelitian ini bertujuan untuk membuat arang aktif dari limbah pembalakan hutan tanaman produksi kayu puspa (*Schima wallichii*), mengidentifikasi karakteristik arang aktif yang dihasilkan, mendapatkan konsentrasi H₃PO₄ dan waktu aktivasi arang aktif. Proses pembuatan arang aktif dilakukan dengan menggunakan retort kapasitas 100 kg arang yang dilengkapi dengan pemanas listrik pada suhu 700 °C, dan mengaplikasikan arang aktif terbaik pada pemurnian minyak goreng curah dan minyak goreng bekas. Analisis karakteristik kualitas arang aktif menunjukkan bahwa penggunaan konsentrasi H₃PO₄ dan waktu aktivasi hanya berpengaruh pada rendemen, daya serap terhadap larutan yodium, daya serap terhadap uap benzena dan daya serap terhadap uap kloroform. Taraf perlakuan yang dapat menghasilkan arang aktif dengan kualitas terbaik yaitu konsentrasi H₃PO₄ 5% dan waktu aktivasi selama 120 menit. Kombinasi taraf perlakuan ini menghasilkan arang aktif dengan rendemen 74,21%, kadar air 4,17%, kadar zat terbang 9,40%, kadar abu 4,37%, kadar karbon terikat 86,23, daya serap terhadap larutan yodium 938,54 mg/g, daya serap terhadap uap benzena 18,81%, dan daya serap terhadap uap kloroform 33,53%. Arang aktif hasil produksi mampu menurunkan kadar asam lemak bebas, menurunkan bilangan peroksida dan meningkatkan kejernihan minyak goreng curah dan minyak goreng bekas. Taraf perlakuan terbaik untuk

menjernihkan minyak goreng curah dan minyak goreng bekas yaitu pada konsentrasi arang aktif 1% dan waktu kontak 1 jam, mampu meningkatkan kejernihan minyak goreng curah 90,95% dan minyak goreng bekas 71,25%, menurunkan kadar asam lemak bebas pada minyak goreng curah 0,12% dan minyak goreng bekas 0,37% serta menurunkan bilangan peroksida pada minyak goreng curah 10 mg O₂/100g dan minyak goreng bekas 17,60 mg O₂/100 g.

Kata kunci : Limbah pembalakan kayu pusa, arang aktif, benzena, yodium, minyak goreng