

**PEMBUATAN ARANG AKTIF DARI TEMPURUNG  
BIJI JARAK PAGAR (*Jatropha curcas* L.)  
Manufacture of Activated Charcoal from *Jatropha*  
(*Jatropha curcas* L.) Seed Shell**

Oleh/By :

**R. Sudradjat, D. Tresnawati & D. Setiawan**

ABSTRACT

This research was aimed at looking into the possibility of activated charcoal from *Jatropha* (*Jatropha curcas* L.) seed shells manufacturing. In the first stage, the seed shells were carbonized into charcoal at 5000C for 5 hours. The resulting charcoal was soaked in H<sub>3</sub>PO<sub>4</sub> solutions at various concentrations i.e : 1%, 2% and 3% each for 24 hours. After soaking, the charcoal was activated at 3 levels of temperatures, i.e : 650o, 750oand 850oC. During the activation, the charcoal was sprayed using hot-water vapor at 125oC, with the flow rate about 0.27 kg per hour and pressure of 0.025 mb, for 60 minutes. The resulting activated charcoal was examined of its characteristics parameters, comprising its yield, moisture content, volatile matter content, ash content, fixed carbon, absorption of iodine and benzene. Besides, some amount of the activated charcoal was used for the refining of *Jatropha* oil and palm oil. Afterwards, opacity of the refined *Jatropha* and palm oil was examined. The optimum results was obtained from sample using temperature of 850oC. Effect of H<sub>3</sub>PO<sub>4</sub> concentration was not significant, so activating charcoal from *Jatropha* seed shell only needs high temperature and spreading of hot water vapour . The optimum result showed that the yield of activated charcoal 80.8% , moisture content about 1.7%, volatile matter content 3.1%, ash content 3.5%, fixed carbon 91.6%, iodine adsorption 1061.2 mg/g, benzene adsorption 24.8% . In addition, the *Jatropha* activated charcoal able to increase the opacity of crude *Jatropha* and palm oil up to 1.8% and 6.2% respectively. All of the physico-chemistry properties have met the SNI standard for powder-form activated carbon (SNI 06-3730-95 ).

Keywords : *Jatropha* seed shell, activated charcoal, iodine adsorption, benzene adsorption.

ABSTRAK

Penelitian ini bertujuan untuk mengetahui cara pembuatan dan sifat arang aktif yang dihasilkan dari tempurung biji jarak pagar. Proses penelitian dilakukan dengan pembuatan arang dari tempurung biji jarak pagar pada suhu 5000C selama 5 jam. Kemudian arang tersebut direndam dalam larutan asam fosfat 1%, 2% dan 3% selama 24 jam. Selanjutnya arang diaktivasi pada suhu 6500, 7500 dan 8500C dan disemprot uap panas selama 60 menit dengan suhu 1250C, laju alir uap panas 0,27 kg/jam dan tekanan 0,025 mb. Parameter yang diuji adalah rendemen, kadar air, kadar zat terbang, kadar abu, kadar karbon terikat, daya serap terhadap yodium dan benzena, peningkatan kejernihan warna minyak jarak pagar dan minyak goreng kelapa sawit yang dijernihkan menggunakan arang aktif dari tempurung biji jarak. Hasil optimum diperoleh pada kondisi aktivasi menggunakan suhu 850oC. Penggunaan bahan kimia H<sub>3</sub>PO<sub>4</sub> tidak berpengaruh terhadap sifat fisiko-kimia arang aktif. Oleh karena itu, pembuatan arang aktif dari tempurung biji jarak pagar hanya memerlukan suhu tinggi dan aliran uap panas. Hasil optimum dari penelitian ini menunjukkan rendemen 80,8% ; kadar air 1,7% ; kadar zat terbang 3,2% ; kadar abu 3,5%

; kadar karbon terikat 91,6% ; daya serap terhadap iodium 1061,2 mg/g ; daya serap terhadap benzena 24,8% ; peningkatan kejernihan minyak jarak pagar 1,8 %, sedang untuk minyak kelapa sawit 6,2 %. Seluruh sifat fisiko-kimia memenuhi standar SNI untuk arang aktif serbuk (SNI 06-3730-95).

Kata kunci : Tempurung biji jarak pagar, arang aktif, daya serap terhadap iodium, daya serap terhadap benzena.