

## **PENGARUH SUHU DAN WAKTU AKTIVASI TERHADAP KUALITAS ARANG AKTIF KAYU TERAS JATI CEPAT TUMBUH**

**Oleh:**

**Amalia Jannati<sup>1</sup>, J. P. Gentur Sutapa<sup>2</sup>**

### **INTISARI**

Seiring dengan perkembangan industri, kebutuhan akan arang aktif semakin meningkat, baik untuk kebutuhan ekspor maupun domestik. Dengan peningkatan kebutuhan arang aktif, maka diperlukan suatu bahan alam yang dapat dijadikan bahan baku alternatif dalam pembuatan arang aktif. Jati sebagai salah satu tanaman yang mengandung kandungan lignin tinggi berpotensi untuk diolah menjadi arang aktif sebab lignin dan selulosa di dalam kayu jati tersusun atas karbon yang cukup banyak.

Penelitian ini menggunakan metode rancangan acak lengkap (*Completely Randomized Design*) dengan faktor yang digunakan yakni suhu aktivasi (750°C, 850°C, dan 950°C) dan waktu aktivasi (30 menit, 60 menit, dan 90 menit) dengan tiga kali ulangan pada masing-masing faktor. Proses pembuatan arang aktif kayu teras jati cepat tumbuh dimulai dengan karbonisasi pada suhu 500°C selama 4 jam, kemudian arang diaktivasi sehingga menjadi arang aktif. Arang aktif tersebut kemudian diuji kualitasnya dan dibandingkan dengan standar SNI 06-3730-1995. Kualitas tersebut antara lain rendemen, kadar air, kadar zat mudah menguap, kadar abu, kadar karbon terikat, daya serap terhadap uap benzena, daya serap terhadap metilen biru, dan daya serap terhadap iodium.

Kualitas arang aktif yang dihasilkan pada penelitian ini, rendemen sebesar 71,46%-76,72%; kadar air sebesar 0,61%-2,57%; kadar zat mudah menguap sebesar 8,28%-13,36%; kadar abu sebesar 4,12%-4,73%; kadar karbon terikat sebesar 81,97%-87,58%; daya serap uap benzena sebesar 7,58%-10,08%; daya serap metilen biru sebesar 73,13 mg/g-83,58 mg/g; dan daya serap iodium sebesar 773,58 mg/g-957,33 mg/g. Diantara kualitas arang aktif kayu teras jati cepat tumbuh tersebut, yang memenuhi standar arang aktif menurut SNI 06-3730-1995 antara lain kadar air, kadar zat mudah menguap, kadar abu, kadar karbon terikat dan daya serap iodium, sedangkan karakteristik arang aktif yang belum memenuhi standar menurut SNI 06-3730-1995 adalah daya serap uap benzena dan daya serap metilen biru.

**Kata kunci:** arang aktif, jati cepat tumbuh, kayu teras, suhu aktivasi, waktu aktivasi

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<sup>1</sup> Mahasiswa Departemen Teknologi Hasil Hutan, Fakultas Kehutanan, Universitas Gadjah Mada

<sup>2</sup> Dosen Departemen Teknologi Hasil Hutan, Fakultas Kehutanan, Universitas Gadjah Mada

## **EFFECT OF ACTIVATION TEMPERATURE AND DURATION ON THE QUALITY OF ACTIVATED CHARCOAL FROM CLONAL TEAK HEARTWOOD**

**Oleh:**

**Amalia Jannati<sup>1</sup>, J. P. Gentur Sutapa<sup>2</sup>**

### **ABSTRACT**

Along with industrial development, the need for activated charcoal is increasing, either for export or domestic needs. With the increasing need for activated charcoal, a natural material that can be used as an alternative raw material in the manufacture of activated charcoal is needed. Teak as one of the plants that contains high lignin content is potentially to be processed into activated charcoal because lignin and cellulose in it are arranged on quite a lot of carbon.

This study uses a Completely Randomized Design method with the factors used are activation temperature (750°C, 850°C, and 950°C) and activation duration (30 minutes, 60 minutes, and 90 minutes) with three replications for each factor. The process of making activated charcoal from clonal teak heartwood starts with carbonization at 500°C within 4 hours, then the charcoal activated to become activated charcoal. The activated charcoal then tested for quality and compared with the SNI 06-3730-1995 standard. These qualities include yield, moisture content, volatile matter, ash content, fixed carbon content, benzene absorption, methylene blue absorption, and iodine absorption.

The quality results of activated charcoal produced in this study, yield 71.46%-76.72%; moisture content 0.61%-2.57%; volatile matter 8.28%-13.36%; ash content 4.12%-4.73%; fixed carbon content 81.97%-87.58%; benzene absorption 7.58%-10.08%; methylene blue absorption 73.13 mg/g-83.58 mg/g%; and iodine absorption 773.58 mg/g-957.33 mg/g. The quality of activated charcoal that fulfill the SNI 06-3730-1995 standard includes moisture content, volatile matter, ash content, fixed carbon content, and iodine absorption, meanwhile the quality of activated charcoal that does not fulfill the SNI 06-3730-1995 standard includes benzene absorption, and methylene blue absorption.

**Keywords:** activated charcoal, clonal teak, heartwood, activation temperature, activation duration

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<sup>1</sup> Student of Forest Product Technology Department, Faculty of Forestry, Universitas Gadjah Mada

<sup>2</sup> Lecturer of Forest Product Technology Department, Faculty of Forestry, Universitas Gadjah Mada