

PENGARUH VARIASI SUHU DAN WAKTU TOREFAKSI TERHADAP SIFAT FISIKA – KIMIA BRIKET DARI LIMBAH TANAMAN TEMBAKAU (*Nicotiana tabacum* L.) BAGIAN BATANG

Oleh :

Dewanda Sekar Putri¹, J.P. Gentur Sutapa²

INTISARI

Kabupaten Temanggung merupakan salah satu daerah penghasil tembakau di Indonesia. Limbah tanaman tembakau (*Nicotiana tabacum* L.) bagian batang belum dimanfaatkan dengan optimal oleh masyarakat. Penelitian ini bertujuan untuk memanfaatkan limbah tanaman tembakau bagian batang menjadi briket berkualitas melalui proses torefaksi, mengetahui pengaruh variasi suhu dan waktu yang optimal dalam pembuatan briket torefaksi, dan mengaplikasikan briket torefaksi dari kombinasi terbaik untuk sumber bahan bakar.

Limbah tanaman tembakau bagian batang berasal dari limbah pertanian milik petani Desa Mojotengah, Kecamatan Kedu, Kabupaten Temanggung. Penelitian ini menggunakan rancangan acak lengkap (*Completely Randomized Design*) dengan 2 faktor perlakuan yaitu suhu torefaksi (230, 250, dan 270 °C) dan waktu torefaksi (10, 20, dan 30 menit) dengan masing-masing perlakuan lima kali ulangan. Pada proses pembuatan briket torefaksi dilakukan dengan cara penambahan bahan perekat yang dibuat dengan perbandingan 1:16 dengan serbuk torefaksi yang sudah ditumbuk sebanyak 9 g kemudian dicetak dengan sistem kempa hidrolis manual dengan tekanan 5000 psi selama 15 menit selanjutnya dikeringkan. Briket torefaksi yang dihasilkan diuji kualitasnya yaitu sifat fisik (kadar air, berat jenis, dan nilai kalor) dan sifat kimia (kadar abu, kadar zat mudah menguap, dan kadar karbon terikat).

Hasil penelitian menunjukkan sifat-sifat briket torefaksi sebagai berikut : kadar air 11,73%; berat jenis 0,67; nilai kalor 4974,65 kal/g; kadar abu 5,45%; kadar zat mudah menguap 60,36%; dan kadar karbon terikat 22,46%. Briket torefaksi kualitas terbaik kombinasi suhu 270 °C dengan waktu 30 menit yang menghasilkan briket torefaksi dengan spesifikasi : kadar air 11,20 %; berat jenis 0,59; nilai kalor 5290,00 kal/g; kadar abu 6,21 %; kadar zat mudah menguap 53,90%; dan kadar karbon terikat 28,69%.

Kata kunci : Torefaksi, Limbah Tanaman Tembakau Bagian Batang, Suhu, Waktu, Briket

¹ Mahasiswa Departemen Teknologi Hasil Hutan, Fakultas Kehutanan, Universitas Gadjah Mada

¹ Dosen Departemen Teknologi Hasil Hutan, Fakultas Kehutanan, Universitas Gadjah Mada

EFFECT OF VARIATION TEMPERATURE AND DURATION OF TORREFACTION ON PHYSICAL - CHEMICALS PROPERTIES OF BRIQUETTES FROM TOBACCO (*Nicotiana tabacum* L.) STEM WASTE

By :

Dewanda Sekar Putri¹, J.P. Gentur Sutapa²

Temanggung Regency is one of the tobacco producing areas in Indonesia. Tobacco waste, i.e., tobacco (*Nicotiana tabacum* L.) stems, has not been utilized optimally by the community. This study aims to utilize tobacco waste into torrefaction-processed briquettes, find out the effect of optimum temperature and duration in the manufacture of torrefaction-processed briquettes, and apply torrefaction-processed briquette from the best combination for fuel source.

Tobacco plant stem waste came from agricultural waste owned by Mojotengah Village farmers, Kedu District, Temanggung Regency. This study used a completely randomized design with 2 treatment factors, which were temperature of torrefaction (230 °C, 250 °C, and 270 °C) and duration of torrefaction (10 minutes, 20 minutes and 30 minutes) with five replications of each treatment. The processes of making torrefaction-processed briquette were done by adding adhesive material made with a ratio of 1:16 with torrefaction powder that had been pounded as much as 9 g, then was drawn by manual hydraulic pressure system with pressure of 5000 psi within 15 minutes, and dried. The result of torrefaction were tested in terms of their quality and chemical properties (ash content, volatile matter content, and fixed carbon content).

The results showed that the torrefaction-processed briquettes owned the following properties: water content of 11.73%; specific gravity of 0.67; calorific value of 4974.65 cal/g; 5.45% ash content; 60,36% volatile matter content; and fixed carbon content of 22.46%. Best quality of the briquette was from combination of temperature at 270 °C and duration for 30 minutes, which produced torrefaction-processed briquette with following specification: water content of 11.20%; specific gravity of 0.59; calorific value of 5290.00 cal/g; ash content of 6.21%; volatile matter content of 53.90%; and fixed carbon content of 28.69%.

Keywords: Torrefaction, Tobacco Plant Stem Part Waste, Temperature, Duration, Briquette

¹ Student of Forest Product Technology Department, Faculty of Forestry, Universitas Gadjah Mada

² Lecturer of Forest Product Technology Department, Faculty of Forestry. Universitas Gadjah Mada