

ABSTRAK

PENGARUH VARIASI KOMPOSISI KULIT KOPI, AMPAS TEBU, DAN PEREKAT (MOLASSES DAN TEPUNG TAPIOKA) TERHADAP KARAKTERISTIK BIOBRIKET

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Telah dilakukan penelitian pengaruh variasi komposisi kulit kopi, ampas tebu, dan perekat (molasses dan tepung tapioka) terhadap karakteristik biobriket. Penelitian ini bertujuan untuk mengetahui pengaruh variasi komposisi kulit kopi, ampas tebu, dan perekat terhadap karakteristik biobriket yang dihasilkan. Bahan baku biomassa dikarbonisasi, dihaluskan, dan dicetak menjadi biobriket dengan variasi komposisi tertentu, kemudian dilakukan pengujian proksimat yang meliputi kadar air, kadar zat terbang, kadar abu, dan karbon tetap. Selanjutnya, biobriket yang dihasilkan dikarakterisasi menggunakan metode *X-Ray Fluorescence* (XRF), *X-Ray Diffraction* (XRD), *Fourier Transform Infrared Spectroscopy* (FTIR), dan *Scanning Electron Microscopy – Energy Dispersive Spectroscopy* (SEM-EDS). Kadar abu pada sebagian sampel besar karena kandungan mineral SiO_2 yang tinggi. Karbon tetap paling tinggi tercatat pada sampel NJ 2 yaitu 88,10%, disertai kadar abu paling rendah sebesar 9,85%. Analisis XRF mengidentifikasi senyawa utama seperti K_2O (44,93%), CaO , dan Fe_2O_3 yang berkontribusi terhadap kadar abu, XRD menampilkan fasa kristalin dominan berupa K_2O , CaO , Fe_2O_3 , dan P_2O_5 , hasil FTIR menunjukkan keberadaan gugus fungsi lignoselulosa ($-\text{OH}$, C-H , C=O , dan C=C). Hasil SEM-EDS menunjukkan distribusi morfologi dengan pori-pori yang bervariasi, mulai dari berongga besar hingga padat dan halus. Hasil penelitian menunjukkan bahwa semua variasi biobriket memenuhi standar SNI 01-6235-2000, sehingga memiliki potensi efisiensi yang baik dalam proses pembakaran.

Kata kunci: biobriket, kulit kopi, ampas tebu, proksimat, karakterisasi.

ABSTRACT

THE EFFECT OF COMPOSITION VARIATIONS OF COFFEE SKIN, SUGAR CANE BAGASS, AND ADHESIVES (MOLASSES AND TAPIOCA FLOUR) ON THE CHARACTERISTICS OF BIOBRIQUETTE

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Research has been conducted on the effect of variations in the composition of coffee husks, bagasse, and binders (molasses and tapioca flour) on the characteristics of biobriquettes. This study aims to determine the effect of variations in the composition of coffee husks, bagasse, and binders on the characteristics of the resulting biobriquettes. The biomass raw materials were carbonized, pulverized, and molded into biobriquettes with specific compositional variations, then subjected to proximate testing covering moisture content, volatile matter content, ash content, and fixed carbon. Furthermore, the resulting biobriquettes were characterized using X-Ray Fluorescence (XRF), X-Ray Diffraction (XRD), Fourier Transform Infrared Spectroscopy (FTIR), and Scanning Electron Microscopy – Energy Dispersive Spectroscopy (SEM-EDS). The ash content in most samples was high due to the high SiO_2 mineral content. The highest fixed carbon content was recorded in sample NJ 2 at 88.10%, accompanied by the lowest ash content of 9.85%. XRF analysis identified main compounds such as K_2O (44.93%), CaO , and Fe_2O_3 , which contribute to the ash content. XRD revealed the dominant crystalline phases as K_2O , CaO , Fe_2O_3 , and P_2O_5 , while FTIR results showed the presence of lignocellulose functional groups ($-\text{OH}$, C-H , C=O , and C=C). The SEM-EDS results showed morphological distribution with varying pores, ranging from large cavities to dense and fine ones. The research results showed that all bio-briquette variations met the SNI 01-6235-2000 standard, thus having good efficiency potential in the combustion process.

Keywords: biobriquette, coffee husk, sugarcane bagasse, proximate, characterization.