ABSTRAK

PENGARUH VARIASI KOMPOSISI KULIT DURIAN DAN KOTORAN SAPI TERHADAP UJI PROKSIMAT PADA PRODUK BRIKET

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Penelitian pengaruh variasi komposisi kulit durian dan kotoran sapi terhadap uji proksimat pada produk briket telah dilakukan. Briket disiapkan dalam lima variasi komposisi (K1-K5) dengan kulit durian digunakan sebagai bahan utama, ditmbah campuran kotoran sapi sertra perekat tapioka. Bahan baku dikeringkan, dikarbonisasi, digiling, diayakan, dicampur, dicetakan dan dikeringkan. Sampel arang bahan baku dan briket biomassa di uji secara proksimat dan dikarakterisasi menggunakan XRF, XRD, FTIR dan SEM-EDS. Uji proksimat dilakukan untuk menentukan kandungan air, zat terbang, kadar abu, karbon tetap serta nilai kalor sebagai parameter mutu briket. Hasil penelitian menunjukkan bahwa variasi komposisi berpengaruh terhadap kualitas briket, di mana kualitas terbaik diperoleh pada K1 (90% kulit durian : 10% perekat) dengan kandungan air 0,64%, zat terbang 21,24%, abu 23,5%, karbon tetap 54,62% dan nilai kalor tertinggi 4.255,25 kcal/kg. Pada karakterisasi sampel briket K1 senyawa K_2O dan SiO_2 teridentifikasi melalui karakterisasi XRF dan XRD, sedangkan gugus O-H, C≡C, C=C, C-H dan C=O terdeteksi pada spektrum FTIR. Hasil pengamatan SEM-EDS terlihat morfologi relatif padat dengan permukaan tidak rata serta retakan-retakan kecil. Pori-pori besar terlihat, sehingga struktur terlihat lebih kompak. Kualitas briket terbukti menurun dengan peningkatan proporsi kotoran sapi, yang ditandai oleh tingginya kadar abu dan rendahnya karbon tetap, sehingga nilai kalor juga turun. Secara keseluruhan, kulit durian lebih berpotensi dimanfaatkan sebagai bahan baku utama dalam pembuatan briket biomassa sebagai bahan bakar alternatif yang terbarukan dan ramah lingkungan.

Kata kunci : briket, kulit durian, kotoran sapi, uji proksimat, bahan bakar alternatif.

ABSTRACT

EFFECT OF VARIATION DURIAN SKIN AND COW DUNG COMPOSITION ON PROXIMATE TEST OF BRIQUETTE PRODUCTS

By

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A study on the effect of variation in the composition of durian skin and cow dung on the proximate test of briquette products was conducted. Briquettes were prepared in five variations of composition (K1-K5) with durian skin used as the main ingredient, added with a mixture of cow dung and tapioca adhesive. The raw materials were dried, carbonized, grinder, sieved, mixed, molded and dried. Samples of raw material charcoal and biomass briquettes were proximate tested and characterized using XRF, XRD, FTIR and SEM-EDS. The proximate test was conducted to determine the moisture content, volatile matter, ash content, fixed carbon and caloric value as a quality parameter of the briquettes. The results showed that the variation of composition affects the quality of briquettes, was obtained in K1 (90% durian skin : 10% adhesive) with a moisture content of 0.64%, volatile matter 21.24%, ash content 23.5%, fixed carbon 54.62%, and the highest caloric value of 4,255.25 kcal/kg. In the characterization of briquette sample K1, the compounds K_2O and SiO_2 were identified through XRF and XRD characterization, while O-H, C-H, C≡C, C=C, C-O and C=O functional groups were detected in the FTIR spectrum. SEM-EDS observations showed a relatively dense morphology with an uneven surface and small cracks. Large pores are visible, so the structure looks more compact. The quality of the briquettes was shown to decrease with increasing proportion of cow dung, characterized by high ash content and low fixed carbon, resulting in lower caloric value. Overall, durian skin have more potential to be utilized as the main raw material in biomass briquetting as a renewable and environmentally friendly alternative fuel.

Keywords : briquettes, durian skin, cow dung, proximate test, alternative fuel.