ABSTRAK

Pembuatan Biobriket dari Arang Tempurung Kelapa Muda (*Cocos Nucifera)* dengan Penambahan NaOH Sebagai Aktivator pada Perekat Tepung Tapioka *(Manihot Esculenta)*

(Della Dwi Agustin, 2026, 67 Halaman, 14 Gambar, 5 Tabel, 4 Lampiran)

Pemanfaatan biomassa sebagai sumber energi alternatif merupakan salah satu upaya untuk mengurangi ketergantungan pada bahan bakar. Limbah biomassa yang dapat di manfaatkan yaitu limbah tempurung kelapa muda (*Cocos nucifera*) sebagai bahan baku biobriket merupakan salah satu upaya menghasilkan energi alternatif terbarukan. Kualitas biobriket dipengaruhi oleh jenis aktivator, suhu karbonisasi, dan komposisi perekat. Penelitian ini bertujuan untuk mengetahui pengaruh penggunaan aktivator NaOH dan aquadest serta variasi komposisi perekat tepung tapioka terhadap karakteristik biobriket tempurung kelapa muda. Proses karbonisasi dilakukan pada suhu 500°C dan 600°C selama 2 jam, kemudian arang dihaluskan dan diayak ukuran 60 mesh. Variasi komposisi tempurung kelapa muda yang digunakan yaitu 90%, 85%, 80%, 75%, dan 70%, sedangkan konsentrasi perekat sebesar 10%, 15%, 20%, 25%, dan 30%. Kualitas biobriket diuji berdasarkan SNI 01-6235-2000 meliputi kadar air, kadar abu, kadar zat menguap, kadar karbon terikat, dan nilai kalor. Hasil penelitian menunjukkan perlakuan NaOH pada suhu karbonisasi 500°C menghasilkan mutu biobriket baik dibandingkan perlakuan aquadest pada suhu 600°C. Sampel terbaik diperoleh pada penggunaan perekat 10% dengan NaOH, yaitu kadar air 7,50%, kadar abu 8,00%, kadar zat menguap 13,90%, kadar karbon terikat 70,60%, dan nilai kalor 6064,4258 kal/gram. Pada perlakuan aquadest, sampel terbaik diperoleh pada perekat 10% dengan kadar air 7,80%, kadar abu 9,45%, kadar zat menguap 13,97%, kadar karbon terikat 68,78%, dan nilai kalor 5340,9011 kal/gram. Peningkatan konsentrasi perekat menyebabkan kadar air dan kadar zat menguap meningkat, sedangkan kadar karbon terikat serta nilai kalor menurun. Sebagian besar parameter memenuhi standar SNI, namun kadar karbon terikat masih berada di bawah batas minimum yang ditetapkan.

Kata kunci: Biobriket, Energi Alternatif, Tempurung Kelapa Muda, NaOH, Perekat Tapioka.

ABSTRACT

Making Biobriquettes from Young Coconut Shell Charcoal (Cocos Nucifera) with the Addition of NaOH As An Activator In Tapioca Flour (Manihot Esculenta) as Adhesive

Della Dwi Agustin, 2026, 67 Pages, 14 Figures, 5 Tables, 4 Attachments)

Utilization of biomass as an alternative energy source is one effort to reduce dependence on fuel. Biomass waste that can be utilized is young coconut shell waste (Cocos nucifera) as a raw material for biobriquettes, which is one effort to produce renewable alternative energy. The quality of biobriquettes is influenced by the type of activator, carbonization temperature, and adhesive composition. This study aims to determine the effect of the use of NaOH and distilled water activators and variations in the composition of tapioca flour adhesive on the characteristics of young coconut shell biobriquettes. The carbonization process was carried out at a temperature of 500°C and 600°C for 2 hours, then the charcoal was ground and sieved to a size of 60 mesh. The variations in the composition of young coconut shells used were 90%, 85%, 80%, 75%, and 70%, while the adhesive concentration was 10%, 15%, 20%, 25%, and 30%. The quality of biobriquettes was tested based on SNI 01-6235-2000 including water content, ash content, volatile matter content, bound carbon content, and calorific value. The results showed that NaOH treatment at a carbonization temperature of 500°C produced good biobriquette quality compared to aquadest treatment at a temperature of 600°C. The best sample was obtained using 10% adhesive with NaOH, namely water content of 7.50%, ash content of 8.00%, volatile matter content of 13.90%, bound carbon content of 70.60%, and calorific value of 6064.4258 cal/gram. In aquadest treatment, the best sample was obtained with 10% adhesive with water content of 7.80%, ash content of 9.45%, volatile matter content of 13.97%, bound carbon content of 68.78%, and calorific value of 5340.9011 cal/gram. Increasing the adhesive concentration causes the moisture and volatile matter content to increase, while the bound carbon content and calorific value decrease. Most parameters meet SNI standards, but the bound carbon content remains below the minimum limit.

Keywords: *Biobriquettes, Alternative Energy, Young Coconut Shell, NaOH, Tapioca Adhesive.*