

PENGOLAHAN LIMBAH KULIT KAKAO DAN KEMIRI SEBAGAI BAHAN BAKAR ALTERNATIF PADA PEMBUATAN BIOPELET MENGGUNAKAN BAHAN PEREKAT TAPIOKA

ABSTRAK

Jumlah cadangan bahan bakar yang semakin menipis menimbulkan permasalahan terjadinya krisis bahan bakar minyak, yang mengakibatkan harganya semakin tinggi dan perekonomian masyarakat semakin merosot. Biomassa merupakan sumber bahan bakar alternatif terbarukan namun masih memiliki kelemahan yaitu kandungan kadar airnya tinggi, nilai kalor yang rendah dan kerapatan yang rendah serta proses pembakarannya membutuhkan suhu yang tinggi. Untuk mengatasi masalah tersebut maka biomassa dapat diolah menjadi biopelet dengan tujuan untuk meningkatkan kerapatannya dan dapat meningkatkan kualitas pembakaran. Penelitian merupakan pengolahan limbah kulit kakao dan kemiri sebagai bahan bakar alternatif pada pembuatan biopelet menggunakan bahan perekat tapioka. Tahapan penelitian ini meliputi persiapan bahan baku kulit kakao dan cangkang kemiri digiling hingga ukuran 60 mesh lalu ditambahkan perekat bervariasi 5%, 10% dan 15%, kemudian dicetak secara manual dan dikeringkan didalam oven dengan suhu 60°C selama ±3 jam. Selanjutnya biopelet dikarakterisasi berdasarkan ketentuan SNI 8021:2014 yang meliputi kerapatan, kadar air, kadar abu, kadar zat menguap, kadar karbon terikat, nilai kalor, dengan nilai paling optimum berturut-turut yaitu 1,02 g/cm³, 3,14%, 6,25%, 64,56%, 26,05% dan 4145,6 cal/g. Biopelet juga dilakukan uji efektivitas seperti uji kuat pecah dan laju pembakaran dengan nilai berturut yaitu 0,14% dan 0,11 g/menit. Biopelet dengan kualitas terbaik terdapat pada jenis biopelet dengan campuran bahan baku 2:1 dan menggunakan perekat tapioka 10%.

Kata Kunci : Biopelet, Bahan Bakar Alternatif, Pengolahan Limbah, Kulit Kakao, Cangkang Kemiri, Nilai Kalor.

**PROCESSING OF COCOA AND CANDLENUT WASTE AS AN
ALTERNATIVE FUEL IN BIOPELLET
USING TAPIOCA ADHESIVES**

ABSTRACT

The amount of fuel reserves were getting depleted and has created problems with the occurrence of a fuel crisis, which has resulted in higher prices and the economy of the community has been down. Biomass is a renewable alternative fuel source but still has weaknesses, like high water content, low calorific value and low density and the combustion process requires high temperatures. To overcome this problem, biomass can be processed into biopellets with the aim of increasing its density and increasing the quality of combustion. The research was about the processing of cocoa and candlenut shell waste as an alternative fuel in the manufacture of biopellets using tapioca adhesive. The stages of this research include the preparation of raw materials for cocoa shells and candlenut shells ground to a size of 60 mesh and then added with various adhesives of 5%, 10% and 15%, then printed manually and dried in an oven with a temperature of 60°C for ±3 hours. Furthermore, the biopellets were characterized based on the provisions of SNI 8021:2014 which included density, moisture content, ash content, volatile matter, fixed carbon, calorific value with the most optimum values, respectively, 1.02 g/cm³, 3.14%, 6.25%, 64.56%, 26.05% and 4145.6 cal/g. Biopellets were also tested for effectiveness such as fracture strength and combustion rates with values of 0.14% and 0.11 g/min, respectively. Biopellet with the best quality was found in the type of biopellet with a mixture of raw materials 2:1 and using 10% tapioca adhesive.

Keyword : *Biopellet, renewable alternative fuel, Waste Treatment, Cocoa, Candlenut, Calorific Value.*