

ABSTRAK

Peningkatan jumlah penduduk berdampak pada tingginya kebutuhan energi. Sehingga, sumber daya yang tersedia juga semakin berkurang dan perlu digantikan dengan sumber energi yang baru. Konsep *waste to energy (WTE)* dapat dijadikan alternatif untuk mengubah sampah menjadi bahan baku *RDF (refuse derived fuel)*. Sampah organik dan plastik sangat berpotensi dijadikan sebagai bahan baku *RDF* karena sifatnya yang mudah terbakar (*combustible*). Penelitian ini bertujuan untuk menganalisis hubungan kedalaman dan material sampah dengan karakteristik material sampah *combustible*, serta menentukan nilai kalor HHV dan LHV berdasarkan kedalaman sampah dan material *combustible* zona aktif II TPA Jatibarang untuk melihat potensinya sebagai bahan baku *RDF*. Metode yang digunakan adalah *random sampling*. Material sampah yang digunakan pada penelitian ini bersasal dari kedalaman 0-1 m; 1-2 m; 2 dan 2-3 m. Pemanfaatan sampah menjadi bahan baku *RDF* dilakukan dengan cara menganalisis nilai kalor yang dihasilkan dari material sampah *combustible* tersebut. Nilai kalor terbagi menjadi *High Heating Value (HHV)* and *Low Heating Value (LHV)*. Untuk menganalisis nilai kalor yang terdapat pada material sampah *combustible* pada zona aktif II TPA Jatibarang dapat dilakukan dengan melakukan pengujian *proximate*, *ultimate* dan termokimia dengan menggunakan alat bom kalorimeter. Hasil penelitian menunjukkan bahwa sampah zona aktif II TPA Jatibarang memiliki nilai kalor yang berbeda pada setiap metode analisa yang dipengaruhi oleh variasi kedalaman, jenis sampah dan ukuran partikel sampah. Pada uji *proximate*, nilai kalor berada di kisaran angka 1000 kkal/Kg. Pada uji *ultimate* nilai kalor berada pada kisaran 1.441,16 – 10.355,54 kkal/kg. Pada bom kalorimeter nilai kalor berada pada kisaran 5.000 kkal/kg. Hal ini menunjukkan bahwa potensi sampah zona aktif II TPA Jatibarang untuk diolah menjadi *RDF* sangat besar.

Kata kunci: sampah *combustible*, *landfill*, *waste to energy*, *RDF (refused-derived fuel)*.

ABSTRACT

The growth of population increases the amount of energy demand. However, the available resources are decreasing and it need to be replaced by a new energy resource. The concept of waste to energy (WTE) can be an alternative to convert waste into raw RDF (refuse derived fuel) material. Especially for organic and plastic as combustible waste is very potential to be raw of RDF Materials. This study aimed to analyze the relationship between depth and material of waste and material characteristics of combustible waste, also to determine the HHV and LHV calor value according to the depth of waste and combustible material in Jatibarang landfill active zone II to see the potential as RDF raw material. Random sampling is a method that used for this research. The waste material required for this research is taken from the depth of 0-1 m; 1-2 m; 2 and 2-3 m. The utilization of waste into raw RDF materials by analyzing the heating value produced from the combustible raw material. Then the heating value divided into High Heating Value (HHV) and Low Heating Value (LHV). To analyze the heat value contained in combustible waste material in active zone II Jatibarang landfill can be done by testing proximate, ultimate and thermochemical with bomb calorimeter. The results showed that the waste of active zone II Jatibarang Landfill had different calorific values on each analysis was also influenced by the depth variation, the type of waste and the type size of the waste particles. In the proximate analysis, the calorific value is in the range of 1000 kcal / kg. In the ultimate analysis the heating value is in the range of 1.441,16 – 10.355,54 kcal / kg. In the calorimeter bomb, the heating value is in the range of 5,000 kcal / kg. This shows that active zone II Jatibarang Landfill has a great potential to be processed into RDF.

Keywords: *combustible waste, landfill, waste to energy, RDF (refused-derived fuel).*

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