

INTISARI

Hydrothermal treatment didefinisikan sebagai proses konversi *thermo-chemical* dimana material (dalam kasus ini biomassa), tersuspensi dengan air di bawah tekanan, dan dipapar suhu sedang (180-320°C). Dalam penelitian ini, biomassa yang digunakan adalah serbuk gergaji kayu dan tongkol jagung dengan variasi rasio biomassa-air (1:20 – 4:20) dan variasi *residence time* (20 – 50 menit). Rasio biomassa-air memberikan pengaruh yang lebih signifikan pada solid yield dan penurunan kandungan kalium pada *biochar*. Untuk serbuk gergaji kayu *energy yield* terbesar didapatkan pada variasi *residence time* 40 menit (rasio 2:20), sedangkan untuk tongkol jagung *energy yield* terbesar didapatkan pada variasi rasio biomassa-air 3:20 (*residence time* 30 menit). Kandungan dalam biomassa bahan baku *hydrothermal treatment* sangat menentukan karakteristik *biochar*. *Biochar* yang berasal dari serbuk gergaji kayu memiliki *energy yield* yang lebih besar (62,71-70,59) daripada *biochar* yang berasal dari tongkol jagung (47,88-57,69). Akan tetapi tongkol jagung lebih mudah bereaksi daripada serbuk gergaji kayu, hal ini dibuktikan dengan E/R dari tongkol jagung yang lebih rendah (0,05-16,19 K) daripada serbuk gergaji kayu (15,72-45,17 K).

Kata kunci: hydrothermal treatment, biomassa, rasio biomassa-air, residence time

ABSTRACT

Hydrothermal treatment is defined as a thermochemical conversion process in which a material (in this case biomass) in a suspension with water under pressure, and exposed to moderate temperature (180-320°C). In this research, biomass used are teak sawdust and corn cobs with variation of biomass to water ratio (1:20 – 4:20) and residence time (20 – 50 minutes). Biomass to water ratio gives more influences on solid yield and reduction of potassium content in biochar. The highest energy yield for sawdust was found in 40 minutes residence time variation (ratio 2:20), while the highest energy yield for corn cobs was found in 3:20 biomass to water variation (residence time 30 minutes). Biomass composition of raw materials for hydrothermal treatment greatly determines the biochar characteristics. Biochar derived from sawdust has a greater energy yield (62.71-70.59) than biochar derived from corn cobs (47.88-57.69). Meanwhile corn cobs are easier to react than sawdust. This is evidenced by the lower E/R of corn cobs (0.05-16.19 K) compared to sawdust (15.72-45.17).

Keywords: hydrothermal treatment, biomass, biomass to water ratio, residence time