

Pengaruh torefaksi terhadap sifat fisik pellet biomassa yang dibuat dari bahan baku tandan kosong kelapa sawit = Torefaction influence on the physical properties of biomass pellets of oil palm empty fruit bunches

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Abstrak

Biomassa merupakan salah satu energi alternatif yang dapat mengatasi solusi krisis energi di Indonesia. Tujuan penelitian ini yaitu melihat pengaruh proses torefaksi terhadap sifat ketahanan moisture content, kemampuan reduksi ukuran biomassa dan ketahanan tekan pellet biomassa yang berasal dari bahan baku tandan kosong kelapa sawit. Analisa yang dilakukan untuk mengetahui karakteristik pengaruh torefaksi yaitu pengujian sifat ketahanan moisture content, pengujian kemampuan reduksi ukuran serta pengujian ketahanan tekan untuk melihat karakteristik sifat fisik pellet biomassa. Penelitian yang dilakukan yaitu membandingkan pembuatan pellet biomassa proses torefaksi pada variasi temperatur 225, 250, 275, 300 dan 325°C dengan tanpa proses torefaksi.

Hasil penelitian menunjukkan sifat ketahanan moisture content terbesar pada kondisi temperatur 325°C dengan nilai 6,34 % penambahan moisture content, sedangkan yang terendah pada kondisi temperatur 225°C dengan nilai 32,08 % penambahan moisture content. Kemampuan reduksi ukuran tertinggi pada distribusi ukuran partikel < 125 m yaitu pada kondisi non torefaksi sebanyak 5,89 gram, sedangkan yang terendah pada variasi temperatur 325°C sebanyak 2,18 gram. Untuk distribusi terbesar ukuran partikel > 297 m yaitu pada kondisi temperatur 325°C sebanyak 2,81 gram, sedangkan distribusi terendah pada kondisi non torefaksi sebanyak 0,24 gram. Nilai ketahanan tekan pellet biomassa terbesar pada kondisi non torefaksi sebesar 2,44 kgf/mm².

.....Biomass is one of the alternative energy solutions that can overcome the energy crisis in Indonesia. The purpose of this study is to see the effect of the resistance properties torefaction moisture content, the ability to reduce the size and durability of biomass pellet press biomass feedstock derived from oil palm empty fruit bunches. Analysis is performed to determine the influence of the characteristics of the testing of resistance torefaction moisture content, test the ability to reduce the size and durability testing tap to see the characteristics of the physical properties of biomass pellets. Research carried out by comparing the biomass pellet making process torefaction the temperature variation 225, 250, 275, 300 and 325 °C with no torefaction process.

Results showed greatest resistance properties of moisture content on the conditions of temperature 325°C with the addition of the value of 6.34% moisture content, and the lowest at 225°C temperature conditions with a value addition of 32.08% moisture content. Ability to reduce the size of the highest in the distribution of particle size <125 m is the condition of non torefacton much as 5.89 grams, while the lowest at 325°C temperature variations of as much as 2.18 grams. For the largest particle size distribution of >297 m is 325°C rise in temperature as much as 2.81 grams, while the lowest distribution in non torefaction conditions as much as 0.24 grams. Resistance value of the largest biomass pellet press on condition of non torefaction of 2.44 kgf/mm².