Torrefaction Method in Making Coffee Ground Briquettes with Orange Peel Adhesive

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ABSTRACT

Energy is generally divided into two, the first is non-renewable energy for example coal, oil, and natural gas. While the second is renewable energy such as geothermal, solar, wind, water, and bioenergy or which can also be called biomass. One of the developments of biomass as an alternative fuel is briquettes. The purpose of this study was to make and analyze the characteristics of coffee grounds briquettes using an adhesive from orange peel using the torrefaction method. Torrefaction is a low temperature (200-300 ^{o}C) carbonization process in the absence of oxygen. Briquettes are made with the percentage of coffee grounds and orange peel adhesive 70% : 30%, 60% : 40%, and 50% : 50%. Torrefaction process with a temperature of 200 ^{o}C within 60 minutes without any air or little air in the furnace with the addition of modified elbows. The results showed that the best composition was found in DK1 with a ratio of 70% coffee grounds with 30% orange peel adhesive, namely density 0.49 gr/cm3, water content 5.11%, volatile matter content 78.33%, bound carbon content 17.31%, 0.62% ash content, and 4656 cal/gr calorific value.

Keywords*: coffee grounds, briquettes, torrefaction, calorific value*