

The Quality of Bio-pellet from a Combination of Walnut Kernel Shell (*Canarium Indicum L.*) and Palm Kernel Shell as Renewable Energy

Linda Jati Kusumawardani, Ani Iryani, Ronaldo Juniansyah

Department of Chemistry, Faculty of Mathematics and Science,

Universitas Pakuan

Bogor, Indonesia

linda.wardani@unpak.ac.id

Abstract

Using biomass as a source of energy allows one to overcome the decreased supply of fossil fuels. Bio pellets—an energy product made from biomass—can be utilized. Bio-pellet research has employed a variety of biomass modifications. Combining or adding additional raw ingredients with superior qualities can raise the quality of the bio-pellet itself. The walnut plant itself is a forest plant that grows widely in eastern Indonesia. Walnut trees are also located in the GOR Pajajaran area of Bogor City, although they are merely one of the flora there and have not been utilized in such a way. If developed and processed further into processed energy products, such as bio-pellets—which are typically used as fuel for winter heating or can also be used to replace petrol fuel because they are more affordable and environmentally friendly—walnut kernel shells have the potential to be an alternative energy source. Bio pellet research has employed a variety of biomass modifications. Combining or adding additional raw ingredients with superior qualities can raise the quality of the bio-pellet itself. Because palm kernel shells have a calorific value when burned, they are frequently employed as a basic ingredient in mixtures to create bio-pellets. Because of their high calorific value, palm oil shells may be used as an extra raw material to produce bio-pellets of a higher caliber. As far as the author knows, there have been known studies about potential walnut kernel shell from GOR Pajajaran area of Bogor City's as Bio-Pellet. The steps of raw material preparation, bio-pellet production, and biopellet characterization in accordance with SNI 8675:2018 on the quality of biomass pellets are where this research starts. This experiment was carried out by different ratios of walnut kernel shell and palm kernel shell, including 70%:30%, 50%:50%, 30%:70%, and 0%:100%. Combining them with a pre-established mixture, and then forming them using a pellet mill. The present study aims to investigate the potential walnut kernel shell *Canarium Indicum L.*) and its combination with palm kernel shell for processing into energy products, specifically bio-pellets. This study will focus on quality tests of bio pellet due to SNI 8675:2018. This experiment was carried out by different ratios of walnut kernel shell and palm kernel shell, including 70%:30%, 50%:50%, 30%:70%, and 0%:100%. Calorific value and proximate value will be evaluated to obtain the highest-quality bio-pellets.

Keywords

Biomass; Energy; Biopellet; Palm Oil Kernel shell; Walnut Kernel Shell.

Biography

Linda Jati Kusumawardani, M.Si is a lecturer in Universitas Pakuan University, Department Chemistry and spend more than 10 years research in inorganic chemistry, physic chemistry and its application in energy also waste water treatment. Linda Jati Kusumawardani, M.Si graduated from Chemistry in Ben-Gurion University before embarking on an academic career. Main academic research interests are focused on Advance Material and its application in energy also waste water treatment.