

## Abstract

Research Title : Development of Biomass Fuel Briquettes from Coconut Residues

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The present study aimed to develop the biomass fuel briquette and pellet from coconut residues, i.e., the coconut husk, the coconut press cake and the coconut coir dust. The briquetting of coconut residues were formed by hot press machine at 300°C. The biomass briquette characteristics, i.e., heating value, moisture content, volatile matter, ash, fixed carbon and bulk density were analyzed. The results showed that the coconut husk has tested to be a high the heating value, especially the production of briquette by aromatic coconut husk showed the high heating value of 4,882 cal/g. Vegetable oil was used as the binder, which mixed by aromatic coconut husk at reduced volatile matter content. In addition, the briquette from the coconut milk husk mixed of the coconut press cake had the high heating value of 5,493 cal/g.

Moreover, the coconut coir dust is a test pelleted material. The pelleting of coconut coir dust was formed by flat die pellet mill type with the diameter of 6 mm. The biomass fuel pellet characteristics were analyzed according to biomass pellet standard, i.e., bulk density, diameter, pellet durability index, fines, moisture content, heating value, ash content, chloride, sulfur and nitrogen. The results showed that the coconut coir dust pellet has tested to be a good quality. This is because the fuel characteristics, the heating value and bulk density of pellet were high, while the moisture content, ash, sulfur and nitrogen were also low content.

The properties of coconut coir dust pellet were qualified for criteria requirement of Thailand biomass pellet quality standard, i.e., the bulk density of 770 kg/m<sup>3</sup>, diameter of 6.06 mm, fine dust of 0.47%, moisture content of 4.74%, ash content of 6.73%, nitrogen of 0.23% and sulfur might be disappeared. Moreover, the heating value of 4,320 kcal/kg, was higher than those of the criteria requirement. However, the chloride could be not qualified by the over value of chloride (0.43%).

**Keywords:** Biomass briquette/ Biomass pellet / Coconut residues