Abstract

The growth of energy consumption has caused the energy availability to diminish, especially fossil fuel. Therefore, new alternative fuel source is needed, which is easy to explore, has similar characteristics with other fuels, achievable price, and environmentally friendly. The high generation of municipal organic solid waste and high-density polyethylene (HDPE) plastic waste are potential to be used as eco-briquette raw materials. Objectives of this research were: (1) to determine eco-briquette composition effects to calorific value, moisture, volatile solids, fixed carbon, ash content, flash point, and compressive strength, (2) to determine moisture, volatile solids, fixed carbon, and ash content effects to heat value of eco-briquette, (3) to determine the best quality of adhesive, and (4) to determine eco-briquette with the best economical value.

Carbonization of organic municipal solid waste was meant to increase the calorific value of eco-briquette. Furthermore, grinding and sieving were done in order to homogenize the organic municipal solid waste carbon size. Homogen size made compounding of carbon particle and adhesive particle easier. The adhesives used in this research were cassava starch and molasses. Ratios of HDPE plastic waste and municipal organic solid waste carbon which were tested in this research were 5:95, 10:90, and 20:80.
Results of this research showed, the heat value of eco-
briquette was higher with the increase of HDPE plastic waste 
ratio. Moisture and ash content of eco-briquette were inversely 
proportional with the heat value. However, volatile solid content 
was comparable to the heat value of eco-briquette. Eco-briquette 
with cassava starch adhesive produced heat value higher than 
that of with molasses adhesive. The best eco-briquette product 
was that of with 20% HDPE plastic waste, with cassava starch 
adhesive. The heat value was 9300.79 cal/gram, which met the 
bio-coal standards according to the Minister of Energy and 

Key words : municipal organic solid waste carbon, 
eco-briquette, HDPE plastic waste