

ABSTRACT

*The growing demand for environmentally friendly alternative energy sources has driven the exploration of agricultural waste such as peanut shells (*Arachis hypogaea* L.). In this study, peanut shells were combined with molasses, a natural binder derived from sugarcane, to produce high-quality biobriquettes. The abundant and underutilized peanut shell waste has significant potential as an alternative fuel source due to its cellulose content and relatively high calorific value. Molasses was chosen as a binder for its natural adhesive properties and high sugar content. The research was conducted using three composition variations: 80%:20%, 85%:15%, and 90%:10% (peanut shells:molasses), through an experimental method involving pyrolysis, mixing, molding, drying, and quality testing of the briquettes. The tested parameters included moisture content, ash content, volatile matter, fixed carbon, combustion rate, and calorific value. Results showed that the best composition was 90% peanut shells and 10% molasses, yielding a moisture content of 2.65%, ash content of 8.18%, volatile matter of 46.3%, fixed carbon of 42.87%, calorific value of 5769.33 cal/g, and combustion rate of 0.005 g/s. The briquettes produced from this composition met most of the SNI 01-6235-2000 standards for solid biomass fuel, indicating their potential as an economical and environmentally friendly alternative energy source.*