Production of biofuel briquettes from carbonized sawdust

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The Africa's energy crisis is one cause of deforestation. However, ongoing logging and wood processing activities generate sawdust, an undervalued bioresource. This study aims to valorize carbonized sawdust to produce biofuel briquettes for domestic use. The Binder percentage, compaction pressure and retention time are studied using Box-Behnken Response Surface Methodology (RSM). ANOVA determined their significance on higher heating value (HHV), ash content and Impact Resistance Index (IRI). The Briquettes are characterized in accordance with ASTM D-(5865 and 3172). The IRI is determined by the drop test. Based on 17 Box-Behnken design experiments, HHV varies between 23074 and 26050 kJ/kg. Ash content ranged from 2.86 to 5.24%. IRI ranges from 136.36 to 500%. Binder significantly affects all responses (P-value < 0.05). After optimization, the ideal conditions for producing quality briquettes in quantity are: binder percentage 10%, compaction pressure 75kPa, retention time 7.49 min. The values for HHV, ash content and IRI under these conditions are 25596 kJ/kg, 3.01% and 375% respectively. By correlating these results with the absence of certain heavy metals, the study confirms that the briquettes produced are suitable for domestic use.

Keywords: sawdust; biofuel briquettes; response surface methodology; optimization.

Biography:

Nganko Junior Maimou: is a Cameroonian doctoral student at the Félix HOUPHOUËT-BOIGNY National Polytechnic Institute; PhD student; CEA-VALOPRO in Yamoussoukro, Ivory Coast. His determination and involvement in scientific activities have enabled him to take part in several national and international communications, winning prizes for the best papers. He is working on the production of biofuel briquettes from biomass.