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Production and Characterization of Briquette from Low–Density Polyethylene waste, Empty Fruits Bunches and Used Cooking oil

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Abstract : Briquette is one of alternative energy source which made from biomass and is potential to sustitute the fossil fuels. Both empty fruit bunches (EFB) and low density polyethylene waste (LDPE) have high calorific value which is potential to be used as the source of briquette raw material. The objective of this study is to determine the optimal pressure and composition of briquette from the mixture of EFB and LDPE. Briquette production was done by variating the composition of EFB and LDPE as follows: 95/5, 90/10, 85/15, 80/20, 75/25 % (weight/weight). EFB was first carbonated under 300°C and the charcoal was pounded and mixed with small pieces of LDPE. The mixture was homogenized with starch adhesive in 10% concentration. The briquetting pressure was variated as follows: 2000, 3000, 4000, 5000 and 6000 Psia. After pressing the mixture, the briquette was soaked in used cooking oil for 30 mintues. Each stamped briquette was examined physically and tested for its calorific value. The result of statistical analysis using ANOVA shows that the best quality of briquette was obtained from 75/25% composition of EFB/LDPE with briquetting pressure of 3000 Psia. The characteristics of briquette was having 1,2% water content, 7000 calorie/gram calorific value, 5-7% ash content and 40-70% fixed carbon besides the effect of carbonization process under 300°C, starch content as the adhesiveand used cooking oil as the immersed liquid.

Key words : briquette, calorific value, EFB,LDPE, used cooking oil.

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