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Comparison Study of Efficiency and Property of Fuel Briquette by Electrical Machine by Motor and Hand Machine Using Bicycle

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Abstract
This study is comparison between fuel briquette from electric machine using motor and hand machine using bicycle. The briquettes from electric machine are 3.5 HP. The material was wooden charcoals which were grinded by grinder. The ratio was 2,000 g of grinded charcoal and 500 g of Tapioca flour (4:1) and water. Those components were mixed to made briquettes by electric motor and bicycle process. The time was record and the fuel was exposed to sun for getting rid of moisture. Calorific value testing was made using Cal 2k e2k (Bomb Calorimeter). And, mechanical property was calculated by finding density, the length of time when the fuel was lit and completely burnt out was also recorded.
It was found that making briquette using electric motor spent 4.29 minutes and using bicycle process spent 4.50 minutes. The percentage of difference in producing time was 4.79% the heating value of fuel from electric motor and bicycle process were 22.68 MJ/KG and 23.34 MJ/KG respectively. The percentage of difference in heating value was 2.87%. And, the density of briquette from electric motor and bicycle process were 907.43 Kg/m3 and 838.57 Kg/m3 respectively. The percentage of difference in density was 7.89%. The igniting period of those from electric motor and bicycle process were 6 minutes and 4.33 minutes. The percentage of difference in igniting period was 32.33%. And, the burning period of those from electric motor and bicycle were 5.17 hours and 4.24 hours respectively. The percentage of difference in burning period was 19.76%.
Keywords: electric machine by motor / hand machine using bicycle / fuel briquette

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