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Thermal Properties of Green Briquettes Fuel from Corn Cobs Residue Materials Mixed Macadamia shell Charcoal Powder

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The objective of this research was to produce green fuel briquettes from corncobs by adding macadamia shell charcoal powder. The study was sectioned into 3 parts: 1) Quality improvement of green fuel briquettes by adding macadamia; 2) Fuel property analysis based on ASTM standards and efficiency on heat capacity; and 3) Economics appropriateness in producing green fuel briquettes. This research produced green fuel briquettes using the ratio of corncobs weight and macadamia shell charcoal powder at 100:0 90:10 80:20 70:30 60:40 and 50:50 and pressing in cold briquettes machine. Fuel property analysis showed that green fuel briquettes at the ratio 50:50 produced maximum heating values at 21.06 Megajoule per kilogram and briquettes density at 725.18 kilogram per cubic meter but percent of moisture content, volatile matter, ash, and fixed carbon were 10.09, 85.83, 2.17 and 1.91 respectively. Heat capacity efficiency of green fuel briquettes was in average at 20.22%. Economics appropriateness at the ratio of corncobs weight and macadamia shell charcoal powder at 50:50 which accounted for the cost per kilogram at 5.75 Baht. The net present value was at 1,791.25 Baht. Internal rate of return was at 8.62 and duration for payback period of investment was at 1.6 years which was suitable for investment.

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