

ABSTRACT

This study aims to determine the effect of temperature and mass fraction factors on calorific value, to determine the effect of temperature and mass fraction factors on the rate of combustion, and the effect of the interaction of heating temperature factor and mass fraction of the briquette charcoal binder on the calorific value and burning rate of sawdust charcoal briquettes and water hyacinth (Ichhornia crassipes). Making charcoal briquettes with a mixture of water hyacinth and wood sawdust using an experimental design with a 3² factorial completely randomized design which means 2 factors and 3 levels, and with 3 repetitions. Based on the results and conclusions of the study, it shows that the calorific value and combustion rate data are not significantly affected by the heating temperature, as exemplified by the P-Value value in the response to the Calorific Value (J) and Combustion Rate, which are $0.658 > 0.05$ and $0.312 > 0.05$ which means that there is no significant effect. The binding mass fraction (%) of charcoal briquettes did not significantly affect the Calorific Value and Combustion Rate, with the results of the P-Value value in the response to Calorific Value (J) and Combustion Rate of $0.341 > 0.05$ and $0.439 > 0.05$, respectively. has the meaning of accepting H_0 or there is no significant effect. The interaction between the heating temperature factor and the mass fraction of the briquette binder on the calorific value and the rate of burning of briquette charcoal has no significant effect, with the results of the P-Value value on the response of Calorific Value (J) and Combustion Rate of $0.221 > 0.05$, respectively. and $0.757 > 0.05$ which means that there is no significant effect of interaction.

Keywords : Charcoal briquettes, water hyacinth (ichhornia crassipes), experimental design, factorial, calorific value, combustion rate.