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Comparison of Corn and Tapioca Starch Binders on the Characteristic of Rice Straw Charcoal Briquettes

Abstract

Agricultural waste was abundant and commonly burnt on the landfilled due to no significant uses. Rice straw was rarely used in proper scientific work for the production of charcoal briquettes. Rice straw can be converted into an alternative charcoal briquette which is used for generating heat energy. However, the suitable type and concentration of binder used for the briquette production were still unclear. The aim of this study is to make the properties comparison between corn and tapioca starch as binder used in rice straw charcoal briquettes. Chopped rice straw was combusted in oven at 260 °C for 4 h in order to produce char powder. Each kind of starch and char powder was thoroughly mixed together and then compacted into charcoal briquettes by using a carbon steel die. Charcoal briquette samples were then analysed for volatile matter, fixed carbon, moisture content, ash content and burning rate. It was found that corn and tapioca starch binders with different binder concentrations affect slightly different characters and properties of charcoal briquettes product.

Keywords

Binders; Biowaste; Briquettes; Charcoal; Rice straw