HYDROTHERMAL TREATMENT OF HERB RESIDUE FOR SOLID FUEL PRODUCTION

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ABSTRACT

Hydrothermal is considered as one of the recommended technology for solid waste treatment for its various advantages. In this research, herb residue was subjected to hydrothermal treatment. Calorific value, yield, and also the composition of obtained char were investigated.
A reactor with a simple design and low-tech component was used in the experiment. It consists of a stainless steel cylindrical reactor with an internal volume of 2.5 Litres. The reactor has a stirrer to fasten heat transfer through the medium from the bottom surface to the upper reactor. Solid products were dried by a microwave oven before analysis.
The results show that the final temperature, holding time and solid-water ratio have various effects on the hydrochar yield, calorific value, and proximate analysis of the hydrothermal products. The hydrochar yield decresed with the increase in final temperature and holding time. Meanwhile, the highest hydrochar yield was obtained at the solid-water ratio of ¼. The hydrochar calorific value increased with the increase in final temperature, holding time and solid-water ratio. The rise in final temperature, holding time and solid-water ratio resulted in the lower moisture content and volatile matter but higher fixed carbon without significantly affected the ash content.

Kata Kunci: *herb residue, hydrothermal, production, solid fuel, treatment*