



Cover page

Project title: Olive Solid Waste As An Alternative of Coconut Charcoal Academic Year: 2023

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Project's Abstract:

Charcoal is produced by extracting water and other volatile components from animal and plant materials without oxygen. Since ancient times, charcoal has been used for various purposes, including art, medicine, and fuel.

This experimental study aims to make charcoal from solid olive waste (peat) with properties based on international standards. It also includes the steps of manufacturing the charcoal to be produced in this study, which begin with drying the raw materials and carbonizing them by pyrolysis, followed by grinding and screening, then mixing the produced powder with starch and shaping it into briquettes, followed by pressing and drying and determining the physical and chemical properties of the produced charcoal.

The first step in preparing charcoal was to purify the raw material (peat) from impurities and residual oil by washing it several times with hot water. It was dried in an oven for 24 hours and then cooled to room temperature. Carbonization (pyrolysis) was carried out by placing a dried and weighed peat sample in an oven at 500 °C for 2 hours. After carbonization was completed, the samples were cooled to room temperature inside a dryer. 100 grams of charred peat was ground using an electric grinder until it turned into a fine powder, then it was mixed with 30 ml of water and different concentrations of starch (1%, 2%, and 5%) until it became a homogeneous mixture.

The experimental results showed that the high percentage of starch caused an increase in the percentage of ash resulting from the charcoal produced when used, and through this study, the percentage of starch 1% was adopted as the best sample for international standards for charcoal, after relying on the standards followed in Indonesia, the United States, and Japan, and the following results were obtained: moisture content 5%, volatile matter content 9%, ash content 6%, fixed carbon 80.5%, and calorific value 6233 (kcal). In addition, it was found that increasing the drying time after preparing the charcoal briquettes (about 48 hours) increases the hardness and ignition of the charcoal.

The analytical study conducted on 10 people using the produced charcoal showed that the quality was very good and similar to the coconut charcoal available in the market, in terms of smell, ignition, and ash content produced with slightly less hardness due to the use of simple pressing tools.