

Comparison and Characterization of Different Types of Durian Husk as Activated Carbon

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Abstract

In this study, characterization of activated carbon (AC) produced from durian husk by chemical activation technique using potassium hydroxide (KOH) as activating agent. Three types of durian husk used were *Durian D-2 (DD-2)*, *Durian Kampung (DK)* and *Durian Kacing Baju (DKB)*. All of these durians husk are then carbonized and activated. The particle size of AC is sieved between 300 – 600 μ m. The AC is then characterised according to proximate analysis and chemical properties. The proximate analysis is including moisture content, ash content, volatile matter and fixed carbon. The elemental analysis is also done. Commercial adsorbent silica gel was compared with carbon produced by using iodine titration. All types of durian husk shows difference values in physical analysis and almost same characteristics in chemical analysis.

Keywords: Activated carbon, characterization, chemical properties, durian husk, proximate analysis.

1 Introduction

In South East Asia countries durian (*Durio zibethinus*) is the most popular seasonal fruit. Durian is a tropical fruit of trees species of Malvales order in *Bombacae* family and *genus* of *Durio* [1]. According to the statistical data reported by the Ministry of Agricultural and Agro- Based Industry Malaysia, the local production of durian in the year 2011 was 300,470 metric tone, and about 255,353 metric tone of it is the durian husk which was produced as the byproducts [2]. Therefore a proper way of managing these durian husks should be done in order to decrease the waste produced. One of the ways of decreasing the waste produced by durian husk is by utilizing it to produce a product which would be beneficial.

According to Tham, *et al.*, (2011) these durian husks has the potential to be an active carbon [6]. Activated carbon (AC) is also known as a solid, porous black carbonaceous material and tasteless [3]. The aim of this study is the characterization of durian husk as activated carbon using chemical and physical properties. Three types of local durian which are *Durian Kacing Baju (DKB)*, *Durian Kampung (DK)* as scientific name is *Durio zibethinus Murray*, and *Durian D-2 (DD-2)* with the local name of 'Dato Nina' is used. Also the prepared activated carbon used in titration of iodine.

2 Materials and Methods

2.1 Fresh sample collection

The durian husk was obtained from Pasar Tani Jeli, Kelantan. The types of durian used were *Durian Kacing Baju (DKB)*, *Durian Kampung (DK)* and *Durian D-2*. These durians were ripe and the colours were greenish yellow with very strong smell and each weights around 4 to 5kg. The durian husk washed first before cut into small pieces range from 1 to 3 cm particle size. Figure 1 shows the flow of methods for activated carbon preparation [7].