A REVIEW ON CHARACTERIZATION OF ACTIVATED CARBON FROM SUGARCANE BAGASSE USING KOH AS CHEMICAL ACTIVATING AGENTS

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ABSTRACT

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Activated carbons (ACs) are highly porous materials with a broad range of applications in industry such as gas storage, water and air purification, gas separation, and catalysis. The microstructure for ACs is still not clearly known in spite of their wide industrial uses. There have been efforts to describe the structure of activated carbons experimentally in relation to its characteristics. In this review, ACs is an important material in various fields owing to its low cost, well-developed porosity, and favorable chemical stability. Key factors for the optimal synthesis of AC are the carbon precursors, activation pathways, activating agents, and design of the procedure parameters. Accordingly, the present review provides a summary of recent research, highlighting the development of activating agents during the process of AC. This review will be focusing on the characteristic of the AC from Sugarcane Bagasse (SB) using KOH as chemical activated agents. Converting SB waste, into activated carbon provides an alternative disposal method, thereby alleviating environmental concerns indirectly. This review will provide the characterization of sugarcane bagasse by using KOH as chemical activated agent to further promote uptake on this method. The AC after the preparation process is characterized by using Scanning Electron Microscope (SEM) for the analysis of composite morphological properties, Thermo Gravimetric Analysis (TGA) to study the thermal behavior of both precursor and activated carbon materials and, FTIR spectroscopy analysis to find out the different chemical bonds, chemical compounds and functional groups present in the materials. The various application of the preparation method of AC in many commercially and industrially as the characteristic of AC makes it versatile in many ways.

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CHAPTER 1

INTRODUCTION

1.1 Background of study

Historically, activated carbon was used to colourized sugar syrup in order to produce white sugar. However, AC use has been expanded to include the treatment of a variety of pollutants. Activated carbon has been shown in previous research to be effective at removing gas pollutants such as nitrogen oxide (NO) (Ao & Lee, 2005), hydrogen sulphide (H_2S) (Duan et al., 2006), and volatile organic compounds (VOCs) (Sidheswaran et al., 2012). In addition to activated carbon, other types of adsorbents can be used to control pollution. Zeolites, polymers, silica gel, and alumina are all examples of synthetic adsorbents. However, because these synthetic adsorbents are so expensive to manufacture, there is a need for a less expensive, renewable, and environmentally friendly alternative material. Utilization of Agricultural Waste (AW) may be the key to a healthy transformation. Each country produces its own AW, which is strongly influenced by the agricultural activities of the country. Malaysia produces approximately 1.2 million tonnes of AW annually (H. Guan et al., 2013a). Combustion is one of the most common methods of disposing of AW, which has resulted in air pollution concerns. Converting one of Malaysia's AW, Sugarcane Bagasse Waste, into activated carbon provides an alternative disposal method,