UNIVERSITI TEKNOLOGI MARA

SYNTHESIS OF CARBON DOTS FROM WATERMELON PEELS AND ACTIVATED CHARCOAL

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ABSTRACT

Carbon has been extensively applied in the development of nanotechnology recently owing to their abundant sources in nature. Carbon dots (CDs) is a carbon-based fluorescence nanoparticles of 2–10 nm in diameter and has been proposed as a new type of imaging reagent. Methods involved are carbonization of carbon from watermelon peels, sonication, centrifugation, 12 hours reflux, freeze dry and evaporation. The samples obtained from the methods were analyzed using UV-visible spectroscopy, fluorescence spectroscopy, UV lamp and pH strips. These entire tests were done to indicate the presence of CDs synthesized from the watermelon peels and activated charcoal. Sample from the watermelon peels showed blue fluorescence color whereas sample from activated charcoal showed green fluorescence color when viewed under UV lamp.

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INTRODUCTION

1.1 Background of Study

Carbon has been extensively applied in the development of nanotechnology recently owing to their abundant sources in nature. Carbon nanoparticles (CNPs) of less than 100 nm size are potentially useful tools for medicine and biology, as they are of commensurate size to important biological components such as DNA, proteins, cell membranes and thus enable them to interact in a more sophisticated and controlled way at the cellular level in the body [1].

Carbon dots (CDs) is a carbon-based fluorescence nanoparticles of 2–10 nm in diameter and has been proposed as a new type of imaging reagent [2]. CDs are non-photo bleaching, easy to prepare with good fluorescent performance, have excellent dispersity and biocompatibility [2]. In comparison with quantum dots (QDs) which are a type of fluorescent nanoparticles made from semiconductor materials, CDs demonstrates greater advantage due to having less toxicity. CDs can be excreted into the urine without undergoing metabolism process in the liver. Goncalves & Esteves da Silva, (2010) described CDs as a valuable tool to overcome the toxicity issues arising from the use of cadmium core-based QDs because their accumulation level in the liver are very low in comparison with the latter and carbon nanotubes.