PREPARATION AND CHARACTERIZATION OF COPPER-CURCUMIN COMPLEX

MAWAR HAZWANI BINTI JASIMIN

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Mawar Hazwani Binti Jasimin

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ABSTRACT

PREPARATION AND CHARACTERIZATION OF COPPER-CURCUMIN COMPLEX

Curcumin can form strong coloured chelates with transition metal ions. In this study, nine samples are prepared and different temperature and ratio. The samples are prepared at room temperature (25°C), 40°C and 60°C. Meanwhile, at different ratio of copper(II) : curcumin, the sample is prepared at 1:1, 1:1.5 and 1:2. The objective of this study are to find out the best ratio and temperature of preparation of Cu(II) –curcumin complex. The samples are prepared by reflux technique and characterized by using UV-VIS Spectrometer, Fluorescence Spectrometer, FTIR, and TGA/DTG. From this study, it showed that sample with ratio of 1:2 at room temperature is the best condition in order to synthesize Cu(II)-curcumin complex. It is recommended that this study is continued by preparing the samples at room temperature and replace ratio of copper complex from 1:1.5 to 1:3. Besides, for the complete characterization of metal complexes, it was recommended that to use X-ray structure analysis. Other than that, for better preparation of copper(II)-curcumin complex, copper chloride was not recommended be used but replace it with copper acetate.

CHAPTER 1

INTRODUCTION

1.1 Background of study

Dye is very suitable as chromospheres for doping onto polymers and metal oxide as photo electronic devices such as solar cell, laser dye, Light Emitting Diode (LED) etc. For further development of highly efficient dye, the dye must have a donor-π-conjugation-linkage-acceptor structure which is required for a wide range absorption extending to the near-infrared or infrared region, which is to produce a large photocurrent response. Dye itself is unstable because it's sensitive to heat and light. Thus, complexation of dye with metal is needed to form a more stable compound. Beside that, the metal-curcumin complex is more active than the parent curcumin by donating proton or electron.

For this study, curcumin is chosen as a dye. This is because curcumin has a high absorption and fluorescence rate. Curcumin, a naturally occurring, intensely yellow dye extracted from the spice turmeric, is an efficient photosensitizer at wavelengths ranging from 340 to 535 nm. In addition, the curcumin itself is a source from natural plant, which is a naturally occurring phytochemical found in the rhizomes of Curcuma longa or turmeric. However, curcumin is commonly use for centuries in a variety of pharmaceutical applications including treatment for arthritis, as an anti-inflammatory agent and as an orally available treatment for diabetes.