PREPARATION OF HYBRID Cu/TiO₂ PHOTOCATALYST RESPONSIVE TOWARDS UV-LIGHT (EFFECT ON INCUBATION TEMPERATURE)

NOR ATIKAH BINTI JEMBARI

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FACULTY OF CHEMICAL ENGINEERING UNIVERSITI TEKNOLOGI MARA SHAH ALAM JULY 2017

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ABSTRACT

In this work, the preparation of hybrid CuO/TiO₂ photocatalyst by using wet impregnation method at different incubation temperature was carried out. The physical characterization of the hybrid photocatalyst was performed using X-ray diffraction (XRD), energy dispersive X-ray spectroscopy (EDX), FESEM and Brunauer-Emmett-Teller (BET). The photocatalytic activity was determined through the percentage degradation of Methyl Orange under uv light irradiation. The observed results of photocatalytic activity suggested that the incubation temperature of 50 °C is the optimum incubation temperature as the percentage degradation recorded highest value of 82.06 %. From hybrid CuO/TiO₂ photocatalyst characterization result, the copper elements were not detected in XRD analysis. The anatase peak at 2θ showed only TiO₂ peak after incorporated with CuO at different incubation temperature. However, the CuO could be detected in the EDX mapping for hybrid CuO/TiO₂ photocatalyst, before and after degradation. The surface area of hybrid CuO/TiO₂ photocatalyst, before and after degradation is higher than bare TiO₂ which recorded 8.8137 m²/g and 9.7521 m²/g, respectively while bare TiO₂ is 2.0801 m²/g. Photocatalyts that synthesized at 50 °C has the best uv light respons and the highest photodegradation activity.

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CHAPTER ONE

INTRODUCTION

1.1 RESEARCH BACKGROUND

There are about two thirds of Earth's surface covered by water, and less than a third is covered by land. While the world's population tripled in the 20th century, the use of water from earth's water resources has grown six times compared to previous years. (M. Khraisheh et. al., 2012) This shows that the water play important role in providing and assisting human to a better life. As the populations continues to grow, they put extraincreasing pressure on the water resources, exclaiming to the serious concern of the water used and the efficiency of the water which might affect the human daily life or versa. Water, being the most important substances on earth, not only for human body and animal, but also important for many other uses such as industrial and agricultural activities.

There are many reasons behind the changes in water quality including the increasing in nutrient loading, from organic waste such as sewage and farm waste, industry discharged, construction sites and forestry. All these factors represent the significant global problem, however, there are a number of options available today for