

***CEIBA PENTANDRA* SEED BASED
ACTIVATED CARBON FOR SYNTHETIC
WASTEWATER (COPPER, CU (II))
TREATMENT**

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**Bachelor of Engineering (Hons) Civil
(Infrastructure)
UNIVERSITI TEKNOLOGI MARA
JANUARY 2019**

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CARBON FOR SYNTHETIC WASTEWATER
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By

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This report is submitted as a
Partial requirement for the degree of
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DECLARATION BY THE CANDIDATE

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This topic has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Under Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

This study will review the research conducted on the effectiveness of modified activated carbon in removing copper, Cu (II) in the synthetic wastewater. The activated carbon (AC) was prepared by using *Ceiba Pentandra* seed by physical activation using microwave irradiation. The optimization condition for the AC was studied by using Central Composite Design (CCD) by considering three factors with two responses, carbon yield and percentage removal of Cu (II) respectively. The optimum condition of AC was obtained at 264 Watt, 4 minutes and 100 cm³ carbon dioxide, CO₂ flow for activation power, activation time and CO₂ flow respectively. A quadratic and mean model was developed for carbon yield and percentage removal of Cu (II) respectively. Batch adsorption studies were carried out by considering the effect of different initial concentration and agitation contact time. The maximum Cu (II) removal in this study was predicted as 74% by the model with the initial concentration of 2 mg/L. The obtained data was found best fits to the Langmuir Isotherm model as for the adsorption studies. As for the kinetic studies, PseudoSecond-Order having well mechanisms sorption system compared to Pseudo-First- Order. The results for both studies are based on the highest value of the coefficient of determination, R².

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