DECOLOURIZATION OF AZO DYES BY USING ACTIVATED CARBON OF *Zea mays* HUSK

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TABLE OF CONTENT

ABSTRACT

DECOLOURIZATION OF AZO DYES BY USING ACTIVATED CARBON OF *Zea mays* HUSK

Zea mays husk has become part of the agricultural waste that are available abundantly which are usually underutilized. Previous study has proven that maize stem as an activated carbon would yield to have excellent adsorption capacity for dye effluent in wastewater, which lead to this study where maize husk is modified into activated carbon. Commercial activated carbon that are widely in the industry are mostly expensive and the production of non-conventional activated carbon from agricultural waste would provide alternatives to this problem as most of the waste can be categorized as inexpensive, abundant and have novelty characteristic. The objectives of this study are to compare the decolourization percentage between three types of azo dyes which are Tartrazine, Carmoisine and Ponceau 4R by using activated carbon derived from *Zea mays* husk. The result obtained from the study manifest that there are significant difference in decolourization percentage between the dyes where Carmoisine possess the highest percentage of decolourization (51.79%) followed by Tartrazine (41.57%) and Ponceau 4R (28.85%) with the least decolourization percentage. Therefore, Carmoisine has been chosen for the optimization process where the optimum initial concentration, amount of adsorbent dosage and contact time were determined. Based on the result, the best parameters for the decolourization of the dye are at 25 mg/L, by using 0.15 g of activated carbon in contact with the dye solution for 120 minutes. All the optimum parameters were applied in batch adsorption process where the percentage of decolourization yield to 98.98% in a duration of 15 minutes. The adsorption capacity (q_m) for the activated carbon of *Zea mays* husk in this study has been obtained to be 8.7121 mg/g. Thus, *Zea mays* husk can be used as effective bio-sorbent for the adsorption of azo dyes.