

**ACTIVATED CARBONS DEVELOPED FROM OIL PALM FIBER FOR THE
REMOVAL OF DYES FROM DILUTE AQUEOUS SOLUTION**

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PENGHARGAAN

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ABSTRACT

ACTIVATED CARBONS DEVELOPED FROM OIL PALM FIBER FOR THE REMOVAL OF DYES FROM DILUTE AQUEOUS SOLUTION

Activated carbon, prepared from low cost palm oil fiber has been utilized as the adsorbent for the removal of basic dyes from aqueous solution. A basic dye, methylene blue has been used as the adsorbate. Experiments were conducted at different parameters of methylene blue solutions namely, pH, adsorbent dose, initial concentration of dye and contact time. The most effective of color removal was achieved at pH 6 and 7, while the percentage removal increased with the increase in carbon dose. The removal's percentage increased with increasing of initial dye concentration. The adsorption equilibrium for color was reached at 90 minutes of contact time. Results obtained were tested using two most common isotherms which are Langmuir and Freundlich isotherms. The adsorption patterns were found to follow both isotherms. Results indicated that activated carbon prepared from palm oil fiber could be employed as an alternative to commercial activated carbon in wastewater treatment for colour removal.

1. INTRODUCTION

Water is essential to human civilization. Some say it might be the water crisis which will lead to the third world war. A basic need for living things, however, the sources of clean water are declining. Human activities, such as industrial, agricultural and commercial are continuously producing substances which end up in water resources.

Water pollution remains as a major problem in the developing world and its abatement has always been an issue in our environmental concern today. Water is considered polluted when the entrance of foreign substances modify the existing parameters of the water bodies such as temperature, colour and odour. Pollutants removal from wastewater grows concurrently with the rapid growth in industrial activities. In Malaysia, 97 % of the highly polluted effluent discharged is mainly from three industrial categories, which are food industry, chemical industry and textiles industry (Azira et al., 2004; Ong et al., 2004).

Among the pollutants usually highlighted, colour stands as one of the critical parameters in wastewater. Colored wastewater resulting from human activities may reduce the aesthetic properties of natural waterbodies. As color is the first contaminant to be recognized in a polluted system. A dye-containing effluent from textile industry for instance, may reduce the light penetration into the aquatic system thus affecting this natural habitat.