

**DECOLOURISATION OF DYES IN WASTEWATER USING
ADSORBENT MATERIALS**

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**Final Year Project Report Submitted in
Partial Fulfilment of the Requirements for the
Degree of Bachelor of Science (Hons.) Textile Technology
in the Faculty of Applied Sciences
Universiti Teknologi MARA**

MAY 2009

ACKNOWLEDGEMENTS

Upon completion of this project, I would like to express my gratitude to many parties. My heartfelt thanks go to my supervisor, Assoc. Prof. Khadijah Omar for giving me the opportunity to completing my final year project under her supervision. I am very grateful to receive her constant guidance and time throughout my journey in completing of this research.

Not forgetting, my appreciation goes to Pn. Norahiza Mhd Soheh from Food Technology laboratory and En Zubir Othman from Environmental Technology Laboratory who always lend they help whenever I asked for help regarding the used of equipment in their respective laboratory. This research will not be a success without their support and contribution. Not forgetting to the En. Zainal Sukail, assistant lecturer for helping me used of equipment in Textile Chemistry laboratory.

Last but not least, I would also like to take this opportunity to thank my parents and to everybody who contributed their help and for morally supporting me in completing this research.

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ABSTRACT

Nowadays, the effluent from textile industry has become one of the major pollutants that affect the water quality of Malaysian rivers. Wastewater from the textile industry needs to be treated before release to the water system to avoid the pollutants. Adsorption technique using adsorbent material from natural waste has been reported to be an alternative to activated carbon to treat the wastewater especially for the colour removal of dyes from the wastewater. The potentials adsorbents which are low cost, locally available and relatively new for their colour removal capacity from aqueous solution were investigated. Sugarcane Bagasse, Eggshells, Tea Wastes and Crab Shells were selected used as adsorbent materials to adsorb the Acidol Red GLX, Supra Yellow RL, Begacron FBL 150% and actual wastewater. The efficiency of the adsorbent materials in treating the wastewater were analysed before and after decolourising treatment based on the colour reduction, COD, and pH value. The result shows that crab shells give excellent adsorption capability as adsorbents material to adsorb dyes effluent. It is proposed that removal of dye in wastewater using these adsorbent materials can be attractive option for dye adsorption.

CHAPTER 1

INTRODUCTION

1.1 Background of the study

Dyestuffs are mainly used in the various industries such as printing, paper, food, pharmaceutical and textile industries. The textile industry is in the forefront in the use of dyes in its operations with more than 9,000 types of dyes incorporated in the colour index (Garg et. al., 2003). In textile industry there are various types of dyestuffs used in dyeing and printing process. The process exists to provide the textile with colour either for aesthetic reasons or for some functional purpose determined by the end-use of the product.

The dyes are classified according to how they are used in the colouration process. Types of dyes are acid dye, basic dye, vat dye, direct dye, mordant dye, reactive dye, disperse dye and azoic dye. The process of dyeing is carried out in a variety of ways depending on the specific dye utilised as well as the properties of the material.

The textile industry consumes large quantities of water and produces large volumes of wastewater from different steps in the dyeing and finishing processes (Ramesh et al., 2007). According to Sumanjit (2007), the use of variety of dyes and chemicals in the dyeing processes causes considerable variation in the wastewater characteristics like pH, colour and chemical oxygen demand (COD), thus creating the environmental concern issue.