TREATMENT OF BATIK WASTEWATER BY USING CHEMICAL ACTIVATED CARBON FROM OIL PALM SHELL

By

NORAZILAH BINTI SULAIMAN

Under the supervision of

Associate Professor Dr. Ku Halim Bin Ku Hamid

Submitted in partial fulfilment of the requirements for the Bachelor of Science (Hons.) in Applied Chemistry

Faculty of Applied Science
Universiti Teknologi Mara
Shah Alam

October 2000

ABSTRACT

TREATMENT OF BATIK WASTEWATER BY USING CHEMICAL ACTIVATED CARBON FROM OIL PALM SHELL

Activated Carbon (AC) filters have been used in batik wastewater purification system to remove taste and odor. AC is most effective at removing organic compounds such as volatile organic compounds, pesticides and benzene. It can also remove some metals, and chlorine. In this experiment AC is used for batik wastewater contain granular activated carbon (GAC) which it produced using chemical method. The source of AC was from palm shell. The wastewater from batik was treated with activated carbon to purify, decolorize and deodorize the wastewater. The contamination of wastewater sample from batik can be measured by TS, SS, VSS, COD and BOD. The chemical coagulation is the best method to remove color, turbidity (NTU), TS, SS, VSS, COD and BOD concentration of the batik wastewater effluent. The COD and BOD values for the wastewater was calculated before and after the treatment with activated carbon. Biochemical Oxygen Demand (BOD) measures the amount of dissolved oxygen required by the microorganisms in the biochemical oxidation of these compounds. It is measured at 20°C under 5 days incubation. Batik wastewater have been treated by chemical activated carbon and the reduction of the batik wastewater has shown a reduction of 93.24 % in TS, 80.08 % in SS, 76.40 % in VSS, 87.94 % in BOD, and 82.48 % in COD.

ACKNOLEDGEMENT

First and foremost, I would like to express my sincere gratitude to Allah for blessing me in completing my thesis . I also extend my appreciate to Mr. Dr. Ku Halim bin Ku Hamid as a supervisor of my thesis project for giving me opportunity, support, and guide line on my work.

Thanks also to Department of Applied Chemistry and course tutor, associate Mrs.Zarila Mohd Shariff who allowed me to fulfill the requirement for B.Sc. (Hons) Applied Chemistry and her advise throughout the course.

Lastly, I would like to express my special gratitude to all my friends who involved in this project, Mr. Imran Ismail, Mr. Muhd Khairul Azman, Miss Fazlin, Miss Tg. Fazilah, Miss Nurul Huda, and Miss Salina Sabuddin for giving me help, advice and courage during project work, and specially for my parent for giving me their support throughout of my study.

Thank you.

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

The rapidly growing textile industries in Malaysia produce large amounts of color effluent. The color of the textile effluent is unacceptable under Malaysia environmental regulation besides other parameters such as COD, BOD, total iron, etc. The color effluent from the dyeing and printing processes has to be decolored before being fed to the subsequent treatment units, such as the adsorption and the biological treatment. Decolorization treatment operations include adsorption, ozonation and chemical precipitation. Each has its merits and limitation in application. [1]

The removal of dyes from industrial effluents is an area of research receiving increasing attention, as government legislation surrounding the release of contaminated effluent is becoming increasingly stringent. The presence of very low concentrations of dyes in effluent is highly visible and undesirable. There are more than 100,000 dyes available commercially, most of which are difficult to decolorize due to their complex structure and synthetic origin. They are specifically designed to resist fading upon exposure to sweat, light, water and oxidizing agents and as such are very stable and difficult to degrade. [2]

In the past, municipal treatment-systems were used for the purification of textile mill wastewater. These systems depended on biological activity and were mostly found inefficient in the removal of the more resistant synthetic dyes. Most