

CHAPTER ONE

INTRODUCTION

Rapid industrialization has resulted in high volumes of wastewater; mostly untreated or inadequately treated. Wastewater is discharged into the natural water bodies. Such wastewaters which are high in polluting matter are detrimental to the water quality. Analysis done by the Malaysian Department of Environment in 1992 on compliance status for manufacturing industries in meeting discharge standards of the Environment Quality Act, 1974; (Sewage and Industrial Effluents) Regulations, 1979 revealed that only 10 percent comply with the regulations, 17 percent have inefficient treatment systems and 73 percent are without treatment systems.

In 1990, 11.7 percent and in 1993, 39 percent of the chemical factories in Malaysia were found not to be able to meet the standards stipulated (Department of Environment, 1991; 1994). The soap and detergent industry has been classified under the chemical industry by the Department of Environment, and this sector has been expanding at a very fast rate. Factories manufacturing toothpaste, shampoo, hair cream, laundry detergent, general cleaning solvent, and soaps are generally categorized in the soap and detergent industry. The industry frequently undergoes changes in the products, types and raw material composition due to the development of better products and changing consumer tastes. Consequently, there will always be a change in the wastewater characteristics. Many factories either do not have any or do not have adequate facilities to meet the stipulated discharge standards.

There are two categories of discharge standards under the Environment Quality Act 1974; (Sewage and Industrial Effluent) Regulations 1979; i.e. Standard A for discharge into catchment areas and Standard B for discharge into any other inland waters (Ministry of Science, Environment and Technology, 1979).

This project was initiated with the primary objective to optimize pH, dosage and rpm values for commercially available coagulants and evaluate adsorption capability of carbon after the wastewater is treated with coagulation and flocculation process. The study focuses on the application of coagulation and flocculation using different coagulants.

This water treatment is necessary for the removal of pollutants and chemical pollutants, prevention of communicable disease transmission and improvement of aesthetic quality of water for consumption (Chap and Purvis, 1983).

2.2 Soap and Detergent Wastewater in Malaysia

The soap and detergent industry is growing rapidly as the population of the country and health awareness increases. Hence the generation of wastewater is on the increase. The wastewater characteristics of a typical soap and detergent factory are as given in Table 2.2 for the years 1993 and 1993 to show the rapid change in the wastewater characteristics of the industry. The significant increase in the concentrations of these selected parameters is due to the legislative changes, more