

## CHAPTER I

### INTRODUCTION

Surfactants are employed in a variety of technological applications such as detergency, emulsification, foaming, lubrication and wetting. For wetting, they are often used to enhance spreading of aqueous solutions on solid surfaces and modify interfacial properties by selectively adsorb at the interfaces.

Adsorption of a surface-active agent at a solid/water interface is an essential factor that must be focus on. While the wetting of hydrophobic surface by pure liquids is well established from the work of Zisman (1964), there is no good correlation for contact angles of aqueous surfactant solution on hydrophobic surface like polymers (Jonathan *et al*, 2001). One reason is that the surface tension of the solution is usually considered as a main factor, whereas the adsorption of surfactant onto solid-liquid interface is generally ignored.

Factors that control surfactant adsorption are the structure of adsorbent surface and pore width, the molecular structure of the surfactant and the nature of aqueous phase. The effectiveness of surfactant is determined by the extent of its adsorption onto a given surface and the conformation of the adsorbed molecules. Therefore, in order to utilize the surfactant effectively, the adsorption isotherm as well as the mechanism needs to be well understood. (Rosen, 1988).

Hydrophobicity and hydrophilicity are general terms utilized to describe relative affinity of material for water. Surfactant used in many processes involves with the hydrophobic surface such as coating and deinking process.

In this study, the adsorption of the surfactant onto several powdered hydrophobic plastics will be measured. Then the plastic is compressed into a smooth sheet for measurement of the contact angle of surfactant solutions. The effect of surfactant on surface tension and the adsorption onto solid-liquid interface in improving wettability will be evaluated for different combinations of surfactant solutions and plastic. The effect of plastic hydrophobicity on wettability will also be determined.