# CHAPTER I
# INTRODUCTION

Surfactants are widely used in industry for many applications such as emulsification, foaming, lubrication, including wetting. Wetting is important for several technological applications; for examples, oil recovery, coatings, detergency, and wetting.

Normally, wetting consists of two major components: the liquid to wet and the substrate to be wet. In general, the substrate to be wet is solid which has a wide variety of properties that has to be considered, for example, degree of homogeneity, ionic nature and degree of hydrophobicity. However, one of the most obvious properties of the substrate is the hydrophobic or hydrophilic nature of the surface.

Surfactant plays an important role in many processes involving with the hydrophobic surface, such as carbon and polymers. Surfactant acts as a dispersant in order to separate ink particles from plastic surface and prevent re-deposition of the separated ink in the flotation deinking process. In the printing process, surfactant acts as a wetting agent to enhance the ability of aqueous solutions to wet and spread over the hydrophobic surface. The addition of surfactants to water is a well-established means of enhancing the ability of aqueous solutions to wet and spread over solid surfaces.

While the wetting of hydrophobic surface by pure liquids is well established, there is no good correlation for contact angles of aqueous surfactant solution on hydrophobic surface like polymers. 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. However, adsorption and wetting are strongly related. The common function of the surfactants is to modify interfacial properties by selectively adsorb at the interfaces. Adsorption of a surface active agent at a solid/water interface leads to a layer formation on the solid surface, which affects its surface tension (Janczuk *et al*, 1997). The presence of the surfactant changes the contact angle in a soild-liquid drop-air system, which is a measure of wettability.

In this study, the adsorption of the surfactant onto several powdered hydrophobic plastics was measured. Then the plastic was 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 was be evaluated for different combinations of surfactant solutions and plastic. The effect of plastic hydrophobicity on wettability was also determined.