CHAPTER I
INTRODUCTION

Deinking is the process that removes ink and other particulate from waste paper. Currently there are two main deinking techniques; washing deinking and flotation deinking (Scamehorn and Harwell, 2000). Prior to the ink removal, used paper is first shredded in a pulper, then the particulate material in the shredded paper is screened out. In washing deinking, the small ink particles can be effectively dispersed by adding dispersants. The water containing suspending ink is then drained out and fresh water is added. For effective ink removal, this process is repeated for a few more times.

In flotation deinking, the ink is separated from the fibers by froth flotation. Air is rapidly bubbled through the pulp slurry in the presence of various additives that promoted foam formation and the attachment of ink particles to the bubble surfaces. The ink particles attached to the bubbles then rise together to the top of the aqueous pulp slurry and form a froth layer at the surface. This froth layer may be removed by flowing over the top of the flotation unit or scraping off from the surface of the pulp slurry. Flotation deinking process is mainly effective in removing hydrophobic inks with particle size larger than about 10 μm (Borchardt, 1994).

The additive used in flotation deinking processes are generally surfactants or fatty acids combined with collector ions e.g. calcium ion that acts as an activator. The use of additives in these processes intended to agglomerate the ink particles and improved attachment to air bubble to increase removal efficiency in flotation cell that is often referred to as "collector chemistry" (Riviello, 1997).

However, the fundamental mechanisms in flotation deinking have not been well understood, particularly the exact mechanism of the interaction of the surfactant, calcium, ink, fiber and air bubbles. This thesis will be focused on the mechanism of "collector chemistry" by investigating the adsorption isotherms of surfactant (Sodium octanoate, C8) and calcium ion, as well as co-adsorption of both species on model ink (carbon black) and model fiber (common office paper). The zeta potential of both model ink and model fiber will be measured in order to facilitate the understanding in the adsorption mechanism of collector chemistry.