CHAPTER I
INTRODUCTION

Surfactant ingredients used today in the detergent industry are often roughly categorized into: high-foaming (generally anionic) or low-foaming (generally nonionic).

Depending on the application, very different physical characteristics of the foam such as density, bubble size and stability may be desired. A shampoo should produce a dense copious foam but the foam characteristic should be different for a baby shampoo. A car wash product should produce a slight foam of poor persistence but a fire fighting foam should have a high water load, and good persistence even in the presence of oils and fuels. An automatic dishwashing product should produce low foam with lack of persistence. However, where handwashing product is concerned, foam has a great psychological effect, although it does not necessary imply a direct relationship with detergency performance.

The methods used to measure the foam formation and persistence are often classified as static and dynamic methods. Foam measurements by static methods are made after the foam has been formed. Conversely dynamic methods take measurements during foam formation.

Static methods measure foam in terms of volume or height of foam formed and are limited by the physical capacity of the reservoir. Dynamic methods often measure the time needed to form a standard amount of foam. These methods are not usually affected by the capacity of the reservoir but only by the foaming capacity of the solution.

Soap (long chain carboxylic acids; normally found in sodium form) is commonly added to laundry detergents containing synthetic anionic surfactants (such as LAS) as an antifoam agent. This is due to the complexation of soap with calcium in solution forming rigid monolayers at the thin liquid film surface. Therefore, soap is not a good foam inhibitor in soft water. Soap is also used in bar soap and other products for cleaning efficiency. A limitation is poor hardness tolerance. Hardness tolerance is the ability of surfactant to withstand precipitation by a multivalent cation. In general, mixture of anionic surfactants precipitate with more difficulty than pure component surfactant (Scamehorn, 1992).

The aim of this work is to study the foaming properties of the mixtures of synthetic anionic surfactant and soap over a wide range of mixture concentration and calcium ion levels and compare results to the conditions under which the soap and synthetic anionic surfactant form precipitate with calcium to help delineate the mechanism of foam inhibition. For this propose, a precipitation phase boundary diagram of Soap/SDS-calcium (Chintanasathien, 1995) has been used.