CHAPTER I
INTRODUCTION

Foams have long been of great practical interest because of the widespread occurrence in everyday life. In addition to their wide occurrence, foams have important properties that may be desirable in a formulated product, such as fire-extinguishing foam, or undesirable, such as foam in an industrial distillation tower. From this reason, it is also important to study and understand foaming and antifoaming properties to be able to control foam in the real system.

Soaps, sodium salts of fatty acid, are known to be excellent detergents and are widely used in mixtures with anionic surfactants in household detergents. One big disadvantage of soaps is their instability towards metal ions, particularly the calcium and magnesium salts found in hard water; they form insoluble soap precipitates (calcium and magnesium soaps). Moreover, these precipitates may effect the foaming properties of the mixtures in water (Porter, 1994). Indeed, soaps were the first compounds to be used as antifoamer in low foaming detergent formulation and generally, soaps with chain length of C_{12}-C_{22} are employed (Garrett, 1992). However, despite the importance of soaps, there have not been many studies on their antifoaming behavior and the mechanism by which soap precipitates reduce foam is still unclear.

In previous work (Srikajorn, 2000), calcium soaps with alkyl chain C_8-C_{18} were found to give the antifoaming effect on SDS solution only at the concentration below CMC and only when calcium soap is present in the form of insoluble precipitates. In this work, the effect of calcium soaps with alkyl chain C_{12}-C_{22} on the foam stability of SDS solution is studied and the contact angles of SDS solution on the calcium soap surfaces are measured to verify the antifoaming mechanism for this system. The effects of hardness tolerance

and alkaline on the foaming properties of SDS in the presence of calcium soap are also studied.