

CHAPTER I

INTRODUCTION

Soap is the oldest cleaning agent, still widely used while synthetic detergents have come in use during the last four decades, now. Consumers in India traditionally use soap more than synthetic detergents. But the production of synthetic detergents has increased much more in comparison to that of soap in the last few decades only. This has been shown below:

| Year | Soaps | | Synthetic Detergents | |
|------|-----------------------------|------------|-----------------------------|------------|
| | Production in Kgs(x1000) | % increase | Production in Kgs(x1000) | % increase |
| 1971 | 710 | | 48 | |
| | | 58 | | 650 |
| 1983 | 1120 | | 310 | |

In today's society, the choice of a commercial detergent product, for laundering of garments, necessitates consideration of the twin factors of good washing and cost. A good detergent formulation should give optimum wash performance without degrading the material of the garment, not harm the hands or skin and result in minimum pollution. But on the other hand commercial soaps and synthetic detergents use large amounts of

alkaline substances (50%) and a small amount of active detergent. A very high amount of alkali has little relevance to cleaning but makes the detergent harsh on the fabric. The cleaning or soil removal in such ^{cases} is done by builders by swelling the yarns and therefore damages the fabrics. Therefore, it was thought that to get good cleaning unbuilt soap and synthetic detergent be used, in combination, if needed. This would get all the desirable properties required for washing at minimum damage to the material.

Detergents including soaps belong to a class of surface active agents which have the ability of cleaning or removal of soil due to their surface activity. These solution wet surfaces readily disperse solid particles, so also emulsify oil and grease. Surface active agents can be wetting agents, detergents penetrates and/or dispersing agents. These properties are interrelated and a compound is called a wetting agent rather than a detergent because its wetting power is greater than its detergent power.

The molecules of these products are made up of two parts: a) the hydrophobic part (oily group) and b) the hydrophillic part (that is the solubilizing polar group). The lowest number of carbon atoms necessary to manifest surface activity is six in the caproates ($\text{CH}_3(\text{CH}_2)_4 \text{COONa}$) but the lowest in the series which can be classified as a good detergents are the Laurates having twelve carbon atoms ($\text{CH}_3(\text{CH}_2)_{10} \text{COONa}$).

Soaps and synthetic detergents have advantages so also disadvantages. Soap is versatile and common and so it is available in many forms. It is also stable and non-toxic. Furthermore, soaps are still accepted as the least expensive of the widely used surfactants. On the other hand synthetic detergents have the advantages of being a strong wetting agent and are stable even in hard water.

A combination of soaps and synthetic detergents could therefore be expected to give good cleaning. One would expect to have advantages of both by appropriate composition and expected cumulative effect.

Reutenauer, Prelat and Sicard (47) have studied the foaming, wetting and emulsifying power of a standard Tallow soap mixed with varying proportions of some anionic detergents. In general the desirable properties of each component were conserved in the mixture. Thus the synthetic detergents contributed to the foaming and wetting power in hard water. Whereas soaps contributed the good emulsifying power which was lacking in some anionic detergents. The anionic/nonionic mixtures also gave increased washing efficiency in low concentrations due to increased adsorption.

As stated earlier the manufacturer of detergents these days try and get the required cleaning by addition of alkaline substances which helps in removing dirt by swelling the fibers

which in the bargain damage the garments. The addition of high amount of builders no doubt reduces the price of the product but at the cost of the clothes and at the cost of the environment pollution.

Thus it was planned to study the optimum combination of anionic soap with anionic/nonionic synthetic detergent for better washing efficiency on different fabrics. The results presented in this work are an attempt to see how some of the problems faced by the consumers can be solved and would help in understanding the detergent characteristic and their effect on soil removal.