CHAPTER I

INTRODUCTION

Surfactants are very versatile materials which can be used in both household products and industrial processes. The utility in household products is used as detergency which is the primary function. In recent years, the softening function has been suggested as secondary function in additional product benefit. In industrial uses, they are used in many processes of petroleum industries, both the preparation and application of synthetic polymeric material, many processes of both fur and leather industries, etc. They can be synthesized by three main sources which are 1) animal fats 2) vegetable oils and 3) mineral oils.

Natural fats and oils of vegetable and animal origin are mainly used for human nutrition. However, ever quantities of these fats and oils are being used as secondary materials in the most varied branches of industry. In this connection, the tecnological utility of these products depends specifically on the particular properties of the fats and oils. In the main natural fats and oils are composed of triglycerides (neutral fats) and a lesser extent of phospholipids and free fatty acids.

For this study, surfactants were synthesized by free fatty acids of soybean oil which were received from vegetable oil refinery industries. The great deal of these fatty acids were extracted and refined from soybean seed owing to large demand of soybean oil for nutrition. They have low value and large part of them were wasted to the environment. Therefore, surfactants were fabricated in order to decrease the environmental problem and improve the value of them.

The free fatty acids of soybean oil have been determined the physical and chemical properties prior to synthesize. Afterward, the synthetic surfactant were used as fatliquor formulation in the leather industrial process to improve physical properties of leather.

Definition of fatliquor (ASTM D1517, 1995) is and emulsions of oils or greases in water, usually with an emulsifying agent, used to lubricate the fibres of leather.

Objectives

1. To synthesize surfactants from free fatty acids of soybean oil.
2. To use surfactants which were synthesized in leather industry.

The Scope of Investigations

For the preparation of surfactant, the appropriate conditions were studied. The application of them in fatliquoring process of leather industry was studied which yielded the good mechanical properties of leather. The necessary procedure may be as follows;

1. Literature survey and in-dept study of the reserch work.
2. Preparing the surfactants by three main steps

a) Esterification of soybean oil fatty acids by excess methanol and concentrated sulfuric acid at 50°C for about 2 hours.

b) Epoxidation of soybean oil methyl ester by peracetic acid which was generated by acetic acid and 30 % v/v hydrogen peroxide. The appropriate conditions were studied.

- The optimum mole ratio of acetic acid and hydrogen peroxide

- The effect of reaction temperature
- The optimum ratio of soybean oil methyl ester (SOME) and generated peracetic acid solution

c) Sulfonation of epoxidized soybean oil methyl ester by saturated sodium bisulfite solution at 90°C for about 24 hours.

3. Studying the effect of surfactants in fatliquoring process for improving mechanical properties of leather.

4. Summerize the results.