CHAPTER I
INTRODUCTION

Surfactants are among the most versatile of the products produced by the chemical and petrochemical industry. They are used in such diverse applications as in the motor oil for automobiles, as detergents for cleaning, in the drilling muds used in prospecting for petroleum and in flotation agents used in benefication of ores.

Foaming is one of the inherent properties of all surfactant solutions which can be either desirable or undesirable. Depending on the applications very different physical characteristics of the foam such as density , bubble size and stability may be desired. 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 persistency even in the presence of oils and fuels. An automatic dishwashing product should produce a low foam height and lack of persistence, since excessive foaming may cause a reduction in efficiency of contact of the detergent solution with dishware.

The foaming properties of liquids are often characterized by their foamability (initial foam formed) and foam stability (duration of foam). The Ross-Miles method (ASTM D 1173-53 standard method) is one of the most widely used methods for both commercial and academic purposes to measure both parameters.

In general, surfactants can be classified in many different types. Nonionic surfactant is one type of surfactants which has no charge on its molecule and is known to be a poor foamer. The foaming of nonionic surfactants is well known to decrease markedly above its cloud point.

The aim of this research is to study the foaming of nonionic surfactants to understand why nonionic surfactants have decreased foamability above their cloud point. The Ross-Miles method together with a Spray method are used to measure the foaming properties of the nonionic surfactants in this work. The Spray method is devised to simulate the spraying action in a dishwashing machine since nonionic surfactants above the cloud point are generally employed in such application. The effects of temperature, concentration, and surfactant structure on foamability and foam stability of the nonionic surfactants were investigated in the study.