CHAPTER I
INTRODUCTION

Detergency, by definition, is the removal of unwanted substances, so-called soils, from a solid surface by contacting them with liquid. Soils can be classified into three categories: (1) liquid (oily) soil (water-insoluble liquid soils) include hydrocarbon, saturated or unsaturated fatty acids, esters of fatty acids, and alcohol example skin fats (sebum), vegetable oils, motor oil, (2) particulate soil, such as clay, carbon, dust, iron oxide and (3) stains, intensively colored substances, are egg, coffee, tea, chocolate, mustard, wine, milk, blood, lipstick, ink, and natural organic colorants in general. (Carroll, 1996; Kissa et al., 1987; N.Yanumet et al., 2003)

To remove these soils, there are several processes: First, macroscopic physical process which removes soils by mechanical work (e.g. abrasion by scrubbing, hydrodynamic flow, flexing or swelling of fiber). Second, chemical processes (e.g. bleaching) and biological processes (enzymatic reaction) are used to remove soils that form covalent bond, chemical adsorption, by destroying those bonds. Finally, microscopic physical processes—surfactants play an important role—are used when the soils make physical adsorption (Van der Waals forces, dipole interaction) or electrostatic forces with substrate, the surface that is to be cleaned.(Rosen, 2004)

As a result of many processes, only one process cannot remove all of the soils, but each of soil can be removed by particulate process.

Removal of oily soils via surfactant is the most difficult process since the substrates and oily soils have the great variabilities. Moreover, several factors—the interfacial tension (IFT), time and temperature of washing, surfactant system, and etc.—also affect to this process. There are two main mechanisms for oily soil removal. The rollup or rollback mechanism is believed to play a major role in oily soil removal. Emulsification-solubilization (sometimes called snap-off) is also responsible in detergency. However, these mechanisms will have high efficiency in removal of oily soils when microemulsions are formed by surfactants. (Verma et al., 1998; Rosen, 2004; N.Yanumet et al., 2003)

Although the general used surfactant such as linear alkyl benzene sulfonate (LAS) can damage the environment affecting to occurrence of water pollutions.

Therefore, the purpose of this thesis is to achieve high oily soil removal by using the friendly environmental surfactant—methyl ester sulfonate (MES) and alcohol ethoxylates—under microemulsion formation.

OBJECTIVES

1. To form microemulsions of motor oil with mixed surfactants of MES and AE.
2. To investigate the relationship between microemulsion phase behavior and detergency.
3. To investigate the residue surfactants in each step in washing process.

SCOPE OF RESEARCH WORK

The scope of this research work will cover:

1. Effect of MES and AE composition on microemulsion formation. (0.1-15%wt/v)
2. Correlation of microemulsion formation and detergency performance.
3. The detergency efficiency of our surfactants and a commercial detergent.