CHAPTER I
INTRODUCTION

Nowadays, a number of widely-used surfactants are synthesized from petroleum and natural gas. However, some difficult problems facing surfactant industries today are a lack of raw materials and an environmental issue. These are due to a high demand in a lot of applications such as detergent, personal care, fabric softening and industrial areas. These major issues force surfactant producers to change some traditional products, to meet environmental requirements, and to give the required performance of synthesized surfactants at the same time.

There has recently been an increased focus by global detergent producers in formulating MES-based products because methyl ester sulfonate (MES) derived from palm and coconut offers an environment friendly and has good detergent properties. Many companies, such as Lion Coporation (Lion), Stepan Company (Stepan), and Chemithon Corporation (Chemithon), have produced alpha methyl ester sulfonate (α-MES) conducted in a film-falling reactor via the sulfonation reaction of methyl ester and sulfur trioxide (SO_3). Although α-MES production has already been produced in commercial scale, there are some limitations, which are disalt formation and low water soluability (Norman *et al.*, 2008). To overcome these drawback, Cohen *et al.* (1998) proposed the use of sufur dioxide/oxygen (SO_2/O_2) and ultraviolet (UV) irradiation via sulfoxidation reaction, providing a random of sulfonated group in akyl chain (Φ-MES).

In this work, the study focused on using another initiator to help generate free radicals which is cheaper than using only UV light. Ozone is one of the most interest chemicals because it is an effective oxidizing agent, which is capable of reacting rapidly under mild conditions with organic compounds (Galimova *et al.*, 1973). The purpose of this work was to synthesize MES via the sulfoxidation reaction by using UV, ozone and UV/ozone as an initiator. The effect of reaction time was also evaluated.