CHAPTER I

INTRODUCTION

1.1 Statement of Problems

Dimerization of unsaturated fatty acids is a liquid phase batch process. Montmorillonite clay is generally employed as heterogeneous catalyst in this reaction. The major product groups are dimers, trimers, and isostearic acid. Dimers and trimers have several applications and the most important ones being as components in e.g., hot melt adhesives, epoxy-coatings and flexographic printing inks. The monomer fraction of the product is applied in lubricants or cosmetics. However, due to the occurrence of many side-reactions, the three product groups each consist of numerous compounds. This is even more so when a natural (industrial) feed, consisting of a variety of fatty acids, is employed. The predominant side reactions are hydrogen transfer, double bond shift, cis/trans isomerisation, and chain branching [1] .

Homogeneous catalysts have been used in dimerization process, but are only active with the methyl esters of the fatty acids as reactants. Dimers of fatty acids can be made using radical initiation, but this leads to an unfavourably high amount of trimers and higher oligomers, compared with the montmorillonite clay catalysed process. Montmorillonite clay is by far the most active heterogeneous catalyst found in scientific and patent literatures on dimerization of unsaturated fatty acids.

1.2 Objectives of the Research

1. To study the dimerization of methyl oleate using Thai clays as catalyst.
2. To compare efficiency of Thai clays as catalyst in the dimerization of methyl oleate.

1.3 Scope of the Research

1. Literature survey of the relevant research works.
2. Design and prepare experimental procedure.
3. Prepare various Thai clays by using acid activation and characterize by spectroscopy such as FT-IR.
4. Synthesis of dimer from methyl oleate using dimerization reaction.
5. Characterize of synthetic dimer obtained from methyl oleate by spectal data such as FT-IR, ^{1}H NMR and ^{13}C NMR.
6. Determine the optimum conditions for dimerization reactions.
7. Discussion and conclusion.