

## CHAPTER I

### INTRODUCTION

#### 1.1 Introduction

Tapioca starch is an important plant in Thailand, that is a long period of time goods agriculture to export, but the quota for the market to export tapioca is still limited. Thai tapioca trade is not quite as successful as it should be. The main reasons are a lack of technological improvement of production capacity, a lack of government support and a lack of experience in international trade. Quantities of tapioca starch have any more in Thailand to lead low price of tapioca starch. The best resolution to increase the value of tapioca starch is to conduct tapioca starch through the chemical modification to develop its qualifications suited for each type of work and to lead high price of tapioca starch.

The disadvantages of unmodified tapioca starch are low solubility, inconsistent viscosity, poor stability and high inclination of becoming gel when treatment with heat. Also, tapioca starch is an endurable to heat and shear substance, not being served in any field of industries.

An interesting quality improvement of tapioca starch in many industry areas is to carry on an experiment with the hydroxypropylation process; hydroxypropylated starch is one of the modified starches, which provides high solubility, lower gelatinization temperature and stronger freeze-thaw stability. This chemical modification to develop its qualification suited for any industries such as food, textile and paper industries. However, hydroxypropylated starch manufacture in Thailand does not flourish since degree of hydroxypropylated groups is still in the primary stage, apparently not deserved for using in any industries.

## 1.2 Objective

The purpose of the study is focused on the development degree of substitution and reaction efficiency of hydroxypropyl groups in tapioca starch and to compare some physical properties with native tapioca starch.

## 1.3 Scope of the Research

This study is a consequent research of the works mentioned above. To develop higher degree of substitution and reaction yield enhance of hydroxypropylated tapioca starch. This study focuses on optimizing parameters affected the higher degree of substitution and reaction efficiency, *i.e.*, reaction medium, the concentration of sodium hydroxide, the concentration of sodium sulfate and propylene oxide concentration by using three level factorial designs. The physical properties of hydroxypropylated starch were investigated to compare with the native tapioca starch.



ศูนย์วิจัยทรัพยากร  
จุฬาลงกรณ์มหาวิทยาลัย