UNIVERSITI TEKNOLOGI MARA

STUDY OF STEREOCHEMICAL EFFECT OF GALACTOSIDE MIXTURE BASED ON REACTION TIME

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Thesis submitted in fulfillment of the requirements for the degree of Bachelor Eng. (Hons)

Faculty of Chemical Engineering

July 2017

ABSTRACT

The research project that had been conducted is the study of stereochemical effect of galactoside mixtures based on reaction time, referring to three different time period which are 12 hour, 24 hour and 48 hours. The reaction occur in this research is between galactose and palm kernel oil alcohol. With the present of lithium aluminium hydride, $LiAlH_4$ as catalyst, the configuration of galactoside will be formed, whether it is in α-galactoside form or β-galactoside form. The amount of production of each configuration depends on the period of time of reaction. NMR Spectroscopy is used to determine the ratio of these galactoside's configuration. In 12 hour time reaction, both α and β galactoside configuration are in an equal ratio which are 1:1. The second reaction time which is 24 hour yield a ratio of α and β galactosides configuration from ~2:1. And the final reaction time which is 48 hours had produced a ratio of ~8:1. This ratio is too high for this time reaction, which α-galactoside configuration produced is too high. There may be some error in analyzing the compound of some error during conducting the experiment. Theoretically, the ratio can be taken because the formation of α-galactoside is increase with increase of reaction time and formation of β-galactoside decrease with increase of reaction time. The research project also involve investigating the ratio produced by two stereoisomers of palm kernel oil derived galactosides, which are the alpha-galactosides and the beta-galactoside. The research conduct by synthesizing galactoside through three different step, which are peracytelation of galactose, glycosylation of galactoside and deacytelation of galactosdie. Three reaction time are 12 hour, 24 hour and 48 hour were done to study the α-galactoside and β galactosides ratio changes. The ratio of production of both α-galactoside and β-galactoside were measured from the NMR results. Based from NMR results obtained, the ratio of more favourable to α-galactoside as time period is longer. This proven that α-galactoside takes more time to form because it is harder to stable in early codition while β-galactoside produce more in earlier stage as it is more stable, making it easier to form.

ACKNOWLEDGEMENT

Thank you to my dear supervisor, Dr. Fadhilah Kamalul Aripin and her assistant, Marina Yusoff for all the support and help in completing my research study in stereochemical effect of galactoside mixture based on reaction time. Every second of their time spending for me in my research are the most valuable time and moment.

And also thanks to University Technology MARA and University Malaya for all materials and resource support along finishing the research. The use of chemicals and materials from University Malaya is very helpful and unforgettable. I owe a big thanks by using a device named Nuclear Magnetic Resonance (NMR) Spectroscopy from University Malaya as this device used to analyze my results.

Also not forget to my all research partner for supporting each other in completing the research. All time spend with them are the most precious time and moment to be remembered. They also had given much hand along the research duration.

Finally, I want to thanks to my beloved mother, and my late father for all goods that they had done. Without them, there are nothing I can do in this world. Also to my siblings for all moral support and guidance throughout my research and my study in UiTM Shah Alam.

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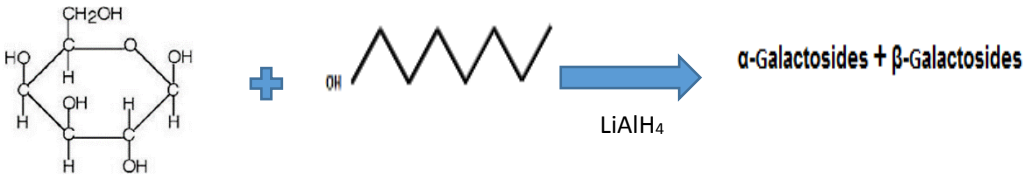
CHAPTER ONE :

INTRODUCTION

1.1 BACKGROUND OF STUDY

The title of the project is study of stereochemical effect of galactoside mixtures based on reaction time. There are two configuration of the product of galactosides, which are α-galactosides and β-galactosides. These two products will be produce from the time reaction of Galactose and Palm Kernel Oil Alcohol. With the present of Lithium Aluminium Hydride, $LiAlH_4$ as the catalyst, these two configuration of the product of galactosides, which are α-galactosides and β-galactosides are produced in different amount and ratio based on the time period.



Galactose **PKO alcohol**

Figure 1.1: Reaction Between Galactose and Palm Kernel Oil Alcohol

The ratio of are α-galactosides and β-galactosides are to be determine under an experiment, conducted using a device name Nuclear Magnetic Resonance Spectroscopy (NMR). Using this device, the ratio of are α-galactosides and β-galactosides can be obtained by the result from the NMR analysis.

The experiment will be conduct in five different time of period. The time are 6 hours, 12 hours, 24 hours, 48 hours and 72 hours. Each time period will be recorded its result for further research. Theoretically, when the longer the time period, the ratio will be more on are α-galactosides. Besides, when the shorter the time period, the amount of β-galactosides will be more than an α-galactosides.