UNIVERSITI TEKNOLOGI MARA

EFFECT OF REACTION TIME ON THE RATIO OF PALM OIL BASED GLUCOSIDES ANOMERS

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ABSTRACT

Development of technology nowadays introduced promising natural surfactants in term of an ecological factor by preventing the adverse environment impacts associated with the land and water use. This is because natural surfactants can easily biodegrade without any problem. Glucose is a subcategory of glycoside that has been studied extensively in this research. PKO based glucosides were synthesized using the glycosylation method. The synthesis method comprised three steps: peracetylation, glycosylation and deacetylation. PKO based glucosides were characterized by ^{1}H NMR Spectroscopy. The reaction produced a mixture of α and β anomers which configurations differ at C1 carbon. Alkyl glucosides consist of glucose with aliphatic chains that vary by the PKO fatty acids compositions. Three types of anomeric mixture were produced from this synthesis such as α-dominant mixture, β-dominant mixture and equal mixture controlled by reaction time. The anomeric mixtures produced were not pure as pure component between α and β anomers. Therefore, purification step is required to separate the anomers using chromatography technique. Purification step consumes a lot of costs.

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CHAPTER 1

INTRODUCTION

This chapter is an overview of the research regarding synthesis Palm Kernel Oil (PKO) based glucoside with reaction time as well as determine through chemical analysis alpha and beta anomers. Section 1.1 comprises the research background of the study. The problem statement referred to in Section 1.2 while Section 1.3 presents the objectives of this research. Section 1.4 explains the scope of the study proposed and applied in this research.

1.1 Research Background

In this recent decade, demand for surfactants is primarily driven by increasing the consumerism. In Asia, the demand is estimated to triple in 20 years from 2010 and occupy 60% of the world demand(LLC, 2012). Surfactant is commonly found in consumer products such as shampoos, laundry detergents, soaps, and many other households, industrial, institutional, and personal cleaning product.

Most of the developed countries have been apply the trend toward ‘’green ’’products. Therefore, uses of renewable resources are growing and the surfactants sector has been responding with new environmentally-friendly product. Since, high petroleum prices and growing supply of palm oil has driven the replacement of petrochemical-based alcohols with oleochemical-derived one for several years(Business, 2010). Palm oil and in particular palm kernel oil is essential feedstock for the oleo chemical industry which, in turn provide critical raw materials such as fatty acids in fatty alcohols for the production of surfactants globally(Berhad, 2012). Basically, PKO is derived from kernel of the fruit of the oil palms.

Practically, synthesizing the palm oil based glucoside to produce a new mixture of alkyl glucoside has been concern in this research. Synthesis can be