UNIVERSITI TEKNOLOGI MARA

EFFECT OF REACTION TIME ON RATIO PALM OIL KERNEL BASED MALTOSIDE ANOMERS

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ABSTRACT

This research is written to study about synthesising and characterisation of synthetic glycolipids which are similar to alkyl polyglucosides (APGs) from palm kernel oil (PKO). Headgroup of glycolipids consist of dissacharides which are maltose and lactose. This research will focus on palm oil kernel based maltoside anomers with the effect of reaction time. This experiment is consist of three main steps which are acetylation, glycosylation and deacetyation. The characterisation of alpha and beta anomers will be determine by the principle on Nuclear Magnetic Resonance (NMR) Spectroscopy. Varieties of the glycosylation conditions prompted blends with various α/β ratio. The β-anomer is kinetically favourable. In this way a short glycosylation time and a moderate active catalyst, boron trifluoride (BF3), were connected to create more β-anomer than α-anomer. Then again, a stronger catalyst such as tin tetrachloride (SnCl4), was utilized to deliver α-dominant products, which are thermodynamically more steady. Regardless of its unsaturation content, palm kernel oil acts comparative than saturated alkyl chains. A twenty four hours reaction with BF3 delivered 1:1 α/β proportion palm part oil lactoside. A slight β-prevailing (1:2) blend was acquired for maltoside with six hours response catalyzed by BF3. The virtue of the blends was around 70-90% because of a little amount of a result that demonstrated an extra H-1 peak for both maltosides and lactosides.

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INTRODUCTION

1.1 Research Background

This research is written to study about synthesising and characterisation of synthetic glycolipids which are similar to alkyl polyglucosides (APGs) from palm kernel oil (PKO). Headgroup of glycolipids consist of dissacharides which are maltose and lactose. This research will focus on palm oil kernel based maltoside anomers with the effect of reaction time.

APGs are of type non-ionic surfactant. They are mostly used in variety of household as well as in industrial application. APGs derived from sugar combining glucose and fatty acids. APGs have a complex mixture of compound consisting two parts which are hydrophilic ends and alkyl group of variable length on their hydrophobic ends. Alkyl groups are defined as functional group of an organic chemical that contain carbon and hydrogen atoms arranged in chain with general formula, C_nH_{2n+1} . Hydrophilic end have a tendency to mix with water while hydrophobic end will repel water.

According to (Sulek M, Wasilewski T, 2005), APGs used as additives considerably reduce motion resistance and wear and also improve antiseizure properties. APGs helps to enhance the formation of foams when added to detergents. Foaming is important to provide better contact time on a soiled surface. By this way, detergent will have more time to do its work thus enhancing its cleaning efficiency.

APGs from natural resources are very complex in their chemical composition thus this research is needed to study a way to produce synthetic APGs derived from palm kernel oil. Another advantages is APGs are biodegradable which made them friendly to the environment.