PHASE DIAGRAM OF PALM OIL BASED ON GLUCOSIDES

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ABSTRACT

Liquid crystals self-assembly have received much attention in bio-medical, bio-food, and nanotechnology applications. Glycolipids are a class of amphiphiles in the colloid and interface science field and progressively gaining importance both technically and scientifically. Glycolipids (monosaccharide/glucose) have been used as surfactant. Glucosides Palm Oil (GPO) is a non-ionic surfactant. It also is known as alky glucosides. Polarizing optical microscope has been used to study the phase behaviors of this compound in phase diagram. The thermotropic liquid-crystalline and lyotropic liquid-crystalline behavior were characterized. Although, the phase diagram of GPO constructed and showed phase at lower to higher concentration regime. They probably displayed anisotropic and isotropic of thermotropic liquid structure. They also probably exhibited lamellar phase, cubic phase, hexagonal phase, miscellar phase of lyotropic liquid crystal structure.

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CHAPTER 1

INTRODUCTION

1.1 Research Background

Glycolipids are natural liquid crystals, whose self-assembly is related to membrane functionality. Because of natural compounds' heterogeneity and due to problems of purifying lipids, synthetic glycolipids have become important media for understanding membranes. However, natural glycolipids require extensive syntheses and, therefore, are of limited accessibility. Although glycolipids exist in nature, they can also be synthesized either chemically or enzymatically. Due to their role in the nervous system and bio-membranes, natural glycolipids are extensively studied by researchers, especially bio-chemists.

Alkyl polyglycosides (APG) is one of non-ionic surfactants widely used in several of residential and industrial applications. They are derived from sugars, usually glucose derivatives, and fatty acid alcohols. The raw materials for industrial manufacture are typically starch and fat, and the products are typically complex mixtures of compounds with different sugars comprising the hydrophilic end and alkyl groups of variable length comprising the hydrophobic end (Nowicki et. al,, 2017).

Alkyl glucosides (AG) are considered as a very important class of biodegradable nonionic surfactants. AG contains a carbohydrate head group which glucose, galactose, maltose, xylose and others while hydrocarbon tail which a linear alkyl chain of different length. AG have numerous important applications as a main components of personal care products, cosmetics, in the preparation of