SYNTHESIS AND THERMAL PROPERTIES OF OCTYL MANNOSIDE

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ABSTRACT

The application of octyl mannose is widely used in industry like drug, pharmaceuticals, biochemistry etc. Since the complexity of natural mannoside, a simple structure that consists of a single alkyl chain with mannose head group is produce as alternative. As the synthetic octyl mannoside is a new molecular science, the content, purity and molecular structure are needed. The aims are to synthesis octyl mannoside and to analyze the thermal properties of octyl mannoside. The purity, content and molecular structure was identified using Nuclear Magnetic Resonance (NMR) while thermal characteristic was identify by Differential Scanning Calorimetry (DSC). It shows that the purity of octyl mannoside is 49%. Since the yield of the product is small and does not enough for DSC analysis, the thermal properties of octyl mannoside cannot be determined.

CHAPTER 1

INTRODUCTION

1.1 RESEARCH BACKGROUND

Developing a new molecular science is one of the most interesting for researchers nowadays. It is due to the benefits of the new molecular science that can give huge impact to some industries. In order to develop a new molecular science, the study of intermolecular interaction is significant. Most of researchers likely to modified saccharide to form new molecules as saccharides are abundantly in this world for instance sucrose which can be found in sugar cane and sugar beets. For food and biological industries, thermodynamic data of saccharide aqueous solution is very important. The presence of several hydroxyl groups makes the saccharides have unique hydration characteristics (Galema et al, 1991; Galema et al, 1994; Galema et al, 1990; Barone et al, 1983; Goldberg & Tewari, 1989; Banipal et al, 1997). Sugar can be classified into three according to the number of individual simple sugar unit, which are polysaccharide, disaccharide and monosaccharide. Polysaccharide is a chain of monosaccharide and having larger molecules while monosaccharide is the simplest sugar. The examples of polysaccharide are cellulose and starch while for monosachharide are fructose, mannose, etc (Segal, 2017).

Mannose is one of the monosaccharide that consists of 6 carbon atoms which called as hexose and it is found in polysaccharide mannan. Mannose is derived from pine trees, yeast, molds, ivory nuts and also bacteria. Basically, mannose is inconsequential to human nutrient, however glycoprotein and mucoprotein, in body,