CHAPTER I

INTRODUCTION

1.1. Background of The Study

Cosmetics is a substance or mixture of substances that are applied to human skin for the purpose of cleaning, maintenance, transfiguring and improving an appearance but they are not included in the class of drugs. One example of cosmetics used for facial care is a mask (Sriwidodo, 1986). There are various kinds of mask products on the market including powder masks, cream masks, gel masks, and paper masks. Among the types of masks in the market, one type of mask that is practically used is a gel mask that can be immediately peeled off after drying or commonly called by peel-off gel mask (Muliyawan dan Suriana, 2013).

The peel-off gel mask is usually in a gel or pastes that are applied by spreading it to the facial skin. After 15-30 minutes, the mask can be removed by peeling (Slavtcheff, 2000). One of the advantages of peel off gel masks compared to other types of masks is the easy use and cleansing that is by lifting or releasing like an elastic membrane (Harry, 1973). In this case, the composition of the ingredients has an important role in determining the physical quality of the preparation of peel off gel masks such as gelling materials that affect the viscosity, dispersion and drying time of the preparation (Vieira, 2009).

هُوَ ٱلَّذِىٓ أَنزَلَ مِنَ ٱلسَّمَآءِ مَآءً لَّكُم مِّنْهُ شَرَابٌ وَمِنْهُ شَجَرٌ فِيهِ تُسِيمُونَ ﴿١٠﴾

Allah SWT says in An-Nahl verse 10 :

"It is He who sent down rain from the sky, from it is drinking and from it is foliage in which you pasture (animals). (Kementrian Agama RI, 2012)

According to the interpretation of al-Misbah, the verse above explains the essence of Allah SWT and explains the details of the blessings that Allah SWT has given to servants. This verse also describes plants as the main requirement for humans and animals. This verse can be used as a reminder for humans to always be grateful for His blessings and to take advantage of the gifts that have been given well (Shihab, 2002). Allah SWT has grown various types of plants on earth to be utilized by humans as well as possible. Likewise with red rice plants. During this time, red rice has only been used to fulfill what food needs. Therefore, the application of red rice starch as a gelling agent in peel-off gel mask preparations is one of the efforts to optimize the utilization of red rice in the world of the pharmaceutical industry.

Starch is a complex carbohydrate that is insoluble in water, a powdery white, tasteless and odorless. In the industrial world, starch can be used as a raw material or as an additional ingredients such as coagulation (thickening agent), gel-forming (gelling agent), film-forming (filming agent) and as a stabilizer (stabilizing agent). Starch has hydrocolloid characteristics so it can be used as a gelling agent and film. The hydrocolloid characteristics of starch are due to the amylose content in starch. Starch is a complex carbohydrate consisting of amylose and amylopectin (Jacobs and Delcour, 1998). Amylose is commonly used to make films and gels because amylose has a structure that makes it possible to form hydrogen bonds between glucose molecules during heating. Garcia et al. (1998) reported that high amylose content would make the film more compact because amylose was in charge of the formation of the film matrix.

Amylose content in rice can be viewed from the properties of cooked rice. Santika and Rozakurniati (2010) said that levels of amylose in rice is one of the indicators that determine the flavor of the rice. Rice which had a low amylose levels (10-20%) will produce rice that is too sticky. Rice which has amylose levels with moderate (20-25%) will produce fluffier rice and is generally preferred by the consumers. Meanwhile, the rice with high

amylose levels (>25%) will produce rice with hard texture and only some consumers prefer it. Red rice is one type of rice that has hard texture and just partially people who want to consume it. This shows that the levels of amylose in red rice is greater than in white rice. According to the study by Umar et al., (2011) about the physicochemical of red rice it was found that levels of amylose in red rice is 23.83%. Therefore, red rice has the potential to be used as a gelling agent and the film.

In the industrial world, native starch has several obstacles if used as food and non-food raw materials. When cooked, starch will take a long time, the paste formed is too hard and not clear. In addition, it is too sticky and cannot stand the acid treatment (Koswara, 2006). Meanwhile, the important characteristics of starch desired by the industry include higher brightness (whiter starch), lower retrogradation, lower viscosity, clearer gel formed, softer formed gel texture and easier starch granules broke (Jane, 1995). This is the reason for starch modification physically, chemically, and enzymatically or a combination of these methods. One method of modifying starch that can be done to change the properties of starch is by making pregelatinized starch using the gelatinization technique.

Pregelatinized starch is starch that has been gelatinized by heating the starch under the temperature of the gelatinization and then dried (Wurzburg, 1989). Gelatinization is the process of breaking starch granules with water and heat so that each surface layer of the molecule can absorb water or dissolve and react with other materials (Smith, 1985). The breakdown of starch granules is caused by the presence of water and heat so that amylose is able to diffuse out of the granule. Pregelatinized starch will dissolve if mixed with cold water and thicken. However, the viscosity produced from the gelatinized starch and pregelatinized starch is different. The viscosity of starch that is gelatinized will be higher than pragelatinized starch. Therefore, modification of starch used in this study was pragelatinized starch.

The gelatinization process can be carried out using a drum dryer, spray dryer or extruder (Collona et al., 1984). In addition to using these 3

devices, gelatinization can also be done using an oven. Research conducted by Lukman *et al.* (2012) on the use of pregelatinized glutinous rice starch as a loose tablet matrix of sodium diclofenac, the gelatinization of glutinous rice starch was carried out using an oven at 50 ^{o}C. The study of the use of modified starch as a gelling agent material was also carried out by Sulastri et al., (2016) on the effect of black rice pregelatinized starch as a gelling agent on the physical quality of the peel-off gel mask. The results of the study showed that the addition of pregelatinized starch can affect the characteristics of peel-off gel masks including lowering the pH value, increasing viscosity, lower dispersion power and shorten drying time. Based on the background above, this study was conducted to find out the appropriate formulations for making peel off gel masks from red rice pregelatinized starch as gelling agent.

1.2. Research Problem

The Research problem in this research are :

1. How is the appropriate formulation for making peel off gel mask from red rice pregelatinized starch as gelling agent ?
2. How is the physical characteristics of peel off gel mask from red rice pregelatinized starch as gelling agent ?
3. What is the best concentration of pregelatinized starch used for peel off gel mask ?

1.3. Purpose of The Study

The purpose of the study are :

1. Knowing the appropriate formulation for making peel off gel masks from red rice pregelatinized starch as gelling agent
2. Knowing the characteristics of peel off gel masks from red rice pregelatinized starch as gelling agent
3. Determine the best concentration of pregelatinized starch used for peel off gel mask

1.4. Significance of The Study

1.4.1. Theoretical Significance

The benefit of this study is to provide scientific information about the potential of red rice starch as gel forming and film forming in preparation of peel off gel mask with gelatinization techniques and to know the characteristics of peel off gel masks produced form pregelatinized starch.

1.4.2. Practical Significance

The benefit of this reaserch is that it can be used as a reference for further reaserch and as a reference for making peel of gel masks with pregelatinized starch as a gelling agent.