UNIVERSITI TEKNOLOGI MARA

RELATIONSHIP BETWEEN THE ELASTICITY OF POLYMERIC GELS AND THE IN-VITRO RELEASE OF MEDICAMENT

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ABSTRACT

Gels are semi solid dosage form that comprise small amount of solid and dispersed in relatively with large amount of liquid, but still having solid-like character. Rheological properties of gels may affect the release of medicament from it. Elasticity of gel may affect the release of medicament from it. The objective of this study is to find the relationship between the elasticity of polymeric gels and the in-vitro release of medicament from them. Five types of gels bases were prepared to observe their rheological properties and the release of medicament after the gels incorporated with medicament. Type of gel bases that were prepared are glycerin of starch gel, gelatin-glycerin gel, sodium carboxy methyl cellulose gel, carbopol 934 gel and Eudragit L100 gel. Rheological properties of gels were observed by using Rheometer. Whereas, all five medicated gels were subjected to analysis by Franz diffusion cell method to study the in-vitro release of medicament from the gels and the sample of from the test was analyzed by UV spectrophotometric to obtain the concentration of Ketoconazole release. Relationship between the elasticity of gel and the release of medicament was observed. The result was showed that the higher the elasticity of gel the higher the release of medicament.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Gels are semi solid dosage form that comprise small amount of solid and dispersed in relatively large amount of liquid, but still having solid-like character. This semi-solid dosage form system is a form occurring as a three-dimensional system which is polymeric matrix in a high degree of physical or sometimes chemical network. Polymeric gels are formed from long disordered chains which are connected at specific point but the link should be reversible (Das Neves & Bahia, 2006).

The structure of gel can strongly affect its rheological properties (Das Neves & Bahia, 2006). The term 'rheology' is derived from the word rheos in Greak which is defined as to stream or flow. Rheology is a study of the flow and deformation of substance and also present as the reactions of different material (Ross-Murphy, 2003). Rheometer can be used to determine the rheological properties of the gels such as viscosity and elasticity (Sundaram, Voigts, Beer, & Meland, 2010). Rheometer can give the exact measurement of a complex substance's response to an applied deformation (strain) or force (stress) (Grillet, Wyatt, & Gloe, 2012).