UNIVERSITI TEKNOLOGI MARA

SOLUBILIZATION OF GRISEOFULVIN BY MIXTURE OF SODIUM LAURYL SULFATE (SLS) AND POLYOXYETHYLENESORBITAN MONOOLEATE (TWEEN 80) BY USING UV-VISIBLE SPECTROPHOTOMETER

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ABSTRACT

The use of mixed surfactant in solubilization of poorly soluble drug has been described in literature. The aim of this study was to determine the solubility of griseofulvin in mixed surfactant solutions compare to in single surfactant solutions. In this study also, the surface tension and critical micellar concentration (CMC) of surfactant solutions and surfactant solutions containing griseofulvin was determined. The relationship between CMC and drug solubility was also investigated in detail. Samples were prepared by dissolving relevant single surfactant at different concentration ranging from 0.005 to 0.12% w/v and mixed surfactant at different ratios ranging from 0.2 to 0.8 in distilled water at room temperature, 25 ± 0.2 °C and an amount of griseofulvin (0.1 %w/v) was dissolved in each concentrations and ratios. Surface tension of griseofulvin in single surfactant solution and mixed surfactant solution was determined by using a torsion balance with Du Noüy ring method. The CMC in single surfactant solutions and its mixture was obtained from the break of the surface tension-concentration profiles. The determination of griseofulvin concentration was done by using UV-Visible spectrophotometer. There was a solubility enhancement of griseofulvin observed in 60:40 molar fraction composition. The CMC value was also greatly reduced in 60:40 molar fraction composition. The solubility enhancement of griseofulvin in 60:40 molar fraction composition system was explained in terms of surfactant-surfactant interaction occurring within the solubilization site and the characteristics of mixed micelles itself.

CHAPTER 1

INTRODUCTION

1.1 Background of study

Griseofulvin is an antifungal drug once used widely for the treatment of dermatophytoses. The physicochemical property of griseofulvin as a lipophilic molecule which is practically insoluble in water makes formulation and delivery difficult (Zili et al., 2005). Basically, in order for a drug to be absorbed into the systemic circulation following oral administration, the drug must be dissolve in the gastric fluids (Wong et al., 2006).

The most common techniques employed by a formulation scientist to enhance the solubility of a drug involve in situ salt formation (pH-adjustment), or by use of additives such as complexing agents, surfactants and co-solvents (Rao et al., 2006).

The addition of surface active agents or surfactants will improve solubilization of poorly soluble drug. Surfactant is a compound that has a tendency to accumulate at the boundary between two phases which is generally described as interface (Aulton, 2002). The lowering of the interfacial tension and incorporation of insoluble drug within