

UNIVERSITI TEKNOLOGI MARA

**SELF-NANOEMULSIFYING DRUG DELIVERY SYSTEMS
(SNEDDS) OF CURCUMIN**

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ABSTRACT

Self nanoemulsifying drug delivery system (SNEDDS) is a mixture of concentration of oils, surfactant and co-surfactant to dissolve the poorly soluble drugs (Curcumin). In this study, isopropyl myristate was used as the oil phase, Cremophore RH40 and polyethylene glycol as the surfactant and co-surfactant respectively. The mixture of isopropyl myristate, Cremophore RH40 and polyethylene glycol were allowed to self-emulsify under gentle agitation. Next, the particle size was measured using Laser diffraction Malvern Mastersizer 2000MU and Malvern Zetasizer Nano ZS. The outcome shows that the ratio of oil, surfactant, and co-surfactant give a large influence to the particle size of the nanoemulsion. Finally, the composition of Cremophore RH40 29%, polyethylene glycol 12% and isopropyl myristate 59% has given the size of 200.1 ± 0.03055 which is the most stable and favorable characteristics of all formulations. The Transmission Electron Microscope (TEM) was used to check the morphology of Curcumin particles. It could be seen that the micelles formed were irregular spherical in shape and the analysis of TEM images reveals that each globule is surrounded by a thick layer that reduces the interfacial energy, and leads to the formation of barrier to coalescence.

CHAPTER 1

INTRODUCTION

1.1 Background

An emulsion is a system of two or more immiscible liquid phases in which the dispersed phase is suspended or dispersed throughout the continuous phase in separate droplets. (Ken Klein, 2008). The liquid phase subdivided into globules is called dispersed phase or internal phase, while the liquid phase in which the globules are dispersed is named continuous phase or external phase (Ajay, B., Mahesh, K.K., Vikramjeet, S., & Vishal, S., 2012). The majority of emulsions have droplets with diameters of 0.1-100 μm (Mehta, 2002 & Winfield, 2004). Based on the emulsions system, it consists of one phase that is polar and the other phase is non-polar. Simple emulsions can be further divided into two categories which are oil-in-water (o/w) emulsions and water-in-oil (w/o) emulsions. When the oil phase is dispersed as globules throughout an aqueous continuous phase, the system is referred to an oil-in-water (o/w) emulsion. But if the aqueous phase is dispersed as globules and the oils phase is the continuous phase, the system is known as water-in-oil (w/o) emulsions. Besides that,