

UNIVERSITI TEKNOLOGI MARA

**PREPARATION OF NANOPARTICLES BY USING
SUCROSE ESTER AS AN ALTERNATIVE
SURFACTANT**

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ABSTRACT

Emulsion evaporation method can be used to prepare nanoparticles. In this study, sucrose ester (SE) was used as an alternative surfactant as it has low toxicity, excellent biocompatibility and biodegradability and provide alternative to the generally more convenient ethylene oxide (EO) based nonionic surfactants if compare to the usage of polyvinyl alcohol (PVA), which reported carcinogenic and lead to many unwanted effects. The formulation was assessed by using Zetasizer and scanning electron microscope. Results showed that at 0.05% (weight/volume) surfactant concentration with HLB 15 provided discrete and spherical nanoparticles if compare to the 0.01 % (weight/volume) and 0.1 % (weight/volume) surfactant concentration with HLB 15. This study may suggest that many options can be done in order to optimize the stability and the particle size of the particles which may be helpful in the development of nanoparticle systems for parenteral delivery of protein and gene medicines, by using SE as alternative surfactants.

CHAPTER ONE

INTRODUCTION

1.1 Background study

For few decades ago, researchers had done many experiments in improving the drug delivery in human which later they discovered the development of polymer based controlled drug delivery and gene therapy. Instead of focusing in the tissue engineering, which posses several problems, the researchers pay more attention on the new design of controlled drug delivery technology. This new delivery system has many advantages such as improved efficacy, reduction in toxicity, increased the patient compliance, masking unpleasant tastes and odors, protecting drugs against environmental stress and cost effective therapeutic treatment (Youan *et. al* 2003).

The main criteria of drug delivery systems are the ability to incorporate with the drugs, without changing its in vivo stability, release kinetics, non-damaging and targeting to the specific organs and tissues.

Liposomes are the most developed carrier system. However, they present some disadvantages, especially the stability and difficult surface functionalization, even though they have the high drugs payloads. In order to overcome the disadvantages,