ABSTRACT

THE EFFECT OF CARBOXYMETHYL CHITOSAN CONCENTRATION ON PHYSICAL CHARACTERISTICS AND IN VITRO RELEASE OF DITERPENE LACTONE FRACTION OF SAMBILOTO NANOPARTICLES (Prepared by Ionic Gelation-Spray Drying)

ASTRID NOOR ASTIDINIA PUTRI

Nanoparticle is a particle in the range of 10-1000 nm consist of a drug that dispersed with polymer. Nanoparticles as carrier of poorly soluble drug can increasing the dissolution rate and improving their bioavailability. Carboxymethyl chitosan is a polymer derived from chitosan which has better solubility in water and also suitable for drug delivery system. The objective of this study is to investigate the effect of carboxymethyl chitosan concentration on physical characteristics, entrapment efficiency and in vitro release of diterpene lactone fraction of sambiloto nanoparticles. Nanoparticles of diterpene lactone fraction (FDTL) sambiloto with different amount of carboxymethyl chitosan were prepared by ionic gelation and spray drying methods with CaCl₂ as cross linker.

The nanoparticles are evaluated in terms of their entrapment efficiency as well as dissolution rate of drug. The result show that the entrapment efficiency increases with increasing the amount of carboxymethyl chitosan, between 84% up to 90%. Dissolution rate of nanoparticles are faster than FDTL substance. It show that FDTL nanoparticles are able to enhance dissolution rate of FDTL. Furthermore, the study about the optimal amount of carboxymethyl chitosan still needed to gain homogeneous spherical nanoparticles which has better in vitro release.

Keywords: Nanoparticles; Ionic Gelation; Spray Drying; Carboxymethyl chitosan; Diterpene lactone.