ABSTRACT

EFFECT OF SODIUM ALGINATE CONCENTRATION WITH CROSSLINKER $CaCl_2$ 1 MOLAR (M) ON THE CHARACTERISTICS OF ERYTHROPOIETIN-ALGINATE MICROSPHERES (Produced Using Gelation Ionotropic Method with Aerosolization Technique)

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The aim of this research was to determine the effect of sodium alginate concentration on the characteristics (morphology, particle size, swelling index, and yield) of erythropoietin-Ca alginate microspheres using gelation ionotropic method with aerosolization technique.

The amount of erythropoietin added was of 5000 IU (70 µl) into 1% w/v, 2%w/v and 3% w/v of alginate solution and $CaCl_2$ 1M at stirring speed 1000 rpm in 30 minutes. Microsphere formed was resuspended into the solution of maltodextrin (as lyoprotectant) and was dried using freeze dryer.

Microspheres evaluation included FT-IR, DTA, investigation of moisture content, morphology using SEM, particle size distribution using optical microscopy, determination of swelling index, and yield. Microsphere had spherical form, smooth surface and the size were below 5 µm.

Determination of swelling index did by two methods, they are calculation of mass differentiation and calculation of size differentiation by time of 24^{th} and 30^{th}. Result of examination from swelling index in F1, F2, F3 are 0.58, 1.25, 1.43 (time of 24^{th}); 0.78, 1.78, 2.16 (time of 30^{th}) 0.50, 1.15, 1.32 (size method with time of 24^{th}), and 0.65, 1.80, 1.98 (size method with time of 30^{th}).

The result of yield formula F1, F2, F3 were 75.55 ± 0,350; 77,84 ± 0,290; 86,65 ± 0,191.

Result of analysis show that the increasing of alginate concentration cause the increasing of particle size, swelling index and also yield.

Keywords: Erythropoetin; alginate microspheres; characteristic microspheres; swelling index yield