ABSTRACT

Poly (lactic-co-glycolic) acid (PLGA) is very famous with its biodegradability property. In the form of nanocapsules (NPs), it is applied as contrast agent or for drug encapsulation. To pursue better function of PLGA NPs, a study about degradation behaviour is necessary because it is related to NPs drug release pattern. To conduct this research, PLGA NPs was prepared by emulsification solvent-evaporation method. Then, it was incubated in phosphate, acetate, and carbonate buffer to observe the effect of different pH into degradation rate of PLGA NPs. The results showed that the acid environment tends to have fast destructuration with the found of PLGA debris after several hours incubation. But, there is not many lactate monomer produced indicating less breaking of ester bonds. It is due to the acid condition only caused the breaking of van der walls bond which connects one PLGA chain with another. While in the basic condition, the degradation is done slowly, maintaining the particle size with the formation of porosity and high production of lactate. The hydroxide ion accelerated the breaking of ester bonds which connects the monomer in the PLGA chain. So, it is clear that different pH affects the morphology and the degradation mechanism of PLGA NPs and it can be applied to encapsulate drug for gastric or small intestinal cancer which have acidic and basic environment respectively.

Keywords: Poly (lactic-co-glycolic) acid nanocapsules, degradation behaviour, pH of incubation