

ABSTRACT

Chitosan is a polysaccharide polymer which was found abundant in marine crustacean outer skeleton. This compromising polymer was popularly used in drug delivery development and some medical applications. However, this polymer still has some imperfection such as fast release, hydrophobic surface and limited self-life properties which needs to be modified. Layer by layer (LBL) chitosan-gelatin was applied to improve some properties such as degradation rate, the contact angle of chitosan film and especially the drug releasing rate. This technique is a method which used the replication coating of chitosan and the gelatin layer by layer on top of each other. The modification provides a significant improvement. The result of analysis revealed that the contact angle of surface of modified chitosan film was improved 6% lower than chitosan film. The modification also reduced the swelling ratio of the film, which also leads to reduce around 68.8% of degradation rate of chitosan film. LBL also improves the strength 2.73 times stronger compare to single chitosan layer film. Moreover, the result from the drug releasing also confirm that the modification also reduces the releasing rate of drug releasing. By increasing the number of layers, the modification could reduce around 3% lower than rate of drug releasing of chitosan film. Furthermore, the increasing of concentration of chitosan also reduced rate of drug releasing around 40 times smaller than the rate of release of chitosan film. However, there are some adverse effects which were found during the experiment. There are reducing drug releasing efficiency significantly after increasing the number of layer and concentration. By the way, the releasing rate also define by the pH of the PBS solution in which the drug was released. These results show that LBL chitosan modification could improve significantly on degradation, contact angle and drug releasing rate. This improvement shows a promising sign for further study to improve this development.

Key words: Layer by layer technique, chitosan, drug release efficiency.