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Abstract
In this study, alginate solution was dropping to CaCl2 solution containing acrylic acid (AAc) and polymerized by UV to prepare hollow Ca-Alginate/PAA hydrogel beads. The mechanical properties, morphology, swelling ratio of these hollow beads were characterized. Release profile of vancomycin as a model drug was investigated in vitro. From sample preparation, it indicates that 3 wt% of alginate was the optimum concentration for preparing the hollow bead which has a moderate compressive strength of about 2.31 MPa, a swelling ratio of 65 w/w, and a water content of 98%. The morphology of the prepared hollow bead revealed from SEM was a structure with a cavity inside the bead and an interpenetrating network constructed from Ca-Alginate and PAA surrounding the cavity. Moreover, the prepared hollow beads were pH sensitive and found to deswell in the acid condition and swell in the neutralic condition. A two-stage of drug release from Ca-Alginate 3 wt% /PAA hollow beads were conducted, the drug was first released from an acidic environment (pH 1.2) and subsequently released from a neutralic environment (pH 7.38). The results indicate about 10% of vancomycin was released in the first stage followed by about 66% release in the second stage. Thus, the pH sensitive hollow beads prepared in this study are feasible to be used as drug carriers which show a small amount of drug release in the gastric environment and follow by a large amount of release in the intestine.
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