

A Novel pH sensitive hydrogel beads composed of sodium alginate and sodium carboxy methyl cellulose cross-linked by ferric chloride as anti-diabetes drug

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In the study, a complex composed of alginate blended with sodium carboxymethyl cellulose (NaCMC) was prepared to form hydrogel beads by dropping aqueous alginate-NaCMC into a ferric chloride solution. These hydrogel beads were evaluated as a pH-sensitive system for delivery of a model anti-diabetes drug. Preparation condition of the hydrogel beads was optimized by considering the percentage of encapsulation efficiency, swelling behavior of beads and their release data. The equilibrium swelling degree of hydrogel beads decreased with increasing of ferric chloride and sodium carboxy methyl cellulose concentrations. The swelling degree of hydrogel beads was found to be significant at intestine compare to simulated gastric media. The in vitro release of metformin (MHC) was carried out at 25°C in simulated gastric and intestinal media for 20 h. At pH 7.4, the amounts of metformin released increased significantly (approximately 50%) as compared to those released at pH 1.2.