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Effect of Crosslinking with Ca^{++} and Zn^{++} in the Formation of Gellan Gum Gels

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***SUMMARY*. This study involves an investigation of the effects of crosslinking of gellan gum (GG) with Ca^{++} or Zn^{++} on the physical properties of GG gels. GG gels crosslinked with different concentrations of Ca^{++} or Zn^{++} were prepared and parameters such as % water holding capacity and penetration thickness were investigated as measures of the extent of interaction of Ca^{++} or Zn^{++} with GG molecules. Data generated from the above studies revealed that Zn^{++} interacted with the GG molecules to a greater extent than Ca^{++}. In order to further strengthen our finding, we have prepared Zn^{++} crosslinked and Ca^{++} crosslinked floating GG beads respectively by ionotropic gelation in the presence of a gas-generating agent ($NaHCO_3$) and compared their physico-chemical properties such as density, drug entrapment efficiency and release in 0.1 M HCl (pH 1.2) using metronidazole (MTZ) as a model drug. Experimental data suggested that Zn^{++} crosslinked floating GG beads were denser and less buoyant than Ca^{++} crosslinked floating beads but capable of significantly ($p < 0.05$) improving MTZ entrapment efficiency and sustaining the MTZ release in 0.1 M HCl (pH 1.2) compared to Ca^{++} crosslinked floating beads. The difference in observed behavior may be attributed to differences in specificity, soft and hard character, enthalpies of hydration and ionization potentials of Ca^{++} and Zn^{++}.**

KEY WORDS: Ca^{++}, Floating beads, Gellan gum, Entrapment efficiency, Penetration thickness, Water holding capacity, Zn^{++}.

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