

ABSTRACT

Hydrogel beads made up of natural biodegradable polymers have paid considerable attention for several years in controlling and sustaining of release rate of drugs. Recently, dosage forms that can precisely control the release rates and targets drugs to a specific body site have made enormous impact in the formulation and development of novel drug delivery systems. The physicochemical and biological properties which include excellent biocompatibility, biodegradability, bioactivity and non-toxicity of carrageenan led to the recognition of this polymer as a promising material for drug delivery. Beads of carrageenan-sodium carboxymethyl cellulose-clay were prepared by conventional dripping method cross-linked using gluteraldehyde, sunflower oil as reaction media and KCl as the precipitating agent for the controlled release of isoniazid drug. The effects of the polymer ratio and clay on on the beads over 8-hour period were assessed with regard to swelling and release of isoniazid in buffer solution and 0.1N HCl solution, stimulating the gastrointestinal tract. Swelling experiment provided important information on drug diffusion properties, which indicated that the crosslinked beads are highly sensitive to the pH environments. Their release mechanism was examined in different time periods and studied by UV-visible spectrophotometer. Characterisation of the isoniazid- loaded beads was carried out by using FTIR, XRD, SEM. The results implied that carrageenan-sodium carboxymethyl cellulose-clay beads can be exploited as potential drug carrier for controlled release.