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Abstract

Preparation and characterization of nanochitosan/sodium alginate/

microcrystalline cellulose beads

Author(s): Vijayalakshmi K, Gomathi T. and Sudha P. N

The main aim of the present study was to synthesize and characterize the nanochitosan /sodium alginate/ microcrystalline cellulose beads in 2:8:1 ratio using the calcium chloride as the ionic crosslinking agent. Initially the steam explosion method was utilized to extract the microcrystalline cellulose from the banana fiber and the nanochitosan was synthesized from chitosan by utilizing the ionotropic gelation method. The characterization of the modified fibers and synthesized bead was done using the FT-IR, XRD, DSC, TGA and SEM studies. The chemical modification occurred during the steam explosion and the physical and chemical interaction in the bead formation was evidenced from the FT-IR results. The XRD pattern elucidates the increase in crystallinity of the fourth stage fiber when compared to first stage fiber and the decrease in crystallinity in case of the bead. The thermal stability of the prepared samples was identified from the TGA and DSC studies. The observed SEM results clearly indicate that the prepared bead has a spherical morphology and the rough surface which will be suitable for the adsorption process. The results were investigated.

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