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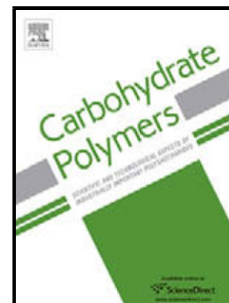
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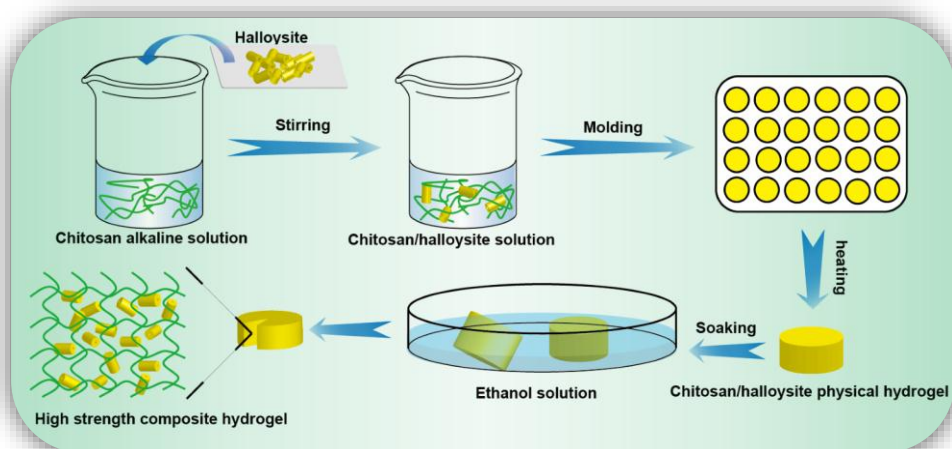
Chitosan Composite Hydrogels Reinforced with Natural Clay Nanotubes

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GRAPHICAL ABSTRACT



Highlight:

- Chitosan composites hydrogels were prepared by addition of halloysite nanotubes.
- Mechanical property of chitosan composite hydrogels was increased by HNTs.
- The pore size of chitosan hydrogels becomes smaller as the HNTs content increases.
- Chitosan/HNTs composite hydrogels show low cytotoxicity towards MC3T3-E1 cells.
- Composite hydrogels show a increased drug entrapment efficiency of doxorubicin.

Abstract

Here, chitosan composites hydrogels were prepared by addition of halloysite nanotubes (HNTs) in the chitosan KOH/LiOH/urea solution. The raw chitosan and chitosan/HNTs composite hydrogels were obtained by heat treatment at 60°C for 8 h and then regeneration in ethanol solution. The viscosity of the composite solution is increased with HNTs content. The Fourier transform infrared spectroscopy (FT-IR) shows that the hydrogen bonds interactions exist between the HNTs and the chitosan. X-ray diffraction (XRD) results show that the crystal structure of HNT is not changed in the composite hydrogels. The compressive property test and storage modulus determination show that the mechanical properties and anti-deformation ability of the composite hydrogel significantly increase owing to the

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