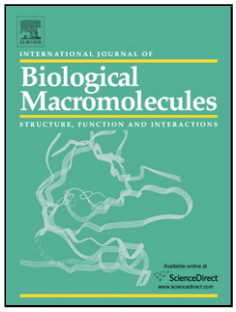

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Structural and viscoelastic properties of chitosan-based hydrogel and its drug delivery application

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Abstract

In this work, tetraethylorthosilicate (TEOS) was used to crosslinked the blend of chitosan (CS) and poly(vinyl alcohol) (PVA). Different amount of TEOS was used and its influence on the structural and viscoelastic properties of CS/PVA blend was studied. XRD results showed that the crystallinity is increased with increase in crosslinking: however after reaching its maximum value it started decreasing. The viscoelastic properties showed that both the values of storage modulus G´and loss modulus G´´ decreases as the temperature and crosslinking density increases exhibiting the viscoelastic behavior. Whereas, the value of storage modulus was increased at room temperature with increasing frequency which indicates the stable structure of the gel and it was not broken down by the mechanical shear force. The CS/PVA hydrogel showed switchable pH-response and this behavior has been exploited for the controlled release of progesterone in gastrointestinal track. The *in-vitro* released data of progesterone loaded CS/PVA hydrogels showed 10.1% of release in simulated gastric fluid for 2 h and a consistent release of remaining drug (81.3 %) over a

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