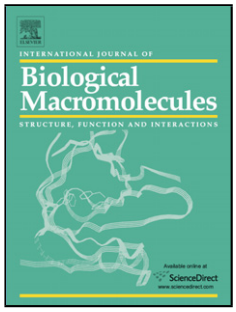

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Enhancing mechanical properties of chitosan films via modification with vanillin

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Abstract:

The vanillin/chitosan composite films were prepared using the solvent evaporation method. The properties of the films including optical property, water vapor permeability (WVP), tensile strength (TS) and elongation at break (%E) were studied to investigate the effect of cross-linking agent of vanillin on chitosan films by thermogravimetric analysis (TGA), scanning electron microscopy (SEM), X-ray diffraction (XRD) and Fourier transform infrared spectrum (FT-IR). Results showed that the TS of composite films increased by 53.3% and the WVP decreased by 36.5% compared with pure chitosan film that were due to the formation of the dense network structure by FT-IR spectra. There were almost no changes of the thermal stability of the composite films compared with the pure chitosan film by TGA analysis. In addition, from the SEM images, it could be seen that the film with addition of vanillin with 0.5-10% concentration exhibited good compatibility.

Keywords: Vanillin, chitosan films, cross-linking reaction, physicochemical properties

1. Introduction

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