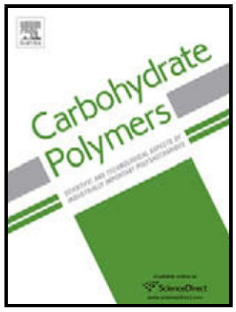

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PII: S0144-8617(17)30471-X
DOI: http://dx.doi.org/doi:10.1016/j.carbpol.2017.04.072
Reference: CARP 12260

To appear in:

Received date: 6-1-2017
Revised date: 26-3-2017
Accepted date: 24-4-2017

Please cite this article as: Elsayed, Nadia H., Monier, M., & Youssef, Ibrahim., Fabrication of photo-active trans-3-(4-pyridyl)acrylic acid modified chitosan.*Carbohydrate Polymers* http://dx.doi.org/10.1016/j.carbpol.2017.04.072

Fabrication of photo-active trans-3-(4-pyridyl)acrylic acid modified chitosan

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Highlights

- Chitosan was chemically modified through incorporation of 3-(4-pyridyl)acrylic acid.
- The resulted polymer was characterized by various instrumental methods
- Photo-induced crosslinking was performed by UV irradiation.
- The morphology, swelling and mechanical properties were examined.

Abstract

Photo-active trans-3-(4-pyridyl)acrylic acid (PYA) modified chitosan (CSPA) was synthesized with different functionalization degrees and extensively examined using Fourier transform infrared spectra (FTIR), ^{1}H nuclear magnetic resonance (NMR) in order to elucidate the chemical structure of the modified biopolymer. The modified CSPA with various substitution degrees were casted in form of thin membranes and cross-linked under photo-chemical condition by exposure to ultra-violet light via [2π+2π] cycloaddition reaction of the incorporated PYA units. The photo-induced reaction were examined using UV-visible light spectra and the cross-linked hydrogel were investigated using both XRD and scanning electron microscope (SEM). Also, the mechanical properties of the hydrogel membranes were studied by measuring the variations of both tensile strength and elongation against corss-linking densities.

Keywords: Chitosan
Trans-3-(4-pyridyl)acrylic acid
Photo-crosslinking
Cycloaddition

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