EFFECT OF FREEZING TEMPERATURE ON CHITOSAN-POLY (VINIL ALCOHOL) HYDRGELS

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A drug delivery system based on physically cross-linked chitosan (CS)-poly (vinil alcohol) (PVA)-blend hydrogels by freezing thawing method is describing in this work. These hydrogels are chemical cross-linking agents free, which are toxic to cells¹. CS and PVA polymers used are biocompatible, non-toxic, non-carcinogenic and safe to use in the human body². The effect of different freezing temperatures on the preparation process of CS-PVA hydrogels was tested. Morphological and chemical evaluation of hydrogels was done by scanning electronic microscopy (SEM) and Fourier transform infrared spectroscopy (FT-IR), respectively. In addition, swelling behavior was examined in water at 25°C through gravimetric method. The degree of crystallinity of PVA on the blend was evaluated with DSC analysis. CS-PVA hydrogels formed by freezing/thawed method are soft, flexible and apparently had good consistency. The SEM results show that with the increase of temperature the pore size and porosity decrease. All FT-IR spectrums showed the same patron signal indicated that different temperature don’t affect the interactions between polymers. Although, characteristic signals of PVA and chitosan (groups of amides) are showed. The morphological structure and degree of crystallinity of CS-PVA blend hydrogels change with different condition of freezing-thawing and this cause that the properties of swelling change too.

Keywords: Hydrogels, Chitosan, Poly (vinil alcohol)

References:


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