

Absorption characterization of Ca^{2+} , Na^{+} , and K^{+} on irradiation crosslinked carboxymethyl sago pulp hydrogel.

ABSTRACT

Hydrogel of carboxymethyl sago pulp (CMSP) of various degree of substitution (DS) was prepared by electron beam irradiation of various radiation doses. The CMSP hydrogels were subjected to swelling in different ionic strength solutions of KCl, NaCl, and CaCl_2 . The CMSP hydrogels, due to its polyelectrolyte nature, were found to be highly sensitive to ionic strength of the medium. All the CMSP hydrogels showed the absorption of K^{+} and Ca^{2+} increases with the increase in the concentrations of the respective cation solutions. The cation absorption also decreases with DS and % gel fraction (%GF) of the CMSP hydrogels. Subjecting the CMSP hydrogels in NaCl results in deswelling and releases Na^{+} to swelling medium where the Na^{+} release increases with the increase of DS and %GF. The sorption capacity depends on the extent of crosslinking and decreases with the increase in the extent of crosslinking.

Keyword: Absorption; Crosslinking; Electron beam irradiation; Hydrogels; Hydrophilic polymers.