

Fabrication of Chitosan/Polyacrylonitrile Blend and SEMI-IPN Hydrogel with Epichlorohydrin

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Abstract : The present study is focused on the preparation of chitosan-based blend and Semi-Interpenetrating Polymer Network (SEMI-IPN) with polyacrylonitrile (PAN). Blend Chitosan/Polyacrylonitrile (PAN) hydrogel films were prepared by solution blending and casting technique. Chitosan in the blend was cross-linked with epichlorohydrin (ECH) to prepare SEMI-IPN. The developed Chitosan/PAN blend and SEMI-IPN hydrogels were characterized with SEM, FTIR, TGA, and DSC. The result showed good miscibility between chitosan and PAN, crosslinking of chitosan in the blend, and improved thermal properties for SEMI-IPN. The swelling of the different blended and SEMI-IPN hydrogels samples were examined at room temperature. Blend (C80/P20) sample showed highest swelling (2400%) and fair degree of stability (28%) whereas SEMI-IPN hydrogel exhibited relatively low degree of swelling (244%) and high degree of aqueous stability (85.5%).

Keywords : polymer hydrogels, chitosan, SEMI-IPN, polyacrylonitrile, epichlorohydrin

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