



Journal

Journal of Macromolecular Science, Part B >

Physics

Volume 52, 2013 - Issue 11

73 | 4 | 0
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Controlled Release of an Antihypertensive Drug through Interpenetrating Polymer Network Hydrogel Tablets of Tamarind Seed Polysaccharide and Sodium Alginate

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Pages 1636-1650 | Received 30 May 2012, Accepted 25 Feb 2013, Accepted author version posted online: 18 Jul 2013, Published online: 18 Jul 2013

 Download citation <http://dx.doi.org/10.1080/00222348.2013.789327>

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Abstract

The application of interpenetrating polymer network (IPN) hydrogel tablets of tamarind seed polysaccharide and sodium alginate for controlled release of a water-soluble antihypertensive drug, propranolol HCl (PPL), was investigated. The IPN tablets loaded with PPL

or PPL–resin complex (resinate) were prepared by a wet granulation/covalent cross-linking method. Fourier Transform Infrared Spectroscopic confirmed the cross-linking reaction and IPN formation, while X-ray Diffraction and Scanning Electron Microscopy studies confirmed the amorphous dispersion of the drug within the IPN tablets. The plain drug PPL showed complete release within 1 h, while drug release from the resinate was prolonged for 2.5 h and the IPN matrices showed drug release up to 24 h. The drug release rate from the IPN matrices was affected by polymer concentration and cross-linking time; the higher the cross-linking time, the slower was the drug release. The drug release mechanism was found to be of a non-Fickian type.

Keywords: [drug release](#), [interpenetrating polymer network](#), [ion exchange resins](#), [sodium alginate](#), [tamarind seed polysaccharide](#)



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