**Synthesis and characterization of moringa gum based hydrogels by radiation method for use in drug delivery applications**

Baljit Singh1 and Ajay Kumar2

Department of Chemistry, Himachal Pradesh University, Shimla -171005, India

1Email: baljitsinghhpu@yahoo.com, Ph. + (91)1772830944

2Email:ajayvermanpr@yahoo.in, Ph. 9418973257

**Abstract:**

Keeping in view the importance of gum polysaccharides in various biomedical applications, in the present work, moringa *oleifera* gum based hydrogels were prepared for controlled and sustained drug delivery applications. Polymers were characterized by Cryo-SEM, 13C-NMR and TGA-DSC techniques. Beside swelling, some important network parameters of the hydrogels like; volume fraction in the swollen state (), Flory-Huggins interaction parameter (), molecular weight of the polymer chain between two neighboring cross-links (), crosslink densityand the mesh size (ξ) were also determined. It has been observed that the reaction conditions used for the synthesis of the hydrogels have influenced the swelling and network parameters of the hydrogels. The crosslink density and the mesh size (ξ) of the polymer network was observed 3.81 x 10-5 mol/cm3 and 38.77 nm respectively in pH 7.4 solution . The swelling of the hydrogels occurred through a non-Fickian diffusion mechanism. Swelling of hydrogels was observed more in the pH 7.4 buffer as compared to the pH 2.2 buffer.Hence, these hydrogels could be used for the controlled and sustained release of the drug for the problems associated with colon and GIT system.

Thrust area : Polymer Chemistry

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