

Synthesis of fast swelling hydrogels: effect of concentration of crosslinker on swelling ratio

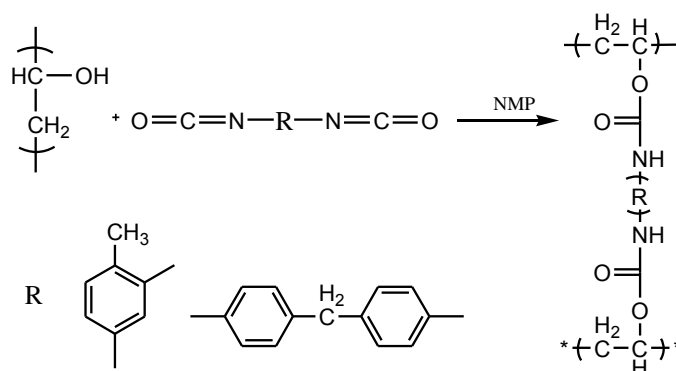
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Hydrogels are lightly crosslinked networks of hydrophilic polymer chains, which can retain large amount of water within its structure but do not dissolve into it. Polymers from natural, synthetic or semi-synthetic sources can be used for preparing hydrogels. It involves crosslinking of either linear polymers or simultaneous polymerization and crosslinking of monomers with polyfunctional monomers.^{1,2}

Hydrogels due to their unique biocompatibility, flexible methods of synthesis, range of constituents and desirable physical characteristics, are widely used in different fields such as biomedical and agricultural.³

The present study investigates some hydrogels based on biodegradable, water-soluble and biocompatible polymer, poly vinyl alcohol (PVA). The cross-linking of PVA with two types of aromatic diisocyanate, such as toluene diisocyanate and Methylene diphenyl diisocyanate were carried out in NMP with five different ratios (w/w %) (Scheme 1).



Scheme 1. Preparation of hydrogels

Equilibrium swelling behavior of hydrogels in water was calculated and indicated the sustained expansion of them. It was found that the swelling behaviors of hydrogels depend on the ratio of cross-linking agent. Also the synthesized hydrogels were characterized using FT-IR, TGA, SEM and XRD.

References

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