

Fig. 2. Formation of PVA crystallites from a homogeneous PVA solution by freeze thawing technique (Adapted from Jinchen 2013).

Aside from radical polymerization of mixtures of vinyl monomers, chemically crosslinked hydrogels can also be obtained by radical polymerization of polymers derivatised with polymerizable groups (macromonomers). If polymers have pendant functional groups (e.g., OH, COOH, and NH₂), covalent linkages between polymer chains can be established by the reaction of functional groups with complementary reactive groups such as an amine-carboxylic acid or an isocyanate-OH/NH₂ reaction, or by Schiff base formation [Fig. 3](#).

A novel hydrogel concept based on enzymatic reaction has also been reported. A tetrahydroxy PEG was functionalized with glutaminyl groups (PEG-Qa). PEG networks were then formed by the addition of transglutaminase to an aqueous solution of PEG-Qa and poly(lysine-co-phenylalanine) (Sperinde and Griffith 1997).

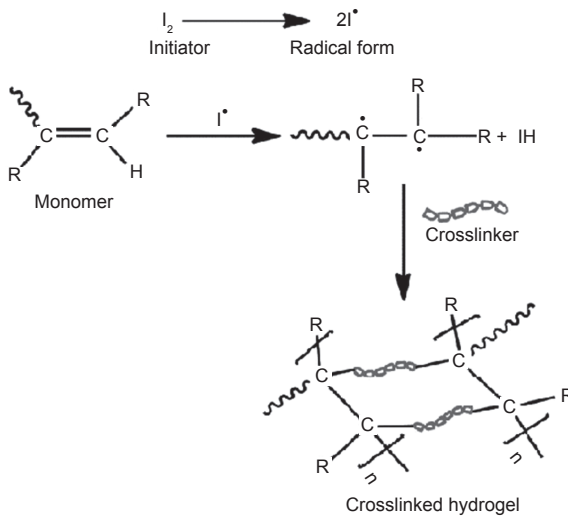


Fig. 3. Crosslinked gel obtained by radical reaction of a low MW monomer and I_2 as initiator with a crosslinking agent (Adapted from Dipankar and Sagar 2015).