



Fig. 6. Commonly used thermoresponsive polymers chemical structures: (a) poly (N-isopropylacrylamide); (b) poly (N,N-diethylacrylamide); (c) poly (N-ethylacrylamide); (d) poly (2-carboxyisopropylamide); (e) poly (N-(L)-(1-hydroxymethyl) propylmethacrylamide); (f) poly (N-acryloyl-N'-propylpiperazine); (g) poly (N-vinylcaprolactam); (h) poly (2-dimethylamino)ethyl methacrylate; (i) poly (2-ethyl-2-oxazoline); (j) poly (2-isopropyl-2-oxazoline); (k) poly (vinyl methyl ether); (l) poly (propylene oxide); (m) methylcellulose; (n) ethyl(hydroxyethyl)cellulose.

hydrogel has proven itself to be a successful injectable delivery carrier for cartilage regeneration (Park et al. 2009). Composite thermosensitive hydrogel using Pluronic derivatives and crosslinked hyaluronic acid loaded with TGF- β 1 have been shown to increase benefits in the induction of chondrogenic differentiation of human adipose-derived stem cells in a full-thickness defect of rabbit knee articular cartilage mode (Jung et al. 2010).

pH-sensitive hydrogels

pH is a notable environmental parameter that can be used for stimuli-sensitive system because each site in the human body possesses a different pH value. A well-designed