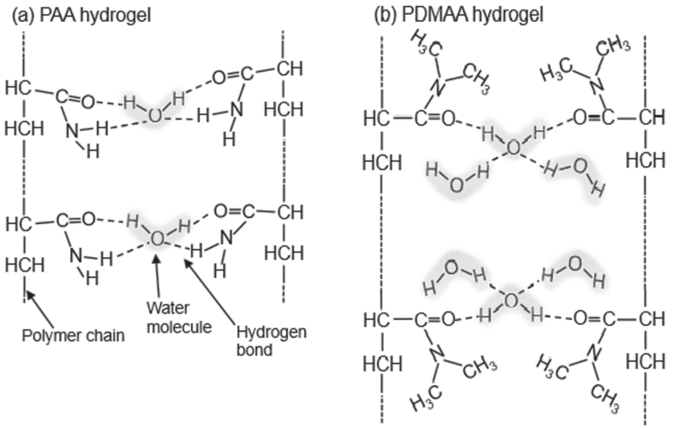

Fig. 23. Structure of PAA and PDMAA with bound water.

confirm that the water structure in hydrogels is sensitive to the polymer species. When the dry hydrogel is reswollen in water, the opposite process occurs, starting from the hydration of the polymeric chains forming the bound water layer and subsequently the establishment of interstitial and free water layers. The composition and disposition of waters inside the polymeric network changes in comparison with those found in the previous process. The uptake of water takes place starting from a dry hydrogel which does not resemble the previous dry hydrogel, of departure. The relocation of

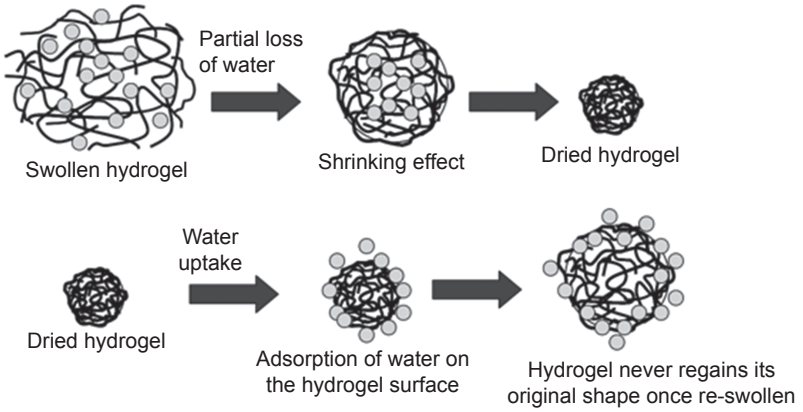

Fig. 24. Sequence of dehydration and rehydration of hydrogel.

the water molecules occurs on a different structural coil. In fact the final volume of the hydrogel results different from that previously seen. The conformation of the polymeric chains, their entanglements and physical interactions are different and the reswelling process occurs differently whenever we rehydrate a dried gel (Fig. 24).