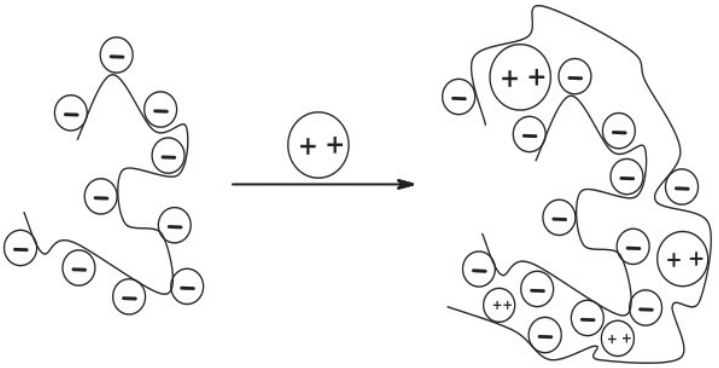

Fig. 8. Schematic representation of ionic interaction.

Table 5. Various hydrogel materials, crosslinking initiators and mechanism.

Material	**Gel Precursor**	**Crosslink Mechanism**
Pluronics	Macromer(s): PEO-PPO-PEO Initiator: temperature (37ºC)	Physical (Ruel-Gariepy et al. 2004)
Chitosan-Pluronics	Macromer(s): Chitosan and pluronics Initiator: temperature (37ºC)	Physical (Weng et al. 2001)
Chitosan-AHP	Macromer(s): Chitosan and AHP Initiator: temperature (37ºC)	Physical (Nair et al. 2007)
Chitosan-Glycerol Phosphate	Macromer(s): Chitosan and glycerol phosphate Initiator: temperature (37ºC)	Physical (Ahmadi et al. 2008)
PPF-Co-Ethylene Glycol	Macromer(s): hydrophobic PPF and hydrophilic PEG Initiator: light	Chemical (Fisher et al. 2004)
Hyaluronic Acid	Macromer(s): tyramine substituted hyaluronic acid Initiator: HRP enzyme	Physical (Darr et al. 2009)
SMO-PCLA-PEG-PCLA-SMO copolymer hydrogel	Macromer(s): pH-sensitive SMOs and thermo-sensitive PCLA-PEG-PCLA Initiator: temperature (37ºC) and pH (7.4)	Physical (Shim et al. 2006)
Oxidised Alginate, Gelatin and Biphasic Calcium Phosphate	Macromer(s): oxidized alginate, gelatin and biphasic calcium phosphate	Chemical (Nguyen and Lee 2012)

and ionic solution of calcium chloride or aqueous slurry of calcium salts such as calcium sulfate, calcium carbonate was injected using dual syringe. The gels were formed instantaneously upon reacting with Ca^{2+} ions. Gelation time depends on the temperature and concentration of calcium ions.

The main drawbacks of alginate hydrogels are very poor bioresorption and rate of degradation. This gel does not undergo hydrolytic cleavage or enzymatic degradation under physiological conditions. However, partial oxidation of alginate using sodium