Both HMWC and LMWC are available. The latter were obtained by the depolymerization of HMWC. This can be carried out by enzymatic (Kittur et al., 2003), physical (Cravotto et al., 2005) or chemical methods (Tian et al., 2004). Industrially, chemical acidic degradation using hydrochloric acid was preferred to prepare LMWC (Varum et al., 2001). This method is usually simple, easy, reproducible and non-random.

Chitosan dissolves easily at low pH due to the protonation of the amino groups, while it is insoluble at higher pH ranges since the amino groups become deprotonated, as the pH approach the pKa of chitosan (6-6.5). The solubility of chitosan depends upon M.W. and DDA % (Marguerite, 2006).

Chitosan with its mucoadhesives and non-toxic properties can act as a significant absorption enhancer by opening the intercellular tight junctions of the epithelia and promoting the paracellular permeation of hydrophilic macromolecules (Junginger & Verhoef, 1998).

Several methods have been developed during the last two decades for preparation of chitosan nanoparticles, such as emulsion cross-linking, spray drying technique, emulsion coalescence method, reverse micellar method and ionic gelatin method (Zhao et al., 2011).