

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

In this thesis work, AMPS-Na⁺ hydrogels and chitin whisker-reinforced AMPS-Na⁺ hydrogels can be produced by free-radical polymerization in aqueous solution using Gamma radiation and Ultraviolet radiation technique and Gamma radiation technique at radiation dose of 25 kGy is more effective than UV radiation to form hydrogel. Monomer concentration and percentage of crosslinker affected the properties of hydrogels. Therefore, the evaluation of appropriate balance between them is very important. But AMPS-Na⁺ hydrogels have less dimensional stability. So, chitin whisker, prepared from acid hydrolysis of chitin flake, was incorporated into AMPS-Na⁺ hydrogels to improve dimensional stability and enhance their mechanical properties. The addition of chitin whisker improved mechanical properties of hydrogel (increase both tensile strength and %Elongation at break) and reduced the swelling properties and WVTR of hydrogel this may be explained that chitin whisker acted as gas and liquid barrier and obstruct the diffusion of water and oxygen. Chitin whiskers reinforced hydrogels can release chitin oligomer within 5 days by enzymatic hydrolysis which this may help to accelerate wound healing. The indirect cytotoxicity and water vapor transmission rate value of AMPS-Na⁺ hydrogels and chitin whisker-reinforced AMPS-Na⁺ hydrogels indicated that all hydrogels were non toxic and can keep moist environment to the wound. Thus, AMPS-Na⁺ hydrogels can be employed as wound dressing materials.