CHAPTER V
CONCLUSIONS AND RECOMENDATIONS

5.1 Conclusions

N-trimethyl chitosan chloride (TMC) was synthesized by using methyl iodide which was used as an antibacterial agent. Carboxymethyl chitosan (CM-chitosan) was synthesized by using monochloroacetic acid which was used as a blood coagulation agent. PVA/CM-chitosan hydrogels were prepared by Gamma-irradiation technique (25, 35 and 45 kGy) from the mixture of a PVA solution in distilled water and a CM-chitosan solution (5, 10, 15, and 20 %w/w of PVA) in distilled water. PVA in the final solution is 10 %w/v. The gel fraction, swelling behavior, weight loss, water absortion, moisture retention capability, and water transmission rate of the blended hydrogels were evaluated to characterize the PVA/CM-chitosan hydrogels. The optimum concentration of CM-chitosan was determined by the obtained data of the blended hydrogels. It was found that the optimum condition for PVA/CM-chitosan hydrogels is CM-chitosan 15 %w/v of PVA. TMC was further added into the PVA/CM-chitosan hydrogels obtained the blended hydrogels. An indirect cytotoxic assay was used to investigate the toxicity of blended hydrogels with mouse fibroblast cells (L 929). The results showed all types of the blended hydrogels released no substances at levels that were harmful to cells. An antibacterial activity of the blended hydrogels was assessed by using colony count method against bacteria in skin infection. The antibacterial activity of the blended hydrogels increases with increasing the TMC content. All obtained results represented that CM-chitosan and TMC are a suitable substance to fabricate the antibacterial hydrogels as wound dressing.

5.2 Recommendations

From the obtained results, the following recommendations are suggested for future studies:

1. To study the characteristic of cross-linking network structure that occurred among PVA, CM-chitosan, and TMC in the blended hydrogels.
2. To study the hemostatic activity of CM-chitosan and blended hydrogels.