CHAPTER V
CONCLUSIONS

In the present study, chitin and chitin nanocomposite films was produced by solvent casting using formic acid as a solvent. A clear β-chitin solution was obtained by dissolving chitin gel, which was firstly dissolved in concentrated sodium hydroxide. α-Chitin whiskers in the range of 0 - 2% (w/v) were used as the reinforcing nanofiller. The appearance of the films revealed that the pure β-chitin film was transparent, while the chitin nanocomposite films were more translucent as the α-chitin whisker content increased. The addition of α-chitin whisker improved the tensile strength, tensile modulus and thermal stability because of the interaction of the α-chitin whisker and β-chitin matrix. The addition of α-chitin whisker inversely enhanced the water accessibility, biodegradation, and oxygen permeability. It can probably be explained in that the α-chitin whisker acted as a liquid and gas barrier to obstruct the diffusion of the water, lysozyme, and oxygen. The interaction between the α-chitin whisker and the β-chitin matrix could be explained by FTIR spectra, which show that there are no peak shifts or new peaks. The interaction, then, was a physical interaction like hydrogen bonding. In terms of cytocompatibility, from the results of MTT, the chitin nanocomposite films were found to be non-toxic with L929 fibroblasts. Moreover, they promoted L929 fibroblast attachment and proliferation onto the surface of the film, as determined by SEM observation. Thus, the chitin nanocomposite films have potential use as wound dressings.