



CHAPTER V CONCLUSIONS

In this study, the chitosan was prepared from shrimp shells by demineralization with HCl, followed by deproteinization with 4% NaOH, and deacetylation with 50% NaOH. The results revealed that the degree of deacetylation (%DD) of chitosan increased with increasing of number of the alkali treatment cycles, but the degree of deacetylation (%DD) of chitosan became constant after the third alkali treatment cycles of chitosan. The increment of the hydrophilicity of the woven PET was caused by the plasma treatment using DBD. The plasma-treated PET samples were further immersed into the chitosan acetate solutions to coat the surface. The chitosan-coated woven PET was examined for the effect of chitosan concentration, temperature, and the washing cycle in order to determine the threshold quantity of the chitosan sustained on the fabric were analyzed extensively. The experiment results were revealed that amount of chitosan deposited on the woven PET fabric increased linearly by the rising of concentration of chitosan from 0.1% to 4% and at the concentration beyond 2 %, it remained almost unchanged. Therefore, the amount of the chitosan deposited on woven PET was 27.3 mg/g of sample. As for the temperature effect, it had no effect on the chitosan coating and the amount of chitosan deposited on woven PET slightly decreased with the rising of the number of washing cycle. With the washing of woven PET for three cycles, the amount of chitosan on the woven PET fabric is constant. Moreover, the XPS analysis presented the incretion of oxygen containing polar groups (O-C=O groups and C-O groups) on the PET surface after the plasma treatment. However, the appearance of these functional groups dropped after the chitosan surface coating with the method of submerging into the chitosan acetate solution, this indicating chitosan could be successfully coated on the plasma-treated woven PET surface. Consequently, the chitosan-coated woven PET exhibited a strong antimicrobial activity against both *S. aureus* (gram-positive bacteria) and *E. coli* (gram-negative bacteria).