CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The blend fibers were prepared from carboxymethylated chitosan and alginate by wet spinning. The electrostatic force and hydrogen bonding occurred between the two polymers. The tensile strength of the blend fibers was significantly lower than that of pure alginate fiber due to the decreasing of alginate content in blend fibers compared to pure alginate fiber at the same weight. The decreasing of alginate content resulted in less calcium content trapped in the blend fibers. Nevertheless, the blend fibers had antibacterial properties against *E. coli* and *S. aureus*.

Based on the ionic interaction between chitosan and alginate, chitosan-coated fiber was prepared by applying chitosan in the first coagulation bath. The tensile strength of the chitosan-coated alginate fibers was higher than that of pure alginate fiber due to the presence of ionic interaction between chitosan and alginate. In addition, the flexibility of the chitosan-coated alginate fibers increased with increasing of chitosan content coated on the alginate fibers due to less calcium content trapped in the alginate part of the chitosan-coated alginate fibers. Furthermore, the chitosan-coated alginate fibers had antibacterial properties against *E. coli* and *S. aureus*.

5.2 Recommendations

The results indicated that CM-chitosan/alginate blend and chitosan-coated alginate fibers had antibacterial properties against *E. coli* and *S. aureus* due to the addition of CM-chitosan and chitosan into alginate fiber. In this study, the antibacterial activities of the fibers were qualitatively investigated. Therefore, further studies on other antibacterial agents and antibacterial tests should be conducted. Moreover, further studies on the variation in other spinning conditions, like the size of nozzle, bath length, take-up speed, etc.

should be also conducted in order to obtain the optimal spinning condition that would give antibacterial fiber with the best properties.