



## CHAPTER V

### CONCLUSIONS

Freeze-drying technique was used to prepare the porous scaffolds of chitosan, CM-chitin, and CM-chitosan. The amino groups of chitosan, CM-chitin, and CM-chitosan might be involved in crosslinking and coloration of the scaffolds during steam treatment. The crosslinking taken place in the steamed scaffolds resulted in a decrease of aqueous solubility of the steam scaffolds. The color change of the steamed chitosan scaffolds intensified from the pale yellow to brown whereas the color of the steamed CM-chitin and CM-chitosan scaffolds changed from white to pale yellow as increasing the steaming temperatures from 110°C to 121°C. The percentages of weight loss and the degrees of swelling of the scaffolds depended on various factors including polymer concentrations, chemical structures of polymers, and steaming temperatures. The higher the steaming temperature was, the lower degree of swelling and weight loss of the scaffolds obtained. The tensile strength and elongation at break of dry scaffolds were rather low at around 0.12 MPa and 10%, respectively. SEM micrographs showed that the pore structures were open pore and columnar shape along the vertical direction. Furthermore, the treatment with saturated steam in autoclave rarely destroyed the pore size and shape of the scaffold.