CHAPTER IV

CONCLUSIONS

4.1 Conclusions

The chemical modification of cotton fabrics with chitosan was achieved through a series of oxidation/reductive amination. Oxidation of cotton fabric with KIO_4 followed by reductive amination with chitosan led to the highest chitosan content in the fabric analyzed by Kjeldahl nitrogen analysis technique. The %exhaustion and color yield (K/S) in the dyeing process with mono-chloro-triazine and vinyl sulphone reactive dyes showed that this method of fabric modification considerably improved dye uptake of the fabric. The dyeability of the modified fabric with monochlorotriazine and vinylsulphone reactive dyes was clearly greater than those of original bleached cotton fabric. The reduction of repulsive force between the negatively charged cellulose and the anionic dye molecules by the more positively charged chitosan chains probably accounted for this greater dyeability. The modification of fabrics chitosan by this method did not post discernable colorfastness to the dyed fabric. The chitosan modified fabric can be dyed under improved dyeing condition in which the amount of dyes and sodium chloride salt used significantly lower without affecting the color yield. This improved dyeing condition can reduce the cost of dyes and salt used but also reduce the amount of dyes and salt remain in the dyeing house effluent.

4.2 Suggestion for future work

Fine tuning of this research work should be studied to bring about real application of the method into an industrial use. Oxidation condition, reductive amination condition and chitosan molecular weight are among the important parameters should be investigated to bring about the most economical and effective method for surface modification of chitosan. Antimicrobial activity of the chitosan-modified fabric is also an interesting property needed to be fully investigated to gain and claim added benefit from using chitosan as a modifying agent.