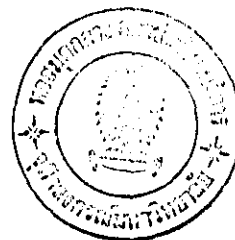


## CHAPTER V



### Conclusions

From this study, the results show that commercial reactive dye, Cibacron blue P-B could be modified with ethanolamine to produce the hydroxyalkyl dye. The technique used for combining modified reactive dyeing and finishing of cotton fabric in single step process was investigated. Cotton fabric was dyed with the hydroxyalkyl dye using a butanetetracarboxylic acid (BTCA) as a crosslinking agent in the presence of sodiumhypophosphite as a crosslinking agent. The dye molecule was believed to be bonded to the cotton fiber by BTCA as a crosslinking agent. In the mean time, BTCA also acted as a crosslinking agent for cellulosic polymer chains. An analytical technique, FT-IR was employed to confirm the characteristics of modified reactive dye and extended to identify the ester bonds produced. Therefore simultaneous dyeing and finishing of cotton fabric was possible.

The other investigations of this project were also focused on the appropriated conditions using in pad-dry-cure process by varying many factors such as pH value of pad-liquor, curing temperature, time and the concentrations of hydroxyalkyl dye, BTCA to  $\text{NaH}_2\text{PO}_2 \cdot \text{H}_2\text{O}$  ratio. The optimum results achieved from this experiment were found when 10 g/l of hydroxyalkyl dye, 50 g/l of BTCA and 50 g/l of  $\text{NaH}_2\text{PO}_2 \cdot \text{H}_2\text{O}$ , and pH value of pad-liquor 2.5 to 3.0 were used. Furthermore, optimum dyeing properties of cotton fabric achievable at the curing temperature of 180 °C for 5 minutes. The study on physical properties of dyed and finished cotton fabric in terms of the percentage of loss strength and crease resistant were undertaken. It was found that an increase in curing temperature resulted in increasing in the degree of loss strength. In the other hand, the crease resistant was increased as curing temperature and duration of cure time increased.

By comparison between the conventional dyeing method and the one step dyeing and finishing method, the degree of dye fixation obtained from the latter process was significantly lower. Yet, the drawback was found during the curing process due to high curing temperature that affected to the strength of cotton fabric because cellulose cotton fiber can be destroyed due to high temperature treatment. Therefore, searching for a more curing condition and the others crosslinking agents are worthwhile target for continuing research. Since the combining reactive dyeing and finishing in one stage process provides a great advantage in terms of saving in production time.



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