

CHAPTER V

Conclusions

This study confirmed that cotton cellulose could be dyed with commercial reactive dyes in the absence of alkalis. The technique used in this study was to introduce reactive group into cellulose backbone. By doing so, cellulose was treated with 2,4-dichloro-6-pyridino-s-triazine compound (DCPT) and followed by the further reaction of DCPT cellulose with ethylenediamine. Many analytical techniques including HPLC , FT-IR and NMR techniques were employed to confirm the characteristics of the prepared DCPT as well as the DCPT treated cotton fabric.

Extensive investigations on dyeing of modified cotton cellulose using commercial reactive dye in the absence of alkalis were undertaken. Traditional dyeing procedures such as exhaustion and pad-thermofixation methods were employed. The results showed that the degree of dye fixation increased with an increase in total nitrogen content on the modified cellulose, in the other word, the amount of reactive sites. The optimum concentration of the modifying agent to achieve the optimum degree of dye fixation was 15 g/l and further increase in the modifying agent resulted in decreasing in the degree of dye fixation. It was also found in this study that high color strength (heavy depth of shade) could be achievable at relatively lower concentrations of dye when compared to the results obtained from conventional dyeing of cotton cellulose. This is the advantage of the alkali-free dyeing system in terms of minimal hydrolysed dye produced. Hence, loss of active dye molecules during dyeing is reduced. High color strength achievable at lower dye concentrations means waste discharge reduced and possible cost effectiveness.

By comparison between methods of dyeing, the degree of dye fixation obtained from exhaustion dyeing method was significantly higher than those obtained from pad-thermofixation method. The poor performance of the latter may be partly due

to the short fixation time, just only three minutes at 160°C, hence resulting in possible poor dye fixation.

However, the drawback was found during the preparation of the modifying agent that the compound was so unstable so that the isolation was quite difficult to achieve. It is necessary that a compound suitable to be used as a modifying agent should be easy to handle. Therefore, searching for a more stable modifying agent is a worthwhile target for continuing research.