

## CHAPTER V

### CONCLUSIONS AND SUGGESTION

#### 5.1 Conclusions

We prepared four types of inkjet inks from four kinds of polymer binder. Three polyacrylate binders with different hydrophilic property and one type of polyurethane were used. These four inks were measured for viscosity, surface tension, and pH.

Viscosity and surface tension are the main factors of inkjet ink, because they are the prime driving parameter for the ink to pass through the nozzles and give the acceptable print quality. In this study, the viscosity of the inks was between 1.50-2.60 mPa s, and the surface tension of the inks was between 57-59 mN m<sup>-1</sup>, which give the continuous and smooth printed images for all types of fabric. The polymeric binders were in an emulsion base of the aqueous-based inkjet inks, which has hydrophilic property and good mechanical stability, could give the smooth ejection of the inks on all fabrics.

The hydrophilic/hydrophobic properties of the fabrics affect the print qualities. The ink penetration into the fabrics controls the stiffness of the printed fabrics. The deep penetration of the inks into the fabrics give the printed fabrics high stiffness. The printed polyester fabric, composed of hydrophobically filament yarn, yielded the most increase of the fabric stiffness. Furthermore, the stiffness of the printed polyester fabric was controlled by the stiffness of the ink binder. The hydrophilic fabrics yielded the minimum increase of the fabric stiffness. The top surface of the hydrophilic fabrics would, of course, localize the ink. The hydrophilic fabrics yielded the lower crockfastness than that of the hydrophobic fabric, the polyester.

The pretreatment of the cotton fabric with aluminum oxide dispersed in poly (vinyl alcohol) reduced the wicking property, increased the whiteness of the nontreated fabric, and smoothened the surface of the pretreated fabric. Therefore, the pretreated fabric gave the higher color saturation of all inks. However, the crockfastness of the pretreated fabric was not better than that of the nontreated fabric due to the poor waterfastness and poor adhesion of the pretreatment dispersion.

## **5.2 Suggestions for Future Work**

The textile inkjet printing by aqueous pigmented inks would be further studied as follows:-

### **5.2.1 Nozzle and print head problems**

To reduce or eliminate the problems of nozzle and printhead clogging, appropriate inkjet ink formulation should be thoroughly investigated to give a perfect ejection.

### **5.2.2 Ink wettability on hydrophobic textile**

Additives to increase ink wetting on the hydrophobic fabric like polyester should be studied. Improved ink wetting properties can increase print quality in terms of color and physical appearance. Surfactants with different hydrophilic/lipophilic balance should be tried.

### **5.2.3 Pretreatment Reagent**

An individual pretreatment reagent suitable for a particular type of fabric should be considered and performed to obtain the better print quality such as color and physical property.