

CHAPTER I

INTRODUCTION

1.1 Scientific Rationale

Microencapsulation is one of the pigment dispersion techniques normally used in preparing inkjet inks. The microencapsulated pigments have a thick acrylic polymer layer with self-dispersion ability on pigment surfaces. These dispersions are excellent in dispersibility and dispersion stability. The other technique is the surface modification technique. It is the technique related to chemical bonding and the number of functional groups of the surface of the pigment. This technique leads to well characterized pure pigments, void of free polymers and impurities. Two types of pigment dispersion is used for preparing digital inkjet inks and printed on paper substrate in some experiment. It was found that the inks show excellent print qualities.

In this research, two types of pigment dispersion will be used for preparing the pigmented ink. Additional studies on pigment dispersion efficiency between the microencapsulation technique and the surface modification technique in terms of viscosity, surface tension and particle size are carried out. The inks will be printed on silk fabric by an inkjet printer. After printing, comparison of the print quality in terms of optical density, color gamut and tone reproduction between two sets of the pigmented ink will be elucidated. Moreover the printed fabric will be evaluated for printed fabric

properties in terms of wet and dry crockfastness, washfastness, lightfastness, air permeability and bending stiffness.

1.2 Objectives of the Research Work

1.2.1 To study the effects of dispersion technologies between chemical surface modification and microencapsulation techniques.

1.2.2 To evaluate the printed fabrics by the inks made of the two types of pigment dispersion.

1.3 Scope of the Research Work

This research involves characterization of pigmented inkjet inks made from two types of pigment dispersion technique, stability of inks and printed quality on silk fabrics. The pigmented inkjet ink was printed onto two groups of silk fabrics, non-pretreatment and pretreatment fabrics with cationic acrylate polymer. The effects of pigment dispersion technique on printed fabrics qualities were evaluated in terms of colors, crockfastness, washfastness, lightfastness, air permeability and bending stiffness.

1.4 Content of the Research Work

This thesis consists of 5 chapters including introduction, theoretical background and literature review, experimental, results and discussion, and concluding and

suggestions. Chapter 2 displays the overview of inkjet printing system, inkjet ink, the dispersion technologies, textile printing, textile fiber and literature reviews of previous works that give beneficial information and trend for the work. Chapter 3 explains about material, apparatus, and procedure of this work. Chapter 4 demonstrates the results and discussion about characteristics of the ink and the printed fabric, ink properties, colors, air permeability, stiffness, crockfastness, washfastness and lightfastness. Finally, the conclusion and suggestions for the future works are described in Chapter 5.



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