

광그래프트를 통한 PET 직물의 반응성 염료 가염화

Dyeability of photografted PET Fabrics to Reactive Dyes

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1. Introduction

The dyeing of PET is usually carried out with disperse dye as high as 130°C under pressure. Moreover, disperse dye covers a wide range of colors with few brilliant shades amongst them. The metal-free reactive lanasol dye is an environment friendly dye and has a excellent colorfastness as well as bright shade. The reactive groups of the lanasol dye are associated with the α -bromoacrylamido group which can bond covalently with nucleophilic moieties such as thiols, amines and alcohols. Many researches have been studied on improving the dyeability of PET with either the modification of PET or the synthesis of new dyes. In the present study, the reactive lanasol dyeability of DMAPMA grafted PET fabrics was studied and compared with the dyeing behavior of wool fabrics.

2. Experimental

2.1 Chemicals and dyes

N-[3-(Dimethylamino)propyl]methacrylamide (DMAPMA) and Benzophenone (BP), supplied by Aldrich Chemical Co., were used as monomer and hydrogen-abstractable photoinitiator respectively. Triton X100, a wetting agent, was bought from Yakuri Pure Chemical Co. Ltd (Kyoto Japan). Reactive dyes of Lanazol Red 6G (C.I. Reactive Red 84) and Lanazol Blue 3R (C.I. Reactive Blue 50) were used for dyeing.

2.2 Dyeing

The dyeing were carried out using a IR dyeing machine (DL-6000, Starlet Co. Ltd.). The standard dyeing conditions were dye concentration of 5%owf with 50g/L NaCl at 60°C and pH 7 for 90 min unless mentioned otherwise. After the dyeing, the dyed fabrics were washed first with 2 wt % detergent solution (HEAL's ECE Phosphate REF DET B) at 50°C subsequently with distilled water at 50°C, finally with tap water. The K/S

value was tested to evaluate the color yield of PET fabrics. The colorfastness to laundering and rubbing of dyed fabrics were carried out with a Launder-O-meter (Atlas, Type LP2) and a crock meter respectively. ISO 105-A05 was used to evaluate the colorfastness.

3. Results and discussion

Fig.1 showed the effect of dye concentration on the color build-up of wool fabrics DMAPMA-grafted PET fabrics. While ungrafted PET fabrics showed no appreciable coloration, the K/S value of the grafted fabrics increased with the increase in dye concentration until 5%owf. The dyed wool fabrics showed a similar color yield with grafted PET below the dye concentration of 3%owf but higher at 5%owf for both colors.

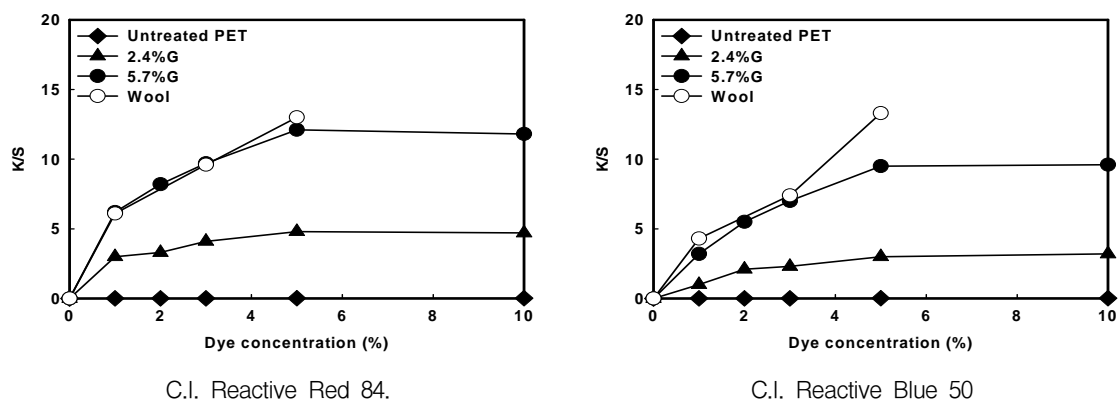


Fig. 1. Effect of dye concentration on K/S of wool and grafted PET fabrics.

The grafting of DMAPMA onto PET is expected to be applied to the wool/PET blend so that the one-bath dyeing of wool/PET blend become possible without the damage of wool.

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