

## 테트라메틸실란의 플라즈마 중합에 의한 폴리에스테르 직물의 농색화 가공

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In the present work, we investigated the effect of plasma polymer on color-depth of polyester(PET) fabric. We obtained the plasma polymers on the fabric by the 13.56MHz RF glow-discharge method using tetramethylsilane(TMS) monomer. This monomer shows lower refractive index( $n_f=1.3585$ ) than that of polyester fabric( $n_f=1.725$ ). And the chemical structure and optical characteristic of the plasma polymer (PP-TMS) has been studied with a control of discharge power  $W$  and feed-in rate of monomer  $F_m$ .

From IR spectra, we observed that Si-H and C-C-Si bond was newly generated in PP-TMS, and the relative absorbance ratio of C-C-Si( $1045\text{cm}^{-1}$ ) onto  $\text{CH}_3$ ( $1255\text{cm}^{-1}$ ) was gradually increased with the value of composit energy  $W/F_m$ . PP-TMS showed highly hydophobicity, and surface energy( $32-36 \text{ dyne/cm}^2$ ) was increased with increasing  $W/F_m$  value.

Fig.1 and Fig.2 show the effect of PP-TMS coating on the reflectance(%) and L value of the polyester fabric according to  $W/F_m$  value respectively. In these figures, We can know that the reflectance(%) and L value of the PET fabric coated with PP-TMS was lower than those of untreated PET fabric. From these results, PP-TMS coatings were effective on the color-depth of PET fabric and these phenomena could be explained by optical theories relating to surface reflection.

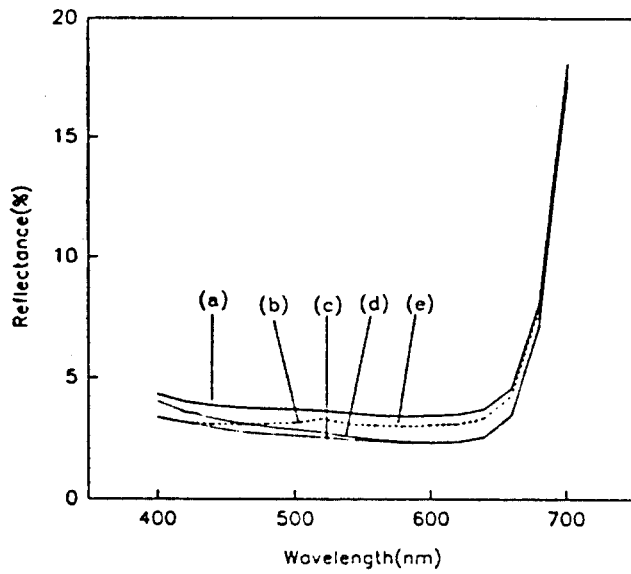


Fig. 1. Specular reflectance of dyed polyester fabrics by the PP-TMS coating  
 $W/F_m(\text{MJ/Kg}) =$  (a) dyed polyester (b) 95  
 (c) 189 (d) 283 (e) 378

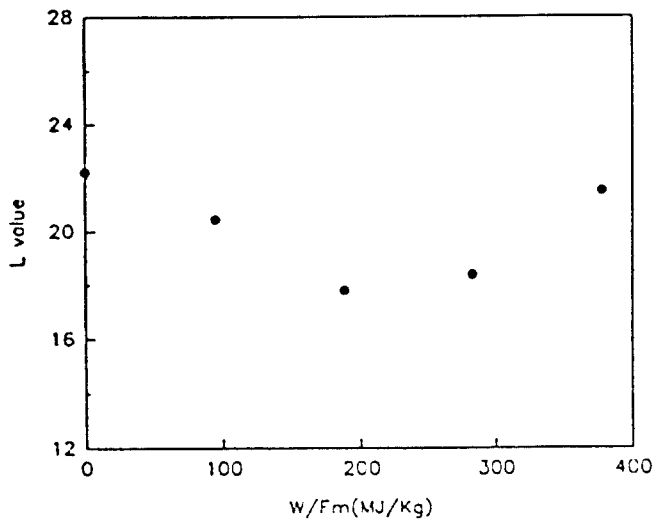


Fig. 2. Change of L value on the dyed polyester fabrics by the PP-TMS coating.