

SYNTHESIS OF BISULFITE ADDUCT OF NCO-TERMINATED PEG-HMDI
PREPOLYMER AND ITS APPLICATION TO HYDROPHILIC FINISH OF PET
FABRICS.

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This study is related to the hydrophilic finishing of synthetic fiber with bisulfite adduct of NCO-terminated PEG-HMDI prepolymer. Through the reaction with excess sodium bisulfite of NCO-terminated PEG-HMDI prepolymer(NCO-t-PEG) synthesized from hexamethylene diisocyanate and polyethylene glycol, the bisulfite adduct of NCO-t-PEG(PEG-PCS), which was water-soluble, could be obtained.

The thermal property of hexamethylene disodium carbamoyl sulfonate(HMDSCS) as a model compound of PEG-PCS was investigated with DSC. It was dissociated to HMDI and sodium bisulfite near at 187 °C under the atmosphere. Therefore the dissociation temperature of PEG-PCS to NCO-t-PEG and sodium bisulfite might be suggested to be the same as that of HMDSCS. However this dissociation temperature was too high to adapt as curing temperature for the hydrophilic finishing of synthetic fiber.

HMDSCS and PEG-PCS were stable in acidic solution, but dissociation to free NCO group and sodium bisulfite in alkaline solution. So the mixture of $\text{Na}_2\text{CO}_3/\text{NaHCO}_3$ was used as a latent alkaline catalyst.

Polyester fabric was padded with the aqueous solution of PEG-PCS, crosslinking agent such as polyethyleneimine, and the latent alkaline catalyst, dried at 100 °C for 3 min. and cured at 140 °C for 1 min.

This finished polyester fabric showed very low frictional electrostatic charge, short half-life time, soft handle and good wicking properties. And their properties were durable to the repeated launderings.