A New Technique for Immunizing Cotton

by

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Dear Sir:

A partial ester, known as immunized cotton because it resists direct dyes, is prepared by the action of p-toluenesulfonyl chloride on alkali cellulose. Weakness of the modified fibers, high production costs, and incomplete immunization all contribute to the decided lack of commercial success of this product. Fibers immunized with lower monocarboxylic acids and anhydrides, having similar shortcomings, have tended to suffer the same fate.

We have recently esterified cotton with phthalic anhydride. Samples of fabric and yarn have been treated in the following ways. In the first process cotton was impregnated (100% pickup) with a solution of phthalic anhydride (4%) in dimethylformamide and then maintained at 155°C for 2½ minutes (alternatively, 190°C for 20 seconds). In a second process an aqueous solution containing phthalic anhydride (4%), acetic acid (10%), and nonionic detergent (0.01%), maintained at 80°C, was used as the esterifying medium, the impregnated cotton being subsequently maintained at 170-180°C for 2½ minutes. Following scouring the modified cotton exhibits strong immunization against direct dyes but is readily dyed with cationic dyes (normally used to dye acrylic fibers). Very little reduction in strength is associated with either of these processes, and the modified yarn has been woven without undue difficulty.

Work continues on this subject. Subsequent papers will describe the procedures and their ramifications in greater detail.

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