Original Paper

Cellulose

June 2014, Volume 21, Issue 3, pp 2147-2156

First online: 26 March 2014

Investigation into the removal of an easy-care crosslinking agent from cotton and the subsequent regeneration of lyocell-type fibres

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Abstract

Dimethylol dihydroxyethylene urea (DMDHEU)-treated cotton fabrics were treated with alkali or alternatively acid followed by alkali for increasing time periods, and their effectiveness in removing the crosslinking agent was investigated by surface (X-ray photoelectron spectroscopy) analysis, bulk analysis, crease recovery angle performance and solubility in specific solvents. The cellulose yield after the chemical stripping processes was established and the effect of the acid and alkali treatments on the degree of polymerisation of the resultant cellulose determined. Surface and bulk analyses and solubility tests suggested that alkali alone could not remove the DMDHEU from the crease-resist-treated cotton fabric. However, a sequential acid/alkali treatment effectively removed the easy-care finish from the cotton fabric and produced a commercially viable yield of cellulose.

Keywords

Easy care, Cotton, DMDHEU, Surface and bulk analysis, Solvent solubility, Acid and alkali treatment, Lyocell