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Using persulfate oxidized chitosan as a novel additives in easy-care finishing for cotton textiles

(2009) *Polymer - Plastics Technology and Engineering*, 48 (2), pp. 130-135.

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Abstract

Easy care finishing of cotton fabric using glyoxal in the presence and absence of low molecular weight chitosan, i.e., persulfate-oxidized chitosan, as a novel additive along with $MgCl_2 \cdot 6H_2O$ as an acid catalyst was studied in detail. Major factors affecting finishing reaction were studied with respect to glyoxal, oxidized chitosan, and catalyst concentrations in addition to curing time and temperature of treatment according to the pad-dry-cure method. The obtained results show the following findings: (a) increasing the glyoxal concentration from 5-50 g/l in absence of oxidized chitosan is accompanied by an increase in crease recovery angle and a decrease in tensile strength of the finished fabric, whereas that treated in the presence of oxidized chitosan shows a higher tensile strength and to some extent comparable crease recovery angle with respect to that finished in the absence of it when the concentration of glyoxal increases; (b) increasing the oxidized chitosan concentration is accompanied by decreasing crease recovery angle, whereas the tensile strength increases when glyoxal concentration increases within the range studied; (c) increasing the $MgCl_2 \cdot 6H_2O$ from 0-15 g/l is accompanied by an increase in the crease recovery angle and a decrease in tensile strength of the finished fabrics in the presence and absence of oxidized chitosan; (d) increasing the time and temperature of curing of the finished fabrics is accompanied by an increase in crease recovery angles and decreases in tensile strength; and (e) the dry wrinkle recovery angle of cotton fabric samples finished in presence of O-chitosan is decreased after washing, and the higher the washing cycle the lower the dry wrinkle recovery angle.

Author Keywords

Acid catalyst; DMDHEU; Durability; Oxidized chitosan; Tensile strength; Wrinkle recovery angle

ISSN: 03602559