

FIBRES (incl. Textile and other utility fibres)

NPARR 2(2), 2011-0162, Cotton textiles modified with citric acid as efficient anti-bacterial agent for prevention of nosocomial infections

To study the antimicrobial activity of citric acid (CA) and sodium hypophosphite monohydrate (SHP) against gram-positive and gram-negative bacteria, and to determine the influence of conventional and microwave thermal treatments on the effectiveness of antimicrobial treatment of cotton textiles. Textile material was impregnated with CA and SHP solution and thermally treated by either conventional or microwave drying/curing treatment. Antibacterial effectiveness was tested according to the ISO 20743:2009 standard, using absorption method. The surfaces were morphologically observed by scanning electron microscopy, while physical characteristics were determined by wrinkle recovery angles method (DIN 53 891), tensile strength (DIN 53 837), and whiteness degree method (AATCC 110-2000).

Cotton fabric treated with CA and SHP showed significant antibacterial activity against MRSA (6.38 log₁₀ treated by conventional drying and 6.46 log₁₀ treated by microwave drying before washing, and 6.90 log₁₀ and 7.86 log₁₀, respectively, after 1 cycle of home domestic laundering washing [HDLW]). Antibacterial activity was also remarkable against *S. aureus* (4.25 log₁₀ by conventional drying, 4.58 log₁₀ by microwave drying) and against *P. aeruginosa* (1.93 log₁₀ by conventional and 4.66 log₁₀ by microwave drying). Antibacterial activity against *P. aeruginosa* was higher in samples subjected to microwave drying/curing than in those subjected to conventional drying/curing. As expected, antibacterial activity was reduced after 10 HDLW cycles but the compound was still effective. The surface of the untreated cotton polymer was smooth, while minor erosion stripes appeared on the surfaces treated with antimicrobial agent, and long and deep stripes were found on the surface of the washed sample [Sandra Bischof Vukušić*, Sandra Flinčec Grgac, Ana Budimir, and Smilja Kalenić (Sandra Bischof Vukušić, University of Zagreb, Faculty of Textile Technology, Prilaz baruna Filipovića 28a, 10 000 Zagreb, Croatia), *Croat Med J*, 2011, **52**(1), 68-75]..

NPARR 2(2), 2011-0163, Cotton fabric dyeing with cochineal extract: influence of mordant concentration

Dyeing with cochineal extract has been carried out in Mexico since pre-Hispanic times as a handcraft process. However, this has limited its application on fabrics other than wool. An experiment was designed to study the influence of mordant concentration on colour behaviour in cotton fabric dyed with cochineal extract at the laboratory. At the same time, colour fastness was determined by applying six fastness tests to define the quality of the dyed fabric. It was concluded that, when there was a larger concentration of metallic ions in the mordant, colour fixation in the fabric was better, as there was less lightness in the red hue of the fabric. In addition, the more hydrogen ions present because of acids, the more intense the red hue. A decreasing trend in the colour fastness tests was observed: dry rubbing>artificial light>acids>alkalis>domestic washing > hot water [Gabriela Arroyo-Figueroa*, Graciela M L Ruiz-Aguilar,, German Cuevas-Rodriguez and Guillermo Gonzalez Sanchez (Agroindustrial Engineering Department, Universidad de Guanajuato, Privada de Arteaga s/n, Zona Centro, 38900, Salvatierra, Guanajuato, Mexico), *Coloration Technology*, 2011, **127**(1), 39-46].

NPARR 2(2), 2011-0164, A study of wicking properties of cotton-acrylic yarns and knitted fabrics

This paper investigated wicking properties of cotton-acrylic rotor yarns and knitted fabrics. The effect of yarn wicking on wicking of fabric in both wale and course directions was also discussed. One way ANOVA results of the experimental study suggested that wicking abilities of yarns and fabrics increased with the increase in acrylic content in the blends and with the use of coarse yarns. Besides, yarn wicking had a significant effect on fabric wicking [Merve Küçükali Öztürk, Banu Nergis*and Cevza Candan (Technical University of Istanbul, Faculty of Textile Technologies and Design, Istanbul), *Textile Research Journal*, 2011, **81**(3), 324-328].

NPARR 2(1), 2011-165, A smart approach for enhancing dyeing and functional finishing properties of cotton cellulose/polyamide-6 fabric

blend

Polyamide-6/cotton fabric blend was modified by chemical treatments using citric acid (30 g/L) as acrosslinker, an acrylate binder (10g/L), Na-hypophosphite (6 g/L) as a catalyst in the presence of basic dye or pigment colorant (15g/L) employing a pad-dry-cure technique (wet-pickup 80%, 80 C/5 min and 180 °C/2 min respectively). Combined modifying and dyeing of the treated fabric samples resulted in a significant improvement in the extent of coloration along with a remarkable improvement in the imparted functional properties namely UV-B protection and

antibacterial function. The change in K/S value as well as in the fastness properties ratings of the obtained dyeings along with variation in their functional properties depend on the ester-crosslinker/catalyst concentration, type and concentration of the coloring agent as well as thermo-fixation temperature. Mode of interaction was reported, and surface modification was also confirmed by SEM analysis [N.A. Ibrahim*, W.M. El-Zairy, M.R. El-Zairy, B.M. Eid and H.A. Ghazal (National Research Centre, Textile Research Division, Dokki, Cairo, Egypt), *Carbohydrate Polymers*, 2011, **83**(3), 1068-1074].