A Laundry Algorithm for Colored Textiles

Authors : H. E. Budak, B. Arslan-Ilkiz, N. Cakmakci, I. Gocek, U. K. Sahin, H. Acikgoz-Tufan, M. H. Arslan

Abstract : The aim of this study is to design a novel laundry algorithm for colored textiles which have significant decoloring problem. During the experimental work, bleached knitted single jersey fabric made of 100% cotton and dyed with reactive dyestuff was utilized, since according to a conducted survey textiles made of cotton are the most demanded textile products in the textile market by the textile consumers and for coloration of textiles reactive dyestuffs are the ones that are the most commonly used in the textile industry for dyeing cotton-made products. Therefore, the fabric used in this study was selected and purchased in accordance with the survey results. The fabric samples cut out of this fabric were dyed with different dyeing parameters by using Remazol Brilliant Red 3BS dyestuff in Gyrowash machine at laboratory conditions. From the alternative reactive-dyed cotton fabric samples, the ones that have high tendency to color loss were determined and examined. Accordingly, the parameters of the dyeing process used for these fabric samples were evaluated and the dyeing process which was chosen to be used for causing high tendency to color loss for the cotton fabrics was determined in order to reveal the level of improvement in color loss during this study clearly. Afterwards, all of the untreated fabric samples cut out of the fabric purchased were dyed with the dyeing process selected. When dyeing process was completed, an experimental design was created for the laundering process by using Minitab® program considering temperature, time and mechanical action as parameters. All of the washing experiments were performed in domestic washing machine. 16 washing experiments were performed with 8 different experimental conditions and 2 repeats for each condition. After each of the washing experiments, water samples of the main wash of the laundering process were measured with UV spectrophotometer. The values obtained were compared with the calibration curve of the materials used for the dyeing process. The results of the washing experiments were statistically analyzed with Minitab® program. According to the results, the most suitable washing algorithm to be used in terms of the parameters temperature, time and mechanical action for domestic washing machines for minimizing fabric color loss was chosen. The laundry algorithm proposed in this study have the ability of minimalizing the problem of color loss of colored textiles in washing machines by eliminating the negative effects of the parameters of laundering process on color of textiles without compromising the fundamental effects of basic cleaning action being performed properly. Therefore, since fabric color loss is minimized with this washing algorithm, dyestuff residuals will definitely be lower in the grey water released from the laundering process. In addition to this, with this laundry algorithm it is possible to wash and clean other types of textile products with proper cleaning effect and minimized color loss.

Keywords : color loss, laundry algorithm, textiles, domestic washing process

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