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Title: Evaluation and optimization of pretreatment process for lyocell knitted fabric dyeing with reactive dyestuff

Abstract:

The optimization of pretreatment parameters is one of the most important factors for the successful dyeing of textile materials. The aim of this study was to investigate the most effective way of pre-treating cellulose based lyocell knitted fabric in order to achieve an optimal result when dyeing it with reactive dyestuffs. This research investigates the effects of pretreatment by exhaust method on lyocell knitted fabric, which is analyzed using five different recipes. Pretreatment techniques that are being used are mild pretreatment, hot wash without detergent, hot wash with detergent, causticization, and hot wash with causticization. Pretreated and untreated lyocell fabric is dyed with bi-functional reactive dyestuffs in a shade of 1%, to produce color. Three key factors are considered in this research work: optimum pretreatment technique, causticization time selection, and causticization concentration selection. In order to optimize the pretreatment technique, 16 trials are performed by varying the time and concentration. Compared to other pretreatment techniques, causticization is the best for dyeing lyocell fabric with reactive dyes. Additionally, causticization treatment is observed to have the best performance on lyocell fabric when applied for 30 min. The optimum concentration of NaOH for causticizing lyocell fabric is 3 mol/l, as determined by the results. This assessment of results is done based on four factors such as K/S value (color strength), strength loss %, weight loss % as well as pilling test results.

Keywords: Causticization, Color strength, Lyocell fabric, Pilling behavior, Weight loss

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