Ultra-violet Protection and Easy-care Children Garments by Nanotechnology

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Abstract:
This research focuses on nanotechnology in finishing of cotton/polyester fabrics. Treatment of cotton / polyester fabrics 75/25% were done by using Arcofix as anti-crease agent and ZnO (Zinc oxide) nanoparticle as UV protection agent in children garments (middle childhood) 6-9 years. The used fabrics have the following specifications: Three weaves structures (plain 1/1- twill 2/2- stain 5) with weft density (16-24-28) picks/cm. The fabrics were treated with Arcofix, 80g/l and ZnO nanoparticle at different concentrations (0.001-0.002-0.003)g/l then curing at 150°C for three minutes, some investigations, such as ( meter square weight – crease recovery angle – tear strength- UPF) were done for treated and untreated fabrics. Scanning electron microscope (SEM) was used to detect the changes in surface characteristics, the obtained results found that the best weave structure for all performance properties was the stain5 with the pick 28pick/ cm which treated by ZnO nanoparticle 0.003g/l , quality factor (94.16)% ,while the plain 1/1with 16 pick/cm was the least by a quality factor (50.55)% . The fabrics with stain 5 design structure used for design of five shirts for middle childhood (6-9) years . The statistics showed that the fifth design is the best design for all proposed designs. Aims of research: Ultra-violet protection and easy-care in children clothes by nanotechnology. Achievement of optimum conditions for weave structure, number of picks and concentration of ZnO nanoparticles. Make some shirts designs suggested to children from the best treatment fabrics and choose the best one. Results: The impact of study factors on the functional properties of the fabrics produced under research. Analysis of variance (ANOVA) has been made to study the impact of study factors (weave structure, numbers of picks, ZnO nanoparticles concentration) of the fabrics produced under research.Hence the importance of this research to shed light on the reciprocal relationship between the mother and her female child and the extent of the Girls’ link and attachment to their mothers, through innovate fabric designs of ladies clothes and their formats for the children. We cannot ignore the world fashion trends and the importance of guide with it to make a printing product with an Egyptian identity and at the same time fits the latest fashion trends in taste, color, shape and quality. And on the other side, and in technological terms, the product has to be environmentally friendly and safe to the young consumer (children).

Keywords:
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