

UV protection of polyamide fabrics with polymeric nanocomposites

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Abstract

Sun protective textiles are highly important regarding health problems, not only for children, but also for people who spend a lot of time outdoors in their line of work. The present study shows results for UV protection with thin and thick polyamide textile fabrics treated with different polymeric nanocomposites. Tests with different concentrations of ZnO, Al₂O₃, SiO₂ and TiO₂ nanoparticles, dispersed in PMMA, were performed. A more effective UV protection is achieved for TiO₂ and ZnO nanocomposites. The increase in UV protection functionality is generally higher for higher concentration of nanoparticles in PMMA matrix and for thicker fabrics. UV protection is eventually more uniform and also more resistant to washing in DBD treated fabrics. Durability of UV protection with ZnO-PMMA stands up to ten washing cycles becoming less effective for more than ten washing cycles. Durability of UV protection given by TiO₂, SiO₂ and Al₂O₃ in PMMA is good facing abrasion and washing conditions.