

Durable functionalities in polyamide 6.6 with ZnO-PMMA nanocomposites

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Abstract

Hydrophobicity and hydrophilicity functionalities imparted in polyamide 6.6 fabrics were tested aiming their permanency facing conditions of wearable common use as domestic washing. High improvement in functional behavior is obtained for well dispersed ZnO nanoparticles in a polymeric matrix applied in polyamide 6.6 fabrics. UV protection has been assigned as very effective for the PA fabric finished with ZnO-PMMA nanocomposite. Experiments were carried out in the fabrics treated with optimized ZnO-PMMA nanocomposites being washing durability of these nanocomposites in PA 6.6 fabrics evaluated measuring hydrophobic behavior by the static water contact angle. Washing durability of hydrophilicity has been tested when the plasmatic preparation of textile polyamide substrates was made. Surface modification of PA 6.6 with plasma treatment has been evaluated by SEM, AFM and XPS techniques, demonstrating oxidative changes and creation of roughness.

Key Words: Functional polyamide, UV-protection, hydrophobicity, durability, zinc oxide nanocomposites