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TEXTILE SURFACE HYDROPHOBIZATION BY USING PLASMA NANOTECHNOLOGY

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Abstract. *In this paper are presented aspects regarding textile surface modification in plasma by using fluorocarbon nano-coating for obtain a hydrophobic character. The samples analyzed consist in woven structure made from 100% cotton yarns. For determine the fabric surface modification, samples treated in plasma were tested tear force according ISO13937-2 and for capture the contact angle values by using VCA Optima device. For observe the treatment performance samples were analyzed by using SEM or different experimental time. By analyzing data correlations we can conclude that after 20 minute plasma treatment the tear force value is maximized and after this point it starts an accentuated depolymerization process till 90 minutes.*

Keywords: hydrophobic, plasma, woven, cotton, contact angle, nanotechnology

1. Introduction

Hydrophobization is used for obtain textile surface with water, oil and strain repellency. For cotton hydrophobization were applied the silica hydrosols were applied to the cotton fabrics by dipping process, followed by the modification with trimethoxysilane and heat treatment to prepare superhydrophobic cotton fabrics [1].

Hydrophobic character may be by using hydrophobization agents such as paraffin waxes, silicones, silanes and fluorinated polymers. Because textile surface have a negative net change, can be used for hydrophobization some cationic surfactants (fluorine groups) [2].

The goal is to obtain a cotton fabric with low energy surface. From all polymers possible to use for obtain hydrophobic character, fluorocarbon chemicals have the lowest surface energy, and this was the raison in choosing for cotton fabric hydrophoization the fluorocarbon treatment by plasma technology. The conventional padding hydrophobization treatment conduct to large quantities of water, chemicals and energy consumes which means high production costs. Plasma technology can substitute finishing processes which determine low costs and a positive environmental impact.

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