

RESULTS OF DIELECTRIC BARRIER DISCHARGE (DBD) ON WOOL and COTTON

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ABSTRACT

The presence of scale on a wool fiber surface introduces a number of problems such as felting and a surface barrier to dyestuffs in the wool industry. In the past, chemical methods were the major treatment for eliminating those problems. However, the effluents generated from wool dyeing and finishing processes are seriously contaminated with different kinds of chemicals, e.g. chlora-organic compounds from the anti-felt process. With the increasing of ecological and economical restrictions imposed on the textile industry, the industries were required to find environmentally favorable alternatives in wool treatment processes. Dielectric barrier discharge (DBD) is one of the treatment methods.

The results of the surface treatment, using an atmospheric pressure dielectric barrier discharge (DBD), of wool in order to establish the most suitable conditions for textile treatments, are presented. Surface treatments will be performed with different frequencies, different applied voltages, different gap sizes, different thicknesses of dielectric, different pressure and different working gases. X-ray Photoelectron Spectroscopy (XPS) will be used to analyze the chemical elements on the surface of the wool specimens. Scanning Electron Microscope (SEM) will be used to detect the physical surface changes on the samples. Surface luster, wet ability, dye ability of specimens will be presented.