

Comparison of plasma surface treatment efficiency of nonwovens using dielectric barrier discharges as potentially applicable plasma sources.

D. Kováčik, A. Zahoranová, T. Homola, M. Černák

kubincova@gimmel.ip.fmph.uniba.sk

Dielectric barrier discharges offer one of possible ways to generate non-equilibrium plasma at atmospheric pressure of working gas. Such a plasma with electrons of much higher energy than energy of heavier particles is, as e.g. ions, atoms or molecules of neutral gas, is applicable for surface treatment of nonwoven textiles which is not hazardous in the sense of surface damage. Plasma exposure of textile surface for short treatment time induces increase of initially low surface energy resulting in their better wettability required by most of applications. Due to this dry way of surface treatment without the presence of dangerous chemicals and necessity to dry textiles, the plasma treatment of nonwovens has potential to become an alternative to chemical ways of treatment which are also harmful to environment. In our contribution we present results on plasma treatment of light-weight polypropylene nonwoven textile which was treated using atmospheric pressure plasma generated by three different dielectric barrier discharges (DBDs) - volume, surface and coplanar DBD. Efficiency of plasma surface treatment using the particular DBDs was compared from various point of views as e.g. degree of hydrophylicity, plasma treatment permanency or power consumption.