Fabrication of nanostructured metallic films on polymers is the topic of long-term interest due to wide range of technological applications of such materials. Among various methods applied for the deposition of metal thin films onto polymeric materials DC magnetron sputtering is highly attractive, as this technique is easy to implement, cost effective and environmentally friendly. However, it is well-known that structures of sputtered metallic coatings are strongly dependent on the surface properties of polymers to be coated. Therefore, in order to control the growth of metal films on polymeric surfaces it is crucial to control the surface properties of polymers that are metalized.

In this study, we investigate influence of pretreatment of polymeric materials (PET, PTFE, LDPE and nylon foils) by planar dielectric barrier discharge (DBD) on the properties of subsequently sputter deposited Ag films. The pretreatment was performed in DBD plasma operated in air at atmospheric pressure and the changes of morphology, chemical composition, mechanical properties and surface energy of polymeric foils were determined by wide range of techniques. Ag films were deposited by DC magnetron sputtering in Ar atmosphere. It was observed that the optical properties, mainly the shape and the position of the anomalous absorption peak of Ag, that strongly reflect the size, shape and distances of created Ag nanoclusters, are significantly influenced by the DBD pretreatment of the foils. In all cases, a red shift and broadening of the anomalous absorption peak of silver was observed for Ag deposited on plasma treated foils as compared to the films deposited at otherwise identical deposition conditions on untreated foils. Comparing these changes with changes of properties of foils induced by DBD plasma, it may be concluded that observed differences in the silver growth on DBD treated polymeric foils are predominantly caused by increased surface density of oxygen containing moieties.

**Keywords**
DBD plasma
Polymer treatment
Metallic coatings