

Surface modification of Poly (ethylene terephthalate) fabric by plasma process

Monday, 21 May 2018 18:30 (15 minutes)

Surface properties of Poly (ethylene terephthalate) or PET fabric were modified by nitrogen plasma pretreatment, chitosan pretreatment and combined of nitrogen plasma - chitosan pretreatment, to improve ink absorption of water-based pigmented inkjet ink. The samples were exposed to the plasma at the operating pressure of 0.8 mbar. The operating RF powers were varied from 50-100 W. The treatment times were set in the range of 0.5-10 min. and the concentration of Chitosan in hydrochloric acid solution was set at 3 g/L. Scanning Electron Microscopy was used to observe the morphology of PET. The protrusions and grooves increase with increasing RF power and treatment time. Analysis of functional groups by Fourier Transform Infrared Spectrometer showed transmission peak at 2969.30 and 1731.42 cm^{-1} which represent a C-H and a Carbonyl (C=O) stretching, respectively. Color strength values (K/S) were evaluated by UV/VIS/NIR spectrometer; spectrum refraction was used to calculate from Kubelka-Munk theory. The K/S values of nitrogen plasma pretreatment, combined nitrogen plasma - chitosan pretreatment at RF power 50 W. treatment time 0.5 min. and chitosan pretreatment were 303.7116, 399.5774 and 401.8398, respectively.

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Session Classification: A04: Plasma and Nuclear Fusion (Poster)

Track Classification: Plasma and Ion Physics, Nuclear and Radiation Physics