

Depositing of metal nanoparticles on the surface of polyethylene terephthalate film by using radio frequency plasma in contact with ionic liquid

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Radio frequency plasma in contact with ionic liquid has been successfully generated under one atmospheric pressure condition by utilizing ionic liquids as liquid phase. The control of the plasma ion irradiation flux and energy to the ionic liquid leads to the creation of platinum/gold nanoparticles by the reduction in $H_2PtCl_6 / HAuCl_3$ solutions, and the realization of efficient synthesis. Furthermore, the platinum nanoparticles and gold nanoparticles are deposited onto the surface of pre-treated polyethylene terephthalate in ionic liquid, (1-butyl-3-methylimidazolium tetrafluoroborate). The treated surface was characterized by water contact angle measurement, X-ray photoelectron spectroscopy (XPS), atomic force microscopy (AFM), Transmission electron microscopy (TEM) and Energy-dispersive X-ray spectroscopy (EDS).