

Surface Modification of Polyethylene Terephthalate Substrates via Direct Fluorination to Promote the Ag⁺ Ions Adsorption

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Abstract : The surface of polyethylene terephthalate (PET) was modified with fluorine gas at 25 °C and 100 Torr for one h. Moreover, the effect of ethanol washing on surface modification was investigated in this study. The surface roughness of the fluorinated and washed PET samples was approximately six times larger than that (0.6 nm) of the untreated thing. The results of Fourier transform infrared spectroscopy, and X-ray photoelectron spectroscopy showed that the bonds such as -C=O and -C-Hx derived from raw PET decreased and were converted into fluorinated bonds such as -CFx after surface fluorination. Even after washing with ethanol, the fluorinated bonds stably existed on the surface. These fluorinated bonds showed higher electronegativity according to the zeta potential results. The negative surface charges were increased by washing the ethanol, and it caused to increase in the number of polar groups such as -CHF- and -C-Fx. The fluorinated and washed surface of PET could promote the adsorption of Ag⁺ ions in AgNO₃ solution because of the increased surface roughness and the negatively charged surface.

Keywords : Ag⁺ ions adsorption, polyethylene terephthalate, surface fluorination, zeta potential

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