

Surface Compositional Changes of Polyethylene, Polyvinylidene fluoride, and Polytetrafluoroethylene modified by a keV irradiation

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Polyethylene (PE), Polyvinylidene fluoride (PVDF), and Polytetrafluoroethylene (PTFE) are most commercially used in polymer engineering and many researchers has concentrated on the surface properties of polymers. The interfaces of chemically inert Metal/PE, PVDF, and PTFE are not adhesive. Chemically reactive such as Al and Cu have been used due to fair adhesion for PE, PVDF, and PTFE. Polymers were irradiated by 1.0 keV Ar⁺ ions in O₂ environment. PE Contact angles of PE, PVDF, and PTFE to de-ionized water were reduced from 85°, 75°, 100 ° to 28 °, 31°, 70 ° at 1×10^{17} , 1×10^{15} , 5×10^{14} Ar⁺/cm², respectively. Working pressure was 2.3×10^{-4} Torr and base pressure was 1×10^{-5} Torr. Metal was deposited by ion beam sputtering and thickness of metal film was 1000 Å. Surface compositional changes on PE, PVDF, and PTFE will be represented.