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Thin Nickel layer growth on PET and PC by HIPIMS and DC sputtering

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Nickel thin films on plastics show very different morphology, magnetic properties and adhesion depending on the deposition process and polymer surface pre-treatment. In order to understand the metal polymer interactions in Ni-PET and Ni-PC systems in view of Ni deposition onto plastic fibres, we have experimentally investigated the growth of a thin nickel layers, with thickness up to 30 nm on PET and PC films by comparing HIPIMS and DC magnetron sputtering deposition, and by tailoring the PET and PC surface roughness by oxygen plasma treatments before deposition. Nickel coated surfaces are characterised by RBS for dose and interface mixing analysis, by AFM and magnetic force measurements in order to study the film morphology and to map the magnetic domains. The high current pulse and DC magnetron deposition parameters are correlated to the physical properties of the Ni coatings.

Keywords

HIPIMS

Nickel

PET / PC

magnetic force microscopy

plastic fibers