

Aluminium and Titanium Alloys Surface Behaviour under Argon and Helium Ion Exposure

Samples of aluminium alloy Al(2024) and titanium alloy Ti-6Al-4V are irradiated with 2 keV helium (He) and argon (Ar) ion fluxes using FALCON ion source. Cone-like structures are found to be formed on the surface of two Al(2024) samples due to both irradiation conditions: Ar and He exposure reaching total charge 150 Coulomb per sample. Ar exposure of Ti-6Al-4V causes cones formation. He exposure causes only physical sputtering morphology at the same total charge. Chemical composition of grown structures is obtained from energy dispersive spectroscopy (EDS). Surface roughness and roughness profile are investigated with co-focal microscope. Hardness of irradiated surfaces is obtained from results of whiskers hardness test. Residual stresses after irradiation and phase composition are measured by X-ray Diffraction spectroscopy (XRD). Free surface energy is measured with drop test.

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