C4-P-018702

EFFECT OF ION ASSISTANCE PARAMETERS ON THE PROPERTIES OF Ir COATINGS DEPOSITED BY MAGNETRON SPUTTERING

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Iridium coatings were deposited on Ni substrates by magnetron sputtering with ion assistance in the plasma of a low-energy electron beam. The influence of the parameters of the ion flux on the microstructure, the intrinsic stresses, and the adhesion of the coating is investigated. It is shown that deposition of a coating with a dense microstructure at a low homologous temperature (~0.15) is provided under the optimal ratio of the ion current density to Ir flux ~0.5 and the ion energy ~150 eV. The coatings deposited in the optimal mode are characterized by microdistortions of the crystal lattice of ~0.9% and have a predominant crystallite orientation (111), which is a favorable factor for providing corrosion protection. A low level of intrinsic stresses (~0.5 GPa) and a high adhesion strength of the coatings (the value of the critical load at nanoindentation is more than 3000 mN) have been achieved.