

COMPARATIVE ANALYSES OF TRIBOLOGICAL BEHAVIOR OF ULTRA NANOCRYSTALLINE DIAMOND FILMS PREPARED ON DIFFERENT SUBSTRATES

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The tribological behavior of ultra nanocrystalline diamond (UNCD) films under reciprocating sliding conditions is the topic of the present study. The UNCD films were grown by plasma enhanced chemical vapor deposition (PECVD). Two types of samples were prepared: UNCD on the silicon plate (DOSi) and on the silicon plate with silicon oxide layer (DOI). The reciprocating sliding tests were carried out on the ball-on-disc type of tribometer at room temperature. The load was varied between 0.3 to 3 N. Scanning electron microscopy (SEM), X-ray diffraction (XRD), Raman spectroscopy, laser scanning microscopy (LSM), mechanical and optical profilometry were used for investigation of UNCD films properties. Ripples and grooves were observed on the bottom of the wear scars after sliding tests. The depth of the wear scars does not significantly change with the increase of load. However, the width of the wear scars increases twice. DOI sample have higher wear resistance then DOSi samples.



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