

Abstract Submitted
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Structural properties of nanometric and micrometric TiCN/TiNbCN superlattices¹ JULIO CAICEDO, Thin Films Group - Universidad del Valle Colombia, LUIS YATE, Universitat de Barcelona. Martí i Franquès 1, E-08028 Barcelona, Catalunya, Spain, JUAN RAMÍREZ, MARIA ELENA GÓMEZ, Thin Films Group - Universidad del Valle Colombia, ARTURO LOUSA, JOAN ESTEVE, Universitat de Barcelona. Martí i Franquès 1, E-08028 Barcelona, Catalunya, Spain, PEDRO PRIETO, Excellence Center for Novel Materials, Colombia — TiCN and TiNbCN systems have broadly been used as protective hard and anticorrosive coatings. $[\text{TiCN}/\text{TiNbCN}]_n$ multilayers were deposited on silicon substrates by two-target-r.f. magnetron sputtering with alternatively changing the sputtering plasma composition between pure Ti+C and Nb elements under a reactive mixture Ar/N₂. TiCN/TiNbCN bilayer period varied from nanometric range (15 nm) to higher micrometric range (1.5 μm) values. Structural, morphological and stoichiometric of the coatings were analyzed by high-angle- and low-angle X-ray diffraction, X-ray photoelectron spectroscopy (XPS), secondary ion mass spectrometry (SIMS) and cross-sectional transmission electron microscopy (TEM). We determined multilayer period, Λ , and individual layer thicknesses. We found a cube-on-cube epitaxial growth structure and with epitaxial relationship between layers inside each columnar crystallite given by $(111)[110]_{\text{TiCN}}// (111)[110]_{\text{TiNbCN}}$.

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