STRESS AND COMPOSITION EVALUATION FOR GRADIENT NITRIDE COATINGS

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Thin gradient Ti-Cr-N layers have been formed by cathodic arc vapour deposition in the nitrogen atmosphere using simultaneous bombardment of surface by metal ions. The deposition was carried out by combining of titanium and chromium plasma flows of various densities.

The residual stress and density depth profile of the coating have been studied with the relation to the hardness of the film. The stress profile was measured by using 1D and 2D detectors and calculated by classical [1] $\sin^2\psi$ and XRD^2 [2] methods. The density and concentration gradients were measured by several methods including specular X-ray reflectivity technique.

1. I.C.Noyan, J.B. Cohen, Residual stress : measurement by diffraction and interpretation, New York : Springer-Verlag (1987)
2. B. He, "Introduction to two-dimensional X-ray diffraction", Powder Diffraction, Vol.18, No 2, 2003.