IBA Characterization of Ti-Si-C-N Nanocomposite Coatings

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Abstract. One of the new developing technologies for increasing hardness, wear resistance and lifetime of cutting tools are the Ti-Si-C-N nanocomposite coatings deposited by a LARC® method. To investigate the effect of the various coating deposition parameters on the coating properties, the Ti-Si-C-N layers were deposited on Ni_2Cu backings. The nondestructive Ion Beam Analysis (IBA) was used for determination of elemental composition depth profiles of prepared layers, so that samples can be further mechanically tested. By application of Rutherford Backscattering Spectrometry (RBS), Proton Induced X-ray Emission (PIXE), Elastic Recoil Detection Analysis (ERDA) and Nuclear Reaction Analysis (NRA) the concentration of Ti, Si, C, N and H was determined. The depth profiles of the individual elements in the surface area and in the layer interface with the backing material were also determined.