
Experiment Title RBS analysis of the multilayer TixNy/TixByNz/WxCyNz samples

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Short presentation of the scientific project

The purpose of this work is to make investigations of the complex tribological coatings with ternary composition from compound materials and with a structure of monolayer or multilayer-type, from the following compound materials: Ti/TixNy; TiB2/ TixByNz; WC/WxCyNz, using Ti, TiB2 and WC sputtering targets.

For obtaining of the monolayer-type structures of Ti+TiB2+WC the DC standard magnetron sputtering deposition method was used and for obtaining of the monolayer-type structures of TixNy+TixByNz+WxCyNz the DC reactive magnetron sputtering deposition method was used, with N2 as reactive gas, with simultaneous working of 3 guns/ magnetron devices.

The multilayer type structure of: TixNy/TixByNz/WxCyNz will be obtained by successively deposition of the component materials by DC reactive magnetron sputtering deposition method by using the Multifunctional Sputtering Deposition Plant, existent in the Hadronic Physics Department of the iHoria Hulubei National Institute for Physics and Nuclear Engineering (IFIN-HH).

The Rutherford Backscattering Spectrometry (RBS) as a nuclear measurement & analysis technique, with a high resolution, uses the irradiation of the sample that must be analyzed with a well collimated and accelerated mono-energetic beam of H or He ions with energy in the field of MeV (usually: 1-2 MeV).

Thickness and stoichiometry of the films will be evaluated using RBS.

We request 5 days of beam time.

Beam time request(unit=8 hours) : 15
Desired Period : 01.11.14/28.03.15

Desired beam properties

Type : He, p
Energy(MeV) : 3
Intensity(p/nA) : 10

Vacuum Requests : 10e-6 mbar

Special requirements for detectors, electronics, acquisition system

Minimal information needed for the radiological risk evaluation:

- a) Source activity : -
 - b) Use of open sources :
 - c) Estimate of the residual activity as a result of irradiation : -
 - d) Means of storage/transportation for irradiated targets : -
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