

DEAR management board of TANDEM

Experiment Title Improving depth profiling analysis of elements using
solid plate samples at the 3 MV Tandem
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Short presentation of the scientific project

The AMS analyzes have important research directions and were developed in our institute. It is well known that there is an AMS facility at 9MV Tandem Accelerator, which had many applications in the various studies in determining the concentration of materials in different hosts. It is important to know that this AMS installation was designed to analyze only powder pressed samples put in small cones. All of these cones are mounted on a standard sample holder.

The collaborations between AMS group and the Euratom programs have required to measure the depth profile of hydrogen isotopes concentration in various host materials. These materials derived from the Plasma Faced Material (PFM) used in tokamak are carbon, tungsten, or mixture of them. The interaction between plasma and the surrounding surfaces leads to retention of hydrogen isotopes in PFM.

Another AMS facility is the new 1 MV Tandem Accelerator in our institute. The samples used at this accelerator are also only powder pressed and are not suitable or useful for depth profiling of elements.

The new 3 MV Tandem Accelerator is not an AMS installation, but there is mounted an negative sputter ion source Model 860A using also only samples of pressed powder.

If we want to analyze the depth profile of concentrations in various materials, it is necessary to slightly modify the sample holder placed in negative sputter ion source, and to adapt our detector frame- holder to the goniometric system in the IBA chamber.

These improvements will be used to obtain important results for PhD thesis entitled "Application of accelerator mass spectrometry to the study materials of interest for the thermonuclear fusion", and for the collaboration work with the "Plasma Processes, materials and surfaces" group and the "Photonics for Advanced Materials Processing Group" group of the INFLPR institute.

Beam time request(unit=8 hours) : 9
Desired Period : 3

Desired beam properties

Type : p, D, He
Energy(MeV) : 9
Intensity(p/nA) : 30
Vacuum Requests : 10⁻⁷

Special requirements for detectors, electronics,aquisition system

Minimal information needed for the radiological risk evaluation:

a)Source activity : None
b)Use of open sources :
c)Estimate of the residual activity as a result of irradiation : None
d)Means of storage/transportation for irradiated targets : None

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