
Experiment Title Studies on optical materials behavior under
proton irradiation
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Short presentation of the scientific project

Due to the high radiation level („15 Gy/s) during hundreds of hours, it is necessary to study the optical degradation especially of thermonuclear reactor candidate materials but, generally, of all optical fibers and glasses used in high-radiation environments (reactors, accelerators, cosmic areas, etc) . The optical transmission properties in the UV region will be measured in-situ and post-irradiation using a dedicated apparatus based on a VARIAN UV-VISible spectrophotometer. The samples ;V special doped quartz-based glasses and optical fibers - will be irradiated with 15 MeV protons at various doses - maximum16.7 MGy, 3.7×10^{-6} dpa. The dose behaviour of the UV absorption will be measured. The accepted model for the coloration curves in alkali halides based on the interstitial trapping, also successfully used for Al₂O₃, will be verified for our cases. Preliminary study on eventual radio-luminescence induced by proton irradiation will be also performed. We;||l also try to observe the well known annealing process for the irradiation damages with temperature.

The goal of this experiment is mainly to verify our methodology in the new conditions of the improved Tandem accelerator, because our last similar experiment was performed in 2007.

Beam time request(unit=8 hours) : 9
Desired Period : december, january, february

Desired beam properties

Type : p
Energy(MeV) : 15
Intensity(p/nA) : min 5 nA
Vacuum Requests : -

Special requirements for detectors, electronics,aquisition system

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Minimal information needed for the radiological risk evaluation:

a)Source activity : max 1 nCi
b)Use of open sources :
c)Estimate of the residual activity as a result of irradiation : -
d)Means of storage/transportation for irradiated targets : small
lead box