Beam Characterization

Intensity

Gold foil activation – a method for measurement of neutron flux, ϕ

The equation that describes the irradiation process is as follows:

$$A_0 = N\sigma\phi t_i\left[1-e^{-\lambda t_i}\right]$$

A_o is the activity produced for the radionuclide of interest
N is the number of target atoms in the sample,
ϕ is the neutron flux,
σ is the cross section for the reaction that produces the radionuclide
λ is the decay constant
t_i is the irradiation time.

After irradiation the radioactive atoms will decay follow the decay equation:

$$A_t = A_0 \cdot e^{(-\lambda t_d)}$$

A_t is the radioactivity of the isotope after a decay time of t_d