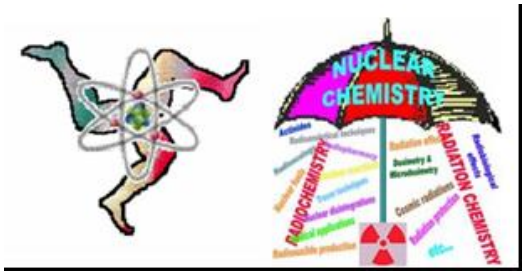

Contribution ID: **47** Type: **poster**

Experimental cross sections for Be-7 production in Al, Si, Mg and C by deuteron irradiations up to 50 MeV

Thursday 22 September 2011 17:30 (1h 30m)

With the advent of high power, high energy deuteron accelerators used for instance for the neutron source of the IFMIF facility detailed analysis of activation products in structural materials receives an increased attention (Fusion Evaluated Nuclear Data Library FENDL 3.0 ; http://www-nds.iaea.org/fendl3/).
A particular case is the formation of 7Be in light, so called low activation elements.
The presence of this radionuclide with T 1/2 = 53.12 d, emitting a unique ⍰-line of 477 keV (10.5 % abundance), can represent a heavy radiation burden for maintenance personnel. In order to make a realistic estimation of deuteron produced activities in collimators, beam stops and mechanical setups made from C, Si and Al different stacks containing foils of these materials were irradiated with 50 MeV beams. The 7Be content, measured with HPGe spectroscopy, allows to determine the excitation function of the X(d, 7Be)Y reactions. Also Mg samples were studied in the same way.
A comparison with the scarce literature values is made.
Thick target yields were derived from fits to our cross sections and integrated personnel dose was calculated for different irradiation cycles and exposure scenarios.
Apart form the radiation protection issue knowledge of the excitation function of this cluster emission is of interest for testing the prediction capabilities of different model codes and to compute depth-activity curves for application in Thin Layer Activation procedures.

Author: HERMANNE, alex (Vrije Universiteit Brussel)

Co-authors: Dr TARKANYI, Ferenc (Institute of Nuclear Research of the Hungarian Academy of Sciences , Pf.51, 4001 Debrecen, Hungary); Prof. CSIKAI, Julius (Institute of Nuclear Physics, University of Debrecen, Pf.105, 4010 Debrecen, Hungary); Mr ADAM-REBELES, Razvan (Cyclotron Laboratory , Vrije Universiteit Brussel, B-1090Brussels, Belgium); Dr TAKACS, Sandor (Institute of Nuclear Research of the Hungarian Academy of Sciences , Pf.51, 4001 Debrecen, Hungary)

Presenter: HERMANNE, alex (Vrije Universiteit Brussel)

Session Classification: Poster Section 2

Track Classification: Health Physics and Radiation Chemistry