Materials subjected to the irradiation by deuterons (and protons) in the IFMIF accelerator and the Lithium loop

U. Fischer, FZK
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	Element	Use	Prority	Remark
Accelerator				
	Cu, Al, Nb	Primary accelerator materials	Very high	Activation by beam losses
	W, Cu, C, Ni	Possible beam dump materials	Very high	Energy deposition and activation
	Fe, Cr, Ni, Mn, Mo, Si, C, P, N, S	Constituents of SS-316 steel in accelerator	High	Activation by beam losses
Lithium loop				
	Li	Target and loop	Very high	Neutron generation, H-3 and Be-7 production
	H, C, N, O, Fe, Cr, Ni, Mn, Mo, Al, Si, P, S, Al, Ti, Co, Cu, Nb, Ag, Sn, Sb, Ta	Impurities and corrosion products in Li loop	High	Activation

Cross-section data need to be provided up to the maximum deuteron energy of 40 MeV. For the materials of the accelerator there are required activation cross-sections as well as general purpose cross-section data to allow the future simulation of the deuteron transport/slowing down in those materials. General purpose data are also required to enable e. g. the calculation of the heat deposition distribution on the beam dump. For the Lithium loop impurities and corrosion products, only activation cross-sections are required. For Lithium, neutron emission cross-section data are required for the neutron source generation simulation as well as activation cross-section data.

The IFMIF accelerator prototype will be first operated by protons up to about 10 MeV. Hence the proton induced cross-section data (general purpose and activation) will be required for the materials of the accelerator as well.

Element priority lists are given in the following for deuteron and proton induced reactions in sequential order so as to provide guidelines for the evaluation of the related cross-section data.

Element piority list for deuteron induced reactions in sequential order

Cu, Nb, Al, Li, W, Cu, C, Fe, Cr, Ni, Mn, Mo, N, O, Co, Nb, Al, Ti, Ag, Sb, Ta , P, S

Element piority list for proton induced reactions in sequential order:

Cu, Nb, Al, W, Cu, C, Fe, Cr, Ni, Mn, Mo, Co, Nb, Al, Ti, Si, Ag, Sb, Ta, P, S, N