Contribution ID: **470**   Type: **Oral talk (15 min + 5 min questions)**

INVESTIGATION OF (γ, αxn) REACTIONS ON 93Nb

Wednesday, 13 July 2022 17:30 (10 minutes)

The study of the photon interactions with atomic nuclei remains a topical experimental and theoretical task at the present time. Despite the accumulated scientific base, there is no unified theory describing the emission of charged particles for a wide range of nuclei. The main reason is the paucity of experimental data on the emission of charged particles. In addition, such studies are of great practical importance. Research of reactions with charged particle emission makes it possible to develop alternative channels for the radioactive isotopes' production for nuclear medicine, industry, and etc.

We have studied reactions with the emission of alpha particles using the induced activity method by 20 and 40 MeV bremsstrahlung beams on natural niobium targets weighing 2.1 g. The induced activity was measured in a low-background laboratory by a Canberra semiconductor spectrometer with an energy resolution of 2 keV on the 1332 keV 60Co gamma line. The 87,88Y weighted average yields were measured for 40 MeV bremsstrahlung quanta and 88Y weighted average yield was measured for 20 MeV bremsstrahlung quanta for the first time. The following weighted average yields were obtained for Ebd=40 MeV: Y(88Y)=242±15 μb and Y(87Y)=176±15 μb; for Ebd =20 MeV: Y(88Y)=970±90 μb.

The dominance of semi-direct processes is stated according to the simulation results within the TALYS 1.96 program code. The obtained results are discussed.

The speaker is a student or young scientist

No

Section

1. Experimental and theoretical studies of nuclear reactions

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Session Classification: Experimental and theoretical studies of nuclear reactions