

PHOTOACTIVATION OF NATURAL TIN WITH 42 MeV BREMSSTRAHLUNG RADIATION

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A 22g natural SnO₂ target was irradiated for 9 minutes with 42 MeV bremsstrahlung beam of the "Siemens" betatron at the Radiological Institute in Belgrade.

Several gamma spectra were taken consecutively, the first 30 minutes after irradiation. The gamma spectrometry was done with 31 ccm Ge(Li) spectrometer of respective resolving power FWHM 2,5 keV and a 5 % efficiency. From the established transition energies and the time variation of the corresponding line intensities we identified ten radioisotopes and six isomers of tin and indium^{+/}. The reactions involved were: (gamma,n), (gamma,p), (gamma, 2n) and (gamma, 3n). Particularly, we identified ¹⁰⁹Sn from the ¹¹²Sn(gamma,3n) ¹⁰⁹Sn reaction and we obtained enough activity of this 18 minute isotope for single crystal gamma spectrometry. (Natural abundance of ¹¹²Sn is about 1% or 160 mg of the isotope in the target).

Our future interest is directed towards gamma spectrometry of neutron deficient radioisotopes produced in various targets by (gamma, 2n) and (gamma,3n) reactions and the measurements of some photoactivation cross section ratios.

^{+/} Bowman W.W., Mac Murdo K.W. Atomic Data and Nuclear Data Tables, 13, 89-292 (1974).