^{139}Tb

Xie et al. reported the first observation of ^{139}Tb in the 1999 paper "New nuclide ^{139}Tb and (EC+β^+) decay of ^{138,139}Gd" (1999Xi04). An enriched ^{106}Cd target was bombarded with a 220 MeV ^{36}Ar beam from the Lanzhou cyclotron and ^{139}Tb was formed in the fusion-evaporation reaction ^{106}Cd(^{36}Ar,1p2n). X-rays and β-delayed γ-rays were measured in combination with a He-jet tape transport system. "In the γ spectrum gated by Gd-K$_\alpha$ X rays two new γ rays with the energies of 109.0- and 119.7-keV were observed. Comparing the excitation functions of the two γ rays with that of the 328.4-keV γ ray, the most intense γ ray of ^{140}Tb, we assigned the 109.0- and 119.7-keV γ rays to the decay of ^{139}Tb."

Adapted from reference (2013Ma01)

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