Adopted Levels

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 194,460 (2024)	31-Oct-2022

Q(β^-)=5797 *5*; S(n)=5568 *6*; S(p)=10093 *7*; Q(α)=−3067 *10* 2021Wa16
S(2n)=10298 *5*, S(2p)=22350 *400* (syst), Q(β^-n)=893 *5* (2021Wa16).

2008Os02 (also 2006SaZS,2006SaZZ): ^{165}Eu was identified in U(p,X) at E(p)=36 MeV on target of natural uranium in the form of uranium carbide. The fission fragments were mass separated as metallic ions and implanted on to a tape transport system using surface ionization type ion source. Measured β, $\beta\gamma$-coin, $\gamma\gamma$-coin. The ^{165}Eu isotope identified by observing K-x rays of Gd, and its half-life was measured from Gd K_α x-ray decay curves.

2014Ha38, 2010Ha38, 2007Ha57 (also 2006HaZT): source was prepared by ^{238}U(p,F) at E(p)=32 MeV at JAEA facility. Fission products were ionized and separated online using Tokai-ISOL mass separator. Measured Q(β^-) using total absorption gamma-ray spectrometer of BGO detector.

2017Wu04: ^{165}Eu was produced in ^{9}Be(^{238}U,F), E(^{238}U)=345 MeV/nucleon reaction, followed by separation of fragments based on Bρ-ΔE-TOF method using the BigRIPS separator at RIBF-RIKEN facility, optimized for the transmission of ^{158}Nd and ^{170}Dy ions. The reaction products were transported through the ZeroDegree spectrometer and implanted into the decay counting system WAS3ABi, surrounded by the EURICA array of 84 HPGe detectors for γ detection. Typical implantation rate was ≈100 ions/s. Measured time distribution of (implanted ion)β^-, (implanted ion)$\beta^-\gamma$ and (implanted ions)γ correlated events, and half-life of decay of ^{165}Sm g.s.

2017Pa25: possible μs isomer from observation of 124.2γ, 156γ and 244γ, following the decay of this isomer.

2022Ki23: ^{165}Eu nuclide was produced at the RIBF-RIKEN facility using the ^{9}Be(^{238}U,F),E(^{238}U)=345 MeV/nucleon, followed by separation of fission fragments by measuring the energy loss (ΔE), magnetic rigidity (Bρ) and time-of-flight (tof) of the ions using the BigRIPS separator, multisampling ionization chambers (MUSIC), and parallel-plate avalanche counters (PPACs), and plastic scintillators. The radioactive ions were implanted in the Advanced Implantation Detector Array (AIDA) consisting of a stack of six double-sided silicon strip detectors (DSSSDs), and centered in the BRIKEN neutron detector consisting of 140 ^{3}He-filled proportional counters embedded in a large polyethylene moderator matrix. For γ and nγ-coin detection, two CLARION-type clover HPGe detectors were used, but γ data were not analyzed in the present experiment. Measured (implanted ions)(β^-) correlations, and (implanted ions)(β^-)(neutron) correlations. Deduced half-life and %β^-n for the decay of ^{165}Eu.

Mass measurements: 2020Vi04, 2022Or02.

2009Co21: theory: calculated half-life of ^{165}Eu decay using artificial neural network (ANN) statistical model.

^{165}Eu Levels

Cross Reference (XREF) Flags

A ^{9}Be(^{238}U,Fγ)

E(level)	$T_{1/2}$	XREF	Comments
0	2.24 s *14*		%β^-=100; %β^-n≤0.4 (2022Ki23) E(level): the reported activity and half-life may include both the g.s. and an isomeric state of ^{165}Eu. J$^\pi$: π5/2[413] Nilsson orbital, based on systematics of known structures in neighboring, well-deformed nuclei (evaluators). $T_{1/2}$: weighted average of 2.16 s *+14−12* (2022Ki23, (implant)β(t)), 2.14 s *45* (2017Wu04, (implants)β^- decay curve); 2.7 s *3* (2008Os02, Gd K_α x-ray decay curves). Additional information 1. Only the β^- decay mode is expected, followed by possible β^--delayed neutron decay. %β^-n deduced from neutron-gated β^--decay events, fitted by an exponential function of the background subtracted time distribution of (implants)(β^-)(neutron)-correlations (2022Ki23). For further details of the analysis method, consult 2020ToZY.
0+x		A	124.2γ, 156γ and 244γ were found to follow a decay of a μs isomer, but no γ ray was assigned to a decay scheme.