Adopted Levels

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 191,1 (2023)	22-Aug-2023

Q(β^-)=5107 *6*; S(n)=4476 *5*; S(p)=11320 *syst*; Q(α)=−2601 *9* 2021Wa16

ΔS(p)=100 (syst,2021Wa16).

S(2n)=10393 *5*, S(2p)=21840 *400* (syst) (2021Wa16).

Measured mass excess for ^{167}Gd=−50783.4 keV *118 123* (2020Vi04), first uncertainty without the systematic uncertainty, second with the systematic uncertainty.

2012Ku26: ^{167}Gd was produced and identified in ^{9}Be(^{238}U,F), E=1 GeV/nucleon reaction using SIS-18 synchrotron facility at GSI. Target=1.6 g/cm^2 ^{9}Be placed at the entrance of projectile Fragment Separator (FRS). Particle identification was achieved by event-by-event in-flight analysis of time-of-flight, energy loss measurement, and magnetic rigidity (tof-ΔE′-Bρ). Time-of-flight measured using two plastic scintillation detectors, energy loss or deposit by ionization chambers (MUSIC), and magnetic rigidity by four time-projection chambers (TPC), which also provided energy deposit information. Isomer tagging method for known μs isomers was used to verify event-by-event identification and in-flight separation of new isotopes. Gamma rays from the known isomers were recorded in coincidence with the incoming ions using either the RISING array of Ge detectors at GSI or only two Ge detectors, a stopper foil and a scintillator for veto signal. Measured production cross section. Comparison of measured σ with predictions from ABRABLA model and EPAX-3 model.

2017Wu04: ^{167}Eu produced and identified in ^{9}Be(^{238}U,F) reaction at E(^{238}U)=345 MeV/nucleon, followed by separation in mass and charge using BigRIPS separator and the ZeroDegree Spectrometer at RIBF-RIKEN facility by TOF-Bρ-ΔE method and the ions of interest were implanted into the beta-counting system WAS3ABi, surrounded by the EURICA array of 84 HPGe detectors. Measured half-life of the decay of ^{167}Eu by (ion)β^-(t), (ion)$\beta^-\gamma$(t) and (ions)γ(t) correlations. ^{167}Gd also reported in A/Q versus Z plot in Fig. 1 of 2017Gu08.

2022Ki23: ^{167}Gd 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 ^{167}Gd.

No references in the NSR database for theoretical structure calculations for ^{167}Gd.

^{167}Gd Levels

E(level)	J$^\pi$	T$_{1/2}$	Comments
0	(5/2$^-$)	4.26 s *+18−32*	%β^-=100 Only the β^- decay mode is expected. 2022Ki23 measured %β^-n≤12, but this decay mode is energetically forbidden from Q(β^-n)=−1038 keV *5* (2021Wa16). J$^\pi$: tentative 5/2$^-$, analogous to known J^π=5/2$^-$ and ν5/2[512] Nilsson orbital assignments for ground states in N=103 isotones: ^{171}Er, ^{173}Yb and ^{175}Hf. 5/2$^-$ from systematic trend in 2021Ko07, and in 2019Mo01 from theory. T$_{1/2}$: from 2017Wu04, fit to the (implanted ion)β^-(t) correlated decay curve using the least-squares and maximum-likelihood methods, including contributions from the decays of the parent, daughter and the ground-daughter, and a constant background. Other: 2.269 s *+1817−988* (2022Ki23, from binned maximum likelihood fitting of the (implant)β correlated decay curve, using Bateman equations to account for the activities of the parent, daughter, grand-daughter, and great-grand-daughter, and the β^--delayed neutron branch of the decay chain). Production σ(at 1 GeV/nucleon)=625 nb *23* (2012Ku26).