Adopted Levels

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 185, 2 (2022)	23-Aug-2022

Q(β^-)=9530 *SY*; S(n)=4460 *SY*; S(p)=11940 *SY*; Q(α)=−4590 *SY* 2021Wa16

Estimated uncertainties (2021Wa16): ΔQ(β^-)=400, ΔS(n)=400, ΔS(p)=500, ΔQ(α)=640.

S(2n)=7520 *400*, S(2p)=26680 *500*, Q(β^-n)=6170 *400* (syst, 2021Wa16).

1987Ra12: Yield of ^{149}Cs is reported as 10^5 atoms/s in U(p,X) E=600 MeV reaction using ISOLDE On-Line Mass Separator.

2000KoZH: ISOLDE On-Line Mass Separator. Measured Eγ, Iγ, En, In; deduced $T_{1/2}$, nuclear magnetic moments, β-delayed neutron emission probabilities.

2017Wu04: The ^{149}Cs nuclide was produced at the RIBF-RIKEN facility using the ^{9}Be(^{238}U,F) reaction at E=345 MeV/nucleon. Two experiments, optimized for the transmission of ^{158}Nd and ^{170}Dy ions, were carried out with average beam intensities of 7 pnA and 12 pnA, respectively. The identification of the nuclide of interest was made in the BigRIPS separator by determining the atomic number and the mass-to-charge ratio of the ion using the tof-Bρ-ΔE method. The reaction products were transported through the ZeroDegree Spectrometer and implanted into the beta-counting system WAS3ABi that was surrounded by the EURICA array comprising of 84 HPGe detectors. The typical implantation rate was ≈100 ions/s. Measured (implanted ions)β^-, (implanted ions)β^--γ and (implanted ions)γ correlations. Deduced half-life of the decay of ^{149}Cs g.s.

2017Li06: ^{149}Cs produced at ISOLDE-CERN facility through U(p,X) reaction with E(p)=1.4 GeV beam from the PS-Booster incident on UC_x target. Measured yield, Eγ, Iγ, $\beta\gamma$-coin, half-life of ground state of ^{149}Cs isotope from γ-decay curves using plastic scintillation detectors for β particles, $LaBr_3$(Ce) and HPGe clover detectors for γ detection.

2018Sh11: ^{149}Cs produced at the RIBF-RIKEN facility using ^{9}Be(^{238}U,F) reaction with $^{238}U^{86+}$ beam of E=345 MeV/nucleon. Comparison of measured cross sections with theoretical calculations using LISE$^+$ abrasion-fission (AF) model.

2020Wu04: ^{149}Cs nuclide produced at the RIBF-RIKEN facility in ^{9}Be(^{238}U,F) reaction at E=345 MeV/nucleon and an intensity of 5 pnA. Identification of fission fragments of interest was made based ON time-of-flight (tof), magnetic rigidity (Bρ), and energy loss (ΔE) using the BigRIPS spectrometer, determining atomic Z and mass-to-charge ratio A/Q, where Q=charge state of the ions. The separated nuclei were implanted at a rate of 100 ions/s in the beta counting system of the Wide range Active Silicon-Strip Stopper Array for Beta and ion detection (WAS3ABi), which included a stack of five Double Sided Silicon Strip Detectors (DSSSDs). The WAS3ABi setup was surrounded by Euroball RIken Cluster Array (EURICA) array of 84 HPGe detectors for γ detection. Half-life of the separated and implanted ions was determined by fitting the time distribution of β(implants)- and/or $\beta\gamma$(implants)-correlated decay curves to the sum of activities of parent nuclei, daughter nuclei, grand-daughter nuclei, β-delayed neutron daughter and grand-daughter nuclei, and a constant background. Comparison of measured half-lives with FRDM+QRPA (2003), FRDM+QRPA (2019), KTUY+GT2, RHB+pn-RQRPA, and DF+CQRPA theoretical calculations.

^{150}Xe isotope has been identified by 2018Sh11 at RIKEN, but its decay characteristics through β^- and β^-n, populating ^{150}Cs and ^{149}Cs, respectively are unknown.

Additional information 1.

2018Ar04: theory: calculated binding energy, charge, proton, and neutron radii, S(n), S(2n), quadrupole deformation parameter, neutron skin thickness, and pairing gap energy using Skyrme Hartree-Fock Bogoliubov (HFB) approach.

^{149}Cs Levels

E(level)	$T_{1/2}$	Comments
0	107 ms *6*	%β^-=100; %β^-n=25 *4* (2017Li06) Theoretical $T_{1/2}$=113 ms, %β^-n=57 (2019Mo01). Theoretical $T_{1/2}$=73.1 ms, %β^-n=33.7 and 27.8 for different fission barriers (2021Mi17). E(level): it is assumed that the observed events correspond to the ground-state activity of ^{149}Cs. J^π: $3/2^+$ from systematic trend (2021Ko07). Ω(p)=$3/2^+$ (2019Mo01, theory). $T_{1/2}$: unweighted average of 113 MS *6* (2020Wu04, (implanted ions)$\beta\gamma$-correlated decay curves to the sum of activities of parent nuclei, daughter nuclei, grand-daughter nuclei, β^-n daughter and grand-daughter nuclei, and a constant background at RIBF-RIKEN); 113 ms *8* (2017Wu04) from (implanted ions)β^--correlated decay curve at RIBF-RIKEN; group and laboratory); 84 ms *2* (2017Li06, γ-decay at ISOLDE-CERN), 112 ms *3* from β^-n decay and 114 ms *16* from β^-nγ decay (2000KoZH, ISOLDE-CERN). only the β^- decay mode is expected, and has been observed.

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Adopted Levels (continued)

^{149}Cs Levels (continued)

E(level)	$T_{1/2}$	Comments
		%β^-n deduced by 2017Li06 from the ratio of number of ^{148}Ba ^{149}Cs nuclei using absolute γ-ray intensities in ^{149}Ba, ^{148}La and ^{148}Cs, the latter two from β^-n decay modes. Production σ=33.7 nb for Te setting, with 30% systematic uncertainty (2018Sh11). Measured yield of ^{149}Cs=100 ions/μC (2017Li06).