Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	09-Sep-2022

Q(β^-)=12260 *syst*; S(n)=3610 *syst*; S(p)=18730 *syst*; Q(α)=−11020 *syst* 2021Wa16

Estimated uncertainties (2021Wa16): 400 for Q(β^-), 500 for S(n), 640 for S(p), 700 for Q(α).

Q(β^-n)=9360 *400*, S(2n)=5660 *400*, S(2p)=35690 *890* (syst,2021Wa16). Q(β^-2n)=4960 *400*, Q(β^-3n)=1585 *400* (syst, deduced by evaluator from mass excesses in 2021Wa16).

2010Oh02: ^{84}Zn nuclide identified in ^{9}Be(^{238}U,F) and Pb(^{238}U,F) reactions with a $^{238}U^{86+}$ beam energy of 345 MeV/nucleon produced by the cascade operation of the RIBF-RIKEN accelerator complex of the linear accelerator RILAC and four cyclotrons RRC, fRC, IRC and SRC. Identification of ^{84}Zn nuclei was made on the basis of magnetic rigidity, time-of-flight and energy loss of the fragments using BigRIPS fragment separator. Based on A/Q spectrum and Z versus A/Q plot, 22 counts were assigned to ^{84}Zn isotope. Probability of misidentification of ^{84}Zn isotope <0.001% (2010Oh02).

2014XuZZ: ^{84}Zn produced in ^{9}Be(^{238}U,F),E=345 MeV/nucleon at RIBF-RIKEN facility. Measured β-decay curve, $\beta\gamma$-coin, $T_{1/2}$ of decay of ^{84}Zn, and %β^-n or Pn.

Theoretical calculations: seven primary references for structure and four primary references for decay characteristics retrieved from the NSR database at www.nndc.bnl.gov/nsr/ are listed in 'document' records which can be accessed via web retrieval of ENSDF database www.nndc.bnl.goc/ensdf/.

Additional information 1.

^{84}Zn Levels

Cross Reference (XREF) Flags

A ^{1}H(^{85}Ga,2pγ)

E(level)[†]	J$^\pi$	$T_{1/2}$	XREF	Comments
0	0$^+$	53.6 ms *81*	A	%β^-=100; %β^-n=73 *26* (2014XuZZ); %β^-2n=?; %β^-3n=? %β^-n from β^-, γ data for ^{84}Zn → ^{83}Ga → ^{82}Ge β^-n decay chain (2014XuZZ). Theoretical $T_{1/2}$=42.7 ms, %β^-n=50, %β^-2n=1, %β^-3n=0 (2019Mo01). Theoretical $T_{1/2}$=44.1 ms, %β^-n=31.5, 30.7; %β^-2n=0.52, 0.68; %β^-3n=0, 0.003 (2021Mi17, two values for different fission barriers). $T_{1/2}$: from 2014XuZZ, from (108.5γ)β-coin data. Other: 65.0 ms *60*, from analysis of implant-β correlated decay curve with theoretical %β^-n values for ^{84}Zn decay, half-lives and %β^-n values daughter and grand-daughter decays. Evaluators prefer value from $\beta\gamma$-coin data, although, 108.5γ from ^{84}Zn to ^{84}Ga remains to be confirmed. Weighted average of the two values is 61 ms *6*. Measured σ=43 pb (2010Oh02), systematic uncertainty≈50%. Configuration=$(\pi f_{5/2})^2(0^+)$ (2017Sh42).
599 *20*	(2$^+$)[‡]		A	
1444 *29*	(4$^+$)[‡]		A	

[†] From Eγ values.

[‡] Systematics of even-even nuclei, shell-model predictions and configuration=$(\pi f_{5/2})^2\otimes(\nu d_{5/2})^4(0^+)$ (2017Sh42).

Adopted Levels, Gammas (continued)

$\gamma(^{84}Zn)$

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π
599	(2^+)	599 *20*	100	0	0^+
1444	(4^+)	845 *21*	100	599	(2^+)

† From $^{1}H(^{85}Ga,2p\gamma)$ (2017Sh42).

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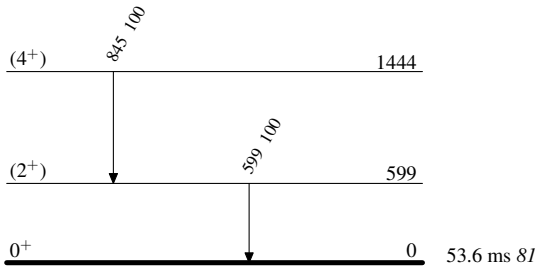
Level Scheme

Intensities: Relative photon branching from each level



$^{84}_{30}Zn_{54}$