^{67}Ga ε decay 2005Ya01,1978Me10

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Huo Junde, Huang Xiaolong, J. K. Tuli	NDS 106, 159 (2005)	1-Apr-2005

Parent: ^{67}Ga: E=0.0; $J^\pi=3/2^-$; $T_{1/2}$=3.2617 d *5*; Q(ε)=1000.8 *12*; %ε decay=100.0

^{67}Ga-$T_{1/2}$: Unweighted average of 3.261 1(1972Le37),3.264 4(1978La21),3.261 1 (1978Me10),3.2594 12(1979De42),3.2607 8(1980Ho17),3.26154 54(2002Un02) 3.2623 15(2004Sc04),3.2634 16(2004Da05). Others: 3.29 8(1938Ma01), 3.46 (1948Ho04),3.26 2(1948Mc32),3.33(1950Ho26),3.246 13(1955To27), 3.30 7(1964Ru06),3.27 6,3.26 5,3.53 10,3.30 6,2.90 15,3.51 5, 3.78 18,3.49 18(1972Cr02).

2005Ya01: measured emission probabilities of K x ray and γ rays, Si(Li).

2000Si03: measured Eγ, Iγ, K x-γ coin. deduced ε branching ratio to the ground state and emission probabilities of 93keV γ ray. 4π(Liquid Scintillation)e, X-γ coincidence.

1991HiZZ: measured Eγ, Iγ, $T_{1/2}$, 4π pressurized proportional counter coincidence counting.

1990Me15: measured Eγ, Iγ using various detectors.

1988Be55: measured probability of K-capture with K x-ray-γ coincidences.

1978Me10: measured Eγ, Iγ, $T_{1/2}$.

1966Fr12, 1969Li04: measured α.

1973Ba54: measured γγ(θ).

The decay scheme is based on the data of 1991HiZZ, 1990Me15, 1978Me10, 1966Fr12, and 1973Ba54.

Others: 1975Ro25, 1972Le37, 1972En08, 1971Su18, 1971Sh36, 1971Re01, 1969Bo41, 1968Li02, and 1974RoZD.

^{67}Zn Levels

E(level)‡	J^π†	$T_{1/2}$	Comments
0.0	$5/2^-$	stable	
93.310 *5*	$1/2^-$	9.07 μs *4*	$T_{1/2}$: from Adopted Levels.
184.576 *6*	$3/2^-$	1.04 ns *2*	g=+0.33 *4* (1969Bo41) g: Others: +0.25 *8* (1968Li02), +0.23 *8* (1971Re01). $T_{1/2}$: unweighted average of 1.06 ns *4* (1975Ro25) and 1.026 ns *14* (1972En08).
393.527 *7*	$3/2^-$	<0.1 ns	$T_{1/2}$: from 1974RoZD, 1975Ro25.
887.693 *9*	$5/2^-$		

† From Adopted Levels.

‡ From a least-squares fit to the Eγ data.

ε radiations

E(decay)	E(level)	Iε†‡	Log *ft*	Comments
(113.1 *12*)	887.693	0.281 *4*	5.646 *12*	εK=0.8682 *2*; εL=0.11154 *18*; εM+=0.02021 *4*
(607.3 *12*)	393.527	23.6 *3*	5.239 *6*	εK=0.8826; εL=0.09964; εM+=0.01778
(816.2 *12*)	184.576	22.71 *9*	5.5153 *22*	εK=0.8833; εL=0.09901; εM+=0.01765
(907.5 *12*)	93.310	52.5 *11*	5.244 *10*	εK=0.8836; εL=0.09882; εM+=0.01761
(1000.8 *12*)	0.0	0.9 *9*	7.1 *5*	εK=0.8837; εL=0.09867; εM+=0.01758

† From γ-ray intensity balance at each level.

‡ Absolute intensity per 100 decays.

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γ(^{67}Zn)

Iγ normalization: From absolute γ intensities per 100 decays obtained in 1991HiZZ and 2005Ya01.
Eγ=604.44,814.7 *5*,979 *1* reported by 1978Me10 are not seen by the same author in a later work (1990Me15) or by 1991HiZZ and are considered spurious. The Iγ in 1990Me15 are consistent with the data of 1991HiZZ used in this evaluation.

E_γ[†]	I_γ[‡@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[&]	Comments
91.265 *5*	3.11 *4*	184.576	3/2$^-$	93.310	1/2$^-$	M1+E2	+0.06 *5*	0.083 *8*	α(K)exp=0.066 *10*(1969Li04) α(K)=0.073 *7*; α(L)=0.0076 *8* δ: from 1975Th01.
93.310 *5*	38.81 *3*	93.310	1/2$^-$	0.0	5/2$^-$	E2		0.87	α(K)exp=0.77 *8*(1966Fr12) α(K)=0.751 *23*; α(L)=0.092 *3*
184.576 *10*	21.41 *1*	184.576	3/2$^-$	0.0	5/2$^-$	M1+E2	0.38 *8*	0.019 *3*	α(K)=0.0169 *23*; α(L)=0.0018 *3* α(K)exp=0.0156 *10*(1966Fr12) α(K)=0.0158 *11*; α(L)=0.00165 *12* δ: from α(K)exp+α(L1)exp=1.72×10^{-2} *10*(1966Fr12). Probability of K-capture=0.89 *4* (1988Be55); assuming a coefficient of K-fluorescence=0.430 *7* (1972Bb16).
208.950 *10*	2.46 *1*	393.527	3/2$^-$	184.576	3/2$^-$	M1+E2	0.035 *21*	0.0091 *1*	α=0.0091 *1*; α(K)=0.00804 *6*; α(L)=0.00082 *1* α(K)exp=0.0075 *7*(1966Fr12) α(K)=0.00804 *6*; α(L)=0.00082 δ: from 1973Ba54.
300.217 *10*	16.64 *12*	393.527	3/2$^-$	93.310	1/2$^-$	M1+E2	−0.18 *1*	0.00395 *3*	α=0.00395 *3*; α(K)=0.00348 *2*; α(L)=0.00035 α(K)exp=0.0034 *3*(1966Fr12) δ: from 1973Ba54.
393.527 *10*	4.56 *24*	393.527	3/2$^-$	0.0	5/2$^-$	M1+E2	0.043 *10*	0.00196	α=0.00196; α(K)=0.00173; α(L)=0.00017 α(K)exp=0.00192 *15*(1966Fr12) δ: from 1973Ba54. Probability of K-capture=0.88 *3* (1988Be55); assuming a coefficient of K-fluorescence=0.430 *7* (1972Bb16).
494.166 *15*	0.0684 *14*	887.693	5/2$^-$	393.527	3/2$^-$	M1+E2	0.14 *3*	0.00117 *1*	α=0.00117 *1*; α(K)=0.00104 *1*; α(L)=0.00010 α(K)exp=0.0019 *15*(1966Fr12) δ: from 1978Lo06.
703.106 *15*	0.0105 *9*	887.693	5/2$^-$	184.576	3/2$^-$			0.00063 *11*	α=0.00063 *11*; α(K)=0.00056 *10* δ: =−0.09 *28* or +8.0 *18* for (M1+E2).

Continued on next page (footnotes at end of table)

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γ(^{67}Zn) (continued)

E_γ [†]	I_γ [‡@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[&]	Comments
794.381 *15*	0.0540 *18*	887.693	5/2$^-$	93.310	1/2$^-$	E2(+M3)	0.04 *4*	0.00053 *1*	α=0.00053 *1*; α(K)=0.00047 *1* Additional information 1. δ: from 1978Lo06.
887.688 *15*	0.148 *3*	887.693	5/2$^-$	0.0	5/2$^-$	M1+E2	+0.96 *9*	0.00036	α=0.00036; α(K)=0.00032 α(K)exp=0.00034 *7*(1966Fr12) δ: from 1978Lo06.

† From 1978Me10 with a correction factor of 2000He14.
‡ From absolute intensities of 2005Ya01 below 400keV and of 1991HiZZ normalized at γ(93.31keV) by 2005Ya01 above 400keV .
# From adopted gammas.
@ Absolute intensity per 100 decays.
& Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

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Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays