^{149}Eu ε decay (93.1 d) 1982Me10,1992Ca11

History

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

Parent: ^{149}Eu: E=0.0; J$^{\pi}$=5/2$^+$; $T_{1/2}$=93.1 d *4*; Q(ε)=695 *4*; %ε decay=100.0

^{149}Eu-J$^{\pi}$,$T_{1/2}$: From ^{149}Eu Adopted Levels.

^{149}Eu-Q(ε): From 2021Wa16.

1982Me10: measured γ, $\gamma\gamma$, ce using a mass-separated source and a Compton suppression spectrometer at LLNL.

1992Ca11: measured Eγ, ce using a mass-separated source and a double focusing magnetic spectrometer at CERN.

2004Mi43: measured emission probabilities of 277.1γ and 327.5γ as 4.13 *3* and 4.75 *3*, respectively using a 4π $\beta\gamma$ coin apparatus at JAERI.

2011In01, 2011In04: measurement of high-resolution ce data for 22.5-keV transition using a combined electrostatic electron spectrometer consisting of a retarding sphere followed by a double-pass cylindrical mirror energy analyzer. The electron spectra were recorded by sweeping the retarding voltage while the analyzer voltage was kept constant. FWHM=7 eV. Sources of ^{149}Eu were prepared from bombardment of natural Er by 500-MeV protons from JINR accelerator followed by chemical separation of Eu fraction as Eu_2O_3 and EuF_3 compounds. Conversion lines of 22.5-keV transition recorded were: L1, L2, L3, M1, M2, M3, M4+M5, N1, N2, N3, O1, O2+O3. Natural widths of Sm atomic levels were deduced from the conversion electron lines of 22.5-keV transition as follows: 3.9 eV *1* for L1 shell, 3.6 eV *1* for L2 shell, 3.3 eV *1* for L3 shell, 13.4 eV *3* for M1 shell, 5.9 eV *3* for M2 shell, 7.3 eV *4* for M3 shell, 5.6 eV *4* for N1 shell, 2.3 eV *8* for N3 shell. Values are averages from Eu_2O_3 and EuF_3 sources (2011In04).

1996Vy01 (also 1979VyZV): analysis of ^{149}Eu ε decay data from authors′ earlier (1978-1980) studies reported in secondary publications; five excited states reported at 22.5, 277.1, 350.0, 528.5 and 558.4 with ε+β^+ feedings for g.s. and the five excited states.

γ, $\gamma\gamma$-coin: 1976Ga10, 1970Ch09, 1968Ad01, 1968Wi21, 1966Mc11, 1966Wi12, 1966Av05, 1962Wa32.

ce: 1981Ar17, 1970An17. Others: 1966Mc11, 1966Av05, 1966Wi12, 1962Wa32, 1962Dz02, 1961Ha23, 1959An36.

$\gamma\gamma(\theta)$: 1980Kr15 (semi-semi and semi-scin systems), 1963Ha43.

$\gamma\gamma(\theta$,H,T): 1981KrZS, 1983Kr19.

$\gamma\gamma$(t) and ceγ(t): 1970Ko30, 1966Be39, 1963Ki15.

Production and $T_{1/2}$ of ^{149}Eu: 1970Ch09, 1962Dz02, 1961Ha40, 1953Ma17, 1951Ho30.

Total decay energy deposit of 682 keV *39* calculated by RADLIST code is in agreement with expected value of 695 keV *4*, indicating the completeness of the decay scheme.

^{149}Sm Levels

E(level)‡	J$^{\pi}$†	$T_{1/2}$†	Comments
0.0	7/2$^-$	stable	
22.5002 *8*	5/2$^-$	7.33 ns *9*	E(level): 22.499 *7* (1996Vy01). $T_{1/2}$: weighted average of 7.12 ns *11* (ce(x-ray)(t),1970Ko30) and 7.37 ns *5* ($\gamma\gamma$(t),1996Vy01). Others: 6.9 ns *5* (1966Be39), 7.6 ns *5* (1963Ki15).
277.072 *7*	5/2$^-$	≤0.2 ns	E(level): 277.083 *4* (1996Vy01). $T_{1/2}$: adopted value from γ(x-ray)(t) (1970Ko30).
285.951 *10*	9/2$^-$	0.22 ns *4*	
350.036 *6*	3/2$^-$	9.5 ps *3*	E(level): 350.00 *5* (1996Vy01). $T_{1/2}$: value from this dataset: ≤0.2 ns from (x-ray)γ(t) (1970Ko30).
399.08 *7*	(1/2$^-$,3/2$^-$)		
528.592 *7*	3/2$^-$	24 ps *3*	E(level): 528.484 *7* (1996Vy01).
558.374 *7*	5/2$^-$	24 ps *8*	E(level): 558.409 *16* (1996Vy01).
590.880 *10*	9/2$^-$		
636.421 *17*	7/2$^-$		
658.62 *4*	(≤7/2)		

† From the Adopted Levels. Comments are given for the source of the Adopted values.

‡ From least squares fit to Eγ data.

^{149}Eu ε decay (93.1 d) 1982Me10,1992Ca11 (continued)

ε radiations

E(decay)	E(level)	Iε[†]	Log *ft*	Comments
(36 *4*)	658.62	0.0082 *15*	8.0 *2*	εL=0.705 *+9−12*; εM+=0.295 *+12−9*
(59 *4*)	636.421	4.85×10^{-4} *17*	9.8 *1*	εK=0.218 *+84−94*; εL=0.576 *+66−60*; εM+=0.206 *+28−24*
(104 *4*)	590.880	1.43×10^{-4} *14*	9.9[1u] *1*	εK=0.171 *24*; εL=0.601 *17*; εM+=0.2281 *79*
(137 *4*)	558.374	0.164 *5*	8.55 *4*	εK=0.7241 *+53−58*; εL=0.2100 *+43−39*; εM+=0.0660 *15* Iε: other: 0.13 *1* (1996Vy01).
(166 *4*)	528.592	1.310 *15*	7.88 *3*	εK=0.7551 *+30−32*; εL=0.1872 *+24−22*; εM+=0.05780 *+85−79* Iε: other: 1.05 *5* (1996Vy01).
(296[‡] *4*)	399.08	<0.0005	>11.3[1u]	εK=0.7087 *30*; εL=0.2206 *22*; εM+=0.07066 *+83−79*
(345 *4*)	350.036	5.53 *5*	8.01 *1*	εK=0.81066 *49*; εL=0.14598 *37*; εM+=0.04336 *13* Iε: other: 4.65 *18* (1996Vy01).
(409 *4*)	285.951	0.00072 *28*	11.8[1u] *2*	εK=0.7626 *12*; εL=0.18126 *+90−87*; εM+=0.05613 *32*
(418 *4*)	277.072	5.30 *5*	8.22 *1*	εK=0.81785 *32*; εL=0.14064 *24*; εM+=4.1515×10^{-2} *+82−80* Iε: other: 4.29 *14* (1996Vy01).
(672 *4*)	22.5002	77.5 *33*	7.50 *2*	εK=0.82970 *11*; εL=0.131819 *82*; εM+=3.8483×10^{-2} *28* Iε: see comment for Iε to g.s. Values of 25 (1982Me10) and 5 (1978LeZA,1976Ho17) are incorrect. Other: 60 *8* (1996Vy01).
(695 *4*)	0.0	10.2 *33*	8.4 *2*	εK=0.83029 *10*; εL=0.131375 *76*; εM+=3.8331×10^{-2} *26* Iε: from I(γ+ce) imbalance. Note that 1982Me10 and earlier compilations (1978LeZA,1976Ho17) give Iε=65 and 85, respectively. The discrepancy is most probably due to incorrect value of α(22γ) used by 1982Me10 and 1978LeZA. Other: 31 *9* (1996Vy01).

† Absolute intensity per 100 decays.
‡ Existence of this branch is questionable.

$\gamma(^{149}Sm)$

Iγ normalization: From Iγ/100 decays=4.75 *4* for 327.5γ by 4$\pi\beta\gamma$ coin method (2004Mi43). Other: 0.0403 *4* (1982Me10, from I(K x ray)/Iγ(327.5γ) and decay scheme.

Measured x-ray intensities per 100 decays (1982Me10): 22.6 *8* for Kα_2, 41.0 *8* for Kα_1, 12.3 *2* for Kβ_1, 3.18 *7* for Kβ_2, and 79.1 *14* for all the x-rays.

Experimental values of α(K)exp, α(L)exp, α(M)exp given under comments have been deduced from present Iγ data and Ice(K), Ice(L), and Ice(M) from 1982Me10. For 254γ, 277γ, 281γ and 327γ, weighted average of electron intensities available from 1992Ca11 and 1982Me10 are taken. The data have been normalized to the 350γ treated as pure E2. On the basis of ≈3% uncertainty on Iγ data and 5% on Ice data an uncertainty of ≈7% is assigned to α(exp) values. It may be noted that in some cases the α(exp) data given by 1982Me10 cannot be reproduced from their intensities. In these cases it appears that the electron intensities are in error.

E_γ[†]	I_γ[‡a]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[&]	δ[&]	α[b]	Comments
22.5002 *8*	57.1[@] *20*	22.5002	5/2$^-$	0.0	7/2$^-$	M1+E2	0.0784 *9*	30.0 *5*	%Iγ=2.71 *10* α(L)=23.5 *4*; α(M)=5.17 *8* α(N)=1.155 *18*; α(O)=0.1620 *25*; α(P)=0.00718 *10* E_γ: weighted average of 22.4999 *9* deduced from an average of nine conversion electron lines and 22.5012 *17* from gamma-ray spectroscopy, both measured by 2011In01. Others: 22.519 *8* (1982Me10) and 22.494 *11* (1970An17). Relative Iγ=55.5 *20* (1992Ca11), 59.6 *25* (1982Me10), 56.8 *40* (1976Ga10). %I(γ+ce)=84 *4* from Iγ and α. From Ice(22γ)/Ice(277K)=185 *8* (1970An17), %I(γ+ce)=56 *3*. The ce data of 1966Av05 give %I(γ+ce)(22γ)=82. Discrepancy is probably due to problems in finding relative ce intensities. Mult.,δ: from 2011In01 for penetration parameter Λ=−2 *10* (2011In01). δ=0.0742 *18* for Λ=2.9 *12* and 0.0722 *20* for Λ=1.5 *15* Other: 0.0715 *11* (1981Ar17,1970An17). Subshell ratios from ce data: L2/L1=0.30 *2*, 0.30 *2*; L3/L1=0.30 *2*, 0.29 *2*; M2/M1=0.29 *2*, 0.29 *2*; M3/M1=0.32 *2*, 0.31 *2*; N3/N1=0.25 *6*, 0.26 *5*; P1/N1=0.013 *2*, 0.014 *3*; (O2+O3)/O1=0.59 *7*, 0,64 *8*. First value for Eu_2O_3, second for EuF_3 (2011In04). Measured electron intensities (2011In01): L1:L2:L3:M1:M2:M3:N1:N3:P1:O1:O2+O3::(49.1 *3*):(14.5 *2*):(14.7 *2*): (10.9 *1*):(3.1 *1*):(3.5 *1*):(2.4 *2*):(0.6 *2*):(0.03 *1*):(0.32 *3*):(0.21 *2*). L- and M- subshell ratios. Weighted average of values deduced from 1981Ar17 and 1970An17. 1981Ar17 give following Ice values relative to ce(K)=100 for 277γ. ce(L1)=10640, ce(L2)=2756 *85*, ce(L3)=2809 *85*, ce(M1)=2490 150, ce(M2)=585 *64*, ce(M3)=585 *64*, ce(N)=745 *110*, ce(O)+ce(P)=160 *53*. Values from 1970An17 are: ce(L1)=9100 *700*, ce(L2)=2590 *180*, ce(L3)=2560 *170*, ce(M1)=2050 *50*, ce(M2)=590 *80*, ce(M3)=570 *120*, ce(N)=800 *100*, ce(O)+ce(P)=200 *50*. Others: 1966Av05, 1962Wa32, 1961Ha23.

$^{149}_{62}Sm_{87}$-3

γ(^{149}Sm) (continued)

E_γ[†]	I_γ[‡a]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[&]	δ[&]	α[b]	Comments
72.983 *10*	0.347[@] *17*	350.036	3/2⁻	277.072	5/2⁻	M1+E2	0.23 *4*	4.36 *9*	%Iγ=0.0165 *8* α(L)exp=0.72 *7*; α(M)exp=0.13 *2* α(K)=3.50 *5*; α(L)=0.67 *6*; α(M)=0.148 *14* α(N)=0.0332 *31*; α(O)=0.0047 *4*; α(P)=0.000221 *4* Relative Iγ=0.38 *4* (1992Ca11), 0.342 *17* (1982Me10), 0.33 *11* (1976Ga10). δ: from ce data.
122.0 *2*	0.007[#] *5*	399.08	(1/2⁻,3/2⁻)	277.072	5/2⁻	[M1,E2]		1.05 *10*	%Iγ=0.00033 *24* α(K)=0.74 *7*; α(L)=0.24 *13*; α(M)=0.055 *30* α(N)=0.012 *7*; α(O)=0.0016 *8*; α(P)=4.1×10⁻⁵ *11*
129.50 *7*	0.010[#] *5*	528.592	3/2⁻	399.08	(1/2⁻,3/2⁻)	[M1,E2]		0.87 *6*	%Iγ=0.00047 *24* α(K)=0.63 *6*; α(L)=0.19 *9*; α(M)=0.043 *22* α(N)=0.010 *5*; α(O)=0.0013 *6*; α(P)=3.5×10⁻⁵ *9*
130.098[c] *35*	0.077[#] *20*	658.62	(≤7/2)	528.592	3/2⁻				%Iγ=0.0037 *10*
178.580 *16*	0.54[@] *3*	528.592	3/2⁻	350.036	3/2⁻	M1+E2	+0.5 *2*	0.325 *6*	%Iγ=0.0257 *14* α(K)exp=0.27 *3*; α(L)exp=0.019 *2*; α(M)exp=0.009 *1* α(K)=0.266 *9*; α(L)=0.046 *4*; α(M)=0.0100 *10* α(N)=0.00226 *22*; α(O)=0.000325 *25*; α(P)=1.63×10⁻⁵ *10* 1982Me10 deduce α(L)exp=0.05, incorrectly. Relative Iγ=0.52 *5* (1992Ca11), 0.571 *25* (1982Me10), 0.45 *1* (1976Ga10); NRM weighted average. δ: from ce data and γγ(θ) assuming δ(328γ)=+0.27 *40* (1980Kr15). (179γ)(328γ)(θ): A_2=+0.114 *36*, A_4=+0.03 *4* (1980Kr15).
208.283 *21*	0.305[@] *25*	558.374	5/2⁻	350.036	3/2⁻	M1+E2	−0.45 *15*	0.210 *4*	%Iγ=0.0145 *12* α(K)exp=0.056 *6*; α(L)exp=0.016 *2* α(K)=0.175 *5*; α(L)=0.0279 *13*; α(M)=0.00606 *33* α(N)=0.00137 *7*; α(O)=0.000199 *7*; α(P)=1.08×10⁻⁵ *5* 1982Me10 give α(K)exp=0.13, α(L)exp=0.04, which cannot be reproduced from their intensity data. Relative Iγ=0.28 *3* (1992Ca11), 0.323 *25* (1982Me10). δ: from γ(θ) in in-beam γ-ray.
251.510 *37*	0.273[@] *25*	528.592	3/2⁻	277.072	5/2⁻	[M1,E2]		0.114 *16*	%Iγ=0.0130 *12* α(K)=0.092 *18*; α(L)=0.0170 *17*; α(M)=0.0037 *5* α(N)=0.00084 *9*; α(O)=0.000119 *7*; α(P)=5.4×10⁻⁶ *16*

$^{149}_{62}Sm_{87}$-4

γ(^{149}Sm) (continued)

E_γ[†]	I_γ[‡a]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[&]	δ[&]	α[b]	Comments
									Relative Iγ=0.26 *5* (1992Ca11), 0.273 *25* (1982Me10), 0.34 *11* (1976Ga10).
254.566 *23*	15.78[@] *20*	277.072	5/2⁻	22.5002	5/2⁻	M1+E2	+0.20 *+8−6*	0.1242 *20*	%Iγ=0.750 *11* α(K)exp=0.097 *8*; α(L)exp=0.0147 *12*; α(M)exp=0.0034 *4* α(K)=0.1052 *19*; α(L)=0.01494 *23*; α(M)=0.00321 *5* α(N)=0.000728 *12*; α(O)=0.0001087 *16*; α(P)=6.63×10^{-6} *14* Relative Iγ=15.8 *2* (1992Ca11), 15.73 *20* (1982Me10), 15.8 *2* (1976Ga10). δ: from γ(θ) in in-beam γ-ray. γ(θ,T) in ^{149}Eu ε decay gives +0.6 *4* (1981KrZS); δ(E2/M1)<0.9 from ce data.
272.21[c] *14*	0.0032[#] *22*	558.374	5/2⁻	285.951	9/2⁻	[E2]		0.0763 *11*	%Iγ=0.00015 *10* α(K)=0.0585 *8*; α(L)=0.01386 *20*; α(M)=0.00310 *4* α(N)=0.000689 *10*; α(O)=9.40×10^{-5} *13*; α(P)=3.09×10^{-6} *4*
277.089 *10*	88.0[@] *4*	277.072	5/2⁻	0.0	7/2⁻	M1+E2	−0.08 *+1−2*	0.0997 *14*	%Iγ=4.18 *4* α(K)exp=0.085 *8*; α(L)exp=0.0123 *12*; α(M)exp=0.0029 *3* α(K)=0.0847 *12*; α(L)=0.01179 *17*; α(M)=0.002530 *35* α(N)=0.000574 *8*; α(O)=8.61×10^{-5} *12*; α(P)=5.36×10^{-6} *8* Relative Iγ=86.9 *5* (2004Mi43), 88.4 *4* (1992Ca11), 88.1 *10* (1982Me10), 88.2 *3* (1976Ga10). Measured Iγ/100 decays=4.13 *3* (2004Mi43), 3.55 *4* (1982Me10). δ: from γ(θ) in in-beam γ-ray. Others: γ(θ,T) in ^{149}Eu ε decay gives +0.036 *18* (1981KrZS); δ(E2/M1)<1.0 from ce data.
281.295 *16*	0.554[@] *25*	558.374	5/2⁻	277.072	5/2⁻	M1+E2	+0.14 *9*	0.0954 *16*	%Iγ=0.0263 *12* α(K)=0.0810 *14*; α(L)=0.01134 *16*; α(M)=0.002433 *35* α(N)=0.000552 *8*; α(O)=8.27×10^{-5} *12*; α(P)=5.11×10^{-6} *10* α(K)exp=0.092 *10* Relative Iγ=0.53 *3* (1992Ca11), 0.571 *25* (1982Me10). δ: from γγ(θ) (1980Kr15). (281γ)(277γ)(θ): A_2=−0.043 *35*, A_4=−0.032 *40* (1980Kr15).
285.95 *1*	0.017[#] *5*	285.951	9/2⁻	0.0	7/2⁻	M1(+E2)	+0.06 *6*	0.0917 *13*	%Iγ=0.00081 *24* α(K)=0.0780 *11*; α(L)=0.01083 *15*; α(M)=0.002323 *33* α(N)=0.000527 *7*; α(O)=7.91×10^{-5} *11*; α(P)=4.93×10^{-6} *7* δ: from γ(θ,T) in ^{149}Pm β⁻ decay.

$^{149}_{62}$Sm$_{87}$-5

γ(^{149}Sm) (continued)

Eγ[†]	Iγ[‡a]	Ei(level)	J^π_i	Ef	J^π_f	Mult.[&]	δ[&]	α[b]	Comments
308.0[c] *1*	0.0025[#] *25*	658.62	(≤7/2)	350.036	3/2⁻				%Iγ=0.00012 *12* Eγ: fitted energy deviates by 0.5 keV.
327.526 *10*	100.0[#] *5*	350.036	3/2⁻	22.5002	5/2⁻	M1+E2	+0.14 *3*	0.0637 *9*	%Iγ=4.75 *5* α(K)exp=0.056 *5*; α(L)exp=0.0083 *8*; α(M)exp=0.0019 *2* α(K)=0.0542 *8*; α(L)=0.00753 *11*; α(M)=0.001614 *23* α(N)=0.000366 *5*; α(O)=5.49×10^{-5} *8*; α(P)=3.41×10^{-6} *5* Relative Iγ=100.0 *6* (2004Mi43), 100 (1992Ca11), 100.0 *10* (1982Me10), 100.0 *4* (1976Ga10). Measured Iγ/100 decays=4.75 *4* (2004Mi43), 4.03 *4* (1982Me10). δ: from γ(θ,T) (1981KrZS). Other: <0.6 from ce data.
350.016 *10*	8.95[@] *14*	350.036	3/2⁻	0.0	7/2⁻	E2		0.0352 *5*	%Iγ=0.425 *8* α(L)exp=0.0048 *5*; α(M)exp=0.0012 *1* α(K)=0.0279 *4*; α(L)=0.00565 *8*; α(M)=0.001252 *18* α(N)=0.000279 *4*; α(O)=3.89×10^{-5} *5*; α(P)=1.539×10^{-6} *22* α(K)(theory)=0.028 is used for normalization of ce data for other transitions. Relative Iγ=8.7 *3* (1992Ca11), 8.91 *10* (1982Me10), 9.6 *2* (1976Ga10); NRM weighted average taken.
376.5[c] *2*	0.0007[#] *5*	399.08	(1/2⁻,3/2⁻)	22.5002	5/2⁻				%Iγ=3.3×10^{-5} *24*
381.7 *2*	0.086[@] *20*	658.62	(≤7/2)	277.072	5/2⁻				%Iγ=0.0041 *10* Relative Iγ=0.094 *20* (1992Ca11), 0.074 *25* (1982Me10).
506.093 *10*	13.58[@] *11*	528.592	3/2⁻	22.5002	5/2⁻	E2+M1	+4.9 *+31−15*	0.0128 *4*	%Iγ=0.645 *8* α(K)exp=0.0115 *11*; α(L)exp=0.00157 *16*; α(M)exp=0.00039 *4* α(K)=0.01051 *34*; α(L)=0.00176 *4*; α(M)=0.000385 *8* α(N)=8.65×10^{-5} *18*; α(O)=1.242×10^{-5} *28*; α(P)=6.09×10^{-7} *23* Relative Iγ=13.60 *8* (1992Ca11), 13.45 *13* (1982Me10), 14.5 *2* (1976Ga10); NRM weighted average. δ: from γ(θ,T) (1981KrZS). Other: >1.8 from ce data.
528.587 *10*	12.73[@] *18*	528.592	3/2⁻	0.0	7/2⁻	E2		0.01108 *16*	%Iγ=0.605 *10*

$^{149}_{62}$Sm$_{87}$-6

$\gamma(^{149}$Sm) (continued)

E_γ[†]	I_γ[‡a]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[&]	δ[&]	α[b]	Comments
									α(K)exp=0.0090 *9*; α(L)exp=0.0013 *2*; α(M)exp=0.00035 *4* α(K)=0.00913 *13*; α(L)=0.001528 *21*; α(M)=0.000334 *5* α(N)=7.49×10^{-5} *10*; α(O)=1.076×10^{-5} *15*; α(P)=5.28×10^{-7} *7* Relative Iγ=12.10 *4* (1992Ca11), 12.73 *13* (1982Me10), 13.0 *2* (1976Ga10); NRM weighted average.
535.897 *12*	1.128[@] *36*	558.374	5/2$^-$	22.5002	5/2$^-$	M1+E2	−0.65 *+23−43*	0.0159 *18*	%Iγ=0.0536 *18* α(K)exp=0.0082 *8*; α(L)exp=0.0014 *3* α(K)=0.0135 *16*; α(L)=0.00191 *15*; α(M)=0.000410 *31* α(N)=9.3×10^{-5} *7*; α(O)=1.38×10^{-5} *12*; α(P)=8.3×10^{-7} *11* Relative Iγ=1.35 *4* (1992Ca11), 1.117 *25* (1982Me10), 1.1 *1* (1976Ga10); NRM weighted average. Mult.: from α(K)exp (1982Me10). δ: from $\gamma(\theta$,T) (1981KrZS). Other: >3 from ce data.
558.372 *10*	1.32[@] *8*	558.374	5/2$^-$	0.0	7/2$^-$	M1+E2	1.2 *+7−4*	0.0124 *13*	%Iγ=0.063 *4* α(K)exp=0.0097 *10*; α(L)exp=0.0016 *2*; α(M)exp=0.00041 *5* α(K)=0.0104 *12*; α(L)=0.00154 *12*; α(M)=0.000333 *24* α(N)=7.5×10^{-5} *6*; α(O)=1.11×10^{-5} *9*; α(P)=6.3×10^{-7} *8* Relative Iγ=1.20 *3* (1992Ca11), 1.464 *35* (1982Me10), 1.3 *1* (1976Ga10). δ: from α(K)exp.
568.27 *10*	0.00060[#] *20*	590.880	9/2$^-$	22.5002	5/2$^-$	E2		0.00919 *13*	%Iγ=2.9×10^{-5} *10* α(K)=0.00761 *11*; α(L)=0.001241 *17*; α(M)=0.000270 *4* α(N)=6.07×10^{-5} *9*; α(O)=8.76×10^{-6} *12*; α(P)=4.42×10^{-7} *6*
590.88 *1*	0.00238[#] *20*	590.880	9/2$^-$	0.0	7/2$^-$	E2+M1	−1.5 *+9−4*	0.0101 *25*	%Iγ=0.000113 *10* α(K)=0.0085 *22*; α(L)=0.00127 *22*; α(M)=0.00027 *5* α(N)=6.2×10^{-5} *11*; α(O)=9.1×10^{-6} *17*; α(P)=5.1×10^{-7} *15* 1982Me10 give α(K)exp=0.0086 and assign M1+E2. But from authors′ intensities evaluators deduce α(K)exp=0.28 which is too high for an M1+E2 assignment. Evaluators suggests that Ice(K)=0.96 *8* (1982Me10) is in error.
613.915 *17*	0.00645[#] *25*	636.421	7/2$^-$	22.5002	5/2$^-$				%Iγ=0.000306 *12* From authors′ intensities, evaluators deduce α(K)exp=0.10 *1*. Evaluators suspect that Ice(K)=0.96 *8* (1982Me10) is in error.

$^{149}_{62}$Sm$_{87}$-7

$\gamma(^{149}$Sm) (continued)

E_γ[†]	I_γ[‡a]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[&]	δ[&]	α[b]	Comments
636.05[c] *10*	0.0074[#]	658.62	(≤7/2)	22.5002	5/2$^-$				%Iγ=3.5×10^{-4}
636.50 *7*	0.00372[#] *25*	636.421	7/2$^-$	0.0	7/2$^-$	M1+E2	−0.30 *+16−18*	0.0114 *5*	%Iγ=0.000177 *12* α(K)=0.0097 *5*; α(L)=0.00132 *5*; α(M)=0.000282 *11* α(N)=6.40×10^{-5} *24*; α(O)=9.6×10^{-6} *4*; α(P)=6.02×10^{-7} *31* α(K)exp=0.058 *12* for doublet. Evaluators suggest that Ice(K)=0.95 *8* (1982Me10) is in error.

† From 1982Me10. In several cases 1982Me10 give uncertainties of less than 10 eV. The evaluators have adopted a lowest uncertainty of 10 eV based on least squares fit to Eγ values in the level scheme.

‡ Relative intensities with respect to 100.0 for 327.5γ. Values in 1982Me10 were given as intensities per 1000 decays. These have been converted to relative values with respect to Iγ(327.5γ)=100 (Iγ/1000=40.3 *4* in 1982Me10) using a multiplicative factor of 2.4814.

From 1982Me10, converted to relative intensity.

@ Weighted average of 1992Ca11, 1982Me10 and 1976Ga10.

& From the Adopted Gammas. Adopted values are based on ce data (1982Me10), unless otherwise noted. For 22.5γ the data are from 2011In01 and 2011In04. Others: 1981Ar17 and 1970An17. For normalization, mult(350γ) was used as pure E2 (1982Me10).

a For absolute intensity per 100 decays, multiply by 0.0475 *4*.

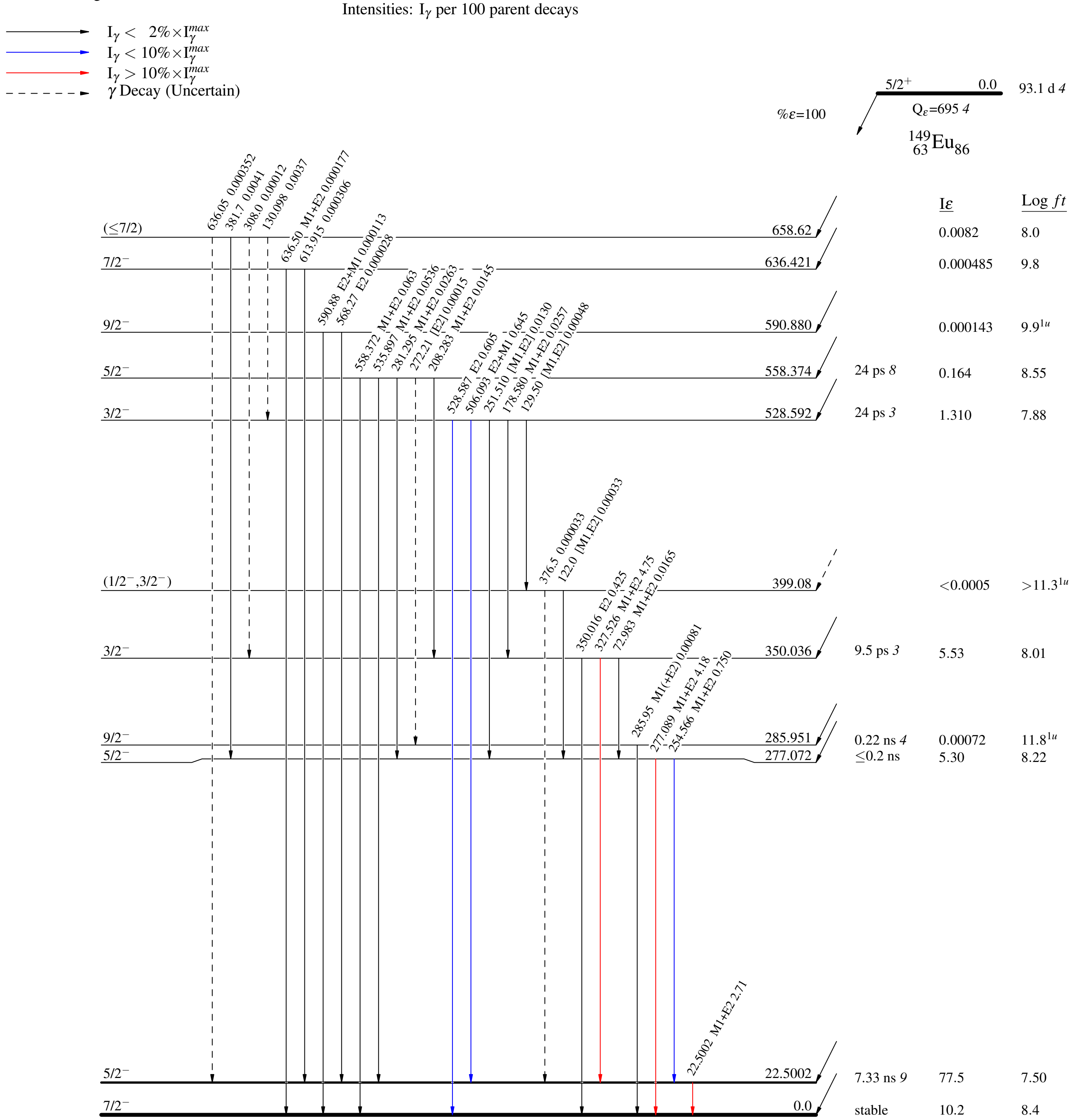
b Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

c Placement of transition in the level scheme is uncertain.

^{149}Eu ε decay (93.1 d) 1982Me10,1992Ca11

Decay Scheme

Intensities: I_γ per 100 parent decays



$^{149}_{62}Sm_{87}$