^{79}Ga β^- decay (2.847 s) 1981Ho24,1977Al17,1975Al11

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 135, 193 (2016)	31-May-2016

Parent: ^{79}Ga: E=0.0; $J^\pi=3/2^{(-)}$; $T_{1/2}$=2.847 s *3*; Q(β^-)=6980 *40*; %β^- decay=100.0

^{79}Ga-J^π,$T_{1/2}$: From ^{79}Ga Adopted Levels.

^{79}Ga-Q(β^-): From 2012Wa38.

Others: 1981Al20, 1977Ru09, 1976Ru01, 1974Gr29, 1972MaWL, 1970OsZZ. All references from the same laboratory. Detailed γ and $\gamma\gamma$ data are from 1980HoZN. Other papers deal with Q(β^-) measurements using β^- and $\beta\gamma$ counting techniques.

1975Al11 measured β^- strength functions and deduced that 43% of β^- emission from ^{79}Ga proceeds to levels above 250 keV, whereas 30% goes to levels above the pairing-gap energy. These values do not agree with those obtained by 1981Ho24.

β^- and $\beta\gamma$ data from 1977Al17.

Additional information 1.

^{79}Ge Levels

E(level)[†]	J^π[‡]	$T_{1/2}$[‡]	Comments
0.0	$(1/2)^-$	18.98 s *3*	
185.95 *4*	$(7/2^+)$	39.0 s *10*	%IT=4 *1*; %β^-=96 *1* From summed I(γ+ce) feeding to this level, isomer population=5.2% *9* in the decay of ^{79}Ga.
390.59 *6*	$(9/2^+)$		
464.73 *3*	$(5/2^-)$	<0.3 ns	$T_{1/2}$: $\gamma\gamma$(t) (1981Ho24).
516.41 *3*	$(3/2^-,5/2^-)$		
607.16 *3*	$(5/2^-)$		
1045.09 *5*			
1087.78 *4*			
1104.40 *4*			
1187.31 *3*			
1473.63 *5*			
1556.38 *4*			
2049.95 *8*			
2070.13 *4*			
2140.32 *4*			
2387.9 *1*			
2487.38 *6*			
2513.58 *4*			
2774.59 *9*			
2779.37 *21*			
2827.26 *10*			
2894.94 *6*			
2998.81 *8*			
3168.02 *12*			
3196.7 *3*			
3205.41 *15*			
3289.81 *10*			
3318.97 *21*			
3352.34 *9*			
3421.08 *6*			
3440.50 *5*			
3783.77 *22*	$(5/2^-)$		
3803.1 *3*			
3831.9 *5*			
3892.56 *21*			
3911.5 *3*			
4056.76 *13*			
4083.7 *3*	$(5/2^-)$		

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^{79}Ga β^- decay (2.847 s) 1981Ho24,1977Al17,1975Al11 (continued)

^{79}Ge Levels (continued)

E(level)†	Comments
4184.3 *3*	
4277.7 *5*	
5740+x	S(n)(^{79}Ge)=5740 *40* (2012Wa38), x<1240, from Q(β^-)(^{79}Ga)-S(n)(^{79}Ge).

† From least-squares fit to Eγ data.
‡ From Adopted Levels.

β^- radiations

E(decay)	E(level)	Iβ^-†	Log *ft*	Comments
(6×10^2# *6*)	5740+x	0.089 *19*		Iβ^-: %β^-n=0.089 *19* (from ^{79}Ga Adopted Levels).
(2.70×10^3 *4*)	4277.7	0.19 *3*	6.05 *8*	av Eβ=1137 *19*
(2.80×10^3 *4*)	4184.3	0.71 *5*	5.54 *4*	av Eβ=1182 *19*
(2.90×10^3 *4*)	4083.7	0.64 *5*	5.65 *5*	av Eβ=1230 *19*
(2.92×10^3 *4*)	4056.76	1.92 *12*	5.19 *4*	av Eβ=1242 *19*
(3.07×10^3 *4*)	3911.5	0.41 *3*	5.95 *4*	av Eβ=1312 *19*
(3.09×10^3 *4*)	3892.56	1.11 *7*	5.53 *4*	av Eβ=1321 *20*
(3.15×10^3 *4*)	3831.9	0.20 *3*	6.31 *7*	av Eβ=1350 *20*
(3.18×10^3 *4*)	3803.1	0.266 *24*	6.20 *5*	av Eβ=1363 *20*
(3.20×10^3 *4*)	3783.77	0.93 *7*	5.67 *4*	av Eβ=1373 *20*
(3.54×10^3 *4*)	3440.50	5.3 *3*	5.11 *4*	av Eβ=1537 *20*
(3.56×10^3 *4*)	3421.08	0.61 *4*	6.06 *4*	av Eβ=1546 *20*
(3.63×10^3 *4*)	3352.34	3.48 *20*	5.34 *4*	av Eβ=1580 *20*
(3.66×10^3 *4*)	3318.97	0.38 *5*	6.32 *6*	av Eβ=1596 *20*
(3.69×10^3 *4*)	3289.81	2.84 *16*	5.46 *4*	av Eβ=1610 *20*
(3.77×10^3 *4*)	3205.41	1.93 *11*	5.67 *4*	av Eβ=1650 *20*
(3.78×10^3 *4*)	3196.7	0.32 *4*	6.46 *6*	av Eβ=1654 *20*
(3.81×10^3 *4*)	3168.02	3.15 *19*	5.48 *4*	av Eβ=1668 *20*
(3.98×10^3 *4*)	2998.81	0.83 *6*	6.14 *4*	av Eβ=1750 *20*
(4.09×10^3 *4*)	2894.94	2.62 *15*	5.69 *4*	av Eβ=1800 *20*
(4.15×10^3 *4*)	2827.26	0.79 *9*	6.24 *6*	av Eβ=1832 *20*
(4.20×10^3 *4*)	2779.37	0.8 *5*	6.3 *3*	av Eβ=1856 *20*
(4.21×10^3 *4*)	2774.59	2.83 *17*	5.71 *4*	av Eβ=1858 *20* E(decay): 3830 *170* from B(2800γ) (1977Al17).
(4.47×10^3 *4*)	2513.58	8.3 *5*	5.36 *4*	av Eβ=1984 *20*
(4.49×10^3 *4*)	2487.38	0.99 *7*	6.30 *4*	av Eβ=1997 *20*
(4.59×10^3 *4*)	2387.9	0.56 *4*	6.59 *4*	av Eβ=2045 *20*
(4.84×10^3 *4*)	2140.32	12.5 *7*	5.34 *3*	av Eβ=2165 *20* E(decay): 4680 *120* from B(2139γ) (1977Al17).
(4.91×10^3 *4*)	2070.13	10.8 *6*	5.43 *3*	av Eβ=2199 *20* E(decay): 4800 *160* from B(1464γ,1605γ) (1977Al17).
(4.93×10^3 *4*)	2049.95	0.44 *4*	6.83 *5*	av Eβ=2208 *20*
(5.42×10^3 *4*)	1556.38	2.9 *4*	6.20 *7*	av Eβ=2448 *20*
(5.51×10^3 *4*)	1473.63	0.25 *15*	7.3 *3*	av Eβ=2488 *20*
(5.79×10^3 *4*)	1187.31	7.8 *7*	5.90 *5*	av Eβ=2627 *20* E(decay): 5440 *170* from B(1187γ) (1977Al17).
(5.88×10^3 *4*)	1104.40	1.92 *13*	6.54 *4*	av Eβ=2667 *20*
(5.89×10^3 *4*)	1087.78	1.00 *7*	6.82 *4*	av Eβ=2675 *20*
(5.93×10^3 *4*)	1045.09	0.40 *9*	7.2 *1*	av Eβ=2696 *20*
(6.37×10^3 *4*)	607.16	3.2 *9*	6.5 *1*	av Eβ=2909 *20*

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^{79}Ga β^- decay (2.847 s) 1981Ho24,1977Al17,1975Al11 (continued)

β^- radiations (continued)

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(6.46×10^3[‡] *4*)	516.41	<1.7	>6.8	av Eβ=2953 *20*
(6.52×10^3[‡] *4*)	464.73	<0.6	>7.2	av Eβ=2978 *20*
(6.59×10^3[‡] *4*)	390.59	<0.4	>7.4	av Eβ=3014 *20*
(6.98×10^3 *4*)	0.0	22 *4*	5.82 *8*	av Eβ=3204 *20* E(decay): 6600 *300* from singles β spectrum.

[†] Absolute intensity per 100 decays.
[‡] Existence of this branch is questionable.
[#] Estimated for a range of levels.

^{79}Ga β^- decay (2.847 s) 1981Ho24,1977Al17,1975Al11 (continued)

$\gamma(^{79}Ge)$

Iγ normalization: From absolute γ-ray intensity measurement (1981Ho24). Feeding to the g.s. should be treated as uncertain since many transitions are as yet unplaced in the level scheme. %β^-n=0.055 (1986Wa17) is used.

E_γ [†]	I_γ [†#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	δ	α [@]	Comments
90.75 *7*	13.2 *11*	607.16	(5/2$^-$)	516.41	(3/2$^-$,5/2$^-$)	M1+E2	0.8 *2*	0.48 *13*	α(K)=0.42 *11*; α(L)=0.054 *15*; α(M)=0.0080 *21*; α(N)=0.00041 *11* Mult.,δ: from α(K)exp=0.041 *11* (1981Ho24).
142.46 *5*	17.9 *12*	607.16	(5/2$^-$)	464.73	(5/2$^-$)	M1+E2	0.9 *8*	0.11 *8*	α(K)=0.09 *7*; α(L)=0.011 *8*; α(M)=0.0016 *12*; α(N)=9.E−5 *7* Mult.,δ: from α(K)exp=0.09 *5* (1981Ho24).
186.02 *7*		185.95	(7/2$^+$)	0.0	(1/2)$^-$	[E3]		0.423	α(K)=0.362 *6*; α(L)=0.0522 *8*; α(M)=0.00774 *11*; α(N)=0.000380 *6* I_γ: 0.6 *1* deduced by evaluator from summed I(γ+ce) feeding at 186 level, total conversion coefficient for 186-keV transition and 4% IT decay branch. This intensity is not given in the data field since the 186-keV transition de-excites an isomeric state in ^{79}Ge whose half-life is ≈13 times longer than that of ^{79}Ga parent, which makes the intensity as time-dependent, based on counting schedule.
204.68 *5*	2.58 *20*	390.59	(9/2$^+$)	185.95	(7/2$^+$)	[M1,E2]		0.032 *20*	α(K)=0.028 *18*; α(L)=0.0031 *20*; α(M)=0.0005 *3*; α(N)=2.8×10^{-5} *17*
278.83 *10*	1.27 *10*	464.73	(5/2$^-$)	185.95	(7/2$^+$)				
421.27 *5*	7.6 *4*	607.16	(5/2$^-$)	185.95	(7/2$^+$)				
437.98 *5*	5.7 *3*	1045.09		607.16	(5/2$^-$)				
464.79 *5*	100 *4*	464.73	(5/2$^-$)	0.0	(1/2)$^-$				
516.41 *7*	89 *6*	516.41	(3/2$^-$,5/2$^-$)	0.0	(1/2)$^-$				
571.35 *5*	1.52 *10*	1087.78		516.41	(3/2$^-$,5/2$^-$)				
580.23[‡] *5*	1.0 *1*	1187.31		607.16	(5/2$^-$)				
580.4[‡] *1*	0.5 *1*	1045.09		464.73	(5/2$^-$)				
607.20 *5*	14.6 *7*	607.16	(5/2$^-$)	0.0	(1/2)$^-$				
670.88 *5*	6.1 *4*	1187.31		516.41	(3/2$^-$,5/2$^-$)				
697.27 *7*	1.42 *10*	1087.78		390.59	(9/2$^+$)				
[x]707.47 *12*	0.80 *8*								
722.55 *5*	2.86 *15*	1187.31		464.73	(5/2$^-$)				
[x]797.27 *7*	0.58 *5*								
[x]802.50 *8*	0.74 *6*								
[x]813.23 *13*	0.62 *6*								
824.84 *6*	1.01 *6*	2894.94		2070.13					
882.65 *8*	0.66 *5*	2070.13		1187.31					
901.76 *5*	2.50 *15*	1087.78		185.95	(7/2$^+$)				
[x]910.12 *10*	0.76 *6*								

$^{79}_{32}Ge_{47}$-4

^{79}Ga β^- decay (2.847 s) 1981Ho24,1977Al17,1975Al11 (continued)

$\gamma(^{79}Ge)$ (continued)

E_γ †	I_γ †#	E_i(level)	J_i^π	E_f	J_f^π
918.39 *5*	4.4 *3*	1104.40		185.95	$(7/2^+)$
949.24 *5*	4.3 *3*	1556.38		607.16	$(5/2^-)$
953.02 *5*	4.9 *3*	2140.32		1187.31	
957.25 *5*	4.4 *3*	2513.58		1556.38	
1008.93 *5*	3.8 *3*	1473.63		464.73	$(5/2^-)$
1025.09 *5*	1.92 *10*	2070.13		1045.09	
1039.97 *5*	9 *1*	1556.38		516.41	$(3/2^-,5/2^-)$
1039.97 *5*	2.0 *5*	2513.58		1473.63	
1052.46 *7*	1.32 *8*	2140.32		1087.78	
1091.66 *5*	19.2 *8*	1556.38		464.73	$(5/2^-)$
1104.38 *5*	5.3 *2*	1104.40		0.0	$(1/2)^-$
x1168.0 *2*	0.82 *7*				
1187.28 *5*	53 *2*	1187.31		0.0	$(1/2)^-$
1211.87 *10*	0.76 *7*	3352.34		2140.32	
x1244.45 *7*	2.39 *15*				
1300.16& *6*	1.12& *8*	2487.38		1187.31	
1300.16& *6*	1.12& *8*	3440.50		2140.32	
1326.18 *7*	3.8 *2*	2513.58		1187.31	
1382.79 *9*	1.75 *13*	2487.38		1104.40	
1462.96 *5*	22.7 *12*	2070.13		607.16	$(5/2^-)$
1533.13 *8*	0.69 *7*	2140.32		607.16	$(5/2^-)$
1553.79 *10*	0.88 *9*	2070.13		516.41	$(3/2^-,5/2^-)$
1585.20 *7*	1.83 *13*	2049.95		464.73	$(5/2^-)$
1605.41 *5*	15.3 *7*	2070.13		464.73	$(5/2^-)$
1623.88 *5*	17.8 *8*	2140.32		516.41	$(3/2^-,5/2^-)$
1639.90 *11*	1.97 *15*	2827.26		1187.31	
x1733.8 *3*	0.94 *10*				
x1741.6 *2*	1.20 *12*				
1816.19 *11*	0.75 *7*	3289.81		1473.63	
1864.68 *5*	2.54 *13*	3421.08		1556.38	
1884.10 *5*	12.1 *6*	3440.50		1556.38	
1906.41 *10*	0.72 *6*	2513.58		607.16	$(5/2^-)$
1923.13 *10*	0.92 *8*	2387.9		464.73	$(5/2^-)$
1953.69 *7*	1.80 *12*	2998.81		1045.09	
1970.78 *16*	1.21 *14*	2487.38		516.41	$(3/2^-,5/2^-)$
1997.09 *10*	16.1 *8*	2513.58		516.41	$(3/2^-,5/2^-)$
2048.73 *10*	7.3 *4*	2513.58		464.73	$(5/2^-)$
2070.00 *10*	4.0 *3*	2070.13		0.0	$(1/2)^-$
2140.20 *10*	28.9 *15*	2140.32		0.0	$(1/2)^-$
2165.5 *2*	4.4 *3*	3352.34		1187.31	
2167.3 *3*	0.5 *2*	2774.59		607.16	$(5/2^-)$
2253.16 *10*	7.8 *4*	3440.50		1187.31	
2258.16 *10*	6.0 *3*	2774.59		516.41	$(3/2^-,5/2^-)$
2287.71 *10*	5.1 *3*	2894.94		607.16	$(5/2^-)$
2310.9 *2*	1.3 *3*	2827.26		516.41	$(3/2^-,5/2^-)$
2314.6 *2*	3.1 *17*	2779.37		464.73	$(5/2^-)$
2387.9 *2*	1.39 *11*	2387.9		0.0	$(1/2)^-$
x2426.5 *2*	1.12 *15*				
2430.0 *2*	4.7 *3*	2894.94		464.73	$(5/2^-)$
x2483.2 *3*	1.18 *20*				
2500.3 *2*	1.61 *15*	4056.76		1556.38	
2534.1 *2*	1.61 *15*	2998.81		464.73	$(5/2^-)$
2560.9 *2*	0.92 *9*	3168.02		607.16	$(5/2^-)$
2598.2 *2*	3.2 *2*	3205.41		607.16	$(5/2^-)$
2682.4 *2*	3.0 *2*	3289.81		607.16	$(5/2^-)$
2703.3 *2*	3.6 *2*	3168.02		464.73	$(5/2^-)$
2731.9 *3*	1.33 *15*	3196.7		464.73	$(5/2^-)$
2740.7 *3*	2.17 *18*	3205.41		464.73	$(5/2^-)$
2774.5 *2*	5.2 *3*	2774.59		0.0	$(1/2)^-$
2802.5 *2*	1.58 *18*	3318.97		516.41	$(3/2^-,5/2^-)$
2825.1 *2*	8.0 *4*	3289.81		464.73	$(5/2^-)$
2836.0 *2*	3.0 *2*	3352.34		516.41	$(3/2^-,5/2^-)$
2869.3 *2*	5.5 *3*	4056.76		1187.31	
2975.5 *3*	0.98 *7*	3440.50		464.73	$(5/2^-)$
x2997.5 *4*	0.71 *7*				
3011.9 *3*	0.83 *7*	4056.76		1045.09	
x3086.5 *6*	0.49 *20*				
3090.3 *5*	0.78 *10*	4277.7		1187.31	
3167.8 *2*	8.5 *5*	3168.02		0.0	$(1/2)^-$
3205.3 *3*	2.60 *15*	3205.41		0.0	$(1/2)^-$
x3244.9 *4*	0.83 *9*				
x3276.1 *6*	0.61 *15*				
3287.0 *4*	0.73 *7*	3803.1		516.41	$(3/2^-,5/2^-)$
x3291.0 *4*	0.52 *5*				
3304.4 *4*	0.67 *7*	3911.5		607.16	$(5/2^-)$
3319.0 *3*	2.06 *18*	3783.77	$(5/2^-)$	464.73	$(5/2^-)$
3352.2 *3*	6.2 *4*	3352.34		0.0	$(1/2)^-$
3367.1 *5*	0.84 *10*	3831.9		464.73	$(5/2^-)$
3375.9 *3*	1.79 *10*	3892.56		516.41	$(3/2^-,5/2^-)$
3428.1 *4*	1.32 *10*	3892.56		464.73	$(5/2^-)$
3446.5 *4*	1.03 *8*	3911.5		464.73	$(5/2^-)$
x3514.4 *4*	1.02 *10*				
x3539.7 *4*	0.54 *5*				
3597.7 *3*	1.80 *15*	3783.77	$(5/2^-)$	185.95	$(7/2^+)$
3619.1 *4*	1.32 *13*	4083.7	$(5/2^-)$	464.73	$(5/2^-)$
3668.4 *4*	2.33 *15*	4184.3		516.41	$(3/2^-,5/2^-)$

$^{79}_{32}Ge_{47}$-5

^{79}Ga β^- decay (2.847 s) 1981Ho24,1977Al17,1975Al11 (continued)

$\gamma(^{79}Ge)$ (continued)

E_γ [†]	I_γ [†#]	E_i(level)	J_i^π	E_f	J_f^π
3802.7 *4*	0.37 *5*	3803.1		0.0	$(1/2)^-$
3892.4 *4*	1.47 *10*	3892.56		0.0	$(1/2)^-$
3897.5 *4*	1.32 *10*	4083.7	$(5/2^-)$	185.95	$(7/2^+)$
4183.6 *4*	0.60 *5*	4184.3		0.0	$(1/2)^-$

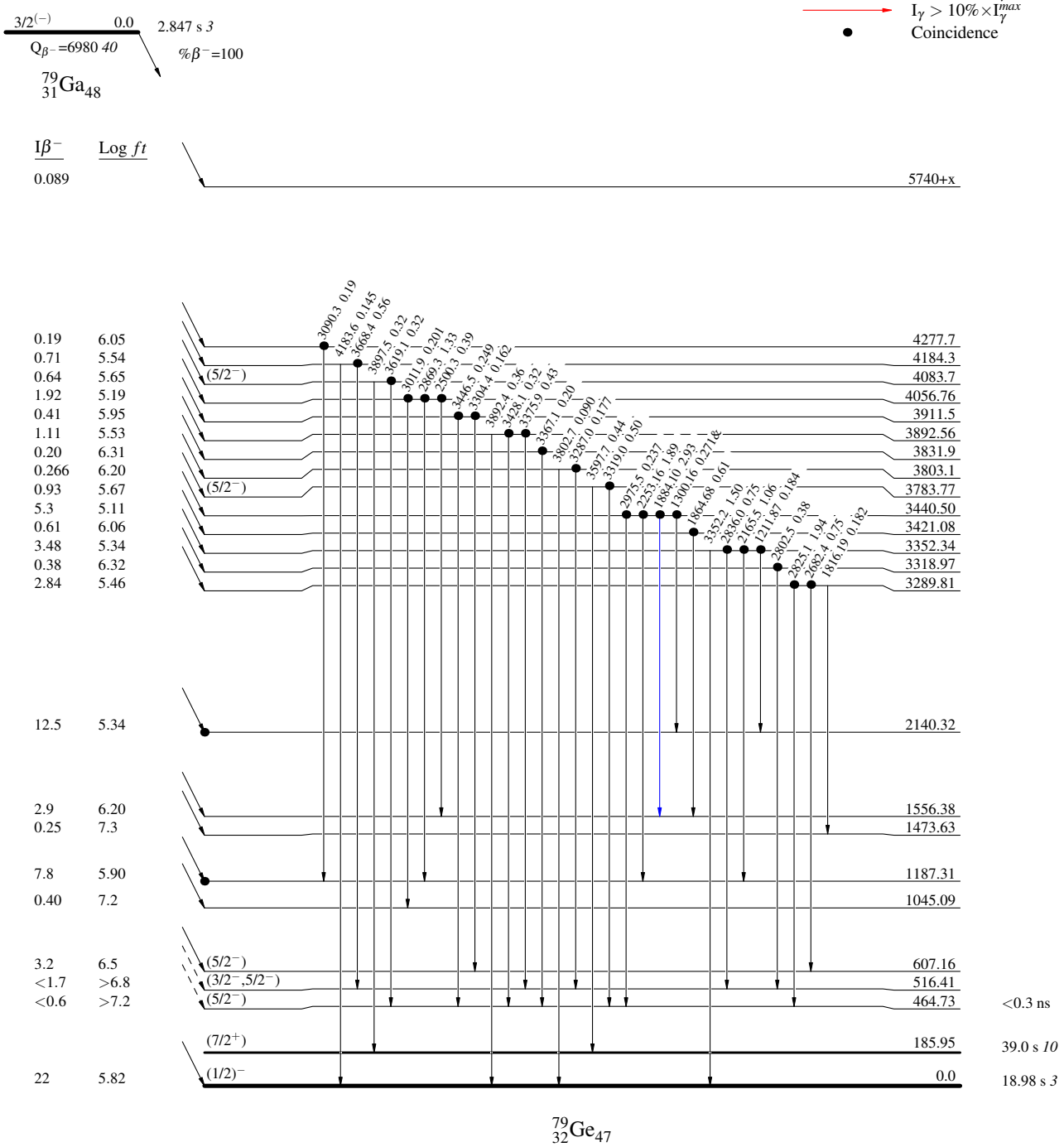
† From 1980HoZN.
‡ 580.4γ and 580.23γ form a doublet.
# For absolute intensity per 100 decays, multiply by 0.242 *10*.
@ Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
& Multiply placed with undivided intensity.
x γ ray not placed in level scheme.

$^{79}_{32}Ge_{47}$-6

^{79}Ga β^- decay (2.847 s) 1981Ho24,1977Al17,1975Al11

Decay Scheme

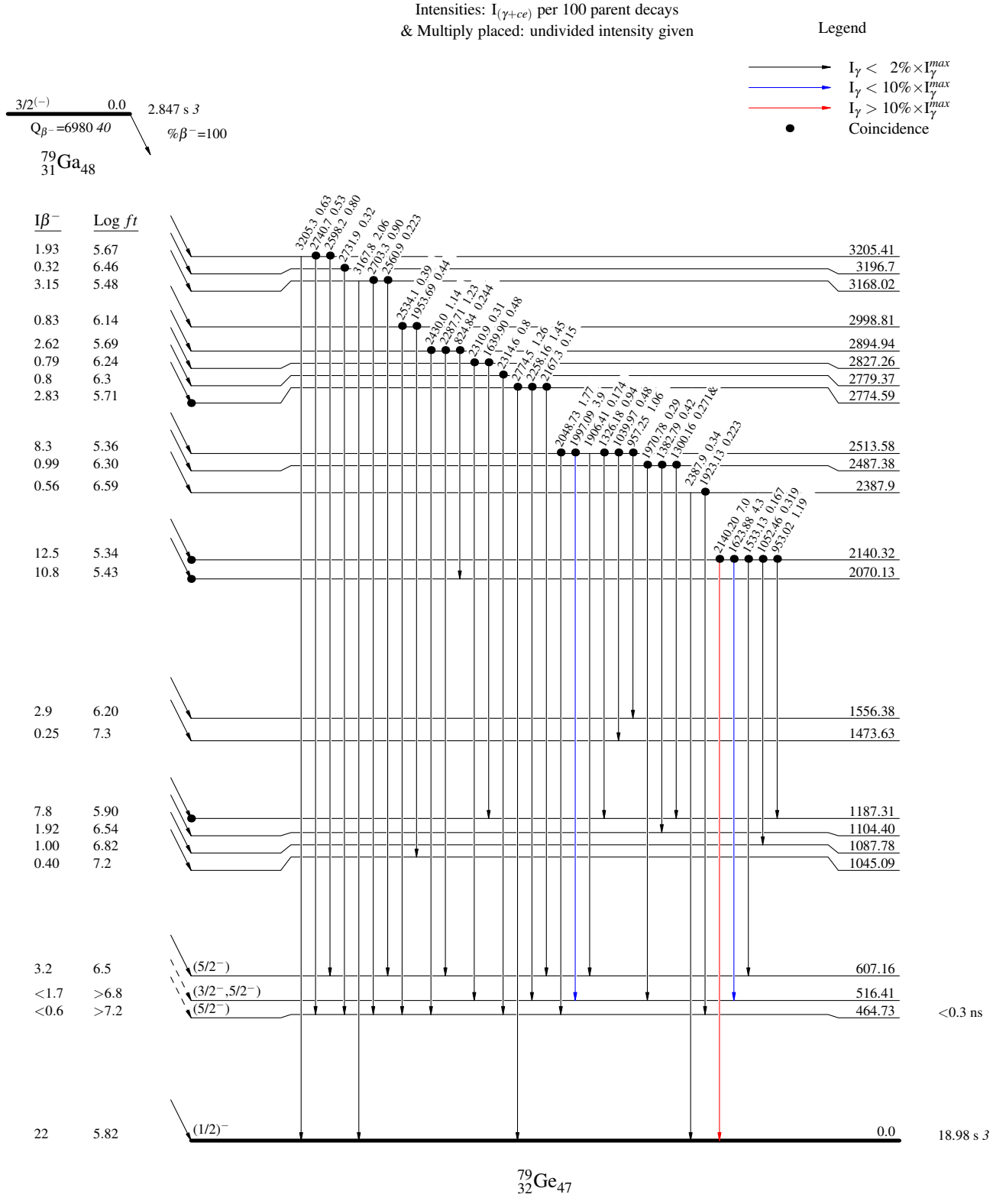
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
& Multiply placed: undivided intensity given



^{79}Ga β^- decay (2.847 s) 1981Ho24,1977Al17,1975Al11

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
& Multiply placed: undivided intensity given



^{79}Ga β^- decay (2.847 s) 1981Ho24,1977Al17,1975Al11

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
& Multiply placed: undivided intensity given