Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 178, 41 (2021).	12-Nov-2021

Q(β^-)=−14780 *SY*; S(n)=15470 *40*; S(p)=5057 *4*; Q(α)=−2566 *4* 2021Wa16
Estimated ΔQ(β^-)=200 (2021Wa16).
Q(ε)=4517 *4*, Q(εp)=609 *4*, S(2n)=28320 *140* (syst), S(2p)=7725 *4* (2021Wa16).
Mass measurements: 2007Cl01, 2007Sc24, 2005Cl08, 2002Li24.
Theory references: consult the NSR database at www.nndc.bnl.gov for 101 primary references, 96 dealing with nuclear structure calculations, and five for half-lives in β and cluster decays.
Additional information 1.
The decay scheme of ^{64}As to ^{64}Ge is not known.

^{64}Ge Levels

Cross Reference (XREF) Flags

A	^{64}As ε decay (69.0 ms)
B	^{65}Se εp decay (34.2 ms)
C	^{12}C(^{54}Fe,2nγ),^{54}Fe(^{12}C,2nγ)
D	^{40}Ca(^{32}S,2$\alpha\gamma$)

E(level)	J$^\pi$	T$_{1/2}$†	XREF	Comments
0.0‡	0$^+$	63.7 s *25*	BCD	%ε+%β^+=100; %εp=? T$_{1/2}$: from 1974Ro16. Other: 70 s *7* (1973Da01).
901.7‡ *3*	2$^+$	2.29 ps *35*	BCD	J$^\pi$: E2 γ to 0$^+$. T$_{1/2}$: from recoil-distance method (2007St16) in ^{12}C(^{65}Ge,^{64}Ge); listed in ^{12}C(^{54}Fe,2nγ),^{54}Fe(^{12}C,2nγ) dataset.
1578.7@ *3*	(2$^+$)	5.5 ps *+28−14*	CD	J$^\pi$: γ to 0$^+$; γ from (4$^+$). T$_{1/2}$: from recoil-distance method (2007St16) in ^{12}C(^{65}Ge,^{64}Ge); listed in ^{12}C(^{54}Fe,2nγ),^{54}Fe(^{12}C,2nγ) dataset.
2052.6‡ *4*	4$^+$		CD	J$^\pi$: ΔJ=2, E2+M3 γ to 2$^+$.
2154.8@ *4*	(4$^+$)		C	J$^\pi$: γ to (2$^+$); γ from (6$^+$).
2669.6 *5*	(4$^+$)		CD	J$^\pi$: ΔJ=1, (E1) γ from (5$^-$) (2003Fa01).
2969.7# *5*	(3$^-$)		CD	J$^\pi$: γ to 2$^+$; ΔJ=2 γ from (5$^-$).
3406.7@ *5*	(6$^+$)		C	J$^\pi$: γ to 4$^+$; possible band assignment.
3465.6‡ *6*	(6$^+$)		C	J$^\pi$: ΔJ=(2) γ to 4$^+$.
3716.9# *7*	(5$^-$)	16.8 ps *+24−20*	CD	E(level): only one level at this energy is proposed by 2003Fa01, the authors do not confirm two levels near this energy as in 1991En01. J$^\pi$: ΔJ=1, (E1+M2) γ to 4$^+$.
4245.7# *6*	(7$^-$)	29.9 ps *+20−17*	CD	J$^\pi$: ΔJ=2, E2 γ to (5$^-$).
5025.5 *8*			C	J$^\pi$: γ to 5$^-$.
5175.2@ *7*	(8$^+$)		C	J$^\pi$: γ to (6$^+$), possible band assignment.
5180.0‡ *8*	(8$^+$)		C	J$^\pi$: γ to (6$^+$); band assignment.
5372.9# *7*	(9$^-$)	≤2.8 ps	CD	J$^\pi$: ΔJ=2, E2 γ to (7$^-$).
6564.4# *8*	(11$^-$)		C	J$^\pi$: γ to (9$^-$); band assignment.
6606.8 *20*	(10)		D	J$^\pi$: ΔJ=1 γ, D+Q γ to (9$^-$). Positive parity proposed by 2003Fa01.
7578.9 *20*	(10)		D	J$^\pi$: ΔJ=1, D+Q γ to (9$^-$). Positive parity proposed by 2003Fa01.
8006.8# *10*	(13$^-$)		C	J$^\pi$: γ to (11$^-$); band assignment.
8426.9 *21*	(12)		D	E(level): 1820γ in ^{12}C(^{54}Fe,2nγ),^{54}Fe(^{12}C,2nγ) (1991En01) is placed from a 6065 level, instead.

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Adopted Levels, Gammas (continued)

^{64}Ge Levels (continued)

E(level)	J$^{\pi}$	XREF	Comments
			J$^{\pi}$: ΔJ=2 γ to (10). Positive parity proposed by 2003Fa01.
9299.9 *23*	(14)	D	J$^{\pi}$: ΔJ=2 γ to (12). Positive parity proposed by 2003Fa01.

† From recoil-distance Doppler-shift (RDDS) method in ^{40}Ca(^{32}S,2$\alpha\gamma$) (2003Fa01), unless otherwise stated.
‡ Band(A): g.s. band.
# Band(B): Band based on 3$^{(-)}$. The 3^{-} level is probably an octupole vibrational state but its collectivity is not established (1991En01). The higher states in this sequence may arise from weak coupling of quasiparticles to the g.s.
@ Band(C): Band based on (2^{+}).

γ(^{64}Ge)

E$_i$(level)	J$_i^{\pi}$	E$_{\gamma}$†	I$_{\gamma}$†	E$_f$	J$_f^{\pi}$	Mult.‡	δ‡	Comments
901.7	2^{+}	901.5 *3*	100	0.0	0^{+}	E2		B(E2)(W.u.)=27 *+5−4*
1578.7	(2^{+})	677.0 *3*	100 *5*	901.7	2^{+}	(M1+E2)		B(M1)(W.u.)=0.0056 *19*; B(E2)(W.u.)=21 *7* Mult.: from $\gamma(\theta)$ in ^{12}C(^{54}Fe,2nγ), and RUL. B(M1)(W.u.) and B(E2)(W.u.) for δ(E2/M1)=1.0.
		1579.0 *4*	16.0 *10*	0.0	0^{+}	[E2]		B(E2)(W.u.)=0.095 *33*
2052.6	4^{+}	1150.8 *4*	100	901.7	2^{+}	E2+M3	+0.06 *1*	
2154.8	(4^{+})	576.2 *3*	100	1578.7	(2^{+})			
2669.6	(4^{+})	1090.9 *4*	100	1578.7	(2^{+})			Mult.: ΔJ=1 γ from ^{12}C(^{54}Fe,2nγ),^{54}Fe(^{12}C,2nγ) is inconsistent with ΔJ=2 from ΔJ^{π}.
2969.7	(3^{-})	2067.8 *5*	100 *8*	901.7	2^{+}			
		2970#	≤5	0.0	0^{+}	[E3]		
3406.7	(6^{+})	1252.1 *4*	100 *5*	2154.8	(4^{+})			
		1353.7 *5*	53 *3*	2052.6	4^{+}			
3465.6	(6^{+})	1413.0 *4*	100	2052.6	4^{+}	(Q)		
3716.9	(5^{-})	747.5 *3*	12.9 *28*	2969.7	(3^{-})	(E2)		B(E2)(W.u.)=0.92 *22* I$_{\gamma}$: unweighted average of 10.0 *9* (^{54}Fe,2nγ) and 15.7 *11* (^{32}S,2$\alpha\gamma$).
		1047.3 *4*	19.8 *31*	2669.6	(4^{+})	(E1)		B(E1)(W.u.)=3.3×10^{-6} *6* I$_{\gamma}$: unweighted average of 16.7 *9* (^{54}Fe,2nγ) and 22.9 *16* (^{32}S,2$\alpha\gamma$).
		1664.8 *4*	100.0 *32*	2052.6	4^{+}	(E1+M2)	−0.09 *3*	I$_{\gamma}$: unweighted average of 100.0 *32* (^{54}Fe,2nγ) and 100.0 *54* (^{32}S,2$\alpha\gamma$). δ: −3.9 *+7−4* or −0.09 *3*, the latter is rejected by 2003Fa01 based on χ^2=0.54 for the former and 0.80 for the latter. In the opinion of the evaluator the difference in the two χ^2 values is not significant enough to reject one value. The study of 1991En01 preferred the lower mixing ratio. See also B(M2) values below which support the lower value of the mixing ratio. B(E1)(W.u.)=4.1×10^{-6} *6*, B(M2)(W.u.)=0.055 *+43−30* for δ(M2/E1)=−0.09 *3*. B(E1)(W.u.)=2.5×10^{-7} *+12−5*, B(M2)(W.u.)=6.4 *+8−10* for δ(M2/E1)=−3.9 *+7−4*, which gives unreasonably high B(M2)(W.u.), as RUL(M2)=1.
4245.7	(7^{-})	528.4 *3*	100	3716.9	(5^{-})	E2		B(E2)(W.u.)=30.2 *20* δ(M3/E2)=+0.07 *8*.

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Adopted Levels, Gammas (continued)

$\gamma(^{64}Ge)$ (continued)

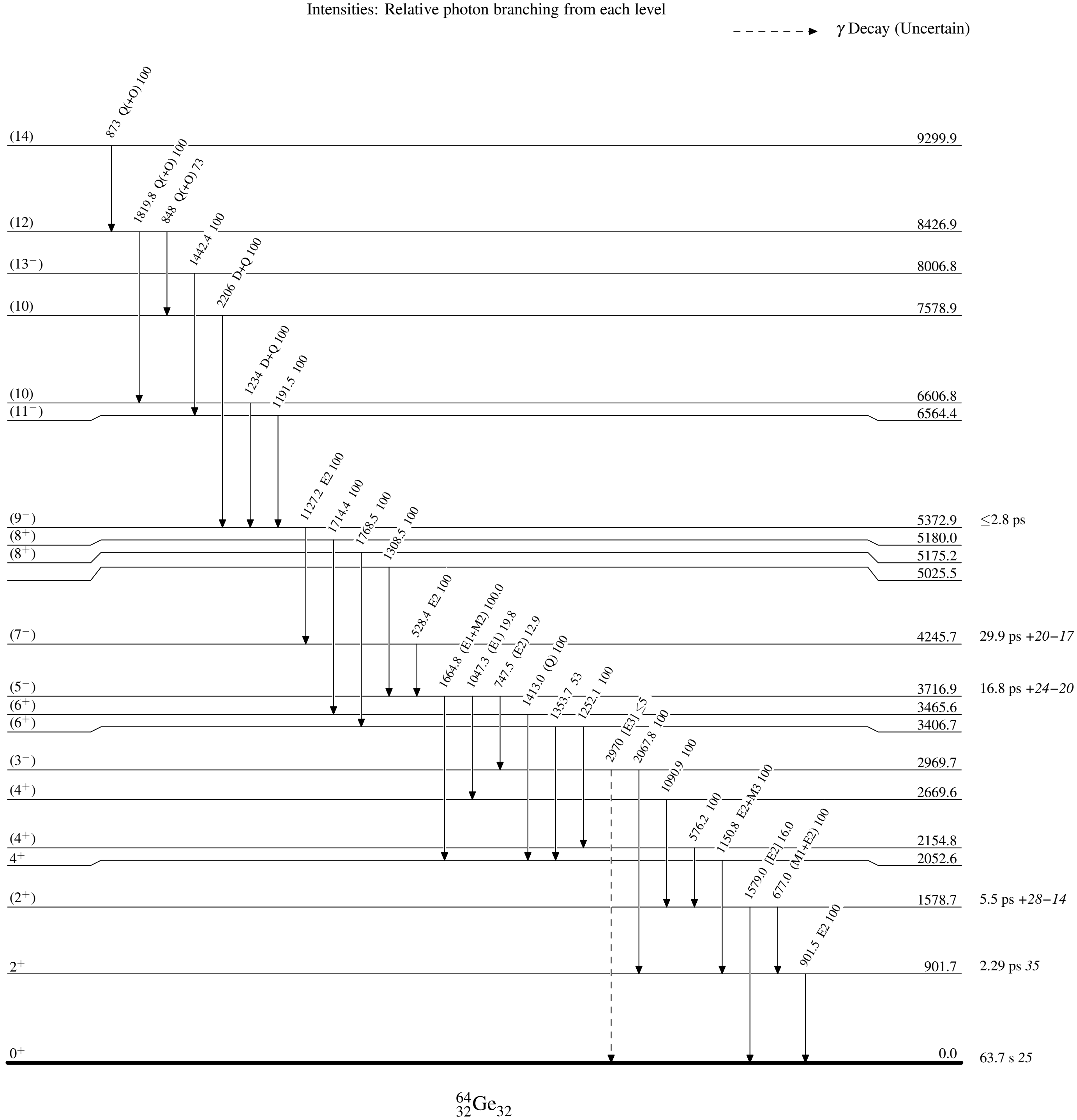
E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult. ‡	δ ‡	Comments
5025.5		1308.5 *5*	100	3716.9	(5⁻)			
5175.2	(8⁺)	1768.5 *5*	100	3406.7	(6⁺)			
5180.0	(8⁺)	1714.4 *5*	100	3465.6	(6⁺)			
5372.9	(9⁻)	1127.2 *4*	100	4245.7	(7⁻)	E2		B(E2)(W.u.)≥7.3 δ(M3/E2)=−0.04 *4*.
6564.4	(11⁻)	1191.5 *4*	100	5372.9	(9⁻)			
6606.8	(10)	1234 *1*	100	5372.9	(9⁻)	D+Q	−3.5 +*34*−*24*	
7578.9	(10)	2206 *1*	100	5372.9	(9⁻)	D+Q	−6 +*6*−*7*	
8006.8	(13⁻)	1442.4 *5*	100	6564.4	(11⁻)			
8426.9	(12)	848 *1*	73 *8*	7578.9	(10)	Q(+O)	+0.08 *5*	
		1819.8 *6*	100 *10*	6606.8	(10)	Q(+O)	−0.06 *7*	
9299.9	(14)	873 *1*	100	8426.9	(12)	Q(+O)	0.00 *7*	

† From $^{12}C(^{54}Fe,2n\gamma)$,$^{54}Fe(^{12}C,2n\gamma)$, when a level is populated in this reaction as well as in $^{40}Ca(^{32}S,2\alpha\gamma)$. Otherwise, the data are from separate reactions. Exception is for 3717 level, where branching ratios from the two reactions are averaged.
‡ From $\gamma\gamma(\theta)$(DCO), $\gamma(\theta)$ and γ(lin pol) data in $^{40}Ca(^{32}S,2\alpha\gamma)$.
# Placement of transition in the level scheme is uncertain.

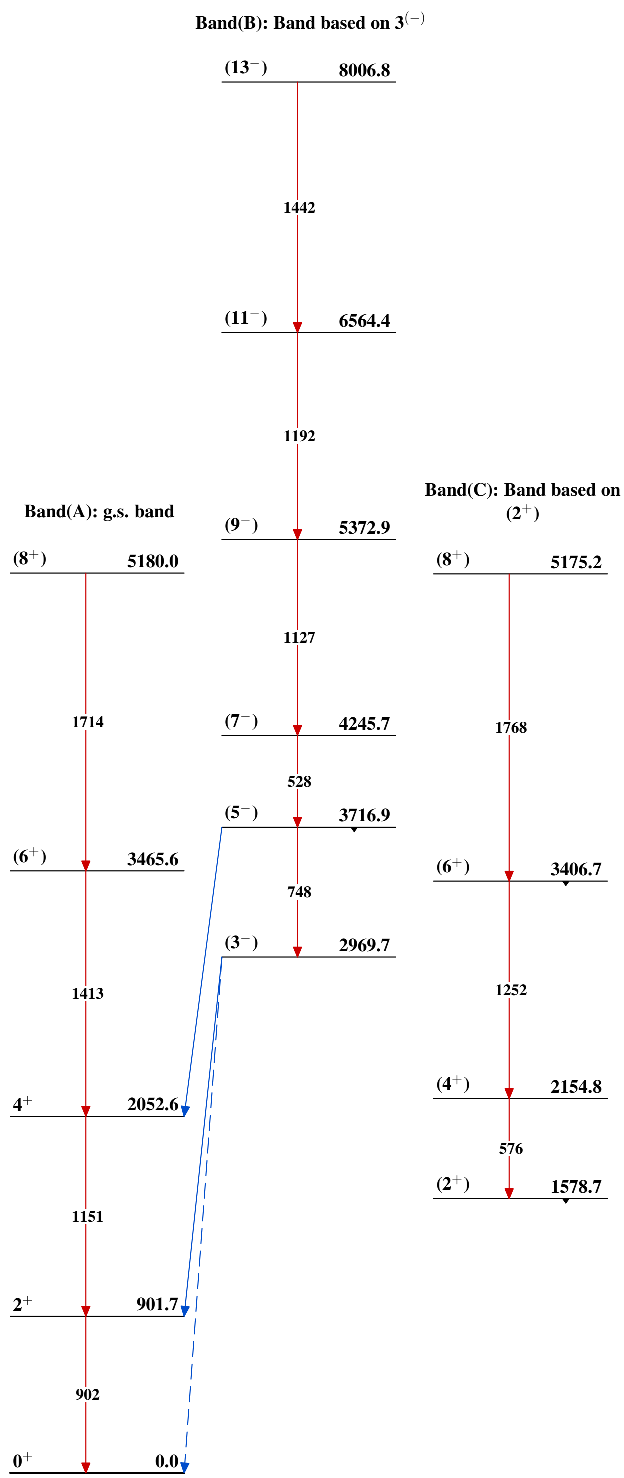
Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



Adopted Levels, Gammas



$^{64}_{32}Ge_{32}$

Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	NDS 111,1093 (2010)	3-Mar-2009

Q(β^-)=−9582 *7*; S(n)=13200 *4*; S(p)=6239 *3*; Q(α)=−2864.4 *25* 2012Wa38
Note: Current evaluation has used the following Q record −1.01E+4 7 *13*.28E3 106260 *30* −2.88×10^{33} 2009AuZZ,2003Au03.
Recent theory, calculations: 2008Mi17, 2007Ah04, 2007Mi19, 2006Ba23, 2005Ha19, 2004Ha43, 2000Su15, 1999Ga16, 1999Sa46.

^{66}Ge Levels

All data are from (HI,xnγ), except where indicated otherwise.

Cross Reference (XREF) Flags

A ^{66}As ε decay
B (HI,xnγ)
C ^{64}Zn(^{3}He,n)

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$[@]	XREF	Comments
0.0[&]	0$^+$	2.26 h *5*	ABC	%ε+%β^+=100 T$_{1/2}$: weighted average of 2.23 h *10* (1969Bo21), and 2.27 h *5* (1970De39). Others: ≈2.5 h (1950Ho26,1965He08).
956.94[&] *8*	2$^+$	3.7 ps *7*	BC	J$^\pi$: J=2 from $\gamma(\theta)$ (1979Wa23,1990HeYS); π=+ from E2 to 0$^+$. T$_{1/2}$: from 1979Wa23.
1693.19[b] *8*	2$^+$	4.5 ps *17*	B	J$^\pi$: J=2 from $\gamma(\theta)$ (1979Wa23,1982So04,1990HeYS); π=+ from E2 to 0$^+$. T$_{1/2}$: from 1979Wa23.
2173.29[&] *10*	4$^+$	<1.4 ps	B	J$^\pi$: J=4 from $\gamma(\theta)$ (1982So04,1990HeYS), DCO (1982So04); π=+ from E2 to 2$^+$. T$_{1/2}$: from 1980Cl01. T$_{1/2}$<2 ps from 1979Wa23.
2495.26[e] *11*	3$^+$		B	J$^\pi$: J=3 from $\gamma(\theta)$ (1990HeYS); 3 supported by $\gamma(\theta)$ and DCO (1982So04).
2725.70[b] *12*	4$^+$		B	J$^\pi$: J=4 from $\gamma(\theta)$ (1982So04,1990HeYS), and DCO (1982So04).
2796.86 *11*	3$^-$		BC	J$^\pi$: J=3 from $\gamma(\theta)$ (1990HeYS).
3022.43[e] *12*	4$^{(+)}$		B	J$^\pi$: J=(3,5) from $\gamma(\theta)$ (1982So04). Configuration=(π f$_{5/2}$)$^{+2}_{4+}$ (1990Bo27).
3242.21? *22*			B	E(level): Not seen in 2003St05.
3639.04 *19*			B	
3654.00[&] *13*	6$^+$	<4.2 ps	B	J$^\pi$: J=6 from $\gamma(\theta)$ (1979Wa23,1990HeYS); π=+ from E2 to 4$^+$. DCO measurements support J=6 (1982So04). T$_{1/2}$: from 1980Cl01.
3683.40 *11*	5$^-$	22 ps *2*	B	J$^\pi$: J=5 from $\gamma(\theta)$, π=− from E1+M2 to 4$^+$ (1980Cl01). $\gamma(\theta)$ (1982So04,1990HeYS) and DCO measurements give J=5 (1982So04). T$_{1/2}$: from 1980Cl01. T$_{1/2}$<2 ps from 1980WaZY.
3736.80[e] *12*	5$^+$	>2 ps	B	J$^\pi$: J=5 from $\gamma(\theta)$ (1982So04,1990HeYS), and DCO (1982So04).
3828.01[d] *14*	5$^-$	0.76 ps *+35−21*	B	J$^\pi$: J=(3,5) from $\gamma(\theta)$ (1982So04); configuration=((π p$_{3/2}$)(π g$_{9/2}$))5$^-$ (1990Bo27).
3980.00 *16*			B	
4080.91?[b] *19*	6$^+$		B	
4204.82[c] *13*	7$^-$	191 ps *9*	B	J$^\pi$: J=7 from $\gamma(\theta)$ (1980Cl01,1990HeYS); π=− from E2 to 5$^-$. Configuration=((ν f$_{5/2}$)(ν g$_{9/2}$))7$^-$ (1990Bo27). T$_{1/2}$: weighted average of 190 ps *10* (1980Cl01) and 204 ps *28* (1979Wa23).
4320.21[d] *14*	6$^{(-)}$		B	
4425.40[e] *14*	6$^{(+)}$		B	

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Adopted Levels, Gammas (continued)

^{66}Ge Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[@]	XREF	Comments
4543.01 *14*	7⁻	60 ps *4*	B	Jπ: Suggested configuration=$((\pi\ f_{5/2})(\pi\ g_{9/2}))7^-$ (1990Bo27). $T_{1/2}$: from 1980Cl01.
4680.01 *22*			B	
4845.62 *16*	7⁻		B	
4920? *50*			B	E(level): reported only in 1990Bo27 in ^{64}Zn(^{12}C,^{10}Be).
5172.01 *18*			B	
5184.22 *14*		0.6 ps *+5−3*	B	$T_{1/2}$: By DSAM from 1988ZhZX.
5307.40[d] *14*	(8⁻)		B	
5358.42[&] *17*	8⁺		B	Jπ: J=8 from $\gamma(\theta)$ (1990HeYS).
5492.33[c] *14*	9⁻	1.94 ps *21*	B	$T_{1/2}$: from 1980Cl01. Other: 1.2 ps *+5−3* (1988ZhZX). Jπ: J=9 from $\gamma(\theta)$ (1990HeYS).
5532.32[b] *15*	8⁺		B	Jπ: J=8 from $\gamma(\theta)$ (1990HeYS) configuration=$(\nu\ g_{9/2})^{+2}_{8+}$ (1990Bo27).
5557.99[e] *17*			B	
5947.32 *14*	9⁻		B	
6033.41 *15*	9⁻		B	Jπ: J=(9,11) from $\gamma(\theta)$ (1990HeYS).
6163.23 *18*			B	
6418.44 *21*	9⁻		B	
6502.11[&] *16*	10⁺	>1.4 ps	B	Jπ: J=10 from $\gamma(\theta)$ (1990HeYS); π=(+) from E2 to 8⁺.
6580.93[b] *15*	10⁽⁺⁾		B	
6635.84[d] *16*	(10⁻)		B	Configuration=$(\pi\ g_{9/2})^{+2}_{8+}$ (1990Bo27).
6948.02[e] *20*			B	
7130.43[c] *16*	11⁻		B	Jπ: J=11 consistent with $\gamma(\theta)$ data (1990HeYS); E2 to 5492-keV (9⁻) level.
7270? *50*			B	E(level): from 1990Bo27 in ^{64}Zn(^{12}C,^{10}Be). Jπ: configuration=$((\pi\ g_{9/2})(\pi\ d_{5/2}))6^+$ (1990Bo27).
7280.88 *22*			B	
7575.41[#a] *18*	(11⁺)		B	
7601.31[d] *19*	11,12		B	
7636.74 *15*	11⁻		B	J=J(5947)+2 from $\gamma(\theta)$ (1990HeYS).
7727.01[#&] *16*	12⁺		B	Jπ: J=12 from $\gamma(\theta)$ (1990HeYS).
7737.41 *16*	11⁻		B	
7847.79 *17*	11⁻		B	
7994.69 *20*	12⁽⁺⁾		B	
8427.18[#a] *18*	13⁽⁺⁾		B	
8543.00[c] *15*	13⁻		B	
8801.31[#&] *18*	14⁺		B	
9404.51[c] *18*	15⁻		B	
9653.0? *3*			B	
9685.71[#a] *22*	15⁽⁺⁾		B	
10473.94[&] *20*	(16⁺)		B	
10691.4[c] *4*	17⁻		B	
11549.1[a] *3*			B	
12660.9[c] *4*	19⁻		B	
13439.2?[a] *5*			B	
15327.9?[c] *11*	21⁻		B	
18080.0?[c] *23*	(23⁻)		B	

[†] From a least-squares fit to Eγ data.
[‡] From DCO, $\gamma(\theta)$, linear polarization measurements in (HI,xnγ), unless indicated otherwise.
[#] The level is also proposed (2003St05) as a member of a deformed 4-qp structure $(\pi g^2_{9/2}\nu g^2_{9/2})$ with staggered M1 transitions.

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Adopted Levels, Gammas (continued)

^{66}Ge Levels (continued)

@ By recoil-distance method (1980Cl01), unless indicated otherwise.
& Band(A): g.s. band.
[a] Band(B): Band based on (11^+).
[b] Band(C): γ band.
[c] Band(D): Band based on 7^-.
[d] Band(E): γ cascade based on 5^-.
[e] Band(F): γ cascade based on 3^+.

Adopted Levels, Gammas (continued)

$\gamma(^{66}\mathrm{Ge})$

All data are from (HI,xnγ), except where indicated otherwise.

E_i(level)	J^π_i	E_γ	I_γ‡	E_f	J^π_f	Mult.	δ	α†	Comments
956.94	2^+	956.9 *1*	100.0	0.0	0^+	E2		0.000393 *6*	α(K)=0.000351 *5*; α(L)=3.61×10^{-5} *5*; α(M)=5.38×10^{-6} *8*; α(N+..)=3.51×10^{-7} *5* α(N)=3.51×10^{-7} *5* B(E2)(W.u.)=12.0 *23*
1693.19	2^+	736.1 *1*	100 *3*	956.94	2^+	M1+E2	−1.15 *26*	0.000691 *25*	α(K)=0.000617 *22*; α(L)=6.36×10^{-5} *24*; α(M)=9.5×10^{-6} *4*; α(N+..)=6.18×10^{-7} *22* α(N)=6.18×10^{-7} *22* B(M1)(W.u.)=0.0041 *19*; B(E2)(W.u.)=16 *7*
		1693.2 *1*	30.2 *8*	0.0	0^+	E2		0.000282 *4*	α(K)=0.0001027 *15*; α(L)=1.042×10^{-5} *15*; α(M)=1.554×10^{-6} *22* α(N)=1.024×10^{-7} *15*; α(IPF)=0.0001672 *24* B(E2)(W.u.)=0.13 *5*
2173.29	4^+	1216.4 *1*	100.0	956.94	2^+	E2		0.000238 *4*	α(K)=0.000203 *3*; α(L)=2.07×10^{-5} *3*; α(M)=3.08×10^{-6} *5*; α(N+..)=1.131×10^{-5} *16* α(N)=2.02×10^{-7} *3*; α(IPF)=1.111×10^{-5} *16* B(E2)(W.u.)>9.6
2495.26	3^+	802.0 *1*	100 *7*	1693.19	2^+	M1+E2	−2.91 *14*	0.000599 *9*	α(K)=0.000535 *8*; α(L)=5.51×10^{-5} *8*; α(M)=8.23×10^{-6} *12*; α(N+..)=5.35×10^{-7} *8* α(N)=5.35×10^{-7} *8*
		1538.4 *2*	3.3 *17*	956.94	2^+	M1+E2		0.000226 *15*	α(K)=0.000121 *4*; α(L)=1.23×10^{-5} *4*; α(M)=1.84×10^{-6} *5*; α(N+..)=9.0×10^{-5} *11* α(N)=1.21×10^{-7} *3*; α(IPF)=9.0×10^{-5} *11*
2725.70	4^+	552.5 *1*	3.4 *6*	2173.29	4^+	M1		0.001111 *16*	α(K)=0.000993 *14*; α(L)=0.0001020 *15*; α(M)=1.524×10^{-5} *22* α(N)=1.003×10^{-6} *14*
		1032.4 *3*	100 *3*	1693.19	2^+	E2		0.000328 *5*	α(K)=0.000293 *5*; α(L)=3.01×10^{-5} *5*; α(M)=4.48×10^{-6} *7*; α(N+..)=2.93×10^{-7} *5* α(N)=2.93×10^{-7} *5*
		1768.8 *2*	54.0 *23*	956.94	2^+	E2		0.000307 *5*	α(K)=9.45×10^{-5} *14*; α(L)=9.57×10^{-6} *14*; α(M)=1.428×10^{-6} *20*; α(N+..)=0.000201 *3* α(N)=9.41×10^{-8} *14*; α(IPF)=0.000201 *3*
2796.86	3^-	1103.6 *1*	<31	1693.19	2^+	E1		0.0001354 *19*	α(K)=0.0001136 *16*; α(L)=1.150×10^{-5} *16*; α(M)=1.715×10^{-6} *24* α(N)=1.126×10^{-7} *16*; α(IPF)=8.47×10^{-6} *12*
		1840.0 *2*	100 *6*	956.94	2^+	E1		0.000569 *8*	α(K)=4.81×10^{-5} *7*; α(L)=4.84×10^{-6} *7*; α(M)=7.22×10^{-7} *11*; α(N+..)=0.000515 *8* α(N)=4.76×10^{-8} *7*; α(IPF)=0.000515 *8*
3022.43	$4^{(+)}$	297.1# *2*		2725.70	4^+				

$^{66}_{32}\mathrm{Ge}_{34}$-4

Adopted Levels, Gammas (continued)

γ(^{66}Ge) (continued)

E_i(level)	J^π_i	E_γ	I_γ‡	E_f	J^π_f	Mult.	δ	α†	Comments
3022.43	$4^{(+)}$	527.1 *2*	3 *15*	2495.26	3^+	(M1)		0.001236 *18*	α(K)=0.001104 *16*; α(L)=0.0001135 *16*; α(M)=1.696×10^{-5} *24* α(N)=1.116×10^{-6} *16*
		849.1 *1*	100 *6*	2173.29	4^+	(M1)		0.000436 *7*	α(K)=0.000390 *6*; α(L)=3.97×10^{-5} *6*; α(M)=5.93×10^{-6} *9*; α(N+..)=3.92×10^{-7} *6* α(N)=3.92×10^{-7} *6*
3242.21?		1549.0# *2*	100.0	1693.19	2^+				
3639.04		1143.8 *3*	≈100.0	2495.26	3^+				
3654.00	6^+	1480.7 *1*	100.0	2173.29	4^+	E2		0.000229 *4*	α(K)=0.0001339 *19*; α(L)=1.361×10^{-5} *19*; α(M)=2.03×10^{-6} *3*; α(N+..)=7.91×10^{-5} *1* α(N)=1.336×10^{-7} *19*; α(IPF)=7.89×10^{-5} *11* B(E2)(W.u.)>1.2
3683.40	5^-	661.0 *2*	≈1.934	3022.43	$4^{(+)}$	(E1)		0.000363 *5*	α(K)=0.000325 *5*; α(L)=3.30×10^{-5} *5*; α(M)=4.93×10^{-6} *7*; α(N+..)=3.21×10^{-7} *5* α(N)=3.21×10^{-7} *5*
		886.5 *1*	18.8 *4*	2796.86	3^-	E2		0.000474 *7*	α(K)=0.000423 *6*; α(L)=4.36×10^{-5} *7*; α(M)=6.50×10^{-6} *10*; α(N+..)=4.23×10^{-7} *6* α(N)=4.23×10^{-7} *6* B(E2)(W.u.)=0.30 *3*
		957.7 *2*	67.5 *8*	2725.70	4^+	E1		0.0001663 *24*	α(K)=0.0001488 *21*; α(L)=1.508×10^{-5} *22*; α(M)=2.25×10^{-6} *4* α(N)=1.475×10^{-7} *21* B(E1)(W.u.)=7.7×10^{-6} *7*
		1510.1 *1*	100.0 *12*	2173.29	4^+	E1+M2	−0.023 *+5−8*	0.000334 *5*	α(K)=6.59×10^{-5} *10*; α(L)=6.65×10^{-6} *10*; α(M)=9.92×10^{-7} *14*; α(N+..)=0.000261 *4* α(N)=6.53×10^{-8} *10*; α(IPF)=0.000261 *4* B(E1)(W.u.)=2.9×10^{-6} *3*; B(M2)(W.u.)=0.0031 *14*
3736.80	5^+	714.4 *2*	53 *4*	3022.43	$4^{(+)}$	(M1)		0.000630 *9*	α(K)=0.000563 *8*; α(L)=5.76×10^{-5} *8*; α(M)=8.61×10^{-6} *12*; α(N+..)=5.67×10^{-7} *8* α(N)=5.67×10^{-7} *8* B(M1)(W.u.)<0.0079
		1011.1 *3*	100 *7*	2725.70	4^+	M1		0.000303 *5*	α(K)=0.000271 *4*; α(L)=2.76×10^{-5} *4*; α(M)=4.12×10^{-6} *6*; α(N+..)=2.72×10^{-7} *4* α(N)=2.72×10^{-7} *4* B(M1)(W.u.)<0.0053
		1241.5 *2*	9 *4*	2495.26	3^+	E2		0.000232 *4*	α(K)=0.000194 *3*; α(L)=1.98×10^{-5} *3*; α(M)=2.95×10^{-6} *5*; α(N+..)=1.581×10^{-5} *23* α(N)=1.93×10^{-7} *3*; α(IPF)=1.561×10^{-5} *23* B(E2)(W.u.)<0.27
		1563.5 *1*	41 *4*	2173.29	4^+	M1+E2		0.000231 *15*	α(K)=0.000118 *3*; α(L)=1.19×10^{-5} *4*; α(M)=1.78×10^{-6} *5*;

From ENSDF

$^{66}_{32}$Ge$_{34}$-5

Adopted Levels, Gammas (continued)

$\gamma(^{66}Ge)$ (continued)

E_i(level)	J^π_i	E_γ	I_γ‡	E_f	J^π_f	Mult.	α†	Comments
								α(N+..)=9.9×10^{-5} *12* α(N)=1.17×10^{-7} *3*; α(IPF)=9.9×10^{-5} *12*
3828.01	5$^-$	805.6 *2*	30 *9*	3022.43	4$^{(+)}$	(E1)	0.000236 *4*	α(K)=0.000211 *3*; α(L)=2.14×10^{-5} *3*; α(M)=3.20×10^{-6} *5*; α(N+..)=2.09×10^{-7} *3* α(N)=2.09×10^{-7} *3* B(E1)(W.u.)=0.00015 *+6−9*
		1031.1 *2*	100 *9*	2796.86	3$^-$	E2	0.000329 *5*	α(K)=0.000294 *5*; α(L)=3.01×10^{-5} *5*; α(M)=4.50×10^{-6} *7*; α(N+..)=2.94×10^{-7} *5* α(N)=2.94×10^{-7} *5* B(E2)(W.u.)=19 *+6−9*
		1654.7 *2*	83 *5*	2173.29	4$^+$	E1	0.000440 *7*	α(K)=5.68×10^{-5} *8*; α(L)=5.72×10^{-6} *8*; α(M)=8.54×10^{-7} *12*; α(N+..)=0.000376 *6* α(N)=5.62×10^{-8} *8*; α(IPF)=0.000376 *6* B(E1)(W.u.)=4.7×10^{-5} *+14−22*
3980.00		957.6 *2*	1.0×10^2 *7*	3022.43	4$^{(+)}$			
		1484.7 *2*		2495.26	3$^+$			
4080.91?	6$^+$	1355.2 *2*	100.0	2725.70	4$^+$	E2	0.000221 *3*	α(K)=0.0001607 *23*; α(L)=1.636×10^{-5} *23*; α(M)=2.44×10^{-6} *4*; α(N+..)=4.15×10^{-5} *6* α(N)=1.604×10^{-7} *23*; α(IPF)=4.13×10^{-5} *6*
4204.82	7$^-$	376.8 *2*	0.364 *12*	3828.01	5$^-$	E2	0.00587 *9*	α(K)=0.00523 *8*; α(L)=0.000557 *8*; α(M)=8.29×10^{-5} *12*; α(N+..)=5.19×10^{-6} *8* α(N)=5.19×10^{-6} *8* B(E2)(W.u.)=0.089 *6*
		521.4 *2*	100.0 *10*	3683.40	5$^-$	E2	0.00207 *3*	α(K)=0.00184 *3*; α(L)=0.000193 *3*; α(M)=2.88×10^{-5} *4*; α(N+..)=1.84×10^{-6} *3* α(N)=1.84×10^{-6} *3* B(E2)(W.u.)=4.81 *24*
		550.8 *2*	0.59 *12*	3654.00	6$^+$	E1	0.000555 *8*	α(K)=0.000497 *7*; α(L)=5.06×10^{-5} *8*; α(M)=7.55×10^{-6} *11*; α(N+..)=4.91×10^{-7} *7* α(N)=4.91×10^{-7} *7* B(E1)(W.u.)=7.6×10^{-8} *16*
4320.21	6$^{(-)}$	115.4 *3*	<4.167	4204.82	7$^-$	D		
		492.2 *3*	100 *9*	3828.01	5$^-$	(M1)	0.001444 *21*	α(K)=0.001290 *19*; α(L)=0.0001328 *19*; α(M)=1.98×10^{-5} *3*; α(N+..)=1.305×10^{-6} α(N)=1.305×10^{-6} *19*
		583.4 *3*	96 *9*	3736.80	5$^+$	(E1)	0.000484 *7*	α(K)=0.000433 *6*; α(L)=4.41×10^{-5} *7*; α(M)=6.58×10^{-6} *10*; α(N+..)=4.28×10^{-7} *6* α(N)=4.28×10^{-7} *6*
		636.8 *2*	79 *5*	3683.40	5$^-$	(M1+E2)	0.00098 *17*	α(K)=0.00087 *15*; α(L)=9.0×10^{-5} *17*; α(M)=1.35×10^{-5} *24*; α(N+..)=8.8×10^{-7} *15* α(N)=8.8×10^{-7} *15*
		681.2 *2*	≈41.67	3639.04				

From ENSDF

γ(^{66}Ge) (continued)

E_i(level)	J_i^π	E_γ	I_γ‡	E_f	J_f^π	Mult.	α†	Comments
4425.40	6$^{(+)}$	445.4 *2*	33 *25*	3980.00				
		597.4 *3*		3828.01	5$^-$	(E1)	0.000458 *7*	α(K)=0.000410 *6*; α(L)=4.17×10^{-5} *6*; α(M)=6.22×10^{-6} *9*; α(N+..)=4.05×10^{-7} *6* α(N)=4.05×10^{-7} *6*
		688.6 *3*	100 *9*	3736.80	5$^+$	(M1+E2)	0.00080 *12*	α(K)=0.00072 *11*; α(L)=7.4×10^{-5} *12*; α(M)=1.10×10^{-5} *17*; α(N+..)=7.2×10^{-7} *11* α(N)=7.2×10^{-7} *11*
		742.0 *2*	7.×10^1 *4*	3683.40	5$^-$	D		
		786.3 *3*	<8.333	3639.04				
4543.01	7$^-$	338.2 *1*	100.0 *22*	4204.82	7$^-$	M1	0.00348 *5*	α(K)=0.00311 *5*; α(L)=0.000323 *5*; α(M)=4.82×10^{-5} *7*; α(N+..)=3.16×10^{-6} *5* α(N)=3.16×10^{-6} *5* B(M1)(W.u.)=0.0074 *6*
		859.6 *2*	28.2 *14*	3683.40	5$^-$	E2	0.000512 *8*	α(K)=0.000457 *7*; α(L)=4.71×10^{-5} *7*; α(M)=7.03×10^{-6} *10*; α(N+..)=4.57×10^{-7} *7* α(N)=4.57×10^{-7} *7* B(E2)(W.u.)=0.279 *24*
4680.01		943.2 *2*	<100.0	3736.80	5$^+$			
4845.62	7$^-$	302.6 *3*	11 *9*	4543.01	7$^-$	M1	0.00455 *7*	α(K)=0.00406 *6*; α(L)=0.000423 *6*; α(M)=6.32×10^{-5} *9*; α(N+..)=4.14×10^{-6} *6* α(N)=4.14×10^{-6} *6*
		640.8 *2*	100 *6*	4204.82	7$^-$	M1	0.000799 *12*	α(K)=0.000714 *10*; α(L)=7.32×10^{-5} *11*; α(M)=1.093×10^{-5} *16*; α(N+..)=7.20×10^{-7} α(N)=7.20×10^{-7} *10*
5172.01		629.0 *2*	<100.0	4543.01	7$^-$			
		746.6 *2*	<100.0	4425.40	6$^{(+)}$			
5184.22		641.2 *2*	61 *7*	4543.01	7$^-$			
		758.8 *2*	<1.563	4425.40	6$^{(+)}$			
		979.4 *1*	100 *4*	4204.82	7$^-$			
5307.40	(8$^-$)	882.0 *2*	<2.500	4425.40	6$^{(+)}$			
		987.2 *1*	100 *5*	4320.21	6$^{(-)}$	(E2)	0.000365 *6*	α(K)=0.000326 *5*; α(L)=3.34×10^{-5} *5*; α(M)=4.99×10^{-6} *7*; α(N+..)=3.26×10^{-7} *5* α(N)=3.26×10^{-7} *5*
		1102.4 *2*	5.0 *25*	4204.82	7$^-$	(M1)	0.000255 *4*	α(K)=0.000228 *4*; α(L)=2.31×10^{-5} *4*; α(M)=3.45×10^{-6} *5*; α(N+..)=8.24×10^{-7} *13* α(N)=2.28×10^{-7} *4*; α(IPF)=5.96×10^{-7} *10*
5358.42	8$^+$	1704.4 *2*	100.0	3654.00	6$^+$	E2	0.000285 *4*	α(K)=0.0001014 *15*; α(L)=1.028×10^{-5} *15*; α(M)=1.535×10^{-6} *22* α(N)=1.011×10^{-7} *15*; α(IPF)=0.0001722 *25*
5492.33	9$^-$	308.1 *3*	0.6 *4*	5184.22				
		949.3 *2*	8.6 *12*	4543.01	7$^-$	E2	0.000401 *6*	α(K)=0.000358 *5*; α(L)=3.68×10^{-5} *6*; α(M)=5.48×10^{-6} *8*;

$^{66}_{32}Ge_{34}$-7

Adopted Levels, Gammas (continued)

γ(^{66}Ge) (continued)

E$_i$(level)	J$^\pi_i$	E$_\gamma$	I$_\gamma$‡	E$_f$	J$^\pi_f$	Mult.	α†	Comments
								α(N+..)=3.58×10^{-7} 5 α(N)=3.58×10^{-7} 5 B(E2)(W.u.)=1.9 4
5492.33	9$^-$	1287.5 1	100.0 14	4204.82	7$^-$	E2	0.000226 4	α(K)=0.000179 3; α(L)=1.83×10^{-5} 3; α(M)=2.72×10^{-6} 4; α(N+..)=2.54×10^{-5} 4 α(N)=1.79×10^{-7} 3; α(IPF)=2.52×10^{-5} 4 B(E2)(W.u.)=4.8 6
5532.32	8$^+$	173.9 2	1.3 9	5358.42	8$^+$	M1	0.0183	α(K)=0.01630 24; α(L)=0.001720 25; α(M)=0.000257 4; α(N+..)=1.673×10^{-5} 24 α(N)=1.673×10^{-5} 24
		852.3 5	<0.4255	4680.01				
		1327.5 2	26.4 13	4204.82	7$^-$	E1	0.000225 4	α(K)=8.17×10^{-5} 12; α(L)=8.25×10^{-6} 12; α(M)=1.231×10^{-6} 18; α(N+..)=0.0001333 α(N)=8.10×10^{-8} 12; α(IPF)=0.0001333 19
		1451.4 2	13 5	4080.91?	6$^+$	E2	0.000225 4	α(K)=0.0001395 20; α(L)=1.418×10^{-5} 20; α(M)=2.12×10^{-6} 3; α(N+..)=6.90×10^{-5} 1 α(N)=1.391×10^{-7} 20; α(IPF)=6.89×10^{-5} 10
		1878.3 2	100 3	3654.00	6$^+$	E2	0.000346 5	α(K)=8.43×10^{-5} 12; α(L)=8.54×10^{-6} 12; α(M)=1.274×10^{-6} 18; α(N+..)=0.000252 4 α(N)=8.40×10^{-8} 12; α(IPF)=0.000252 4
5557.99		373.8 2	40 14	5184.22				
		712.3 2	100 7	4845.62	7$^-$			
		1015.0 2	≈6.667	4543.01	7$^-$			
		1132.6 3	<6.667	4425.40	6$^{(+)}$			
5947.32	9$^-$	455.0 1	63 3	5492.33	9$^-$	(M1)	0.001730 25	α(K)=0.001546 22; α(L)=0.0001593 23; α(M)=2.38×10^{-5} 4; α(N+..)=1.564×10^{-6} α(N)=1.564×10^{-6} 22
		763.1 2	24 3	5184.22				
		1404.3 1	100 6	4543.01	7$^-$	E2	0.000221 3	α(K)=0.0001493 21; α(L)=1.518×10^{-5} 22; α(M)=2.27×10^{-6} 4; α(N+..)=5.45×10^{-5} 8 α(N)=1.489×10^{-7} 21; α(IPF)=5.44×10^{-5} 8
		1742.5 2	6 3	4204.82	7$^-$	E2	0.000298 5	α(K)=9.72×10^{-5} 14; α(L)=9.85×10^{-6} 14; α(M)=1.470×10^{-6} 21; α(N+..)=0.000189 3 α(N)=9.69×10^{-8} 14; α(IPF)=0.000189 3
6033.41	9$^-$	541.1 3	100 3	5492.33	9$^-$	M1	0.001165 17	α(K)=0.001041 15; α(L)=0.0001069 15; α(M)=1.598×10^{-5} 23 α(N)=1.051×10^{-6} 15
		726.0 2	<1.282	5307.40	(8$^-$)	(M1)	0.000608 9	α(K)=0.000544 8; α(L)=5.56×10^{-5} 8; α(M)=8.31×10^{-6} 12; α(N+..)=5.48×10^{-7} 8 α(N)=5.48×10^{-7} 8
		849.2 2	15 6	5184.22				
		1187.8 1	27 4	4845.62	7$^-$	E2	0.000246 4	α(K)=0.000213 3; α(L)=2.18×10^{-5} 3; α(M)=3.25×10^{-6} 5; α(N+..)=7.11×10^{-6} 10 α(N)=2.13×10^{-7} 3; α(IPF)=6.90×10^{-6} 10
6163.23		979.0 2	100 17	5184.22				
		991.2 3	<4.167	5172.01				

$^{66}_{32}$Ge$_{34}$-8

$\gamma(^{66}Ge)$ (continued)

E_i(level)	J^π_i	E_γ	I_γ‡	E_f	J^π_f	Mult.	δ	α†	Comments
6163.23		1620.2	<4.167	4543.01	7^-				
6418.44	9^-	1572.8 *4*	100.0	4845.62	7^-	E2		0.000248 *4*	α(K)=0.0001187 *17*; α(L)=1.205×10^{-5} *17*; α(M)=1.80×10^{-6} *3*; α(N+..)=0.0001151 α(N)=1.183×10^{-7} *17*; α(IPF)=0.0001150 *17*
6502.11	10^+	969.8 *2*	100.0 *16*	5532.32	8^+	E2		0.000381 *6*	α(K)=0.000340 *5*; α(L)=3.49×10^{-5} *5*; α(M)=5.21×10^{-6} *8*; α(N+..)=3.40×10^{-7} *5* α(N)=3.40×10^{-7} *5* B(E2)(W.u.)<14
		1009.8 *2*	27.9 *16*	5492.33	9^-	E1+M2	−0.05 *3*	0.000151 *3*	α(K)=0.000135 *3*; α(L)=1.37×10^{-5} *3*; α(M)=2.05×10^{-6} *4*; α(N+..)=1.34×10^{-7} *3* α(N)=1.34×10^{-7} *3* B(E1)(W.u.)<3.8×10^{-5}; B(M2)(W.u.)<0.95
		1143.7 *2*	81.2 *16*	5358.42	8^+	E2		0.000262 *4*	α(K)=0.000232 *4*; α(L)=2.37×10^{-5} *4*; α(M)=3.54×10^{-6} *5*; α(N+..)=2.90×10^{-6} *5* α(N)=2.32×10^{-7} *4*; α(IPF)=2.67×10^{-6} *4* B(E2)(W.u.)<5.1
6580.93	$10^{(+)}$	1048.6 *2*	100 *5*	5532.32	8^+	(E2)		0.000316 *5*	α(K)=0.000283 *4*; α(L)=2.90×10^{-5} *4*; α(M)=4.32×10^{-6} *6*; α(N+..)=2.83×10^{-7} *4* α(N)=2.83×10^{-7} *4*
		1222.5 *3*	10 *5*	5358.42	8^+				
		1396.7 *1*		5184.22					
6635.84	(10^-)	688.5 *3*	3.8 *19*	5947.32	9^-	(M1)		0.000683 *10*	α(K)=0.000610 *9*; α(L)=6.25×10^{-5} *9*; α(M)=9.33×10^{-6} *13*; α(N+..)=6.15×10^{-7} *9* α(N)=6.15×10^{-7} *9*
		1328.3 *2*	100 *6*	5307.40	(8^-)	(E2)		0.000222 *4*	α(K)=0.0001677 *24*; α(L)=1.708×10^{-5} *24*; α(M)=2.55×10^{-6} *4*; α(N+..)=3.49×10^{-5} *5* α(N)=1.673×10^{-7} *24*; α(IPF)=3.47×10^{-5} *5*
		1451.6 *2*	19 *19*	5184.22					
6948.02		1390.0 *3*	<100.0	5557.99					
7130.43	11^-	1638.0 *2*	100.0	5492.33	9^-	E2		0.000265 *4*	α(K)=0.0001096 *16*; α(L)=1.112×10^{-5} *16*; α(M)=1.659×10^{-6} *24* α(N)=1.092×10^{-7} *16*; α(IPF)=0.0001429 *20*
7280.88		699.9 *2*	100.0	6580.93	$10^{(+)}$				
7575.41	(11^+)	994.5 *2*	32 *4*	6580.93	$10^{(+)}$	(M1)		0.000314 *5*	α(K)=0.000281 *4*; α(L)=2.85×10^{-5} *4*; α(M)=4.26×10^{-6} *6*; α(N+..)=2.82×10^{-7} *4* α(N)=2.82×10^{-7} *4*
		1073.3 *2*	100 *5*	6502.11	10^+	(M1)		0.000268 *4*	α(K)=0.000240 *4*; α(L)=2.44×10^{-5} *4*; α(M)=3.65×10^{-6} *6*; α(N+..)=2.41×10^{-7} *4* α(N)=2.41×10^{-7} *4*
7601.31	11,12	965.3 *2*	100.0	6635.84	(10^-)				

$^{66}_{32}Ge_{34}$-9

$\gamma(^{66}Ge)$ (continued)

E_i(level)	J^π_i	E_γ	I_γ‡	E_f	J^π_f	Mult.	α†	Comments
7636.74	11^-	506.4 2	40 4	7130.43	11^-	M1	0.001353 19	α(K)=0.001209 17; α(L)=0.0001244 18; α(M)=1.86×10^{-5} 3; α(N+..)=1.222×10^{-6} α(N)=1.222×10^{-6} 18
		688.7 2	<1.099	6948.02				
		1000.9 2	9 7	6635.84	(10^-)			
		1218.3 2	6.6 22	6418.44	9^-	E2	0.000237 4	α(K)=0.000202 3; α(L)=2.06×10^{-5} 3; α(M)=3.07×10^{-6} 5; α(N+..)=1.163×10^{-5} 17 α(N)=2.01×10^{-7} 3; α(IPF)=1.143×10^{-5} 17
		1473.5 3	5.5 22	6163.23				
		1603.3 4	7.7 11	6033.41	9^-	E2	0.000256 4	α(K)=0.0001143 16; α(L)=1.160×10^{-5} 17; α(M)=1.731×10^{-6} 25 α(N)=1.139×10^{-7} 16; α(IPF)=0.0001279 18
		1689.4 1	100 4	5947.32	9^-	E2	0.000281 4	α(K)=0.0001032 15; α(L)=1.046×10^{-5} 15; α(M)=1.561×10^{-6} 22 α(N)=1.028×10^{-7} 15; α(IPF)=0.0001655 24
7727.01	12^+	125.6 2	3.5 25	7601.31	11,12	D		
		151.6 3	3.0 15	7575.41	(11^+)	(M1)	0.0261	α(K)=0.0233 4; α(L)=0.00247 4; α(M)=0.000369 6; α(N+..)=2.39×10^{-5} 4 α(N)=2.39×10^{-5} 4
		596.7 2	≤4.5	7130.43	11^-	E1	0.000459 7	α(K)=0.000411 6; α(L)=4.18×10^{-5} 6; α(M)=6.24×10^{-6} 9; α(N+..)=4.06×10^{-7} 6 α(N)=4.06×10^{-7} 6
		1224.9 1	100 4	6502.11	10^+	E2	0.000236 4	α(K)=0.000200 3; α(L)=2.04×10^{-5} 3; α(M)=3.04×10^{-6} 5; α(N+..)=1.276×10^{-5} 18 α(N)=1.99×10^{-7} 3; α(IPF)=1.256×10^{-5} 18
7737.41	11^-	606.4 2	24.5 19	7130.43	11^-	M1+E2	0.00111 21	α(K)=0.00099 19; α(L)=0.000103 20; α(M)=1.5×10^{-5} 3; α(N+..)=9.9×10^{-7} 18 α(N)=9.9×10^{-7} 18
		789.4 3	<1.887	6948.02				
		1574.3 4	15 6	6163.23				
		1704.1 2	100 6	6033.41	9^-	E2	0.000285 4	α(K)=0.0001015 15; α(L)=1.029×10^{-5} 15; α(M)=1.535×10^{-6} 22 α(N)=1.011×10^{-7} 15; α(IPF)=0.0001720 24
		2245.1 2	8 4	5492.33	9^-	E2	0.000498 7	α(K)=6.10×10^{-5} 9; α(L)=6.16×10^{-6} 9; α(M)=9.19×10^{-7} 13; α(N+..)=0.000430 6 α(N)=6.07×10^{-8} 9; α(IPF)=0.000430 6
7847.79	11^-	717.7 3	25 5	7130.43	11^-	M1	0.000624 9	α(K)=0.000558 8; α(L)=5.70×10^{-5} 8; α(M)=8.52×10^{-6} 12; α(N+..)=5.62×10^{-7} 8 α(N)=5.62×10^{-7} 8
		1429.3 3	100 9	6418.44	9^-	E2	0.000223 4	α(K)=0.0001439 21; α(L)=1.464×10^{-5} 21; α(M)=2.18×10^{-6} 3; α(N+..)=6.19×10^{-5} 9 α(N)=1.436×10^{-7} 21; α(IPF)=6.18×10^{-5} 9
		1684.5 2	13 17	6163.23				
		1814.3 2	25 5	6033.41	9^-	E2	0.000323 5	α(K)=9.00×10^{-5} 13; α(L)=9.12×10^{-6} 13; α(M)=1.361×10^{-6} 19;

$\gamma(^{66}Ge)$ (continued)

E_i(level)	J_i^π	E_γ	I_γ‡	E_f	J_f^π	Mult.	α†	Comments
								α(N+..)=0.000222 *4* α(N)=8.97×10^{-8} *13*; α(IPF)=0.000222 *4*
7847.79	11^-	2355.4 *3*	13 *9*	5492.33	9^-	E2	0.000546 *8*	α(K)=5.61×10^{-5} *8*; α(L)=5.66×10^{-6} *8*; α(M)=8.45×10^{-7} *12*; α(N+..)=0.000484 *7* α(N)=5.58×10^{-8} *8*; α(IPF)=0.000484 *7*
7994.69	$12^{(+)}$	1492.6 *5*	100.0	6502.11	10^+	(E2)	0.000231 *4*	α(K)=0.0001318 *19*; α(L)=1.339×10^{-5} *19*; α(M)=2.00×10^{-6} *3*; α(N+..)=8.34×10^{-5} *1* α(N)=1.314×10^{-7} *19*; α(IPF)=8.32×10^{-5} *12*
8427.18	$13^{(+)}$	432.5 *2*	25 *4*	7994.69	$12^{(+)}$	(M1)	0.00195 *3*	α(K)=0.001738 *25*; α(L)=0.000179 *3*; α(M)=2.68×10^{-5} *4*; α(N+..)=1.761×10^{-6} *25* α(N)=1.761×10^{-6} *25*
		700.2 *2*	64 *4*	7727.01	12^+	M1	0.000658 *10*	α(K)=0.000588 *9*; α(L)=6.02×10^{-5} *9*; α(M)=8.99×10^{-6} *13*; α(N+..)=5.93×10^{-7} *9* α(N)=5.93×10^{-7} *9*
		825.8 *2*	25.5 *19*	7601.31	11,12			
		851.8 *2*	100 *4*	7575.41	(11^+)	(E2)	0.000524 *8*	α(K)=0.000468 *7*; α(L)=4.82×10^{-5} *7*; α(M)=7.19×10^{-6} *10*; α(N+..)=4.68×10^{-7} *7* α(N)=4.68×10^{-7} *7*
		1146.2 *3*	3.6 *19*	7280.88				
8543.00	13^-	548.3 *2*	3.9 *7*	7994.69	$12^{(+)}$	(E1)	0.000561 *8*	α(K)=0.000502 *7*; α(L)=5.12×10^{-5} *8*; α(M)=7.63×10^{-6} *11*; α(N+..)=4.96×10^{-7} *7* α(N)=4.96×10^{-7} *7*
		695.3 *3*	81.8 *13*	7847.79	11^-	E2	0.000895 *13*	α(K)=0.000799 *12*; α(L)=8.29×10^{-5} *12*; α(M)=1.236×10^{-5} *18*; α(N+..)=7.98×10^{-7} α(N)=7.98×10^{-7} *12*
		805.5 *1*	22.7 *20*	7737.41	11^-	E2	0.000605 *9*	α(K)=0.000540 *8*; α(L)=5.57×10^{-5} *8*; α(M)=8.31×10^{-6} *12*; α(N+..)=5.39×10^{-7} *8* α(N)=5.39×10^{-7} *8*
		816.0 *2*	3.9 *7*	7727.01	12^+	E1	0.000230 *4*	α(K)=0.000206 *3*; α(L)=2.09×10^{-5} *3*; α(M)=3.11×10^{-6} *5*; α(N+..)=2.04×10^{-7} *3* α(N)=2.04×10^{-7} *3*
		906.3 *1*	100.0 *20*	7636.74	11^-	E2	0.000449 *7*	α(K)=0.000401 *6*; α(L)=4.12×10^{-5} *6*; α(M)=6.15×10^{-6} *9*; α(N+..)=4.00×10^{-7} *6* α(N)=4.00×10^{-7} *6*
		1412.7 *2*	38.3 *20*	7130.43	11^-	E2	0.000222 *4*	α(K)=0.0001474 *21*; α(L)=1.500×10^{-5} *21*; α(M)=2.24×10^{-6} *4*; α(N+..)=5.69×10^{-5} *8* α(N)=1.471×10^{-7} *21*; α(IPF)=5.68×10^{-5} *8*
8801.31	14^+	1074.3 *1*	100.0	7727.01	12^+	E2	0.000299 *5*	α(K)=0.000268 *4*; α(L)=2.74×10^{-5} *4*; α(M)=4.09×10^{-6} *6*; α(N+..)=2.67×10^{-7} *4* α(N)=2.67×10^{-7} *4*
9404.51	15^-	603.2 *2*	12.2 *4*	8801.31	14^+	E1	0.000448 *7*	α(K)=0.000401 *6*; α(L)=4.08×10^{-5} *6*; α(M)=6.08×10^{-6} *9*; α(N+..)=3.96×10^{-7} *6* α(N)=3.96×10^{-7} *6*

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$\gamma(^{66}Ge)$ (continued)

E_i(level)	J^π_i	E_γ	I_γ[‡]	E_f	J^π_f	Mult.	α[†]	Comments
9404.51	15^-	861.5 *1*	100.0 *12*	8543.00	13^-	E2	0.000509 *8*	α(K)=0.000455 *7*; α(L)=4.68×10^{-5} *7*; α(M)=6.99×10^{-6} *10*; α(N+..)=4.54×10^{-7} *7* α(N)=4.54×10^{-7} *7*
9653.0?		851.7[#] *4*	<100.0	8801.31	14^+			
		1225.8[#] *2*	≈100.0	8427.18	$13^{(+)}$			
9685.71	$15^{(+)}$	884.4 *2*	30 *6*	8801.31	14^+	(M1)	0.000400 *6*	α(K)=0.000358 *5*; α(L)=3.65×10^{-5} *6*; α(M)=5.45×10^{-6} *8*; α(N+..)=3.59×10^{-7} *5* α(N)=3.59×10^{-7} *5*
		1258.5 *2*	100 *6*	8427.18	$13^{(+)}$	(E2)	0.000229 *4*	α(K)=0.000188 *3*; α(L)=1.92×10^{-5} *3*; α(M)=2.86×10^{-6} *4*; α(N+..)=1.92×10^{-5} *3* α(N)=1.88×10^{-7} *3*; α(IPF)=1.90×10^{-5} *3*
10473.94	(16^+)	1672.6 *1*	100.0	8801.31	14^+	E2	0.000276 *4*	α(K)=0.0001052 *15*; α(L)=1.067×10^{-5} *15*; α(M)=1.592×10^{-6} *23* α(N)=1.048×10^{-7} *15*; α(IPF)=0.0001581 *23*
10691.4	17^-	1286.9 *3*	100.0	9404.51	15^-	E2	0.000226 *4*	α(K)=0.000179 *3*; α(L)=1.83×10^{-5} *3*; α(M)=2.73×10^{-6} *4*; α(N+..)=2.53×10^{-5} *4* α(N)=1.79×10^{-7} *3*; α(IPF)=2.51×10^{-5} *4*
11549.1		1863.4 *2*	100.0	9685.71	$15^{(+)}$			
12660.9	19^-	1969.4 *2*	100.0	10691.4	17^-	E2	0.000382 *6*	α(K)=7.72×10^{-5} *11*; α(L)=7.82×10^{-6} *11*; α(M)=1.166×10^{-6} *17*; α(N+..)=0.000296 *5* α(N)=7.69×10^{-8} *11*; α(IPF)=0.000295 *5*
13439.2?		1890.0 *4*	100.0	11549.1				
15327.9?	21^-	2667 *1*	100.0	12660.9	19^-	E2	0.000681 *10*	α(K)=4.53×10^{-5} *7*; α(L)=4.57×10^{-6} *7*; α(M)=6.82×10^{-7} *10*; α(N+..)=0.000631 *9* α(N)=4.51×10^{-8} *7*; α(IPF)=0.000631 *9*
18080.0?	(23^-)	2752 *2*	100.0	15327.9?	21^-	(E2)	0.000718 *10*	α(K)=4.30×10^{-5} *6*; α(L)=4.33×10^{-6} *6*; α(M)=6.47×10^{-7} *9*; α(N+..)=0.000670 *10* α(N)=4.28×10^{-8} *6*; α(IPF)=0.000670 *10*

† Additional information 1.
‡ Relative branching from each level is given.
# Placement of transition in the level scheme is uncertain.

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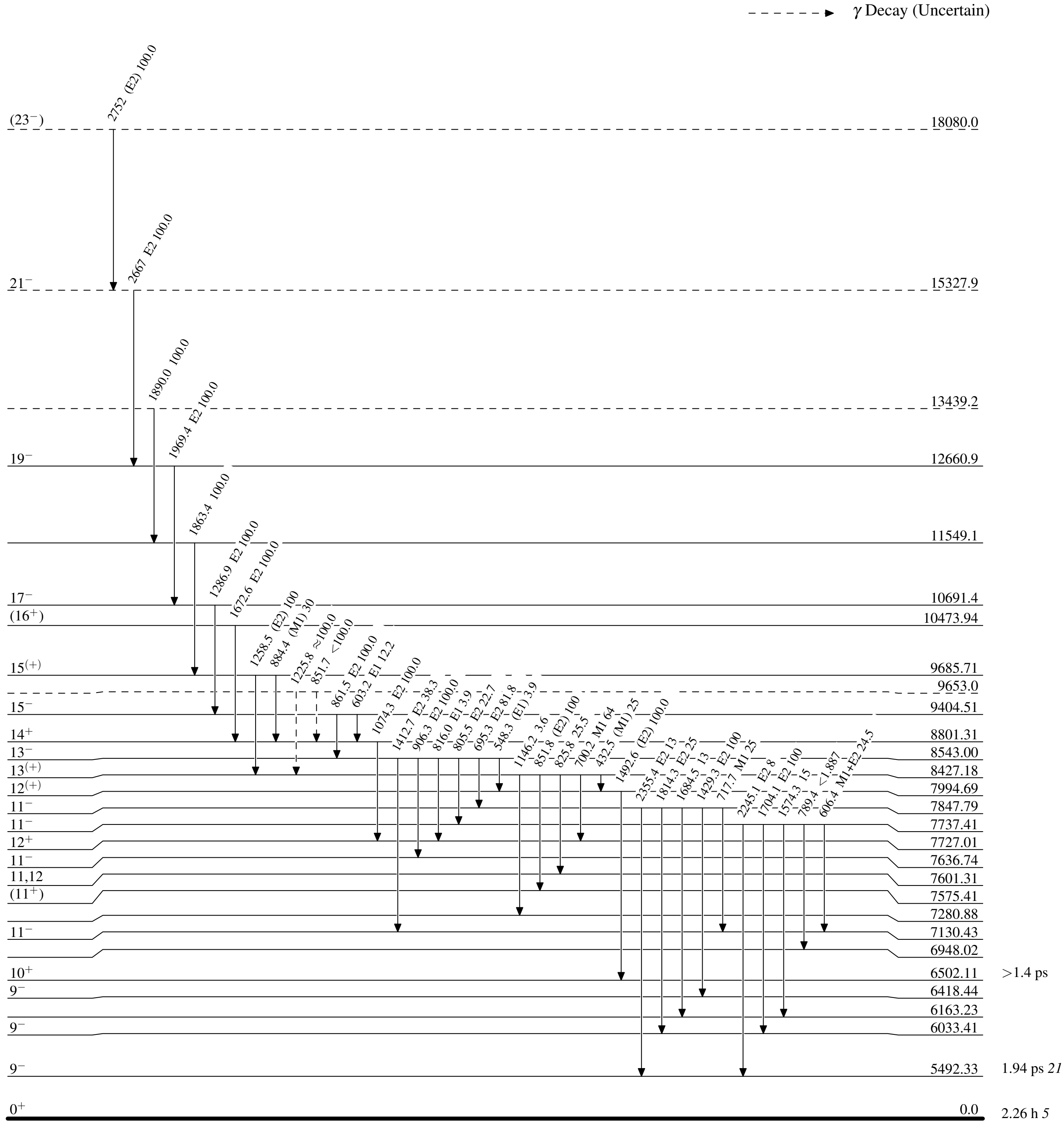
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

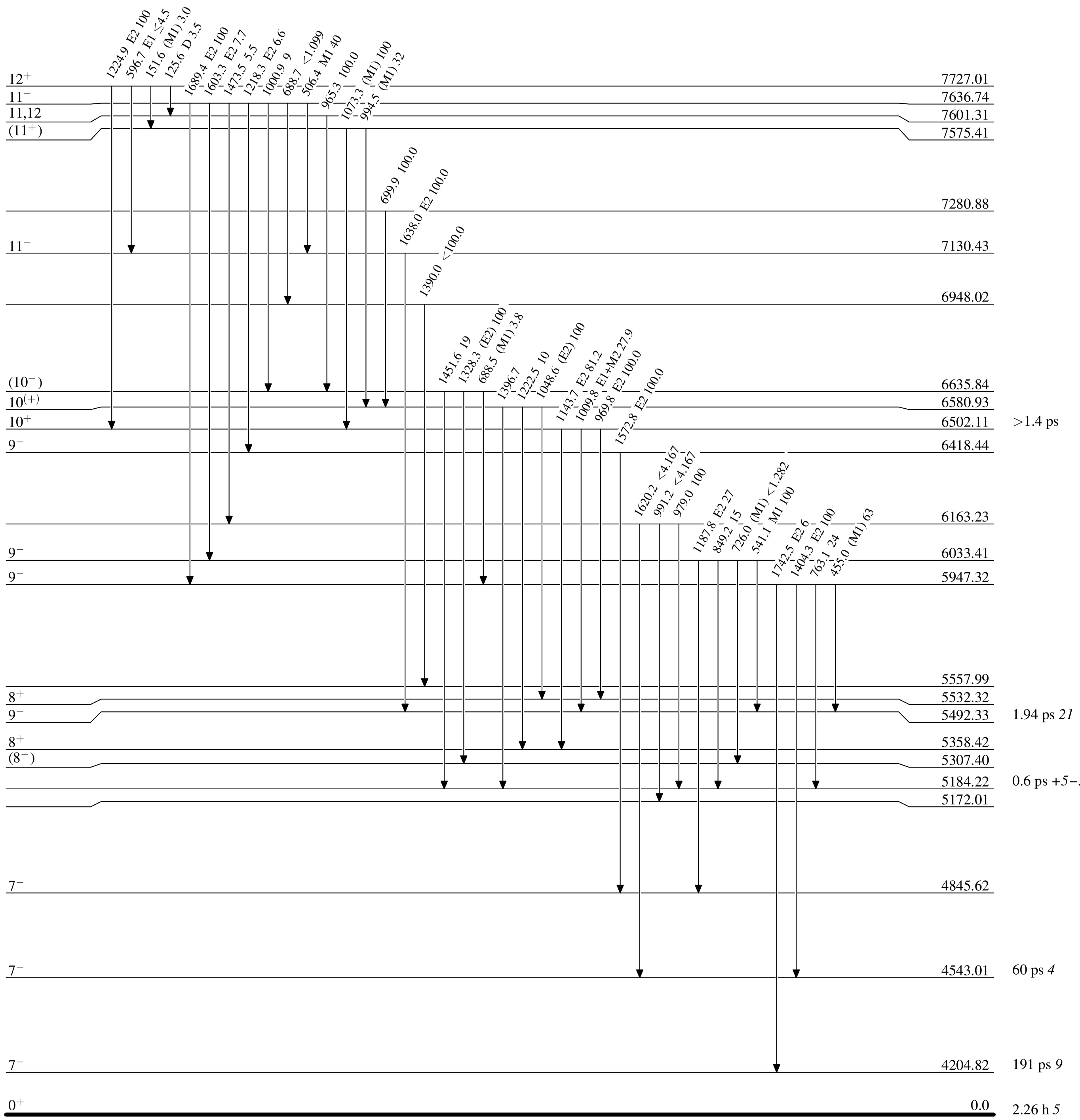


$^{66}_{32}Ge_{34}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



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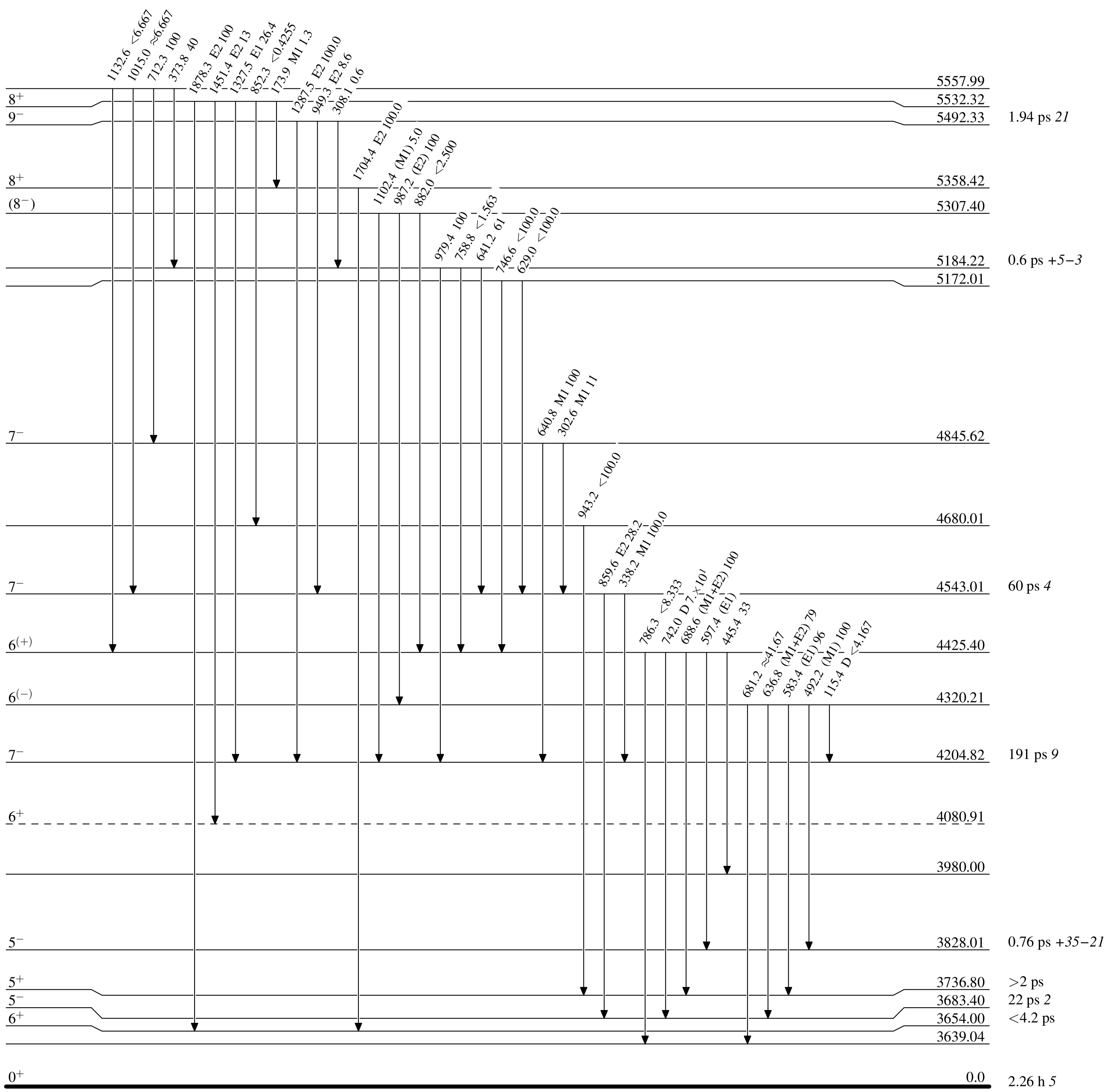
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



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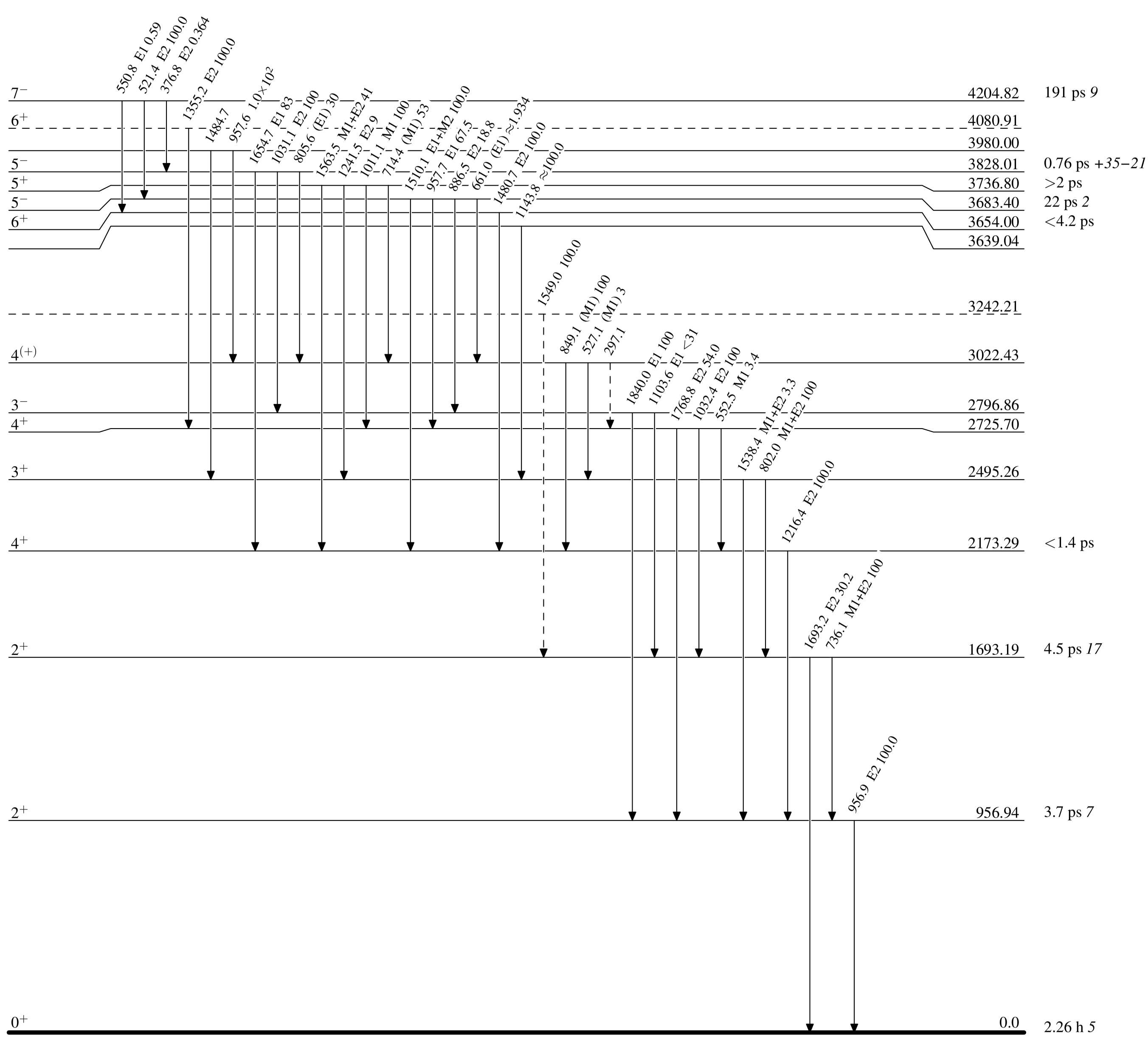
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



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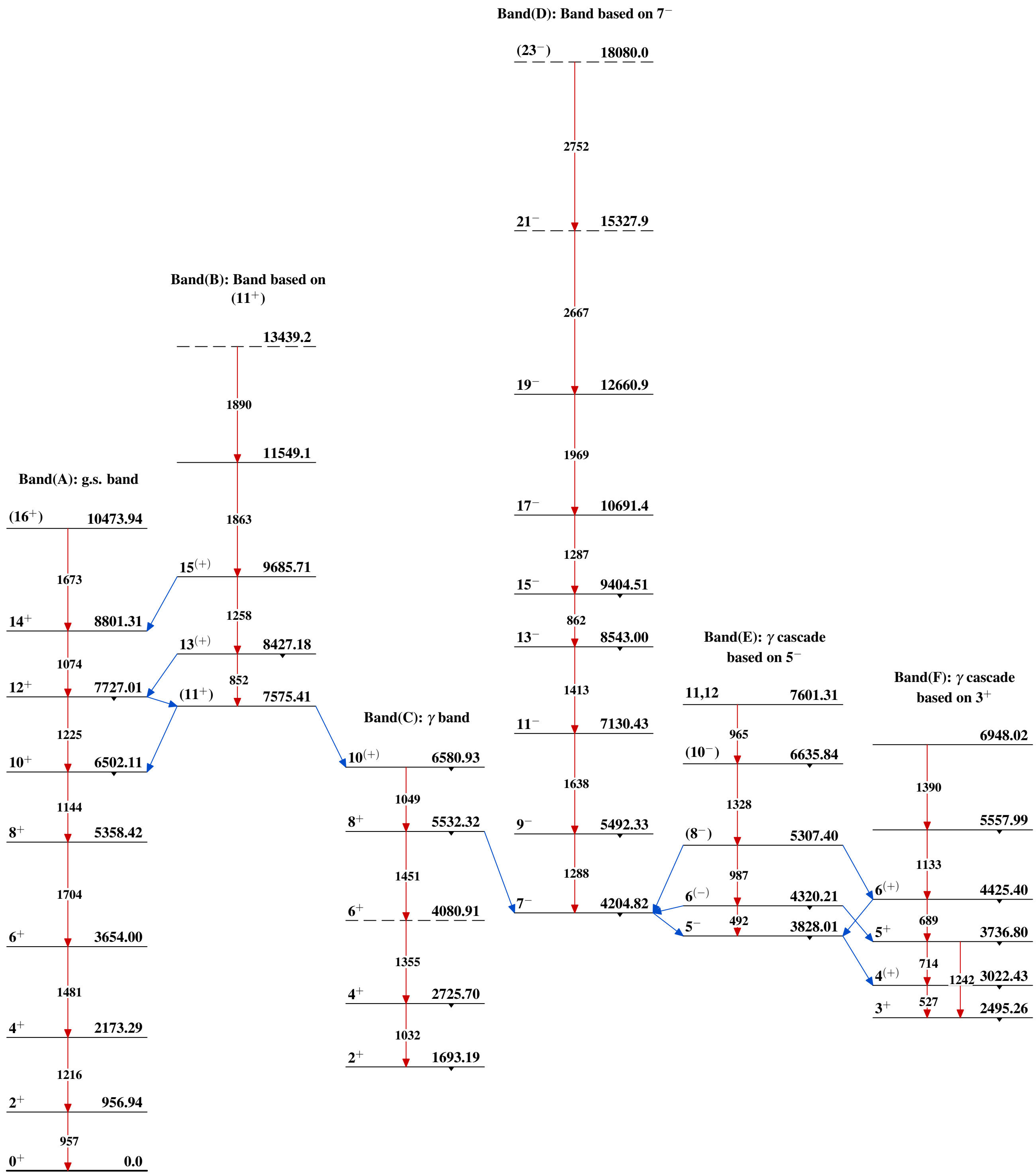
Adopted Levels, Gammas



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Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	E. A. Mccutchan	NDS 113,1735 (2012)	1-Mar-2012

Q(β^-)=−8084 *3*; S(n)=12392 *5*; S(p)=7388.9 *23*; Q(α)=−3399.9 *20* 2012Wa38
Note: Current evaluation has used the following Q record −8084 3 *12392 5 7388.9 23* −3400.0 *20* 2011AuZZ.
S(2n)=21514 *3*, S(2p)=12657.7 *21* (2011AuZZ).
α: Additional information 1.

^{68}Ge Levels

Cross Reference (XREF) Flags

A	^{68}As ε decay (151.6 s)	E	^{12}C(^{64}Zn,^{8}Beγ)
B	^{69}Se εp decay (27.4 s)	F	^{64}Zn(^{6}Li,d)
C	^{70}Ge(p,t)	G	^{58}Ni(^{12}C,2pγ),^{64}Zn(^{7}Li,p2nγ)
D	^{66}Zn(^{12}C,^{10}Be)	H	(HI,xnγ)

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$[#]	XREF	Comments
0[@]	0$^+$	270.93 d *13*	ABCDEFGH	%ε=100 T$_{1/2}$: weighted average of 270.82 d *27* (1981Wa26) and 270.99 d *19* (1994Sc44). Others: 228 d *6* (Rudstam thesis, Uppsala University, Sweden) and 275 d *20* (1956Cr29).
1015.81[@] *8*	2$^+$	2.08 ps *11*	ABCDE GH	μ=+1.1 *3* J$^\pi$: L(p,t)=2. μ: from transient field method (2011StZZ,2005Le19). T$_{1/2}$: weighted average of 2.15 ps *14* from DSAM in ^{12}C(^{64}Zn,^{8}Beγ) and 1.98 ps *17* from DSAM and RDM in ^{58}Ni(^{12}C,2pγ),^{64}Zn(^{7}Li,p2nγ). Others: 2.1 ps *7* (1981De03), 3.5 ps *+21−14* (1977Mo20), and 1.4 ps *7* (1977Gu08) all from DSAM/RDM in ^{58}Ni(^{12}C,2pγ),^{64}Zn(^{7}Li,p2nγ).
1754.5[&] *4*	0$^+$		A Cd GH	J$^\pi$: L(p,t)=0.
1777.42[a] *10*	2$^+$	1.80 ps *14*	A CdE GH	T$_{1/2}$: from DSAM in ^{12}C(^{64}Zn,^{8}Beγ). Others: >3.5 ps (1982Pa03), 3.5 ps *+21−14* (1977Mo20), and 4.2 ps *7* (1977Gu08) from ^{58}Ni(^{12}C,2pγ),^{64}Zn(^{7}Li,p2nγ). J$^\pi$: E2 1777γ to 0$^+$ g.s.
2267.83[@] *11*	4$^+$	0.87 ps *10*	A CDE GH	J$^\pi$: L(p,t)=4. T$_{1/2}$: weighted average of 0.90 ps *14* from ^{12}C(^{64}Zn,^{8}Beγ) and 0.83 ps *14* from ^{64}Zn(^{7}Li,p2nγ).
2428.59[a] *12*	3$^+$	2.1 ps *7*	A E GH	J$^\pi$: J=3 from $\gamma(\theta)$, $\gamma\gamma(\theta)$(DCO), π from 651γ to 2$^+$.
2457.15[&] *13*	2$^+$	1.3 ps *4*	A E GH	T$_{1/2}$: from DSAM in ^{12}C(^{64}Zn,^{8}Beγ). J$^\pi$: 190γ to 4$^+$, 2457γ to 0$^+$.
2617 *3*	0$^+$		C	J$^\pi$: L(p,t)=0.
2648.67[b] *11*	3$^-$	2.1 ps *+14−7*	A CDE GH	J$^\pi$: L(p,t)=3; J=3 from $\gamma(\theta)$ and $\gamma\gamma(\theta)$(DCO).
2831.86[a] *11*	4$^+$	0.8 ps *+7−3*	A C E GH	J$^\pi$: L(p,t)=4.
2900.2[c] *7*	(4$^-$)		H	
2947.1 *5*	2$^+$		A C G	XREF: C(2942). J$^\pi$: L(p,t)=2.
3023.1 *5*	2$^+$		A C	J$^\pi$: L(p,t)=2.
3040.73 *23*	(4)$^+$		A d GH	J$^\pi$: J=(4) from $\gamma(\theta)$, M1+E2 612γ to 3$^+$.
3061.87 *11*	(3$^-$)		Cd GH	J$^\pi$: 2046γ to 2$^+$, 587γ from 5$^-$; L(p,t)=(3).
3087.5 *4*	2$^{(+)}$		A G	J$^\pi$: γ's to 0$^+$, log *ft*=6.7 from ^{68}As ε decay (J$^\pi$=3$^+$).
3182.26[&] *11*	4$^+$		C GH	J$^\pi$: L(p,t)=4; E2 1405γ to 2$^+$.
3204 *3*	0$^+$		C	J$^\pi$: L(p,t)=0.

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Adopted Levels, Gammas (continued)

^{68}Ge Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$[#]	XREF	Comments
3287.8 *7*	$2^{(+)}$		A	J^{π}: 3288γ to 0^+; log *ft*=7.0 from ^{68}As ε decay ($J^{\pi}=3^+$).
3400.3 *4*	2^+		A C G	J^{π}: γ's to 0^+; log *ft*=6.2 from ^{68}As ε decay ($J^{\pi}=3^+$).
3417.0 *4*			A	
3474.7 *10*			A	E(level): log *ft*=6.2 from ^{68}As ε decay ($J^{\pi}=3^+$) suggests this is a distinct level from the 0^+ 3476 *3*.
3476 *3*	0^+		C F	J^{π}: L(p,t)=L(^{6}Li,d)=0.
3509.67 *12*	4^-		H	
3522.1 *10*	2^+		A C	J^{π}: L(p,t)=2.
3581.98[b] *12*	5^-	1.2 ps *4*	C GH	E(level): doublet suggested by L(p,t)=(5+1). J^{π}: E2 933γ to 3^-, E2 472γ from 7^-.
3604 *3*	4^+		C	J^{π}: L(p,t)=4.
3649.05[d] *11*	5^-	0.4 ps *+3−1*	Cd GH	J^{π}: E2 1000γ to 3^-, E2 405γ from 7^-; L(p,t)=(4) discrepant.
3675.34[a] *14*	5^+		d GH	J^{π}: 1247γ to 3^+, band member.
3695.94[@] *12*	6^+	0.49 ps *14*	GH	J^{π}: J=6 from γ(θ), DCO and yield function; E2 1428γ to 6^+.
3735 *3*	(2^+)		C	J^{π}: L(p,t)=(2).
3809.3 *10*	2^+		A C	J^{π}: L(p,t)=2.
3882.95[c] *12*	6^-	132 ps *35*	GH	μ=0.53 *11* μ: from recoil into gas perturbed angular correlations (2011StZZ,1986Ba64). Relative to g=0.44 *2* for the 596 2+ state in ^{74}Ge. J^{π}: J=6 from γ(θ), DCO and yield function; M1(+E2) 234γ to 5^-.
4021 *3*	4^+		C	J^{π}: L(p,t)=4.
4037 *3*	(2^+)		C	J^{π}: L(p,t)=(2).
4053.72[d] *11*	7^-	118 ps *21*	CD GH	μ=0.78 *12* J^{π}: L(p,t)=(7); J=7 from γ(θ), DCO and yield function. μ: from recoil into gas perturbed angular correlations (2011StZZ,1986Ba64). Relative to g=0.44 *2* for the 596 2+ state in ^{74}Ge.
4078 *3*	0^+		C	J^{π}: L(p,t)=0.
4144.07[&] *11*	6^+		C H	J^{π}: 962γ to 4^+, band member.
4238.5 *10*	(2^+)		A C	J^{π}: L(p,t)=(2).
4322 *3*	2^+		C	J^{π}: L(p,t)=2.
4358 *3*	0^+		C	J^{π}: L(p,t)=0.
4453.89[b] *13*	7^-	0.97 ps *21*	C GH	J^{π}: J=7 from γ(θ), DCO and yield function; M1+E2 400γ to 7^-. L(p,t)=(6) discrepant (but the fit is poor).
4567.5 *10*	(2^+)		A C	J^{π}: L(p,t)=(2).
4614 *3*	(3^-)		C	J^{π}: L(p,t)=(3).
4659.46 *13*	7^-	0.3 ps *1*	CD GH	$T_{1/2}$: the B(E2)(606γ) exceeds RUL by a factor of ≈3, suggesting that the $T_{1/2}$ value may be too small.
4736 *3*	0^+		C	J^{π}: L(p,t)=0.
4789 *3*	0^+		C	J^{π}: L(p,t)=0.
4836.97[@] *12*	8^+	1.04 ps *21*	D GH	μ=+0.8 *3* μ: from transient field method (2011StZZ,1986Ba64); measured relative to a theoretical value of g=0.4 for the 3696, 6^+ state in ^{68}Ge. J^{π}: J=8 from γ(θ), DCO and yield function; E2 1141γ to 6^+.
4857 *10*			C	
4877.7 *10*			A C	
4957.40[c] *15*	8^-	0.9 ps *+4−2*	GH	J^{π}: J=8 from γ(θ), DCO and yield function; E2 1074γ to 6^-.
4999?		>0.35 ps	G	
5049.58[e] *12*	8^+	0.49 ps *+21−14*	GH	μ=−2.2 *10* μ: from transient field method (2011StZZ,1986Ba64); measured relative to a theoretical value of g=0.4 for the 3696, 6^+ state in ^{68}Ge. J^{π}: J=8 from γ(θ), DCO and yield function; E2 1354γ to 6^+.

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Adopted Levels, Gammas (continued)

^{68}Ge Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$[#]	XREF	Comments
5074 *10*			C	
5148.69 *13*	(8^-)	1.2 ps *3*	D GH	
5217 *10*			C	
5266.6[a] *10*	7^+		H	J^{π}: 1591γ to 5^+, band member.
5330.11[d] *13*	9^-	0.69 ps *+21−14*	GH	J^{π}: J=9 from γ(θ), DCO and yield function; E2 1276γ to 7^-.
5366.08[&] *13*	8^+	0.83 ps *+28−21*	GH	J^{π}: J=8 from γ(θ), DCO and yield function; E2 1670γ to 6^+.
5560 *50*			D	
5678.02[b] *13*	9^-	0.5 ps *2*	GH	J^{π}: J=9 from γ(θ), DCO and yield function; E2 1224γ to 7^-.
5821.61 *14*	9^-	0.8 ps *4*	GH	
5873.98 *23*	9^+	1.5 ps *+10−6*	GH	
5961.49[@] *14*	10^+	0.76 ps *+21−14*	GH	J^{π}: J=10 from γ(θ), DCO and yield function; E2 1124γ to 8^+.
6214.89[e] *14*	10^+	<0.7 ps	GH	J^{π}: J=10 from γ(θ), DCO and yield function; E2 1165γ to 8^+.
6300 *50*	(8^+)		D	J^{π}: from crude shell-model calculations (1990Bo27). Configuration:$(\pi g_{9/2})^2_{8+}$ (1990Bo27).
6420.36[c] *25*	10^-		H	
6556.52 *14*	$(10)^-$		H	
6595.71[&] *16*	10^+		H	J^{π}: 1230γ to 8^+, band member.
6663.81 *24*	10^+		H	
6671.10? *16*			H	
6960 *50*	(6^+)		D	J^{π}: from crude shell-model calculations (1990Bo27). Configuration:$(\pi g_{9/2}\pi d_{5/2})_{6+}$ (1990Bo27).
7044.83[d] *16*	11^-	1.0 ps *+4−3*	GH	J^{π}: J=11 from γ(θ), DCO and yield function; E2 1715γ to 9^-.
7145.30[b] *16*	11^-		GH	J^{π}: J=11 from γ(θ), DCO and yield function; E2 1467γ to 9^-.
7242.1? *10*	(10^+)	0.7 ps *+7−4*	G	J^{π}: (E2) 1876 γ to 8^+.
7251.12 *13*	11^-		H	
7320.1? *10*	(12^+)		H	
7371.21[@] *15*	12^+	0.7 ps *+14−3*	GH	J^{π}: J=12 from γ(θ), DCO and yield function; E2 1410γ to 10^+.
7495.95 *16*	(11^-)		H	
7516.89[e] *14*	12^+		H	
7532.5[f] *10*	12^+		H	
7559.38[g] *14*	12^+	0.8 ps *+6−4*	GH	J^{π}: J=12 from γ(θ), DCO and yield function; E2 1344γ to 10^+.
7761.85 *14*	12^+		H	
7881.5? *10*			H	
8043.38[l] *16*	13^+		H	
8171.94 *14*	13^-		H	J^{π}: J=13 from γ(θ); E2 921γ to 11^-.
8621.5? *10*			H	
8660.57[g] *15*	14^+		H	
8663.3? *10*			H	
8781.4? *10*			H	
8790.26[h] *17*	15^-		H	J^{π}: J=15 from γ(θ); E2 618γ to 13^-.
8868.18 *19*	14^-		H	
8930.9? *10*	(14^+)		H	
9012.1[e] *6*	14^+		H	
9112.5 *6*	14^+		H	
9170.0[@] *5*	14^+	0.4 ps *2*	GH	J^{π}: J=12 from γ(θ); E2 1798γ to 12^+.
9386.56 *17*	$15^{(-)}$		H	
9418.9[f] *14*	14^+		H	
9563.9[j] *8*	$15^{(-)}$		H	
9605.7[l] *7*	15^+		H	
10024.58? *18*			H	
10126.6 *8*	$16^{(-)}$		H	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{68}Ge Levels (continued)

E(level)[†]	J^{π}[‡]	XREF
10217.53[g] *24*	16^+	H
10295.51[h] *25*	$17^{(-)}$	H
10493.4 *6*	$16^{(-)}$	H
10664.0[e] *7*	16^+	H
10665.6 *6*	$17^{(-)}$	H
10688.8? *10*		H
10896.0 *7*	16^+	H
10897.0? *12*		H
10927.0[j] *5*	$17^{(-)}$	H
10957.9 *7*	16^+	H
10988.1 *6*	16^+	H
10989.8[l] *12*	17^+	H
10990.0[@] *11*	16^+	H
11085.6[f] *17*	16^+	H
11406.4? *10*		H
11417.4 *17*	16^+	H
11542.7? *19*	(17^+)	H
11793.4? *13*		H
11794.2? *10*	(19^-)	H
11832.2 *10*	(20^-)	H
11994.4[g] *6*	18^+	H
12136.9[h] *3*	$19^{(-)}$	H
12165.0 *8*	(19^-)	H
12246.0[e] *6*	18^+	H
12262.5[i] *8*	(18^-)	H
12363.4[j] *7*	(19^-)	H
12501.8? *12*		H
12535.8? *10*		H
12641.7 *17*	(18^+)	H
12652.3 *13*	(18^-)	H
12719.4[f] *19*	18^+	H
12779.1? *12*		H
12817.2[l] *16*	19^+	H
12884.1? *12*		H
13104.3? *10*		H
13265.3? *10*		H
13617.4? *12*		H
13751.3? *10*		H
13953.0[e] *12*	20^+	H
13991.0? *12*		H
14085.5[i] *7*	(20^-)	H
14116.5[g] *12*	20^+	H
14360.9? *10*		H
14401.9[h] *10*	$21^{(-)}$	H
14426.6? *16*	(21)	H
14485.6[j] *8*	(21^-)	H
14504.9[l] *19*	21^+	H
14560.4 *6*	(21)	H
15562.8[g] *15*	22^+	H
15835.1[e] *15*	22^+	H
16130.5[i] *12*	$22^{(-)}$	H

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Adopted Levels, Gammas (continued)

^{68}Ge Levels (continued)

E(level)[†]	J^{π}[‡]	XREF	Comments
16733.9[l] *21*	23^+	H	
17360.5? *21*		H	
17496.0[h] *14*	$23^{(-)}$	H	
18022.1[e] *18*	24^+	H	
18132.5[i] *16*	$24^{(-)}$	H	
18274.1 *18*		H	
19785.0[l] *23*	25^+	H	
20356.6[i] *19*	$26^{(-)}$	H	
20821.2[e] *21*	26^+	H	
22958.6[i] *21*	$28^{(-)}$	H	
x[k]	(14)	H	Additional information 2.
1575.0+x?[k] *6*	(16)	H	Additional information 3.
1620.0+x[k] *10*	(16)	H	
3425.0+x[k] *12*	(18)	H	
5440.1+x[k] *16*	(20)	H	
7677.1+x[k] *19*	(22)	H	
10126.2+x[k] *21*	(24)	H	
12815.2+x[k] *23*	(26)	H	

† From a least squares fit to Eγ′s for levels connected by γ′s; ΔE=0.3 keV assumed when not given.
‡ Unless noted otherwise, from $^{40}Ca(^{32}S,4p\gamma)$ in (HI,xnγ) by 2001Wa02. Based on a DCO analysis (no explicit values given) and the assumption that levels decaying predominantly to negative parity levels have themselves negative parity. The 3649 *5*-, 3883 *6*-, and 4054 *7*- J^{π} assignments are taken from previous measurements.
\# From DSAM and RDM in $^{58}Ni(^{12}C,2p\gamma)$,$^{64}Zn(^{7}Li,2n\gamma)$..., except where noted.
@ Band(A): Yrast band.
& Band(B): Band based on 0^+, 1755 level. 2001Wa02 and 1996Ch34 differ in the assignment of the 10^+ member of this band, 1996Ch34 assign the 6671 level, while 2001Wa02 assign the 6597 level. The latter is adopted here.
a Band(C): γ band (2001Wa02).
b Band(D): Two ν quasiparticle band. One rotationally-aligned quasiparticle in $g_{9/2}$ and one deformation-aligned quasiparticle in $p_{1/2}$, $p_{3/2}$, or $f_{5/2}$ (2001Wa02).
c Band(E): Even-spin signature partner of Band d (1981De03,2001Wa02).
d Band(F): Two π quasiparticle band. One rotationally-aligned quasiparticle in $g_{9/2}$ and one deformation-aligned quasiparticle in $p_{1/2}$, $p_{3/2}$, or $f_{5/2}$ (2001Wa02).
e Band(G): Band based on 8^+ 5050 level. Proposed configuration of $\pi(g_{9/2})^2(f_{5/2},p_{3/2})^2$ and $\nu(g_{9/2})^2(f_{5/2},p_{3/2})^6$ (2001Wa02).
f Band(H): Side-band based on 12^+ 7533 level.
g Band(I): Side-band based on 12^+ 7560 level.
h Band(J): Octupole band based on 15^- 8790 level. Proposed configuration of $\pi(g_{9/2})^1(f_{5/2},p_{3/2})^3$ and $\nu(g_{9/2})^2(f_{5/2},p_{3/2})^6$ (2001Wa02).
i Band(K): Octupole band based on (18^-) 12263 level. Proposed configuration of $\pi(g_{9/2})^2(f_{5/2},p_{3/2})^2$ and $\nu(g_{9/2})^3(f_{5/2},p_{3/2})^5$ (2001Wa02).
j Band(L): Octupole band built on the 15^- 9564 level.
k Band(M): Super-deformed band (2001Wa02). Percent population=0.2%.
l Band(N): Band based on 13^+ 8043 level. Proposed configuration of $\pi(g_{9/2})^1(f_{5/2},p_{3/2})^3$ and $\nu(g_{9/2})^3(f_{5/2},p_{3/2})^5$ (2001Wa02).

Adopted Levels, Gammas (continued)

$\gamma(^{68}Ge)$

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡	δ‡	α	Comments
1015.81	2^+	1015.74 *4*	100	0	0^+	E2		0.000341 *5*	α(K)=0.000305 *5*; α(L)=3.12×10^{-5} *5*; α(M)=4.66×10^{-6} *7*; α(N+..)=3.04×10^{-7} *5* B(E2)(W.u.)=15.3 *8* E_γ: from ^{64}Zn(^{7}Li,p2nγ). Mult.: from γ(lin pol) in (HI,xnγ).
1754.5	0^+	738.4@ *5*	100@	1015.81	2^+	E2		0.000760 *11*	α(K)=0.000679 *10*; α(L)=7.03×10^{-5} *10*; α(M)=1.048×10^{-5} *15*; α(N+..)=6.78×10^{-7} Mult.: from $\gamma\gamma(\theta)$(DCO) in ^{58}Ni(^{12}C,2pγ) (1981De03).
1777.42	2^+	761.6@ *1*	100@ *5*	1015.81	2^+	M1+E2	−0.15 *3*	0.000552 *8*	α(K)=0.000494 *7*; α(L)=5.05×10^{-5} *8*; α(M)=7.54×10^{-6} *11*; α(N+..)=4.97×10^{-7} *7* B(E2)(W.u.)=1.0 *5*; B(M1)(W.u.)=0.0169 *18* δ: Others: −0.49 *7* from $\gamma(\theta)$ in ^{48}Ca(^{32}S,4pγ), −0.09 *2* from $\gamma(\theta)$ in ^{63}Cu(^{7}Li,2nγ), −6 *+2−5* or −0.65 *10* from $\gamma(\theta)$ in ^{64}Zn(^{7}Li,p2nγ), and −0.18 *+20−10* from $\gamma(\theta)$ in ^{66}Zn(α,2nγ).
		1777.3@ *2*	60@ *4*	0	0^+	E2#		0.000310 *5*	α(K)=9.36×10^{-5} *14*; α(L)=9.48×10^{-6} *14*; α(M)=1.415×10^{-6} *20* α(N+..)=0.000205 *3* B(E2)(W.u.)=0.40 *5* I_γ: Others: 63 *3* in ^{58}Ni(^{12}C,2pγ) and 44.2 *16* in (HI,xnγ).
2267.83	4^+	1252.0 *1*	100	1015.81	2^+	E2#		0.000230 *4*	α(K)=0.000190 *3*; α(L)=1.94×10^{-5} *3*; α(M)=2.89×10^{-6} *4*; α(N+..)=1.79×10^{-5} *3* B(E2)(W.u.)=12.8 *15* δ: δ(M3/E2)=0.0 *1* from $\gamma(\theta)$ in ^{66}Zn(α,2nγ).
2428.59	3^+	651.2@ *3*	100@ *5*	1777.42	2^+	M1+E2	+0.06 *2*	0.000772 *11*	α(K)=0.000690 *10*; α(L)=7.07×10^{-5} *10*; α(M)=1.056×10^{-5} *15*; α(N+..)=6.96×10^{-7} B(E2)(W.u.)=0.34 *+28−24*; B(M1)(W.u.)=0.026 *+13−7* δ: Others: +0.11 *2* from $\gamma(\theta)$ in ^{48}Ca(^{32}S,4pγ), −0.02 *2* from $\gamma(\theta)$ in ^{63}Cu(^{7}Li,2nγ), and −0.15 *+10−50* from $\gamma(\theta)$ in ^{66}Zn(α,2nγ).
		1413.3@ *5*	47.6@ *24*	1015.81	2^+	M1+E2	+0.16 *8*	0.000200 *3*	α(K)=0.0001396 *20*; α(L)=1.415×10^{-5} *20*; α(M)=2.11×10^{-6} *3* α(N+..)=4.42×10^{-5} *8* B(E2)(W.u.)=0.023 *+31−19*; B(M1)(W.u.)=0.0012 *+6−3* I_γ: Others: 36.6 *19* in ^{58}Ni(^{12}C,2pγ) and 6.9 *15* in (HI,xnγ).
2457.15	2^+	190.3 *10*	47 *3*	2267.83	4^+	[E2]		0.0669 *17*	α(K)=0.0592 *15*; α(L)=0.00669 *17*; α(M)=0.000992 *25*; α(N+..)=5.81×10^{-5} *14* B(E2)(W.u.)=2.5×10^4 *8*
		702.2 *10*	28.7 *18*	1754.5	0^+	[E2]		0.000871 *13*	α(K)=0.000778 *12*; α(L)=8.06×10^{-5} *12*; α(M)=1.203×10^{-5} *18*; α(N+..)=7.77×10^{-7} B(E2)(W.u.)=22 *7* I_γ: Other: 69 *8* in ^{68}As ε decay (151.6 s).

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Adopted Levels, Gammas (continued)

$\gamma(^{68}$Ge) (continued)

E$_i$(level)	J$^\pi_i$	E$_\gamma$†	I$_\gamma$†	E$_f$	J$^\pi_f$	Mult.‡	δ‡	α	Comments
2457.15	2$^+$	1441.0 *10*	22 *3*	1015.81	2$^+$				
		2457.1 *2*	100 *7*	0	0$^+$	[E2]		0.000591 *9*	α(K)=5.21×10^{-5} *8*; α(L)=5.26×10^{-6} *8*; α(M)=7.85×10^{-7} *11*; α(N+..)=0.000533 *8* B(E2)(W.u.)=0.15 *5*
2648.67	3$^-$	871.2 *2*	5.27 *24*	1777.42	2$^+$	[E1]		0.000201 *3*	α(K)=0.000180 *3*; α(L)=1.82×10^{-5} *3*; α(M)=2.72×10^{-6} *4*; α(N+..)=1.781×10^{-7} *25* B(E1)(W.u.)=1.5×10^{-5} *+7−6* I$_\gamma$: Other: 15 *4* in ^{58}Ni(^{12}C,2pγ).
		1632.8 *2*	100 *4*	1015.81	2$^+$	E1+M2	+0.09 *3*	0.000423 *6*	α(K)=5.91×10^{-5} *13*; α(L)=5.96×10^{-6} *13*; α(M)=8.90×10^{-7} *19*; α(N+..)=5.86×10^{-8} *13* B(E1)(W.u.)=4.2×10^{-5} *+20−17*; B(M2)(W.u.)=0.6 *5* δ: Others: −0.05 *3* from $\gamma(\theta)$ in ^{48}Ca(^{32}S,4pγ), +0.01 *2* from $\gamma(\theta)$ in ^{63}Cu(^{7}Li,2nγ), −0.11 *9* from $\gamma(\theta)$ in ^{64}Zn(^{7}Li,p2nγ), and −0.16 *+20−50* from $\gamma(\theta)$ in ^{66}Zn(α,2nγ).
2831.86	4$^+$	403.8 *10*	2.5 *3*	2428.59	3$^+$				
		564.0 *10*	6.8 *6*	2267.83	4$^+$				
		1054.4 *2*	100 *3*	1777.42	2$^+$	E2		0.000312 *5*	α(K)=0.000279 *4*; α(L)=2.86×10^{-5} *4*; α(M)=4.27×10^{-6} *6*; α(N+..)=2.79×10^{-7} *4* B(E2)(W.u.)=24 *+14−10* Mult.: from $\gamma\gamma(\theta)$(DCO).
		1816.1 *2*	30.1 *11*	1015.81	2$^+$	E2		0.000323 *5*	α(K)=8.98×10^{-5} *13*; α(L)=9.10×10^{-6} *13*; α(M)=1.358×10^{-6} *19* α(N+..)=0.000223 *4* B(E2)(W.u.)=0.47 *+28−22* I$_\gamma$: Others: 33 *3* in ^{58}Ni(^{12}C,2pγ) and 78 *9* in ^{68}As ε decay (151.6 s).
2900.2	(4$^-$)	251.5 *10*	100	2648.67	3$^-$				
2947.1	2$^+$	1169.7@ *5*	100@	1777.42	2$^+$				
3023.1	2$^+$	1245.1@ *10*	13.0@ *22*	1777.42	2$^+$				
		2007.4@ *5*	100@ *9*	1015.81	2$^+$				
3040.73	(4)$^+$	612.0@ *3*	100@ *6*	2428.59	3$^+$	M1+E2	+0.24 *4*	0.000906 *15*	α(K)=0.000810 *13*; α(L)=8.31×10^{-5} *14*; α(M)=1.242×10^{-5} *21*; α(N+..)=8.16×10^{-7}
		1263.4@ *3*	53@ *3*	1777.42	2$^+$				
		2025.3@ *10*	5.6@ *8*	1015.81	2$^+$				
3061.87	(3$^-$)	230.0 *1*	17 *28*	2831.86	4$^+$				
		413.2& *1*		2648.67	3$^-$				
		633.3 *1*	17 *28*	2428.59	3$^+$				
		794.0 *2*	100 *28*	2267.83	4$^+$				
		2046.0 *2*	78 *28*	1015.81	2$^+$				

From ENSDF

$\gamma(^{68}Ge)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡	δ‡	α	Comments
3087.5	$2^{(+)}$	1309.6@ *10*	47@ *7*	1777.42	2^+				
		1332.8@ *5*	100@ *7*	1754.5	0^+				
		2071.8@ *10*	27@ *7*	1015.81	2^+				
		3088.3@ *10*	87@ *7*	0	0^+				
3182.26	4^+	725.1 *1*	59.8 *22*	2457.15	2^+				
		915.0 *10*	21.2 *11*	2267.83	4^+				
		1404.8 *2*	100 *4*	1777.42	2^+	E2		0.000221 *3*	α(K)=0.0001492 *21*; α(L)=1.517×10^{-5} *22*; α(M)=2.26×10^{-6} *4* α(N+..)=5.47×10^{-5} *8*
		2166.4 *2*	27.4 *12*	1015.81	2^+				
3287.8	$2^{(+)}$	2271.3@ *10*	100@ *10*	1015.81	2^+				
		3288.4@ *10*	40@ *10*	0	0^+				
3400.3	2^+	1622.5@ *5*	100@ *6*	1777.42	2^+				
		1645.9@ *10*	24.1@ *19*	1754.5	0^+				
		2384.6@ *10*	22.2@ *19*	1015.81	2^+				
		3401.3@ *10*	5.6@ *19*	0	0^+				
3417.0		988.3@ *5*	59@ *5*	2428.59	3^+				
		1639.9@ *7*	100@ *5*	1777.42	2^+				
3474.7		2458.8@ *10*	100@	1015.81	2^+				
3509.67	4^-	861.0 *1*	63 *4*	2648.67	3^-				
		1081.1 *1*	100 *5*	2428.59	3^+				
3522.1	2^+	2506.2@ *10*	100@	1015.81	2^+				
3581.98	5^-	520.1& *1*		3061.87	(3^-)				
		750.1 *2*	13.4 *4*	2831.86	4^+				
		933.3 *2*	22.2 *7*	2648.67	3^-	E2		0.000418 *6*	α(K)=0.000373 *6*; α(L)=3.83×10^{-5} *6*; α(M)=5.72×10^{-6} *8*; α(N+..)=3.73×10^{-7} *6* B(E2)(W.u.)=6.6 *23*
		1314.1 *2*	100 *3*	2267.83	4^+	E1+M2	+0.04 *3*	0.000218 *3*	α(K)=8.35×10^{-5} *15*; α(L)=8.44×10^{-6} *15*; α(M)=1.259×10^{-6} *22*; α(N+..)=0.0001244 B(E1)(W.u.)=0.00011 *4*; B(M2)(W.u.)=0.5 *+8−5* δ: Others: −0.08 *3* from $\gamma(\theta)$ in ^{48}Ca(^{32}S,4pγ), +0.06 *2* from $\gamma(\theta)$ in ^{63}Cu(^{7}Li,2nγ), and −0.15 *+10−50* from $\gamma(\theta)$ in ^{66}Zn(α,2nγ). Mult.: E1 from γ(lin pol) in ^{58}Ni(^{12}C,2pγ),^{64}Zn(^{7}Li,p2nγ).
3649.05	5^-	587.2 *1*	8.5 *15*	3061.87	(3^-)				
		817.2 *1*	2.6 *15*	2831.86	4^+				
		1000.4 *1*	12.8 *4*	2648.67	3^-	E2		0.000353 *5*	α(K)=0.000316 *5*; α(L)=3.24×10^{-5} *5*; α(M)=4.83×10^{-6} *7*;

$^{68}_{32}Ge_{36}$-8

$\gamma(^{68}Ge)$ (continued)

E_i(level)	J_i^π	E_γ†	I_γ†	E_f	J_f^π	Mult.‡	δ‡	α	Comments
									α(N+..)=3.15×10^{-7} *5* B(E2)(W.u.)=8.8 *+23−67*
3649.05	5$^-$	1381.2 *1*	100 *3*	2267.83	4$^+$	E1+M2	+0.04 *2*	0.000253 *4*	α(K)=7.67×10^{-5} *12*; α(L)=7.75×10^{-6} *12*; α(M)=1.156×10^{-6} *18*; α(N+..)=0.0001676 B(E1)(W.u.)=0.00031 *+7−14*; B(M2)(W.u.)=1.2 *+16−11* δ: Others: +0.01 *2* from $\gamma(\theta)$ in ^{48}Ca(^{32}S,4pγ), −0.01 *2* from $\gamma(\theta)$ in ^{63}Cu(^{7}Li,2nγ), and −0.02 *+2−15* from $\gamma(\theta)$ in ^{66}Zn(α,2nγ). Mult.: E1 from γ(lin pol) in ^{58}Ni(^{12}C,2pγ),^{64}Zn(^{7}Li,p2nγ).
3675.34	5$^+$	843.2 *10*	28.5 *21*	2831.86	4$^+$				
		1246.7 *2*	100 *6*	2428.59	3$^+$				
3695.94	6$^+$	1428.1 *1*	100	2267.83	4$^+$	E2		0.000223 *4*	α(K)=0.0001442 *21*; α(L)=1.466×10^{-5} *21*; α(M)=2.19×10^{-6} *3* α(N+..)=6.16×10^{-5} *9* B(E2)(W.u.)=12 *4* δ: δ(M3/E2)=−0.1 *1* from $\gamma(\theta)$ in ^{66}Zn(α,2nγ).
3809.3	2$^+$	2793.4@ *10*	100@	1015.81	2$^+$				
3882.95	6$^-$	207.6 *1*	1.0 *16*	3675.34	5$^+$				
		233.9 *1*	100 *3*	3649.05	5$^-$	M1(+E2)	0.01 *2*	0.00860 *13*	α(K)=0.00767 *11*; α(L)=0.000803 *12*; α(M)=0.0001201 *17*; α(N+..)=7.84×10^{-6} B(E2)(W.u.)=0.04 *+15−4*; B(M1)(W.u.)=0.012 *4* Mult.,δ: from $\gamma(\theta)$ in ^{63}Cu(^{7}Li,2nγ). Others: +0.07 *1* from $\gamma(\theta)$ in ^{40}Ca(^{32}S,4pγ) and 0.00 *+2−20* from $\gamma(\theta)$ in ^{66}Zn(α,2nγ).
		373.3 *1*	1.44 *5*	3509.67	4$^-$				
		982.7& *10*	1.33 *5*	2900.2	(4$^-$)				
4053.72	7$^-$	170.7 *1*	100 *3*	3882.95	6$^-$	M1+E2	+0.04 *2*	0.0193 *4*	α(K)=0.0172 *3*; α(L)=0.00182 *3*; α(M)=0.000272 *5*; α(N+..)=1.77×10^{-5} *3* B(E2)(W.u.)=1.6 *+17−16*; B(M1)(W.u.)=0.019 *4* δ: Others: +0.07 *1* from $\gamma(\theta)$ in ^{40}Ca(^{32}S,4pγ) and +0.05 *1* from $\gamma(\theta)$ in ^{66}Zn(α,2nγ).
		357.8 *1*	25.5 *8*	3695.94	6$^+$	E1		0.0017 *7*	α(K)=0.0015 *6*; α(L)=0.00016 *7*; α(M)=2.4×10^{-5} *10*; α(N+..)=1.5×10^{-6} *7* B(E1)(W.u.)=9.8×10^{-6} *18* Mult.: from $\gamma(\theta)$ in ^{66}Zn(α,2nγ). δ: δ(M2/E1)=−0.07 *+10−20*.
		404.7 *1*	26.8 *8*	3649.05	5$^-$	E2		0.00463 *7*	α(K)=0.00412 *6*; α(L)=0.000438 *7*; α(M)=6.52×10^{-5} *10*; α(N+..)=4.10×10^{-6} *6* B(E2)(W.u.)=3.7 *7* δ: δ(M3/E2)=0.0 *+3−1* from $\gamma(\theta)$ in ^{66}Zn(α,2nγ). I_γ: Other: 31.7 *16* in ^{58}Ni(^{12}C,2pγ).
		471.7 *1*	40.1 *14*	3581.98	5$^-$	E2		0.00282 *4*	α(K)=0.00252 *4*; α(L)=0.000265 *4*; α(M)=3.95×10^{-5} *6*;

$^{68}_{32}Ge_{36}$-9

$\gamma(^{68}\mathrm{Ge})$ (continued)

E_i(level)	J^π_i	E_γ †	I_γ †	E_f	J^π_f	Mult. ‡	δ ‡	α	Comments
									α(N+..)=2.51×10^{-6} *4* B(E2)(W.u.)=2.6 *5* δ: δ(M3/E2)=−0.07 *10* from $\gamma(\theta)$ in ^{66}Zn(α,2nγ). I_γ: Other: 52 *3* in ^{58}Ni(^{12}C,2pγ).
4144.07	6^+	448.2 *10*	6.4 *5*	3695.94	6^+				
		961.8 *1*	100 *3*	3182.26	4^+				
		1312.2 *1*	39.7 *15*	2831.86	4^+				
		1876.2 *1*	73.7 *24*	2267.83	4^+				
4238.5	(2^+)	3222.6@ *10*	100@	1015.81	2^+				
4453.89	7^-	400.1 *1*	100 *3*	4053.72	7^-	M1+E2	+0.5 *2*	0.0028 *4*	α(K)=0.0025 *3*; α(L)=0.00026 *4*; α(M)=3.9×10^{-5} *5*; α(N+..)=2.5×10^{-6} *3* B(E2)(W.u.)=4.E+2 *3*; B(M1)(W.u.)=0.17 *5*
		570.9 *2*	24.6 *8*	3882.95	6^-				
		804.9 *10*	9 *6*	3649.05	5^-				
		871.9 *2*	32.3 *10*	3581.98	5^-				I_γ: Other: 18 *5* in ^{58}Ni(^{12}C,2pγ).
4567.5	(2^+)	3551.6@ *10*	100@	1015.81	2^+				
4659.46	7^-	205.5 *1*		4453.89	7^-				
		605.7 *3*	100 *3*	4053.72	7^-	E2		0.001322 *19*	α(K)=0.001180 *17*; α(L)=0.0001230 *18*; α(M)=1.83×10^{-5} *3* α(N+..)=1.178×10^{-6} B(E2)(W.u.)=1.2×10^3 *+6−3*
		776.6 *1*	20.2 *7*	3882.95	6^-				
4836.97	8^+	692.9 *1*	5.69 *19*	4144.07	6^+				
		783.3 *2*	18.2 *6*	4053.72	7^-				I_γ: Other:13.2 *10* in ^{58}Ni(^{12}C,2pγ).
		1141.0 *2*	100 *3*	3695.94	6^+	E2		0.000264 *4*	α(K)=0.000233 *4*; α(L)=2.38×10^{-5} *4*; α(M)=3.56×10^{-6} *5*; α(N+..)=2.73×10^{-6} *4* B(E2)(W.u.)=14 *3* δ: δ(M3/E2)=0.0 *1* from $\gamma(\theta)$ in ^{66}Zn(α,2nγ).
4877.7		2229.0@ *10*	100@	2648.67	3^-				
4957.40	8^-	903.7 *2*	41 *11*	4053.72	7^-				I_γ: Other:14.7 *21* in ^{58}Ni(^{12}C,2pγ).
		1074.4 *10*	100 *3*	3882.95	6^-	E2		0.000299 *5*	α(K)=0.000267 *4*; α(L)=2.74×10^{-5} *4*; α(M)=4.08×10^{-6} *6*; α(N+..)=2.67×10^{-7} *4* B(E2)(W.u.)=19 *+5−9*
4999?		1303.0	100	3695.94	6^+				E_γ,I_γ: from ^{58}Ni(^{12}C,2pγ).
5049.58	8^+	212.6 *1*	3.32 *12*	4836.97	8^+				
		905.5 *1*	20.6 *7*	4144.07	6^+				
		995.9 *10*	7.2 *3*	4053.72	7^-				
		1353.6 *2*	100 *3*	3695.94	6^+	E2		0.000221 *3*	α(K)=0.0001611 *23*; α(L)=1.640×10^{-5} *23*; α(M)=2.45×10^{-6} *4* α(N+..)=4.11×10^{-5} *6* B(E2)(W.u.)=12 *+4−5*

$^{68}_{32}\mathrm{Ge}_{36}$-10

$\gamma(^{68}Ge)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡	α	Comments
5148.69	(8^-)	489.1 *10*	7.4 *3*	4659.46	7^-			
		695.4&		4453.89	7^-			
		1095.0 *2*	100 *3*	4053.72	7^-			
		1265.7 *1*	15.7 *7*	3882.95	6^-			
5266.6	7^+	1591.2 *10*	100	3675.34	5^+			
5330.11	9^-	1276.4 *1*	100	4053.72	7^-	E2	0.000227 *4*	α(K)=0.000183 *3*; α(L)=1.86×10^{-5} *3*; α(M)=2.78×10^{-6} *4*; α(N+..)=2.30×10^{-5} *4* B(E2)(W.u.)=15 *+3−5*
5366.08	8^+	316.5 *1*	11.5 *7*	5049.58	8^+			
		1222.0 *1*	70 *27*	4144.07	6^+			
		1670.1 *2*	100 *4*	3695.94	6^+	E2	0.000275 *4*	α(K)=0.0001055 *15*; α(L)=1.070×10^{-5} *15*; α(M)=1.597×10^{-6} *23* α(N)=1.051×10^{-7} *15* B(E2)(W.u.)=1.8 *+6−7*
5678.02	9^-	347.9 *1*	14.0 *4*	5330.11	9^-			
		720.6 *1*	14.7 *5*	4957.40	8^-			
		1224.1 *2*	100 *3*	4453.89	7^-	E2	0.000236 *4*	α(K)=0.000200 *3*; α(L)=2.04×10^{-5} *3*; α(M)=3.04×10^{-6} *5*; α(N)=1.99×10^{-7} *3* α(N+..)=1.262×10^{-5} *18* B(E2)(W.u.)=19 *8*
		1624.3 *2*	4 *4*	4053.72	7^-			
5821.61	9^-	491.5 *2*	66.6 *20*	5330.11	9^-			I_γ: Other: 36 *4* in $^{58}Ni(^{12}C,2p\gamma)$.
		672.9 *1*	34.4 *10*	5148.69	(8^-)			
		985.1 *10*	24 *10*	4836.97	8^+			
		1162.9 *10*	100 *3*	4659.46	7^-			
5873.98	9^+	1037.0 *2*	100	4836.97	8^+			
5961.49	10^+	631.4 *2*	5.43 *17*	5330.11	9^-			
		1124.5 *2*	100 *3*	4836.97	8^+	E2	0.000271 *4*	α(K)=0.000241 *4*; α(L)=2.46×10^{-5} *4*; α(M)=3.68×10^{-6} *6*; α(N)=2.41×10^{-7} *4* α(N+..)=1.85×10^{-6} *3* B(E2)(W.u.)=24 *+5−7* δ: 0.0 *1* from $\gamma(\theta)$ in $^{66}Zn(\alpha,2n\gamma)$ (1977Mo20).
6214.89	10^+	848.5 *10*	3.24 *14*	5366.08	8^+			
		1165.3 *2*	100 *3*	5049.58	8^+	E2	0.000253 *4*	α(K)=0.000223 *4*; α(L)=2.27×10^{-5} *4*; α(M)=3.39×10^{-6} *5*; α(N)=2.22×10^{-7} *4* α(N+..)=4.62×10^{-6} *7* B(E2)(W.u.)>19
		1377.9 *1*	18.7 *6*	4836.97	8^+			
6420.36	10^-	1463.0 *2*	100	4957.40	8^-			
6556.52	$(10)^-$	1226.4& *1*		5330.11	9^-			
		1407.8 *1*	100	5148.69	(8^-)			
6595.71	10^+	1229.6 *1*	100 *3*	5366.08	8^+			
		1759.4@ *10*	28 *28*	4836.97	8^+			
6663.81	10^+	789.82 *7*	100	5873.98	9^+			

$\gamma(^{68}Ge)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[‡]	α	Comments
6671.10?		1305.0[&] *1*	100	5366.08	8^+			
7044.83	11^-	1714.7 *2*	100	5330.11	9^-	E2	0.000289 *4*	α(K)=0.0001003 *14*; α(L)=1.016×10^{-5} *15*; α(M)=1.517×10^{-6} *22* α(N)=9.99×10^{-8} *14* B(E2)(W.u.)=2.3 *+7−10*
7145.30	11^-	588.0[@] *10*	2.82 *13*	6556.52	$(10)^-$			
		1467.2 *2*	100 *4*	5678.02	9^-	E2	0.000227 *4*	α(K)=0.0001364 *20*; α(L)=1.387×10^{-5} *20*; α(M)=2.07×10^{-6} *3* α(N+..)=7.43×10^{-5} *1*
7242.1?	(10^+)	1876.0[&]	100	5366.08	8^+	(E2)	0.000345 *5*	α(K)=8.45×10^{-5} *12*; α(L)=8.56×10^{-6} *12*; α(M)=1.277×10^{-6} *18* α(N+..)=0.000251 *4* B(E2)(W.u.)=2.1 *+12−21* E_γ,I_γ: from ^{58}Ni(^{12}C,2pγ).
7251.12	11^-	694.6 *1*	13.5 *5*	6556.52	$(10)^-$			
		1289.6 *1*	38 *5*	5961.49	10^+			
		1429.5 *1*	100 *3*	5821.61	9^-			
		1573.1 *3*	50.4 *15*	5678.02	9^-			
		1921.0 *2*	5.08 *19*	5330.11	9^-			
7371.21	12^+	1409.7 *2*	100	5961.49	10^+	E2	0.000221 *4*	α(K)=0.0001481 *21*; α(L)=1.506×10^{-5} *21*; α(M)=2.25×10^{-6} *4* α(N+..)=5.61×10^{-5} *8* B(E2)(W.u.)=9 *+18−7*
7495.95	(11^-)	1077.1 *10*	28.7 *15*	6420.36	10^-			
		1817.9 *2*	100 *3*	5678.02	9^-			
7516.89	12^+	1302.0 *1*	100	6214.89	10^+			
7532.5	12^+	1571.0 *10*	100	5961.49	10^+			
7559.38	12^+	963.1 *10*	5.86 *21*	6595.71	10^+			
		1344.4 *2*	100 *3*	6214.89	10^+	E2	0.000221 *3*	α(K)=0.0001635 *23*; α(L)=1.664×10^{-5} *24*; α(M)=2.48×10^{-6} *4* α(N+..)=3.88×10^{-5} *6* B(E2)(W.u.)=8 *+9−3*
		1597.9 *2*	18.1 *5*	5961.49	10^+			
7761.85	12^+	202.5 *1*	20.4 *7*	7559.38	12^+			
		245.0 *1*	9.2 *4*	7516.89	12^+			
		1800.4 *2*	100 *3*	5961.49	10^+			
7881.5?		1920.0[&] *10*	100	5961.49	10^+			
8043.38	13^+	281.5 *1*	18.4 *7*	7761.85	12^+			
		672.2 *1*	100 *3*	7371.21	12^+			
		723.3 *10*	40 *11*	7320.1?	(12^+)			
8171.94	13^-	410.5 *2*	3.27 *11*	7761.85	12^+			
		612.5[&] *1*		7559.38	12^+			
		655.0 *1*	6.70 *19*	7516.89	12^+			
		676.0 *1*	3.24 *11*	7495.95	(11^-)			

$^{68}_{32}Ge_{36}$-12

$\gamma(^{68}Ge)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡	α	Comments
8171.94	13⁻	800.7 *1*	13.7 *4*	7371.21	12⁺			
		920.8 *1*	100 *3*	7251.12	11⁻	E2	0.000432 *6*	α(K)=0.000386 *6*; α(L)=3.96×10^{-5} *6*; α(M)=5.91×10^{-6} *9*; α(N)=3.85×10^{-7} *6* α(N+..)=3.85×10^{-7} *6* Mult.: from $\gamma(\theta)$ and γ(lin pol) in (HI,xnγ).
		1026.6 *1*	39.6 *14*	7145.30	11⁻			
		1127.1 *1*	22.8 *7*	7044.83	11⁻			
8621.5?		1062.1& *10*	100	7559.38	12⁺			
8660.57	14⁺	898.7 *1*	25.0 *8*	7761.85	12⁺			
		1101.2 *1*	100 *3*	7559.38	12⁺			
		1143.7 *1*	45.6 *14*	7516.89	12⁺			
8663.3?		1618.5& *10*	100	7044.83	11⁻			
8781.4?		1736.5& *10*	100	7044.83	11⁻			
8790.26	15⁻	618.3 *1*	100	8171.94	13⁻	E2	0.001246 *18*	α(K)=0.001112 *16*; α(L)=0.0001158 *17*; α(M)=1.726×10^{-5} *25* α(N)=1.110×10^{-6} *16* Mult.: from $\gamma(\theta)$ in ^{40}Ca(^{32}S,4pγ).
8868.18	14⁻	696.0 *10*	100 *3*	8171.94	13⁻			
		824.8 *1*	48.8 *18*	8043.38	13⁺			
8930.9?	(14⁺)	1559.7&	100	7371.21	12⁺			
9012.1	14⁺	1452.6@ *10*	14.5 *5*	7559.38	12⁺			
		1495.2@ *10*	100 *3*	7516.89	12⁺			
9112.5	14⁺	1068.8 *10*	100 *4*	8043.38	13⁺			
		1595.0 *10*	47.6 *21*	7516.89	12⁺			
9170.0	14⁺	1410.0&		7761.85	12⁺			
		1798.1 *10*	100	7371.21	12⁺	E2	0.000317 *5*	α(K)=9.16×10^{-5} *13*; α(L)=9.27×10^{-6} *13*; α(M)=1.384×10^{-6} *20* α(N+..)=0.000215 *3* B(E2)(W.u.)=4.6 *23*
9386.56	15⁽⁻⁾	596.1 *10*	20.0 *6*	8790.26	15⁻			
		1214.6 *1*	100 *4*	8171.94	13⁻			
9418.9	14⁺	1886.4 *10*	100	7532.5	12⁺			
9563.9	15⁽⁻⁾	904.0 *10*	100	8660.57	14⁺			
9605.7	15⁺	945.4 *10*	73.6 *23*	8660.57	14⁺			
		1562.1 *10*	100 *3*	8043.38	13⁺			
10024.58?		854.4& *10*	100	9170.0	14⁺			
		1364.0& *1*		8660.57	14⁺			
10126.6	16⁽⁻⁾	1336.7 *10*	100	8790.26	15⁻			
10217.53	16⁺	1425.8 *10*	14.7 *6*	8790.26	15⁻			
		1557.0 *2*	100 *3*	8660.57	14⁺			

$^{68}_{32}Ge_{36}$-13

Adopted Levels, Gammas (continued)

$\gamma(^{68}Ge)$ (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π
10295.51	$17^{(-)}$	908.5 *10*	5.17 *17*	9386.56	$15^{(-)}$	12246.0	18^+	1949.5 *10*	38.4 *14*	10295.51	$17^{(-)}$
		1505.2 *2*	100 *3*	8790.26	15^-	12262.5	(18^-)	1967.0 *10*	100	10295.51	$17^{(-)}$
10493.4	$16^{(-)}$	1106.4 *10*	40.4 *18*	9386.56	$15^{(-)}$	12363.4	(19^-)	1436.7 *10*	100 *3*	10927.0	$17^{(-)}$
		1625.7 *10*	70.8 *23*	8868.18	14^-			2067.4 *10*	54 *18*	10295.51	$17^{(-)}$
		1702.9 *10*	100 *4*	8790.26	15^-	12501.8?		1837.8& *10*	100	10664.0	16^+
10664.0	16^+	1651.7@ *10*	100	9012.1	14^+	12535.8?		2318.2& *10*	100	10217.53	16^+
10665.6	$17^{(-)}$	369.2 *10*	16.0 *6*	10295.51	$17^{(-)}$	12641.7	(18^+)	1224.9 *10*	1.0×10^2 *17*	11417.4	16^+
		1278.8 *10*	100 *3*	9386.56	$15^{(-)}$			1555.5 *10*	1.0×10^2 *17*	11085.6	16^+
10688.8?		1898.5& *10*	100	8790.26	15^-	12652.3	(18^-)	2525.6 *10*	100	10126.6	$16^{(-)}$
10896.0	16^+	1727.3 *10*	100 *4*	9170.0	14^+	12719.4	18^+	1633.8 *10*	100	11085.6	16^+
		2105.8 *10*	93 *4*	8790.26	15^-	12779.1?		2115.1& *10*	100	10664.0	16^+
10897.0?		1884.8& *10*	100	9012.1	14^+	12817.2	19^+	1274.5 *10*	100 *16*	11542.7?	(17^+)
10927.0	$17^{(-)}$	631.4 *10*	9.1 *7*	10295.51	$17^{(-)}$			1827.4 *10*	81 *16*	10989.8	17^+
		800.8 *10*	50.0 *16*	10126.6	$16^{(-)}$	12884.1?		2220.1& *10*	100	10664.0	16^+
		1363.8 *10*	99 *3*	9563.9	$15^{(-)}$	13104.3?		2808.7& *10*	100	10295.51	$17^{(-)}$
		1540.4 *10*	100 *3*	9386.56	$15^{(-)}$	13265.3?		2969.7& *10*	100	10295.51	$17^{(-)}$
		2136.2 *10*	53 *26*	8790.26	15^-	13617.4?		1623.0& *10*	100	11994.4	18^+
10957.9	16^+	1845.0 *10*	100	9112.5	14^+	13751.3?		3455.7& *10*	100	10295.51	$17^{(-)}$
10988.1	16^+	1875.2 *10*	94 *3*	9112.5	14^+	13953.0	20^+	1707.0 *10*	100	12246.0	18^+
		1975.8 *10*	100 *4*	9012.1	14^+	13991.0?		1996.6& *10*	100	11994.4	18^+
		2328.1 *10*	42.5 *20*	8660.57	14^+	14085.5	(20^-)	1823.0 *10*	40 *50*	12262.5	(18^-)
10989.8	17^+	1384.0 *10*	100	9605.7	15^+			1921.0 *10*	20.7 *10*	12165.0	(19^-)
10990.0	16^+	1820.0 *10*	100	9170.0	14^+			1948.0 *10*	100 *3*	12136.9	$19^{(-)}$
11085.6	16^+	1666.0 *10*	100	9418.9	14^+	14116.5	20^+	2122.0 *10*	100	11994.4	18^+
11406.4?		2616.1& *10*	100	8790.26	15^-	14360.9?		2224.0& *10*	100	12136.9	$19^{(-)}$
11417.4	16^+	1999.0 *10*	100	9418.9	14^+	14401.9	$21^{(-)}$	2265.0 *10*	100	12136.9	$19^{(-)}$
11793.4?		1666.8& *10*	100	10126.6	$16^{(-)}$	14485.6	(21^-)	2122.1 *10*	100 *23*	12363.4	(19^-)
11794.2?	(19^-)	1498.7 *10*	100	10295.51	$17^{(-)}$			2348.7 *10*	27 *23*	12136.9	$19^{(-)}$
11832.2	(20^-)	1536.7 *10*	100	10295.51	$17^{(-)}$	14504.9	21^+	1687.7 *10*	100	12817.2	19^+
11994.4	18^+	1006.4 *10*	36.0 *10*	10988.1	16^+	15562.8	22^+	1446.3 *10*	100	14116.5	20^+
		1036.3 *10*	14.4 *6*	10957.9	16^+	15835.1	22^+	1882.0 *10*	100	13953.0	20^+
		1330.5 *10*	15.6 *6*	10664.0	16^+	16130.5	$22^{(-)}$	1703.9 *10*	39.0 *14*	14426.6?	(21)
		1776.9 *10*	100 *11*	10217.53	16^+			2045.0 *10*	100 *3*	14085.5	(20^-)
12136.9	$19^{(-)}$	1470.0 *10*	32.0 *10*	10665.6	$17^{(-)}$	16733.9	23^+	2229.0 *10*	100	14504.9	21^+
		1841.32 *4*	100 *3*	10295.51	$17^{(-)}$	17360.5?		2855.5& *10*	100	14504.9	21^+
12165.0	(19^-)	1870.0 *10*	100	10295.51	$17^{(-)}$	17496.0	$23^{(-)}$	3094.0 *10*	100	14401.9	$21^{(-)}$
12246.0	18^+	1287.8 *10*	57 *3*	10957.9	16^+	18022.1	24^+	2187.0 *10*	100	15835.1	22^+
		1351.3 *10*	65.3 *20*	10896.0	16^+	18132.5	$24^{(-)}$	2002.0 *10*	100	16130.5	$22^{(-)}$
		1581.9 *10*	100 *3*	10664.0	16^+	18274.1		2439.0 *10*	100	15835.1	22^+

Adopted Levels, Gammas (continued)

$\gamma(^{68}Ge)$ (continued)

E_i(level)	J^π_i	E_γ [†]	I_γ [†]	E_f	J^π_f
19785.0	25^+	3051.0 *10*	100	16733.9	23^+
20356.6	$26^{(-)}$	2224.0 *10*	100	18132.5	$24^{(-)}$
20821.2	26^+	2799.0 *10*	100	18022.1	24^+
22958.6	$28^{(-)}$	2602.0 *10*	100	20356.6	$26^{(-)}$
1620.0+x	(16)	1620.0 *10*	100	x	(14)
3425.0+x	(18)	1805.0 *10*		1620.0+x	(16)
3425.0+x	(18)	1850.0[&] *10*		1575.0+x?	(16)
5440.1+x	(20)	2015.0 *10*	100	3425.0+x	(18)
7677.1+x	(22)	2237.0 *10*	100	5440.1+x	(20)
10126.2+x	(24)	2449.0 *10*	100	7677.1+x	(22)
12815.2+x	(26)	2689.0 *10*	100	10126.2+x	(24)

† From (HI,xnγ), except where noted.

‡ From $\gamma(\theta)$ in ^{58}Ni(^{12}C,2pγ) (1981De03), except where noted.

From γ linear polarization in ^{63}Cu(^{7}Li,2nγ) (1981De03).

@ From ^{68}As ε decay (151.6 s).

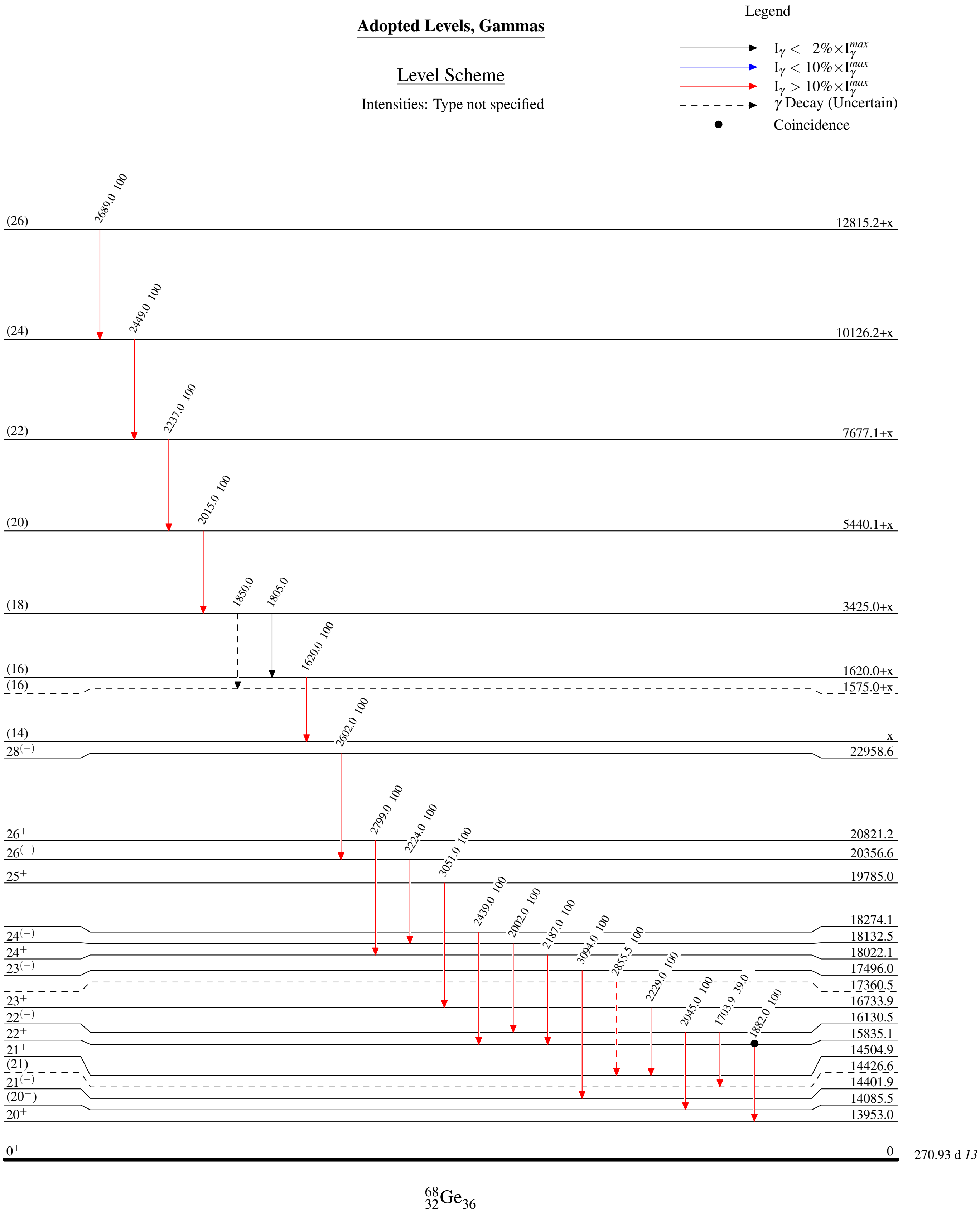
& Placement of transition in the level scheme is uncertain.

$^{68}_{32}Ge_{36}$-15

Adopted Levels, Gammas

Level Scheme

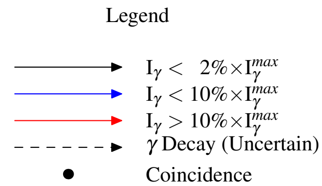
Intensities: Type not specified

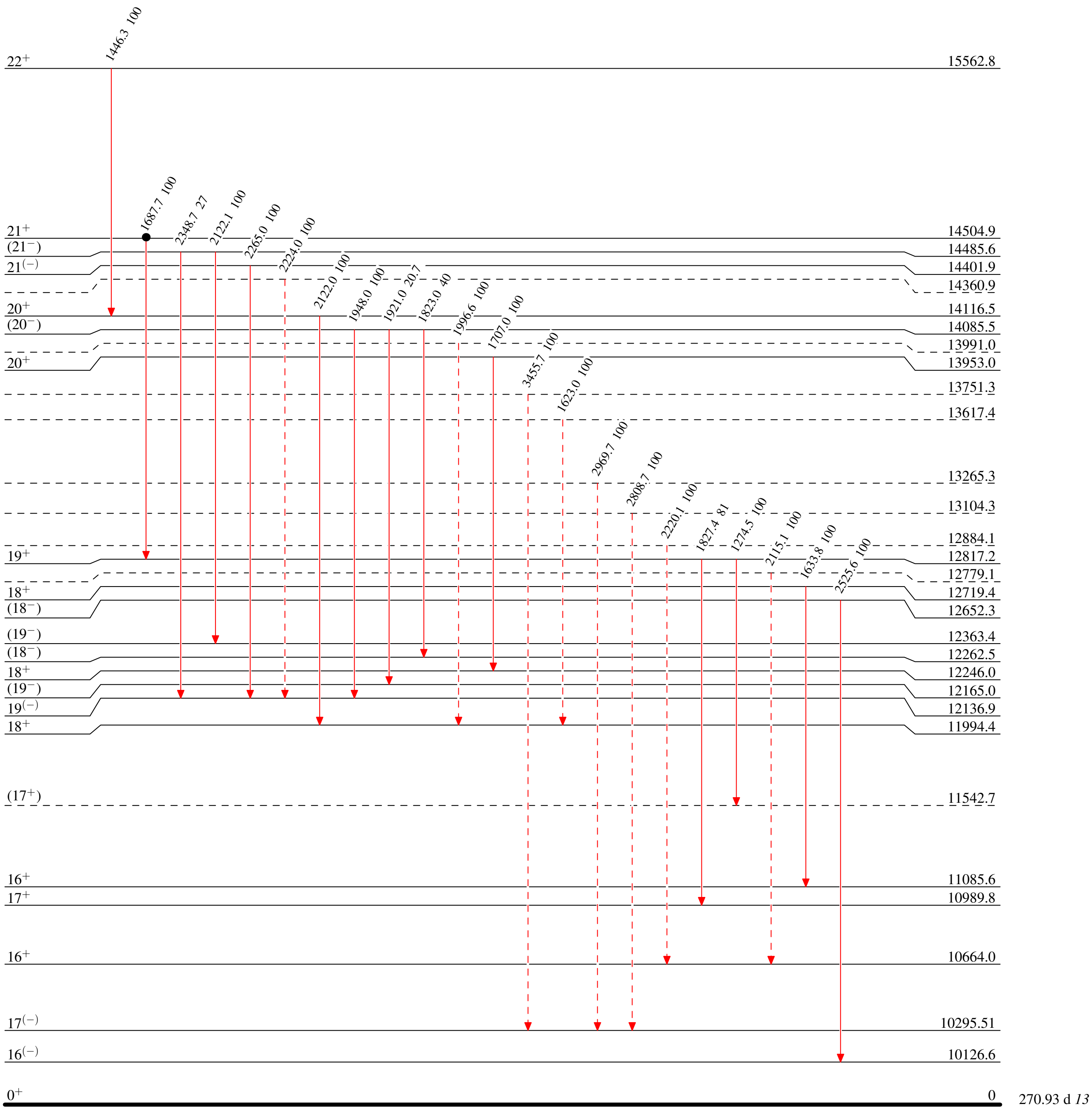


Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified



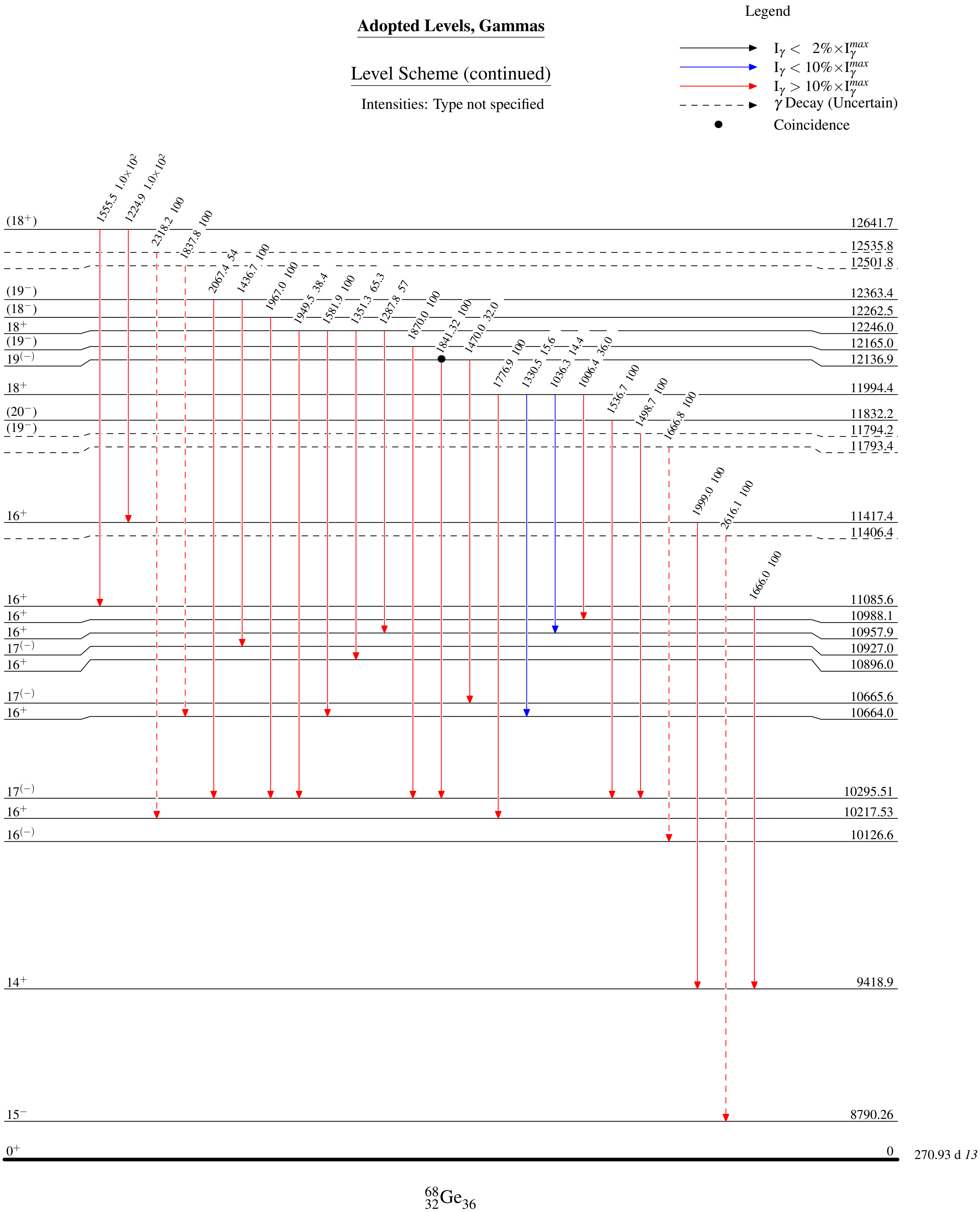


$^{68}_{32}Ge_{36}$

Adopted Levels, Gammas

Level Scheme (continued)

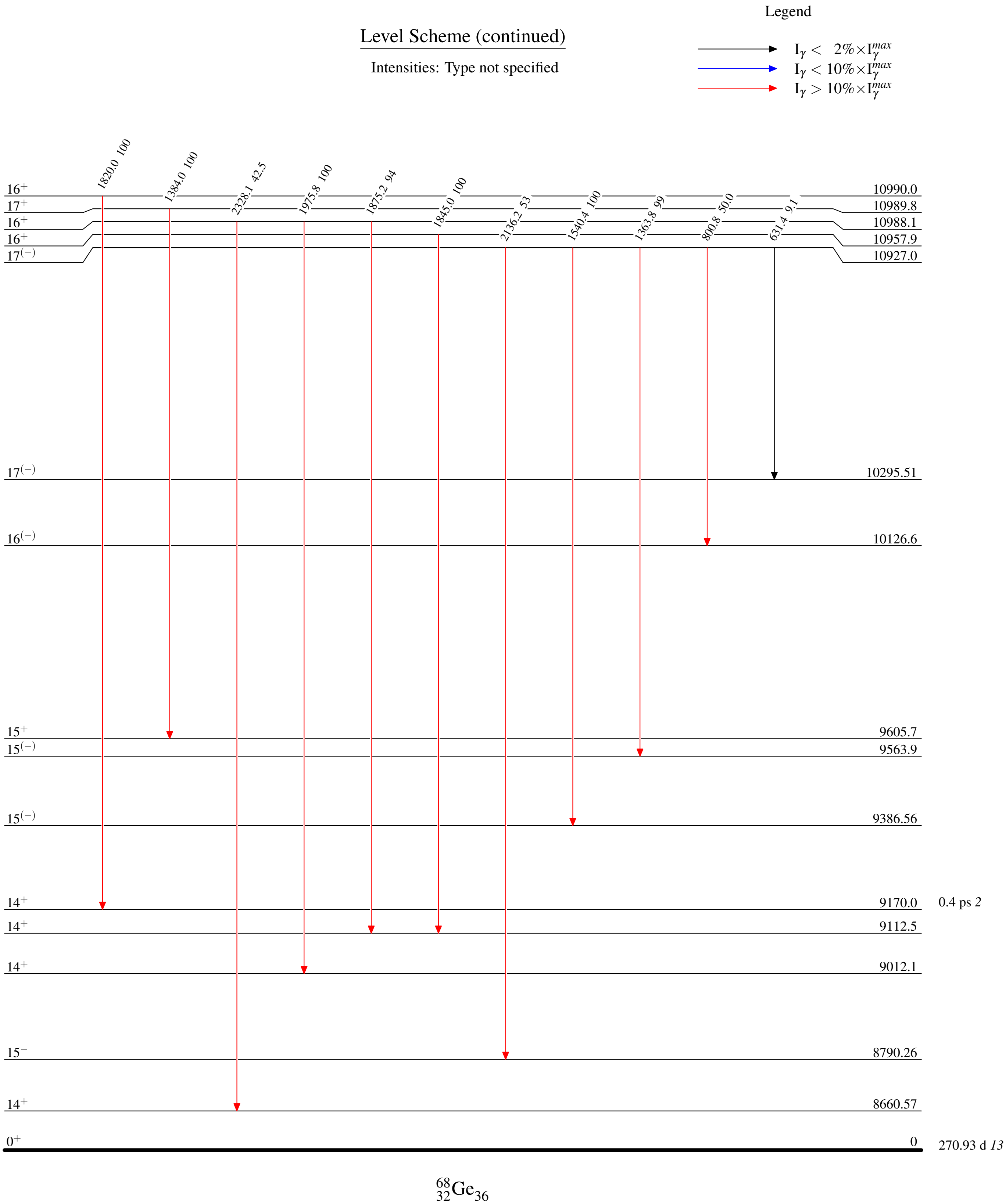
Intensities: Type not specified



Adopted Levels, Gammas

Level Scheme (continued)

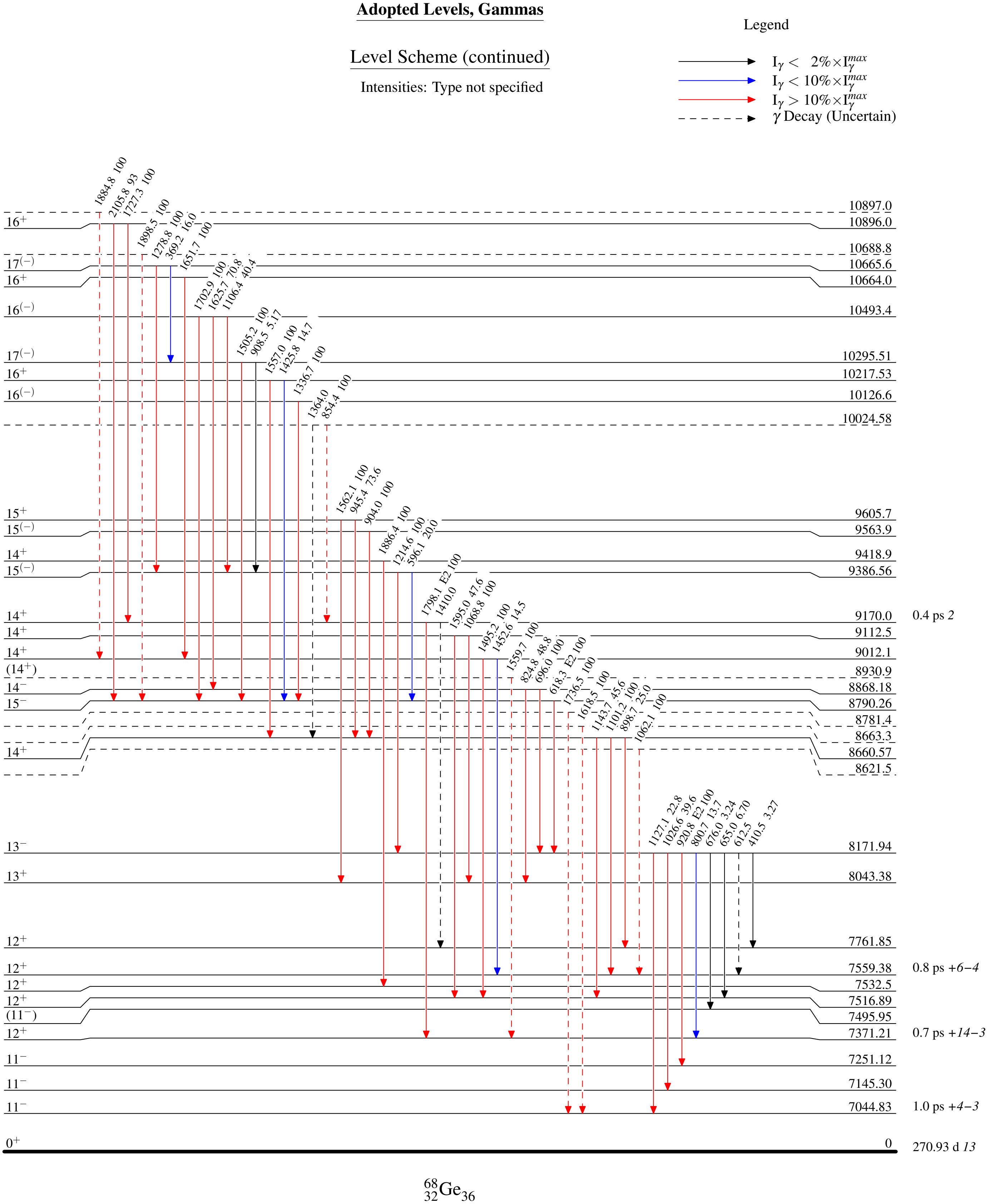
Intensities: Type not specified



Adopted Levels, Gammas

Level Scheme (continued)

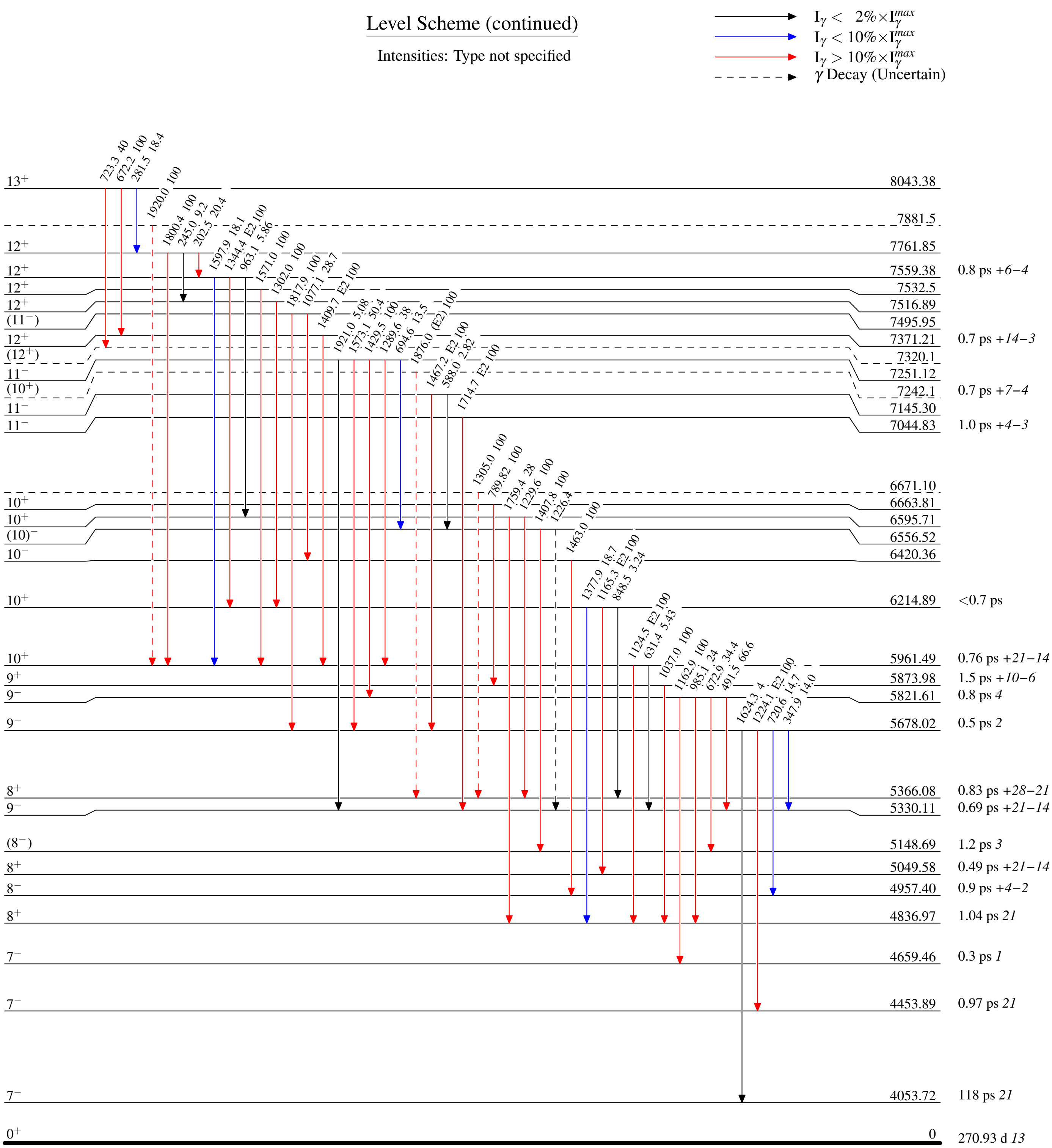
Intensities: Type not specified



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

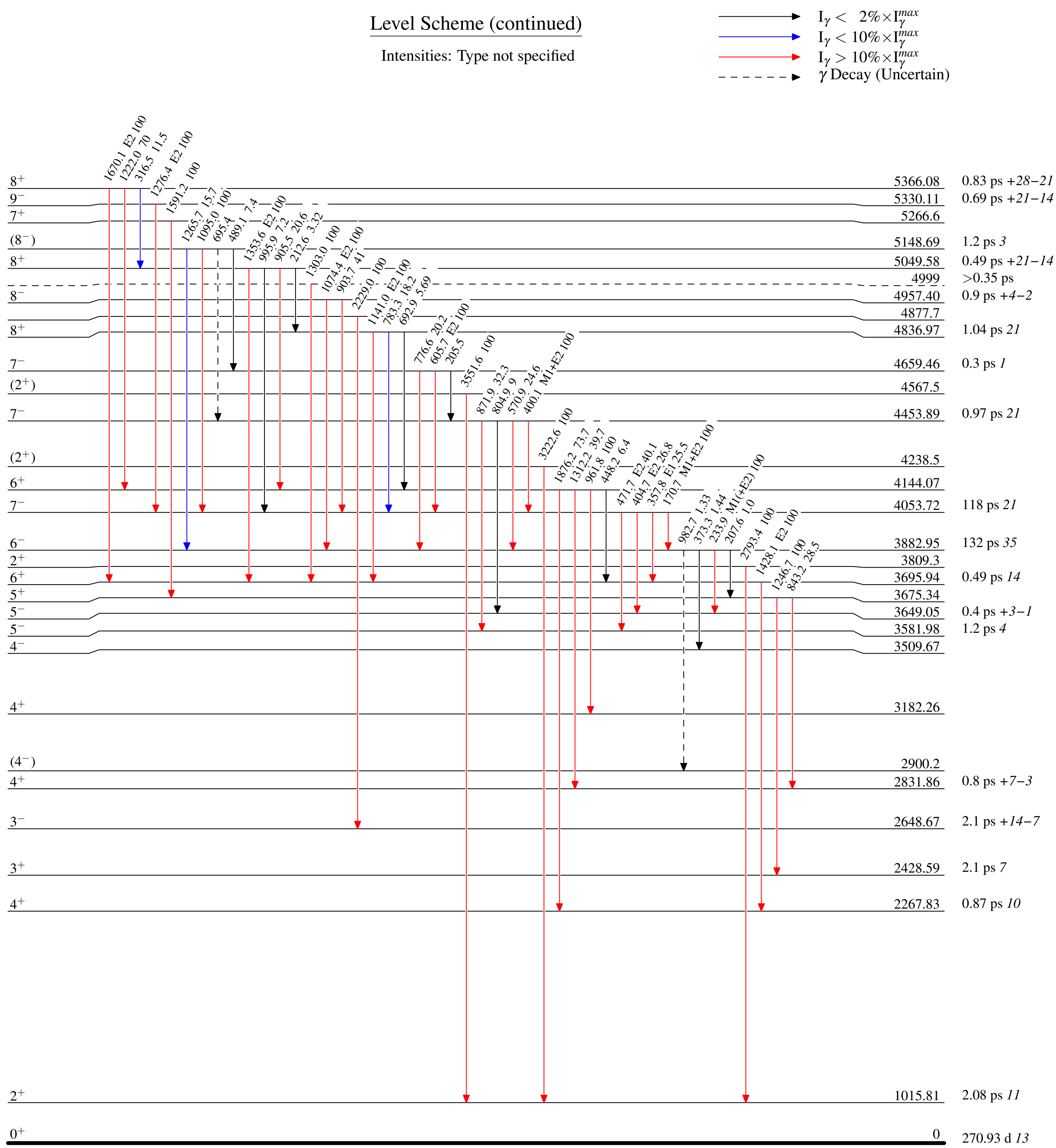


$^{68}_{32}Ge_{36}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

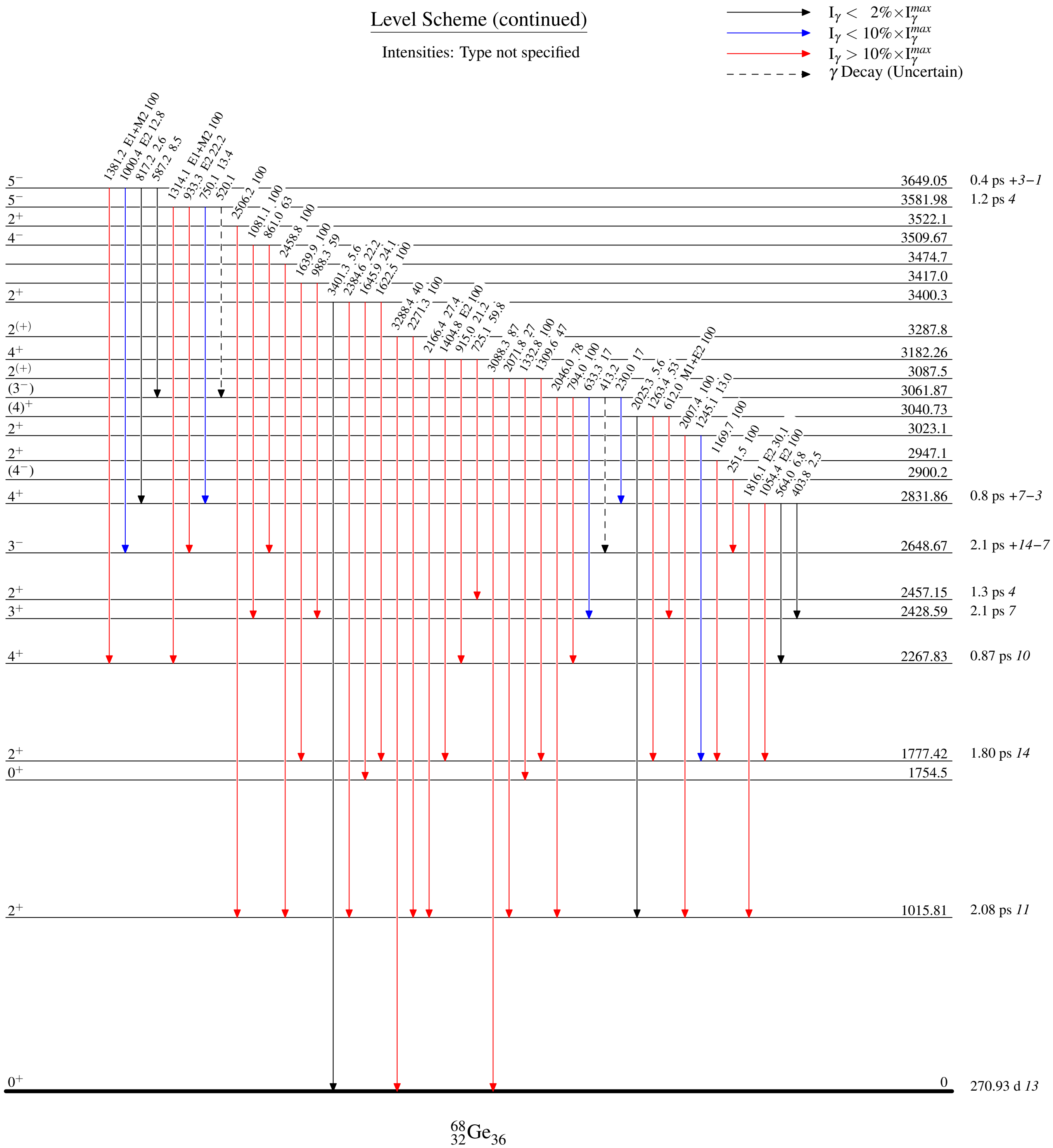


$^{68}_{32}Ge_{36}$

Adopted Levels, Gammas

Level Scheme (continued)

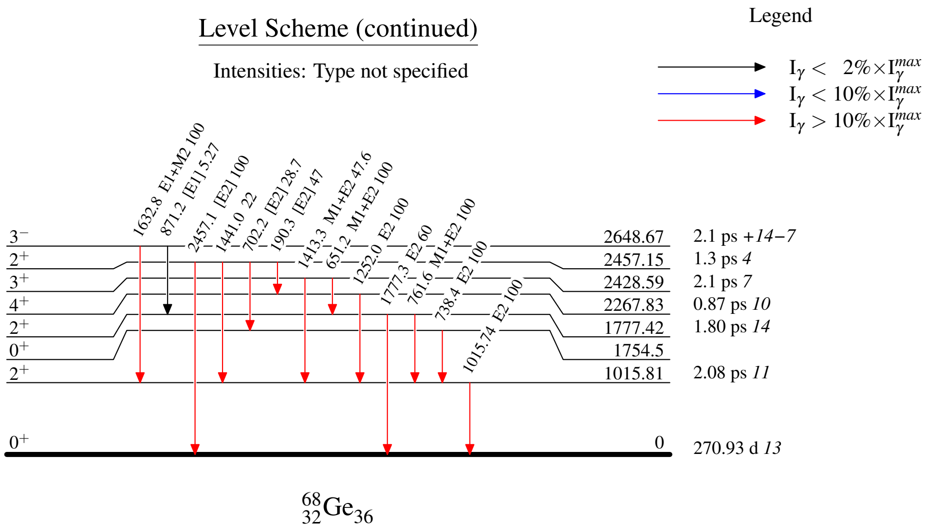
Intensities: Type not specified



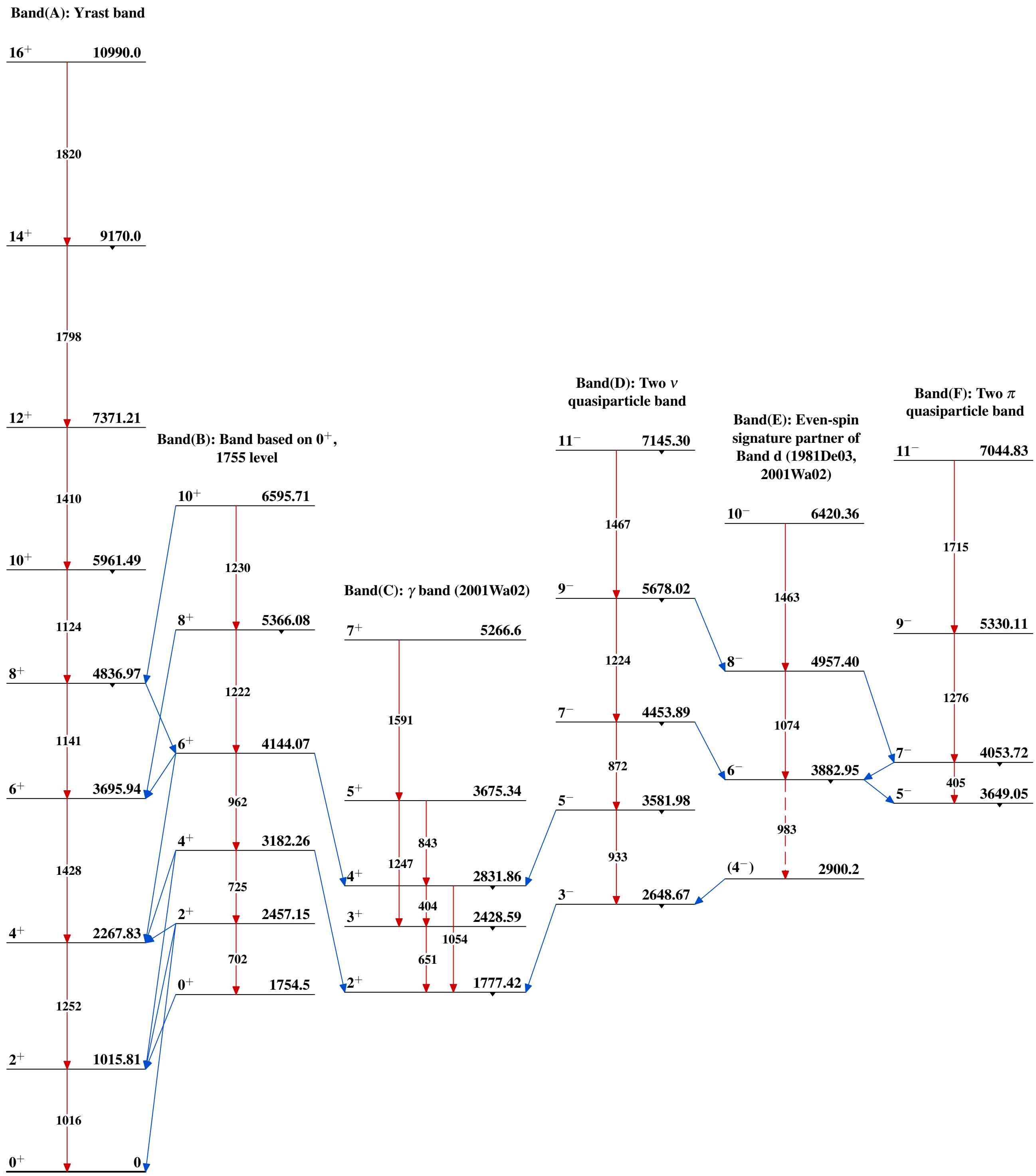
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

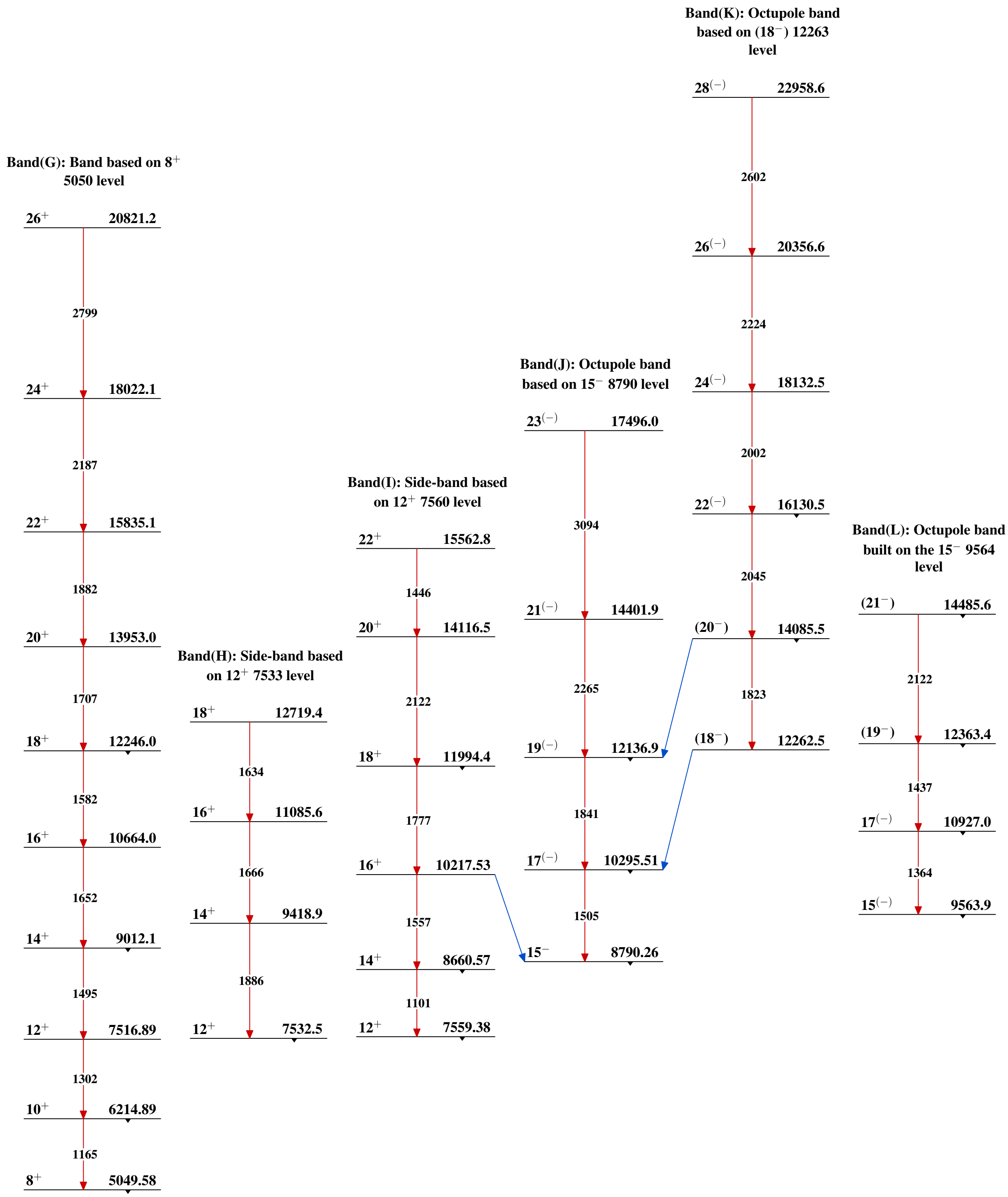


Adopted Levels, Gammas



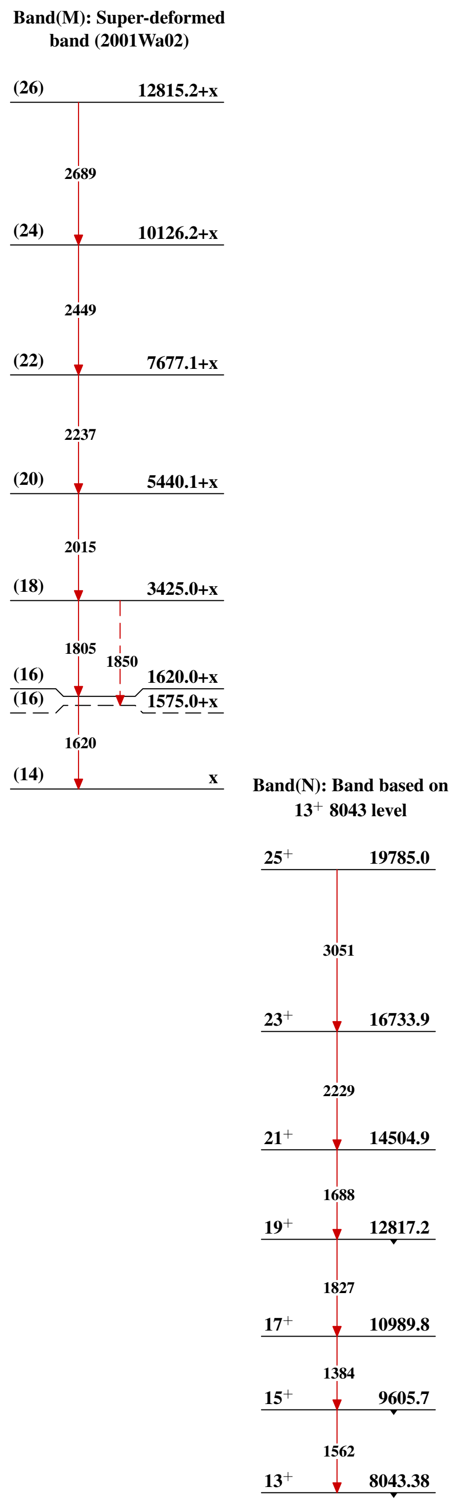
$^{68}_{32}Ge_{36}$

Adopted Levels, Gammas (continued)



$^{68}_{32}Ge_{36}$

Adopted Levels, Gammas (continued)



$^{68}_{32}Ge_{36}$

Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	G. Gürdal, E. A. Mccutchan	NDS 136, 1 (2016)	1-Jul-2016

Q(β^-)=−6.22×10^3 *5*; S(n)=11532.5 *16*; S(p)=8523.0 *15*; Q(α)=−4087.7 *11* 2012Wa38
S(2n)=19725.7 *21*; S(2p)=15132.9 *11* (2012Wa38).
α: Additional information 1.

^{70}Ge Levels

Cross Reference (XREF) Flags

A	^{70}Ga β^- decay	J	^{69}Ga(p,γ)	S	^{70}Ge(p,p′),(pol p,p′)
B	^{70}As ε decay	K	^{69}Ga(d,n)	T	^{70}Ge(d,d′)
C	^{70}Zn 2β^- decay	L	^{69}Ga(α,t)	U	^{70}Ge(^{6}Li,^{6}Li′)
D	^{12}C(^{66}Zn,^{8}Beγ)	M	^{69}Ga(^{3}He,d)	V	^{70}Ge(α,α′)
E	^{46}Ti(^{28}Si,4pγ)	N	Coulomb excitation	W	^{70}Ge(e,e′)
F	^{64}Ni(^{12}C,α2nγ)	O	^{70}Ge(γ,γ′)	X	^{72}Ge(p,t)
G	^{65}Cu(^{7}Li,2nγ), ^{60}Ni(^{12}C,2pγ)	P	^{70}Ge(pol γ,γ′)	Y	^{74}Se(d,^{6}Li)
H	^{66}Zn(^{6}Li,d)	Q	^{70}Ge(n,n′γ)		
I	^{68}Zn(α,2nγ), ^{67}Zn(α,nγ)	R	^{70}Ge(p,p′γ)		

E(level)[†]	J$^\pi$	T$_{1/2}$	XREF	Comments
0.0[b]	0$^+$	stable	ABCDEFGHIJKLMNOPQRSTUVWXY	R=4.055 fm *8*; where R is the rms value of charge distribution from (e,e′).
1039.506[b] *9*	2$^+$	1.31 ps *2*	AB DEFG IJ LMN QRSTUVWXY	Q=+0.04 *3* (2003Su01); μ=+0.91 *5* T$_{1/2}$: from B(E2)=0.179 *3* in Coulomb excitation. Others: 1.38 ps *8* from B(E2)=0.169 *10* from (e,e′), 1.32 ps *14* from DSAM in ^{12}C(^{66}Zn, ^{8}Be), 1.3 ps *3* from DSAM in ^{68}Zn(α,2nγ), ^{67}Zn(α,nγ) and >5 ps in (^{7}Li,2nγ). J$^\pi$: from 1039.49γ E2 to 0$^+$. Q: from multiple Coulomb Excitation (2003Su01). μ: from weighted average of 0.88 *8* (2013Gu23, from g-factor using TF), 0.90 *16* (2007Bo41, from g-factor using TF), 0.86 *24* (2006Le24, from g-factor using TF), 0.740 *178* (1987La20, from g-factor using TF), 0.94 *52* (1984Pa20, from g-factor using TF), 0.94 *20* (1977Fa07, from g-factor using IMPAC). Others: 0.76 *16* (1977Fa07), 1.18 *58* (1969He11); the same data reanalyzed by 1974Hu01 gave μ=1.76 *42*; the same data reanalyzed by 1977Fa07 according to the latest understanding of the experiment and corrections μ = 0.94 *20* (from g=0.47 *10*) (this value is included in the weighted average).
1215.621[e] *15*	0$^+$	3.7 ns *2*	AB DE GHIJKLMN QRSTUV XY	T$_{1/2}$: from electron spectrometer measurement with pulsed-cyclotron beam in (p,p′γ). Others: 2.9 ns *4* from ^{70}Ga β^- decay; 4.8 ns *7* from B(E2) in Coulomb excitation. J$^\pi$: L=0 from ^{72}Ge(p,t) and ^{66}Zn(^{6}Li,d); E0 transition to g.s.. The level interpreted as deformed-intruder state (2003Su01).
1707.689[c] *14*	2$^+$	1.94 ps *28*	B DEFG IJ LMN QRSTUV X	Q=−0.07 *4* (2003Su01); μ=+1.3 *7* (2013Gu23) J$^\pi$: from 1708γ E2 transition to g.s. T$_{1/2}$: from DSAM in ^{12}C(^{66}Zn, ^{8}Be). Other: 1.1 ps *+10−4* from (α,2nγ), (α,nγ), 4.2 ps *+26−14* from Coulomb

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Adopted Levels, Gammas (continued)

^{70}Ge Levels (continued)

E(level)[†]	J$^{\pi}$	T$_{1/2}$	XREF	Comments
				excitation and > 7 ps in ^{65}Cu(^{7}Li, 2nγ), ^{60}Ni(^{12}C,2pγ). Q: from multiple Coulomb Excitation. μ: from g-factor measurements using TF in Coulomb excitation. Other: 0.8 *12* from ^{12}C(^{66}Zn, ^{8}Be) using TF.
2153.084[b] *20*	4^{+}	0.76 ps *14*	B DEFG IJ L N QR UV X	Q=+0.22 *5* (2003Su01); μ=+1.7 *8* T$_{1/2}$: from DSAM in ^{12}C(^{66}Zn,^{8}Be). Others: 4 ps *1* from DSAM in ^{65}Cu(^{7}Li,2nγ), ^{60}Ni(^{12}C,2pγ) and 1.7 ps *4* from Coulomb excitation and 0.8 ps *2* from DSAM in ^{68}Zn(α.2nγ),^{67}Zn(α,nγ). J$^{\pi}$: from 1113.60γ E2 to 2^{+}; assumed E2 cascade member. Q: from multiple Coulomb Excitation (2003Su01). μ: from g-factor measurements using TF in Coulomb excitation (2013Gu23,2007Bo41).
2156.744[e] *21*	2^{+}		B D G J MN QRS	Q=+0.26 *10* (2003Su01) J$^{\pi}$: 941.10γ E2 to 0^{+}. Q: from multiple Coulomb Excitation.
2160			ST	
2307.0 *5*	0^{+}	≤40 ps	J LM QRS X	T$_{1/2}$: centroid-shift time measurement in (p,p′γ). J$^{\pi}$: E0 transition to g.s.
2451.313[c] *21*	3^{+}	1.7[#] ps *+10−3*	B D FG IJ LM QRS	J$^{\pi}$: from 743.62γ M1(+E2) to 2^{+}; J = 3 from angular distribution and yield function in (α,2nγ).
2534.95 *4*	2^{+}	0.6[#] ps *2*	B D IJ LM QRS X	J$^{\pi}$: L(p,t)=2; *J$^{\pi}$* not consistent with observed log *ft*=7.8 from 4^{+}. T$_{1/2}$: Other: >0.4 ps from DSAM in (n,n′γ).
2562.049[d] *20*	3^{-}	0.50 ps *7*	B DE G I LMN QRSTUVWX	μ=0.3 *9* (2007Bo41) T$_{1/2}$: weighted average of 0.55 ps *7* in ^{12}C(^{66}Zn, ^{8}Beγ) (from DSAM) and 0.4 ps *1* in ^{65}Cu(^{7}Li,2nγ), ^{60}Ni(^{12}C,2pγ) (from DSAM). Others: 2.3 ps *5* from ^{65}Cu(^{7}Li,2nγ), ^{60}Ni(^{12}C,2pγ). J$^{\pi}$: L(p,t)=3. B(E3)=0.073 *10* in ^{70}Ge(e,e′); 0.068 from Coulomb excitation. μ: from transient field method in Coulomb excitation (2007Bo04).
2806.25[c] *3*	4^{+}	0.6[#] ps *2*	B DEFG IJ LM QRS V X	J$^{\pi}$: L(p,t)=4; 1098.54γ E2 to 2^{+}. Discrepant with L(α,α′)=3 for E=2800 keV *10* which may be a different level.
2887.4 *7*	0^{+}		LM QRS X	J$^{\pi}$: from L(p,t)=0.
2945.0 *10*	2^{+}		J LM QRS V X	J$^{\pi}$: from L(p,t)=2.
3046.439 *20*	3^{+}		B lM QRS U X	J$^{\pi}$: from 889.72γ D+Q to 2^{+}; 893.59γ D+Q to 4^{+}, log *ft*=5.75 from 4^{+} parent.
3058.695[e] *16*	4^{+}	1.4[#] ps *3*	B DE G I m QRST V	T$_{1/2}$: other: 1.0 ps *5* from DSAM in ^{65}Cu(^{7}Li,2nγ), ^{60}Ni(^{12}C,2pγ). J$^{\pi}$: L(p,t)=4.
3105.7 *7*	(0^{+})		M QRS X	J$^{\pi}$: from excitation function in (p,p′γ).
3130 *10*			V	
3180.6 *10*	2^{+}	0.015 ps *6*	M QRS UV X	J$^{\pi}$: L(p,t)=2. T$_{1/2}$: from DSAM in (n,n′γ).
3194.2 *6*	4^{+}		L S V X	J$^{\pi}$: L(p,t)=4; discrepant with L(α,α′)=(5) for E=3200 keV *10*. Also, L(p,p′)=4.

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Adopted Levels, Gammas (continued)

^{70}Ge Levels (continued)

E(level)[†]	J$^\pi$	T$_{1/2}$	XREF	Comments
3240.5 *10*	1$^+$		LM O RS	J$^\pi$: 1 from $\gamma(\theta)$ in (γ,γ') and π=+ from L=1 in (^{3}He,d).
3294.79 *8*	3$^+$,4$^+$		B e QR X	J$^\pi$: from 1587γ to 2$^+$ and L(p,p′) = 4.
3296.98[b] *3*	6$^+$	0.5[#] ps *1*	eFG I Q S	T$_{1/2}$: others: 2.6 ps *6* from DSAM in ^{65}Cu(^{7}Li,2nγ), ^{60}Ni(^{12}C,2pγ). J$^\pi$: from 1143.89γ E2 to 4$^+$; band assignment.
3308			X	
3314.5 *7*	1$^-$		M O QRS UV X	J$^\pi$: 1 from $\gamma(\theta)$ in (γ,γ'), π=− from L(α,α')=1. B(E1)↑: from ^{70}Ge(γ,γ').
3334.8 *10*	0$^+$ to 3$^+$		LM QRS X	J$^\pi$: from L=1(+3) in (^{3}He,d) and from observed 2295.3γ to 2$^+$.
3345 *2*			S	
3351 *2*			S	
3371.57 *10*	(3,4)	0.3 ps *2*	B Q	J$^\pi$: log *ft*=7.7 *1* from 4$^+$ in ε decay; J=5 unlikely because of 2333γ to 2$^+$ level. T$_{1/2}$: from DSAM in (n,n′γ).
3416.32[d] *4*	5$^-$	13.7[@] ps *10*	DE G I M Q S X	J$^\pi$: L(p,t)=5. T$_{1/2}$: Other: > 14 ps in ^{65}Cu(^{7}Li, 2nγ), ^{60}Ni(^{12}C,2pγ).
3423 *2*	(2$^+$)		V X	J$^\pi$: from L(p,t)=(2).
3428 *2*	5$^-$		STU	J$^\pi$: from L(α,α')=5.
3432 *2*	3$^-$		M S V X	J$^\pi$: from L(α,α')=3.
3456 *2*	4$^+$		S	J$^\pi$: from L=4 in (p,p′) and (^{6}Li,^{6}Li′).
3466? *6*			M	
3482.3 *5*	1$^+$,2$^+$,3$^+$		M RS X	J$^\pi$: from L=1+3 in (^{3}He,d).
3488.276 *21*	(3,4$^+$)		B QRS	J$^\pi$: log *ft*=6.0 *1* from 4$^+$ in ε decay; J=4$^-$ and 5 unlikely because of 2449γ to 2$^+$ level.
3517? *6*			M	
3540?			T	
3562.7 *6*			M RS X	
3570.44 *7*	(3)$^-$		B M S UV	J$^\pi$: from 2531.7γ to 2$^+$; 1471.24γ to 4$^+$; L=4(+2) in (^{3}He,d).
3580.7 *10*	4$^+$	0.6 ps *2*	Q S	J$^\pi$: L(α,α')=4. T$_{1/2}$: from DSAM in (n,n′γ).
3590.3 *5*			M RS	
3631.5 *10*	(2)$^+$	0.5 ps *1*	LM QRS X	J$^\pi$: from L(p,t)=(2); π=+ from L(^{3}He,d)=1. T$_{1/2}$: from DSAM in (n,n′γ).
3637 *10*	0$^+$		V	J$^\pi$: L(α,α')=0.
3666.78[d] *6*	6$^-$	35[@] ps *3*	E G I M Q S	J$^\pi$: J=6 from $\gamma(\theta)$ in ^{46}Ti(^{28}Si,4pγ), π from 250γ M1(+E2) to 5$^-$. T$_{1/2}$: others: 40 ps *8* in ^{68}Zn(α,2nγ), ^{67}Zn(α,nγ) and 74 ps *6* in (HI,xnγ).
3669.4[c] *10*	(5$^+$)	1[#] ps *1*	F I M	J$^\pi$: 1218γ to 3$^+$; band assignment.
3675.76 *7*	4$^+$		B L RS V	J$^\pi$: from L(α,α')=4.
3683 *3*	0$^+$		X	J$^\pi$: from L(p,t)=0.
3687 *3*	1$^+$,2$^+$,3$^+$		M S	J$^\pi$: L=1+3 in (^{3}He,d).
3708.5 *9*			M RS	
3733 *3*	1$^+$,2$^+$,3$^+$		M	J$^\pi$: L=1+3 in (^{3}He,d).
3740 *3*	0$^+$		S X	J$^\pi$: L(p,t)=0.
3753.2[c] *4*	6$^+$	1.6[#] ps *5*	EFG I S	J$^\pi$: from stretched 946.7γ E2 to 4$^+$, L(p,p′)=(6); band assignment.
3776 *2*	3$^-$		S V X	J$^\pi$: from L(α,α')=3.
3782 *2*	2$^+$		M S	XREF: M(3775). J$^\pi$: from L(p,t)=2.

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Adopted Levels, Gammas (continued)

^{70}Ge Levels (continued)

E(level)[†]	J^π	$T_{1/2}$	XREF	Comments
3850 *3*			LM S	
3856 *2*	$(2)^-$		S	J^π: from L=4+2(+0) in (^{3}He,d).
3870 *2*	3^-		S V X	J^π: from L(α,α')=3.
3890 *3*	$1^+,2^+,3^+$		M S	J^π: from L=1+3 in (^{3}He,d).
3895.2 *10*	1		L O X	J^π: from 3895.1γ D to 0^+.
3900.6 *7*	$(4^-,5,6,7^-)$		E	J^π: from 234γ to 6^-, 484γ to 5^-.
3903.9 *7*	+		M RS V	J^π: L=1+3 in (^{3}He,d), L(p,p')=(0). E(level): from (p,p'γ).
3911 *3*			S	
3928 *3*	4^+		S X	J^π: from L(p,t)=4.
3941? *10*			S	
3955.11[d] *8*	7^-	17.0[@] ps *10*	E G I Q S V	J^π: J=7 from $\gamma(\theta)$ in (α,2nγ), π from 288γ M1+(E2) to 6^-.
3964 *3*	$(2)^-$		LM V	J^π: from L=4+2(+0) in (^{3}He,d).
3976 *3*	$1^+,2^+,3^+$		S	J^π: from L(α,α')=2.
3990 *3*			M S	
4003 *2*			RS V	
4024 *3*	4^+		M X	J^π: from L(p,t)=4.
4037 *3*	(4^+)		S V	J^π: from L(α,α')=(4).
4053.3 *10*			E	
4054 *3*			M S	
4061 *2*	$1^+,2^+,3^+$		S	J^π: from L=1+3 in (^{3}He,d).
4080 *3*	$1^+,2^+,3^+$		M	J^π: from L=1+3 in (^{3}He,d).
4086 *3*	4^+		V X	J^π: L(p,t)=4.
4096.1 *20*	3^-		RS	J^π: from L(α,α')=3.
4101.45 *5*	$3^-,4^-$		B S	J^π: from 688γ to 5^- and L(p,p')=3.
4103.5[‡e] *5*	6^+		G	J^π: 1295γ Q to 4^+; band assignment in ^{65}Cu(^{7}Li, 2nγ), ^{60}Ni(^{12}C, 2pγ) (2010Su05).
4119 *3*			M S	
4131 *2*	2^-		M S	J^π: from L=4+2+0 in (^{3}He,d).
4144.7 *20*	1^-		RS V	J^π: from L(α,α')=1.
4155 *2*	$1^+,2^+,3^+$		M S	J^π: L=1+3 in (^{3}He,d).
4166 *3*			S	
4180 *3*	2^+		S X	J^π: L(p,t)=2.
4203.5[b] *4*	8^+	8[@] ps *2*	EFG I M S	J^π: from 906.6γ E2 to 6^+; band assignment.
4212 *3*	$3^+,4^+,5^+$		M S	J^π: from L(p,p')=4.
4226 *3*	2^+		S X	J^π: from L(p,t)=2.
4238 *3*	$1^+,2^+,3^+$		M S X	J^π: from L=1+3 in (^{3}He,d).
4243.11 *15*			B	
4261 *10*	2^+		S X	J^π: from L(p,t)=2.
4268 *10*	5^-		V	J^π: from L(α,α')=5.
4282 *10*	$3^+,4^+,5^+$		S	J^π: from L(p,p')=4.
4287 *3*	$1^+,2^+,3^+$		M	J^π: from L(^{3}He,d)=1+3.
4299.3 *3*	7^-	3[@] ps *1*	E G I S V	J^π: from L(α,α')=7.
4330 *3*			LM S V X	L=4+2(+0) in (^{3}He,d); L(α,α')=(3+5), L(p,t)=0.
4352 *3*	$(2)^-$		M P X	J^π: from L=4+2(+0) in (^{3}He,d).
4356.7 *7*	$1^{(-)}$[&]		P	B(E1)↑=0.0023 *4* B(E1) from ^{70}Ge(pol γ, γ').
4357 *10*	+		S X	L(p,t)=2 at 4357 *20*; L(p,p')=4 at 4357 *10*.
4365 *10*	(3^-)		S V	J^π: from L(α,α')=(3) for 4373 *10*.
4378 *10*			S	
4391 *3*	$1^+,2^+,3^+$		M S	J^π: from L(^{3}He,d)=1+3.
4409 *10*	4^+		S V	J^π: from L(α,α')=4.
4419 *3*	$2^-,3^-,4^-$		M S	J^π: from L(^{3}He,d)=4+2.

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Adopted Levels, Gammas (continued)

^{70}Ge Levels (continued)

E(level)[†]	J^π	$T_{1/2}$	XREF	Comments
4431.4 *4*	8^+	0.4[#] ps *2*	EFG I	J^π: from 1134.6γ E2 to 6^+ and yield function in ^{68}Zn(α,2nγ).
4447.5 *8*	1^-[&]		M P	B(E1)↑=0.0036 *7* B(E1) from ^{70}Ge(pol γ, γ′).
4448 *2*	2^+		S V X	J^π: from L(p,t)=2.
4473 *2*	4^+		M S V X	J^π: from L(p,t)=4. Other: L(α,α′)=(3+5) is discrepant.
4520 *3*	$2^-,3^-,4^-$		M S	J^π: from L(^{3}He,d)=4+2.
4520.9 *8*	1^-		P	B(E1)↑<0.0005 B(E1) from ^{70}Ge(pol γ, γ′).
4534 *10*	(4^+)		S V	J^π: from L(α,α′)=(4).
4539 *3*	0^+		X	J^π: from L(p,t)=0.
4546 *10*			S	
4552.1 *10*	(8)	104[@] ps *+70−35*	I	J^π: from 253γ to 7^+ and 1253.2γ to 6^+.
4555 *3*			M S	
4574 *3*			M	
4577.18 *15*	$(3,4^+)$		B S	J^π: log *ft*=6.4 from 4^+ in ε decay; J=5 unlikely because of 2421γ to 2^+ level.
4606 *10*			S	
4613 *3*	$1^+,2^+,3^+$		M S	J^π: from L(^{3}He,d)=1+3.
4629 *3*	(4^+)		S V X	J^π: L(α,α′)=(4).
4642 *3*	$(2)^-$		M S	J^π: L(^{3}He,d)=4+2(+0).
4657 *10*			V	E(level): multiplet.
4675.39 *21*	$(3,4^+)$		B S	J^π: log *ft*=6.2 *2* from 4^+ in ε decay; J=5 or 4^- are unlikely because of 2968.1γ to 2^+ level.
4687 *2*	$(2)^-$		LM S	J^π: L=4+2(+0) in (^{3}He,d).
4707 *10*			S X	
4716 *10*	(2^+)		S V	J^π: from L(p,t)=(2).
4727 *10*			S	
4736 *3*			M	
4768 *3*	$(2)^-$		M	J^π: L(^{3}He,d)=4+2(+0).
4775 *10*	(4^+)		V	J^π: from L(α,α′)=(4).
4790.6 *19*	$1^{(-)}$[&]		P	
4810 *10*	3^-		V	J^π: from L(α,α′)=3.
4820.2[c] *11*	(8^+)		F	J^π: 1067γ to 6^+; band assignment.
4851.9 *4*	(8^-)[a]	>3[#] ps	E G I M	J^π: from (M1+E2) γ to 7^-.
4877 *3*	2^-		M	J^π: L=4+2+0 in (^{3}He,d).
4886.6 *13*	1[&]		P	
4905 *3*	3^-		M	J^π: from L(α,α′)=3.
4908.1[d] *10*	(9^-)[a]		E	
4915 *10*			V	
4935 *3*	1^-		X	J^π: from L(p,t)=1.
4940 *10*	3^-		V	J^π: from L(α,α′)=3.
4943 *3*	$(2)^-$		M	J^π: L(^{3}He,d)=4+2(+0).
4979 *3*	$(2)^-$		M	J^π: L=4+2(+0) in (^{3}He,d).
4985.0 *10*			I	
5008 *3*	2^-		M V	J^π: from L=4+2+0 in (^{3}He,d); L(α,α′)=(3).
5024 *3*	2^+		X	J^π: from L(p,t)=2.
5040 *10*	(3^-)		I M V	J^π: L(α,α′)=(3).
5048.4 *10*	(4^-)		I M	J^π: from L(^{3}He,d)=4+2+0; 1381.gγ to 2^-.
5050 *3*	0^+		L X	J^π: from L(p,t)=0.
5078 *3*	$1^+,2^+,3^+$		M V	J^π: L=1+3 in (^{3}He,d).
5102 *3*	$1^+,2^+,3^+$		M	J^π: L=1+3 in (^{3}He,d).
5113 *10*	(3^-)		V	J^π: L(α,α′)=(3).

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Adopted Levels, Gammas (continued)

^{70}Ge Levels (continued)

E(level)[†]	J^π	$T_{1/2}$	XREF	Comments
5129.6 7	1^-[&]		P	B(E1)↑=0.0029 8 B(E1) from ^{70}Ge(pol γ, γ′).
5145 3	(3^-)		M V	J^π: L(α,α′)=(3); discrepant with L(^{3}He,d)=(4+2+0).
5184 3	0^+		X	J^π: L(p,t)=0.
5195 10	(4^+)		V	J^π: L(α,α′)=(4).
5222.3 14			E	
5227 10	(3^-)		V	J^π: L(α,α′)=(3).
5242.7[b] 11	10^+		EFG I	J^π: from 1039.2γ Q to 8^+; band assignment.
5263.4 8	$1^{(-)}$[&]		P	B(E1)↑=0.0022 4 B(E1) from ^{70}Ge(pol γ, γ′).
5265.82 14			B	
5290 3	0^+		X	J^π: L(p,t)=0.
5299.2 4	$9^{(-)}$		E G I	J^π: from 1344.1γ (E2) to 7^-, 1273γ from $11^{(-)}$; inconsistent with (6,7,8) from γ(θ) in (^{7}Li,2nγ).
5338 3	0^+		X	J^π: L(p,t)=0.
5370.11 5			B	
5403 3	0^+		X	J^π: L(p,t)=0.
5410 3			X	
5435.5[‡e] 11	8^+		G	J^π: from 1332γ Q to 6^+; band assignment in ^{65}Cu(^{7}Li, 2nγ), ^{60}Ni(^{12}C, 2pγ) (2010Su05).
5441 3	(2^+)		X	J^π: L(p,t)=(2).
5465.3 8	1^-[&]		P	B(E1)↑=0.0023 4 B(E1) from ^{70}Ge(pol γ, γ′).
5467 3	0^+		X	J^π: L(p,t)=0.
5512.5 10	$1^{(-)}$[&]		P	B(E1)↑=0.0019 3 B(E1) from ^{70}Ge(pol γ, γ′).
5539.7 5	(10)	5 ns 2	FG I	$T_{1/2}$: from electronic timing in ^{68}Zn(α,2nγ), ^{67}Zn(α,nγ). J^π: $T_{1/2}$ of this level suggests that the 1108γ to 8^+ may be M2, suggesting an assignment of $J^\pi=10^-$. However, level is assigned as side band member based on 8^+ in ^{64}Ni(^{12}C,α2nγ), suggesting an assignment of $J^\pi=10^+$. Other: 9^+ in ^{65}Cu(^{7}Li,2nγ), ^{60}Ni(^{12}C,2pγ).
5552.5[‡] 5	$9^{(-)}$		G	J^π: 1253.2γ Q to 7^-.
5876.9 7	$1^{(-)}$[&]		P	B(E1)↑=0.0014 4 B(E1) from ^{70}Ge(pol γ, γ′).
5989.7 7	$1^{(+)}$[&]		P	
6006.9 11			E	
6160.1[d] 14	(11^-)[a]		E	
6297.0 14	1[&]		P	
6362.8 8	1[&]		P	
6549.1 14			E	
6572.2 11	$11^{(-)}$		G	J^π: from 1273γ Q to $9^{(-)}$.
6587.7 8	$1^{(+)}$[&]		P	
6604.2 11			E	
6636.6 15	1[&]		P	
6702.5 13	$1^{(-)}$[&]		P	B(E1)↑=0.0027 5 B(E1) from ^{70}Ge(pol γ, γ′).
6716.8[b] 15	12^+		FG	J^π: Q 1474γ to 10^+; band assignment.
6779.7 11	(12)		F	
6786.1[d] 17	(13^-)[a]		E	
7306.3 8	$1^{(+)}$[&]		P	

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Adopted Levels, Gammas (continued)

^{70}Ge Levels (continued)

E(level)[†]	J^π	XREF	Comments
7426.0 *8*	$1^{(-)}$[&]	P	B(E1)↑=0.0022 *4* B(E1) from ^{70}Ge(pol γ, γ').
7619.7 *15*	(14)	F	J^π: Q 840γ to (12).
7753.5 *10*	$1^{(-)}$[&]	P	B(E1)↑=0.0026 *6* B(E1) from ^{70}Ge(pol γ, γ').
7767.8[b] *18*	14^+	F	J^π: Q 1051γ to 12^+, band assignment.
8058.1[d] *20*	(15^-)[a]	E	
8245.7 *18*	(16)	F	J^π: Q 626γ to (14).
8283.7 *15*	$1^{(+)}$[&]	P	
8878.5 *14*	1[&]	P	
9423.7 *21*	(18)	F	J^π: Q 1178γ to (16).
9619.2[d] *22*	(17^-)[a]	E	
10269.7 *23*	(20)	F	J^π: 846γ to (18).
11336.2[d] *25*	(19^-)[a]	E	
13173[d] *3*	(21^-)[a]	E	

† From a least-squares fit for levels connected by γ's and from reaction data sets for others.
‡ This level was only reported in 2010Su05 in ^{65}Cu(^{7}Li,2nγ), ^{60}Ni(^{12}C,2pγ).
# From DSAM in ^{68}Zn(α,2nγ), ^{67}Zn(α,nγ).
@ From RDM in ^{68}Zn(α,2nγ), ^{67}Zn(α,nγ) (1982Cl02).
& From mult in (pol γ,γ').
a From (^{28}Si,4pγ) based on DCO, and level cascades.
b Band(A): sequence based on g.s..
c Band(B): sequence based on 2^+, 1707.7 keV level.
d Band(C): sequence based on 3^-, 2562.05 keV level.
e Band(D): sequence based on 0^+, 1215.62 keV level.

Adopted Levels, Gammas (continued)

$\gamma(^{70}Ge)$

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	δ	α	$I_{(\gamma+ce)}$	Comments
1039.506	2^+	1039.513 *10*	100	0.0	0^+	E2[d]		3.23×10^{-4}		α(K)=0.000289 *4*; α(L)=2.96×10^{-5} *5*; α(M)=4.41×10^{-6} *7*; α(N)=2.88×10^{-7} *4* B(E2)(W.u.)=20.8 *4* E_γ: from ^{70}Ga β^- decay.
1215.621	0^+	176.115 *13*	100 *9*	1039.506	2^+	E2[f]		0.0894		α(K)=0.0790 *11*; α(L)=0.00902 *13*; α(M)=0.001337 *19*; α(N)=7.73×10^{-5} *11* B(E2)(W.u.)=48 *7* E_γ: from ^{70}Ga β^- decay.
		1215.8[b]		0.0	0^+	E0[f]			1.00 *4*	$I_{(\gamma+ce)}$: for 100 transitions of 176γ from (p,p$'\gamma$) (1985Pa15).
1707.689	2^+	492.09 *5*	4.9 *4*	1215.621	0^+	E2		0.00247		α(K)=0.00220 *3*; α(L)=0.000232 *4*; α(M)=3.45×10^{-5} *5*; α(N)=2.20×10^{-6} *3* B(E2)(W.u.)=16 *3* Mult.: from RUL and decay pattern.
		668.21 *4*	100 *6*	1039.506	2^+	M1+E2	−3.6 *+11−6*	9.80×10^{-4} *2*		α(K)=0.000875 *21*; α(L)=9.08×10^{-5} *22*; α(M)=1.35×10^{-5} *4*; α(N)=8.74×10^{-7} *20* B(E2)(W.u.)=64 *11*; B(M1)(W.u.)=0.0015 *9* Mult.,δ: from RUL, δ and decay pattern. δ as evaluated by 1977Kr17;
		1707.61 *2*	79.2 *23*	0.0	0^+	E2		2.87×10^{-4}		α(K)=0.0001011 *15*; α(L)=1.025×10^{-5} *15*; α(M)=1.529×10^{-6} *22*; α(N)=1.007×10^{-7} *15* B(E2)(W.u.)=0.50 *8* Mult.: from angular distribution in $^{68}Zn(\alpha,2n\gamma)$, $^{67}Zn(\alpha,n\gamma)$ and RUL.
2153.084	4^+	445.6 *10*	0.7 *4*	1707.689	2^+	[E2]		0.00338 *6*		α(K)=0.00301 *5*; α(L)=0.000318 *5*; α(M)=4.74×10^{-5} *8*; α(N)=3.00×10^{-6} *5* B(E2)(W.u.)=17 *10*
		1113.60 *4*	100 *6*	1039.506	2^+	E2		2.77×10^{-4}		α(K)=0.000247 *4*; α(L)=2.52×10^{-5} *4*; α(M)=3.76×10^{-6} *6*; α(N)=2.46×10^{-7} *4* B(E2)(W.u.)=25 *5* Mult.: from $^{68}Zn(\alpha,2n\gamma)$, $^{67}Zn(\alpha,n\gamma)$ and RUL. δ = −0.1 *2* in $^{68}Zn(\alpha,2n\gamma)$, $^{67}Zn(\alpha,n\gamma)$ gives a large B(M3) which is excluded by RUL.
2156.744	2^+	450.4 *5*	4.7 *24*	1707.689	2^+	E2		0.00327		α(K)=0.00291 *5*; α(L)=0.000308 *5*; α(M)=4.58×10^{-5} *7*; α(N)=2.90×10^{-6} *5* Mult.: from (p,p$'\gamma$). Other: D from $^{65}Cu(^{7}Li,2n\gamma)$, $^{60}Ni(^{12}C,2p\gamma)$.
		941.10 *4*	62 *3*	1215.621	0^+	E2		4.09×10^{-4}		α(K)=0.000366 *6*; α(L)=3.76×10^{-5} *6*; α(M)=5.60×10^{-6} *8*; α(N)=3.65×10^{-7} *6* Mult.: from (p,p$'\gamma$).
		1117.28 *4*	100 *6*	1039.506	2^+	E2		2.75×10^{-4}		α(K)=0.000245 *4*; α(L)=2.50×10^{-5} *4*;

γ(^{70}Ge) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	δ	α	$I_{(\gamma+ce)}$	Comments
										α(M)=3.73×10^{-6} *6*; α(N)=2.44×10^{-7} *4* Mult.: from (p,p′γ).
2156.744	2$^+$	2156.65 *6*	17.1 *9*	0.0	0$^+$	[E2]		4.60×10^{-4}		α(K)=6.55×10^{-5} *10*; α(L)=6.62×10^{-6} *10*; α(M)=9.88×10^{-7} *14*; α(N)=6.52×10^{-8} *10*
2307.0	0$^+$	599.1[b]	82[@] *7*	1707.689	2$^+$	E2[b]		1.36×10^{-3}		α(K)=0.001218 *17*; α(L)=0.0001270 *18*; α(M)=1.89×10^{-5} *3*; α(N)=1.216×10^{-6} *17* B(E2)(W.u.)>4.8
		1091.3[b]		1215.621	0$^+$	E0[f]			0.013 *2*	$I_{(\gamma+ce)}$: for 100 transitions of 1268γ from (p,p′γ) (1985Pa15).
		1267.5[b]	100[@] *7*	1039.506	2$^+$	E2[b]		2.28×10^{-4}		α(K)=0.000185 *3*; α(L)=1.89×10^{-5} *3*; α(M)=2.82×10^{-6} *4*; α(N)=1.85×10^{-7} *3* B(E2)(W.u.)>0.14
		2307.1[b]		0.0	0$^+$	E0[f]			0.040 *9*	$I_{(\gamma+ce)}$: for 100 transitions of 1268γ from (p,p′γ) and includes pair production (1985Pa15).
2451.313	3$^+$	294.60 *16*	0.37 *15*	2156.744	2$^+$					
		297.88 *8*	2.4 *4*	2153.084	4$^+$					
		743.62 *4*	100 *7*	1707.689	2$^+$	M1(+E2)	+0.04 *8*	5.78×10^{-4} *9*		α(K)=0.000517 *8*; α(L)=5.28×10^{-5} *8*; α(M)=7.89×10^{-6} *12*; α(N)=5.20×10^{-7} *8* B(E2)(W.u.)<0.5; B(M1)(W.u.)=0.022 *+14−5* Mult.,δ: D+Q from ^{65}Cu(^{7}Li,2nγ), ^{60}Ni(^{12}C,2pγ), M1+(E2) from RUL. Other: δ=+3.5 *9* from $\gamma(\theta)$ in (n,n′γ).
		1411.86 *4*	39.3 *23*	1039.506	2$^+$	M1+E2	−2.2 *+5−3*	2.18×10^{-4} *4*		α(K)=0.0001463 *22*; α(L)=1.487×10^{-5} *22*; α(M)=2.22×10^{-6} *4*; α(N)=1.460×10^{-7} *22* B(E2)(W.u.)=0.79 *+48−17*; B(M1)(W.u.)=0.00022 *+15−10* Mult.: D+Q from $\gamma(\theta)$ in (n,n′γ); M1+E2 from RUL. δ: from $\gamma(\theta)$ in (n,n′γ).
2534.95	2$^+$	827.24 *10*	32 *4*	1707.689	2$^+$					
		1319.6	9.5 *10*	1215.621	0$^+$					I_γ: from (n,n′γ); Iγ(827)/Iγ(1495)=76 *10*/100 *10*, in (n,n′γ) which ratio is different from the adopted Iγ from ^{70}As ε decay.
		1495.43 *5*	100 *8*	1039.506	2$^+$	M1+E2	−0.75	2.15×10^{-4}		α(K)=0.0001274 *18*; α(L)=1.291×10^{-5} *18*; α(M)=1.93×10^{-6} *3*; α(N)=1.273×10^{-7} *18* B(E2)(W.u.)=1.9 *7*; B(M1)(W.u.)=0.0050 *18* Mult.,δ: D+Q from $\gamma(\theta)$ in (n,n′γ); M1+E2 from RUL.
2562.049	3$^-$	1522.55 *2*	100	1039.506	2$^+$	E1+M2[d]	−0.11[d] *10*	3.42×10^{-4}		α(K)=6.7×10^{-5} *6*; α(L)=6.8×10^{-6} *6*; α(M)=1.01×10^{-6} *8*; α(N)=6.6×10^{-8} *6*

$^{70}_{32}$Ge$_{38}$-9

$\gamma(^{70}Ge)$ (continued)

E$_i$(level)	J$^\pi_i$	E$_\gamma$†	I$_\gamma$†	E$_f$	J$^\pi_f$	Mult.	α	Comments
								B(E1)(W.u.)=0.00022 *4* δ: other: −0.11 *4* from $\gamma(\theta)$ in (n,n′γ); 0.02 *5* from ^{65}Cu(^{7}Li,2nγ).
2806.25	4$^+$	653.15 *6*	11.8 *14*	2153.084	4$^+$	(M1)	7.66×10^{-4}	α(K)=0.000685 *10*; α(L)=7.01×10^{-5} *10*; α(M)=1.048×10^{-5} *15*; α(N)=6.90×10^{-7} *10* B(M1)(W.u.)=0.014 *5* Mult.: D from ^{65}Cu(^{7}Li,2pγ), ^{60}Ni(^{12}C,2pγ) based on ΔJ = 0 dipole transition; Δπ=no from level scheme.
		1098.54 *4*	100 *6*	1707.689	2$^+$	E2	2.84×10^{-4}	α(K)=0.000254 *4*; α(L)=2.60×10^{-5} *4*; α(M)=3.88×10^{-6} *6*; α(N)=2.54×10^{-7} *4* B(E2)(W.u.)=31 *11* Mult.: from ^{68}Zn(α,2nγ), ^{67}Zn(α,nγ) and RUL; δ=−0.2 *2* in ^{68}Zn(α,2nγ), ^{67}Zn(α,nγ) gives a large B(M3) which is excluded by RUL.
2887.4	0$^+$	730.8‡	100‡ *10*	2156.744	2$^+$			
		1179.5‡	100‡ *15*	1707.689	2$^+$			
2945.0	2$^+$	1237.3[b]	100[b]	1707.689	2$^+$			
3046.439	3$^+$	239.90 *10*	1.1 *3*	2806.25	4$^+$			
		595.11 *4*	100 *6*	2451.313	3$^+$	[M1+E2]		
		889.72 *4*	14.0 *9*	2156.744	2$^+$	M1+E2[h]		
		893.50 *4*	10.0 *5*	2153.084	4$^+$	M1+E2[h]		
		1338.76 *4*	48 *3*	1707.689	2$^+$	M1+E2[h]		
		2006.87 *3*	14.8 *5*	1039.506	2$^+$	M1+E2[h]		
3058.695	4$^+$	252.46 *4*	16.3 *10*	2806.25	4$^+$	[M1+E2]		
		496.74 *4*	15.3 *10*	2562.049	3$^-$	[E1]	7.15×10^{-4}	α(K)=0.000639 *9*; α(L)=6.52×10^{-5} *10*; α(M)=9.72×10^{-6} *14*; α(N)=6.31×10^{-7} *9* B(E1)(W.u.)=0.00015 *4* Mult.: D from $\gamma(\theta)$ in ^{65}Cu(^{7}Li,2pγ), ^{60}Ni(^{12}C,2pγ).
		607.34 *4*	26.2 *15*	2451.313	3$^+$	M1+(E2)[h]		
		901.95 *5*	5.9 *4*	2156.744	2$^+$	[E2]	4.54×10^{-4}	α(K)=0.000406 *6*; α(L)=4.17×10^{-5} *6*; α(M)=6.22×10^{-6} *9*; α(N)=4.05×10^{-7} *6* B(E2)(W.u.)=1.00 *23*
		905.61 *2*	67 *4*	2153.084	4$^+$	[M1+E2]		
		1350.90 *6*	2.8 *3*	1707.689	2$^+$	[E2]	2.21×10^{-4}	α(K)=0.0001618 *23*; α(L)=1.647×10^{-5} *23*; α(M)=2.46×10^{-6} *4*; α(N)=1.614×10^{-7} *23* B(E2)(W.u.)=0.063 *16*
		2019.16 *2*	100.0 *25*	1039.506	2$^+$	E2	4.02×10^{-4}	α(K)=7.38×10^{-5} *11*; α(L)=7.46×10^{-6} *11*; α(M)=1.114×10^{-6} *16*; α(N)=7.35×10^{-8} *11* B(E2)(W.u.)=0.30 *7* Mult.: from ^{68}Zn(α,2nγ), ^{67}Zn(α,nγ) and RUL. M3 is ruled out because δ=+0.2 *2* from ^{68}Zn(α,2nγ), ^{67}Zn(α,nγ) gives a large B(M3).
3105.7	(0$^+$)	1397.9‡	33‡ *10*	1707.689	2$^+$			
		2066.3‡	100‡ *7*	1039.506	2$^+$			
3180.6	2$^+$	2141.1‡	100	1039.506	2$^+$			

Adopted Levels, Gammas (continued)

$\gamma(^{70}Ge)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	δ	α	Comments
3240.5	1^+	3240.4	100	0.0	0^+	M1		8.29×10^{-4}	α(K)=3.21×10^{-5} *5*; α(L)=3.23×10^{-6} *5*; α(M)=4.82×10^{-7} *7*; α(N)=3.19×10^{-8} *5* E_γ: from (γ,γ'). Mult.: D from $\gamma(\theta)$ in (γ,γ'), $\Delta\pi$=yes from level scheme.
3294.79	$3^+,4^+$	760.2 *5*	$8.\times10^{1}$ *4*	2534.95	2^+				
		1587.17 *12*	100 *13*	1707.689	2^+				
		2255.16 *11*	44 *6*	1039.506	2^+				
3296.98	6^+	490[g]	0.80[g] *20*	2806.25	4^+	[E2]			
		1143.89[&] *2*	100[g]	2153.084	4^+	E2		2.62×10^{-4}	α(K)=0.000232 *4*; α(L)=2.37×10^{-5} *4*; α(M)=3.53×10^{-6} *5*; α(N)=2.31×10^{-7} *4* B(E2)(W.u.)=34 *7* Mult.: From angular distribution in ^{68}Zn(α,2nγ), ^{67}Zn(α,nγ) and RUL. δ = 0.0 *2* from $\gamma(\theta)$.
3314.5	1^-	2274.6[‡]		1039.506	2^+				
		3314.8		0.0	0^+	E1		1.41×10^{-3}	α(K)=2.09×10^{-5} *3*; α(L)=2.10×10^{-6} *3*; α(M)=3.14×10^{-7} *5*; α(N)=2.07×10^{-8} *3* E_γ: from (γ,γ'). Mult.: D from $\gamma(\theta)$ in (γ,γ'), $\Delta\pi$=yes from level scheme.
3334.8	0^+ to 3^+	2295.3[‡]	100	1039.506	2^+				
3371.57	(3,4)	1218.57 *11*	100 *21*	2153.084	4^+				
		2331.59 *24*	26 *6*	1039.506	2^+				
3416.32	5^-	357.72 *5*	59 *4*	3058.695	4^+	E1[d]		1.68×10^{-3}	α(K)=0.001499 *21*; α(L)=0.0001533 *22*; α(M)=2.28×10^{-5} *4*; α(N)=1.475×10^{-6} *21* B(E1)(W.u.)=0.000146 *16* Mult.: From ^{68}Zn(α,2nγ), ^{67}Zn(α, nγ) and RUL. δ =−0.06 *3* in ^{68}Zn(α,2nγ), ^{67}Zn(α, nγ) gives a large B(M2). δ: Other: 0.00 *4* in ^{65}Cu(^{7}Li, 2nγ), ^{60}Ni(^{12}C, 2pγ).
		854.6 *4*	97 *6*	2562.049	3^-	E2		5.20×10^{-4}	α(K)=0.000464 *7*; α(L)=4.78×10^{-5} *7*; α(M)=7.13×10^{-6} *10*; α(N)=4.64×10^{-7} *7* B(E2)(W.u.)=2.00 *21* Mult.: From ^{68}Zn(α,2nγ), ^{67}Zn(α, nγ) and RUL. δ =0.02 *5* in ^{68}Zn(α,2nγ), ^{67}Zn(α, nγ) gives a large B(M3).
		1263.09[&] *6*	100 *6*	2153.084	4^+	E1(+M2)[d]	−0.05[d] *5*	1.90×10^{-4} *4*	α(K)=8.98×10^{-5} *24*; α(L)=9.07×10^{-6} *25*; α(M)=1.35×10^{-6} *4*; α(N)=8.90×10^{-8} *25* B(E1)(W.u.)=5.5×10^{-6} *6*; B(M2)(W.u.)=0.040 *4*
3488.276	$(3,4^+)$	953.30 *7*	11.3 *11*	2534.95	2^+				
		1036.99 *4*	64 *5*	2451.313	3^+				

$^{70}_{32}Ge_{38}$-11

Adopted Levels, Gammas (continued)

$\gamma(^{70}Ge)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.	δ	α	Comments
3488.276	(3,4$^+$)	1331.58 *7*	10.0 *9*	2156.744	2$^+$				
		1335.28 *10*	8.1 *9*	2153.084	4$^+$				
		1780.52 *2*	100.0 *22*	1707.689	2$^+$				
		2448.82 *9*	7.7 *5*	1039.506	2$^+$				
3570.44	(3)$^-$	1417.24 *7*	100 *10*	2153.084	4$^+$				
		2531.7 *2*	6.0 *20*	1039.506	2$^+$				
3580.7	4$^+$	1427.6[‡]	100	2153.084	4$^+$				
3631.5	(2)$^+$	2591.9[‡]	100	1039.506	2$^+$				
3666.78	6$^-$	250.46[&] *5*	100	3416.32	5$^-$	M1(+E2)[d]	0.03[d] *+2−5*	0.00727	α(K)=0.00648 *10*; α(L)=0.000678 *10*; α(M)=0.0001013 *15*; α(N)=6.62×10^{-6} *10* B(E2)(W.u.)=0.85 *7*; B(M1)(W.u.)=0.040 *3* δ: Other: +0.05 *2* in ^{65}Cu(^{7}Li,2nγ), ^{60}Ni(^{12}C,2pγ).
3669.4	(5$^+$)	1218.1[&]	100	2451.313	3$^+$				
3675.76	4$^+$	1523.2 *7*	100 *19*	2153.084	4$^+$				
		2636.20 *7*	43.6 *19*	1039.506	2$^+$				
3753.2	6$^+$	946.7[#] *4*	100[#]	2806.25	4$^+$	E2		4.03×10^{-4}	α(K)=0.000360 *5*; α(L)=3.70×10^{-5} *6*; α(M)=5.52×10^{-6} *8*; α(N)=3.60×10^{-7} *5* B(E2)(W.u.)=27 *9* Mult.: Q from $\gamma(\theta)$ in (α,2nγ), M2 excluded by comparison to RUL.
3895.2	1	3895.1	100	0.0	0$^+$	D		1.07×10^{-3}	α(K)=2.40×10^{-5} *4*; α(L)=2.41×10^{-6} *4*; α(M)=3.60×10^{-7} *5*; α(N)=2.39×10^{-8} *4* E_γ: from (γ,γ'). Mult.: from $\gamma(\theta)$ in (γ,γ').
3900.6	(4$^-$,5,6,7$^-$)	234		3666.78	6$^-$				E_γ: From ^{46}Ti(^{28}Si, 4pγ).
		484		3416.32	5$^-$				E_γ: From ^{46}Ti(^{28}Si, 4pγ).
3955.11	7$^-$	288.33[&] *5*	100[&] *10*	3666.78	6$^-$	M1(+E2)[d]	0.01[d] *3*	0.00512	α(K)=0.00457 *7*; α(L)=0.000476 *7*; α(M)=7.12×10^{-5} *11*; α(N)=4.66×10^{-6} *7* B(E2)(W.u.)=0.081 *12*; B(M1)(W.u.)=0.045 *7*
		658.1[&] *4*	19[&] *4*	3296.98	6$^+$	E1(+M2)	+0.02 *5*	3.67×10^{-4} *10*	α(K)=0.000329 *9*; α(L)=3.34×10^{-5} *9*; α(M)=4.98×10^{-6} *13*; α(N)=3.25×10^{-7} *9* B(E1)(W.u.)=1.3×10^{-5} *3*; B(M2)(W.u.)=0.056 *13* Mult.,δ: D+Q from ^{65}Cu(^{7}Li,2nγ), $\Delta\pi$= yes from level scheme.
4053.3		1247[#]	100[#]	2806.25	4$^+$				
4101.45	3$^-$,4$^-$	688[@]		3416.32	5$^-$				
		1045[@]		3058.695	4$^+$				
		1295.24 *6*	100 *11*	2806.25	4$^+$	Q			Mult.: Q from $\gamma(\theta)$ in ^{65}Cu(^{7}Li, 2nγ), ^{60}Ni(^{12}C, 2pγ).

$\gamma(^{70}Ge)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.	δ	α	Comments
4101.45	$3^-,4^-$	1539.29 *20*	31 *9*	2562.049	3^-				
		1944.21 *16*	25 *4*	2156.744	2^+				
		1948.35 *11*	59 *5*	2153.084	4^+				
4103.5	6^+	688[c]	7.3[c] *6*	3416.32	5^-				
		1045[c]	100[c] *9*	3058.695	4^+				
		1295[c]	14.8[c] *13*	2806.25	4^+	Q			Mult.: from angular distribution of oriented nuclei (ADO) radios in ^{65}Cu(^{7}Li, 2nγ), ^{60}Ni(^{12}C, 2pγ) (2010Su05).
		1948[c]	5.5[c] *6*	2156.744	2^+				E_γ: 1948γ populates 2^+ state according to level scheme given in 2010Su05. Placement of 1948γ is questionable due to ΔJ.
4203.5	8^+	450[g]	2.9[g] *6*	3753.2	6^+	[E2]			
		906.6[@] *4*	100[g] *10*	3296.98	6^+	E2		4.48×10^{-4}	α(K)=0.000401 *6*; α(L)=4.12×10^{-5} *6*; α(M)=6.14×10^{-6} *9*; α(N)=4.00×10^{-7} *6* B(E2)(W.u.)=6.7 *17* Mult.: from angular distribution and linear-polarization data in ^{68}Zn(α,2nγ), ^{67}Zn(α,nγ) and RUL. δ=−0.2 *2* is ^{68}Zn(α,2nγ), ^{67}Zn(α,nγ) gives a large B(M3) value, M3 is not possible because of RUL.
4243.11		1196.66 *15*	100	3046.439	3^+				
4299.3	7^-	344.1[&] *4*	73[&] *15*	3955.11	7^-	M1(+E2)	0.1 *3*	0.0034 *6*	α(K)=0.0030 *6*; α(L)=0.00031 *6*; α(M)=4.7×10^{-5} *9*; α(N)=3.1×10^{-6} *6* B(E2)(W.u.)=10 *4*; B(M1)(W.u.)=0.08 *3* Mult.,δ: D+Q from angular distribution data in ^{65}Cu(^{7}Li,2nγ), $\Delta\pi$ = no from level scheme.
		1002.4[&] *4*	100[&] *20*	3296.98	6^+	E1+M2	0.11 *2*	1.59×10^{-4} *4*	α(K)=0.000142 *3*; α(L)=1.44×10^{-5} *4*; α(M)=2.15×10^{-6} *5*; α(N)=1.41×10^{-7} *3* B(E1)(W.u.)=8.E−5 *4* Mult.,δ: D+Q from angular distribution data in ^{65}Cu(^{7}Li,2nγ), $\Delta\pi$ = yes from level scheme.
4356.7	$1^{(-)}$	4356.6[a] *7*	100	0.0	0^+	E1[a]		0.00182	α(K)=1.480×10^{-5} *21*; α(L)=1.483×10^{-6} *21*; α(M)=2.21×10^{-7} *3*; α(N)=1.463×10^{-8} *21*
4431.4	8^+	677	3.4 *10*	3753.2	6^+	[E2]			
		1134.6[@] *4*	100 *9*	3296.98	6^+	E2		2.66×10^{-4}	α(K)=0.000236 *4*; α(L)=2.42×10^{-5} *4*; α(M)=3.60×10^{-6} *5*; α(N)=2.36×10^{-7} *4* B(E2)(W.u.)=44 *22* Mult.: from angular distribution in ^{68}Zn(α,2nγ), ^{67}Zn(α,nγ) and RUL. δ=−0.1 *2* in ^{68}Zn(α,2nγ), ^{67}Zn(α,nγ) gives large B(M3). RUL rules out M3.
4447.5	1^-	4447.3[a] *8*	100	0.0	0^+	E1[a]		0.00185	α(K)=1.443×10^{-5} *21*; α(L)=1.446×10^{-6} *21*; α(M)=2.16×10^{-7} *3*; α(N)=1.426×10^{-8} *20*
4520.9	1^-	4520.7[a] *8*	100	0.0	0^+	E1[a]		0.00188	α(K)=1.414×10^{-5} *20*; α(L)=1.417×10^{-6} *20*; α(M)=2.11×10^{-7} *3*; α(N)=1.398×10^{-8} *20*

$^{70}_{32}Ge_{38}$-13

$\gamma(^{70}Ge)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.	δ	α	Comments
4552.1	(8)	252.8[&]	100	4299.3	7^-				
4577.18	$(3,4^+)$	2419.88 *24*	86 *15*	2156.744	2^+				
		2424.41 *20*	100 *15*	2153.084	4^+				
4675.39	$(3,4^+)$	2521.8 *3*	49 *13*	2153.084	4^+				
		2968.1 *3*	100 *15*	1707.689	2^+				
4790.6	$1^{(-)}$	4790.4[a] *19*	100	0.0	0^+	E1[a]		0.00196	α(K)=1.317×10^{-5} *19*; α(L)=1.319×10^{-6} *19*; α(M)=1.97×10^{-7} *3*; α(N)=1.302×10^{-8} *19*
4820.2	(8^+)	1067[g]	100	3753.2	6^+				
4851.9	(8^-)	896.8[&] *4*	100	3955.11	7^-	(M1+E2)[e]	0.4[e] *2*	3.98×10^{-4} *11*	α(K)=0.000356 *10*; α(L)=3.64×10^{-5} *11*; α(M)=5.43×10^{-6} *15*; α(N)=3.58×10^{-7} *10* B(E2)(W.u.)<4.9; B(M1)(W.u.)<0.01 δ: Other: +1.1 *3* in ^{65}Cu(^{7}Li,2nγ), ^{60}Ni(^{12}C,2nγ).
4886.6	1	4886.4[a] *13*	100	0.0	0^+	D[a]			
4908.1	(9^-)	953[#]	100[#]	3955.11	7^-				
4985.0		1029.9[&]	100	3955.11	7^-				
5048.4	(4^-)	1381.6[&]	100	3666.78	6^-				
5129.6	1^-	5129.4[a] *7*	100	0.0	0^+	E1[a]		0.00207	α(K)=1.212×10^{-5} *17*; α(L)=1.214×10^{-6} *17*; α(M)=1.81×10^{-7} *3*; α(N)=1.198×10^{-8} *17*
5222.3		1169[#]	100[#]	4053.3					
5242.7	10^+	1039.2[&]	100	4203.5	8^+	E2		3.23×10^{-4}	α(K)=0.000289 *4*; α(L)=2.96×10^{-5} *5*; α(M)=4.41×10^{-6} *7*; α(N)=2.88×10^{-7} *4* Mult.: Q from $\gamma(\theta)$ in ^{65}Cu(^{7}Li, 2nγ),^{60}Ni(^{12}C, 2pγ), assumed E2 band member.
5263.4	$1^{(-)}$	5263.2[a] *8*	100	0.0	0^+	E1[a]		0.00211	α(K)=1.175×10^{-5} *17*; α(L)=1.177×10^{-6} *17*; α(M)=1.756×10^{-7} *25*; α(N)=1.162×10^{-8} *17*
5265.82		2219.34 *14*	100	3046.439	3^+				
5299.2	$9^{(-)}$	1344.1[@] *4*	100	3955.11	7^-	(E2)			Mult.: from $\gamma(\theta)$ in ^{65}Cu(^{7}Li,2nγ), ^{60}Ni(^{12}C,2nγ).
5370.11		1881.67 *5*	100 *6*	3488.276	$(3,4^+)$				
		2325.42 *18*	21 *2*	3046.439	3^+				
5435.5	8^+	1332[c]	100[c]	4103.5	6^+	Q			Mult.: from angular distribution of oriented nuclei (ADO) radios in ^{65}Cu(^{7}Li, 2nγ), ^{60}Ni(^{12}C, 2pγ) (2010Su05).
5465.3	1^-	5465.1[a] *8*	100	0.0	0^+	E1[a]		0.00216	α(K)=1.124×10^{-5} *16*; α(L)=1.125×10^{-6} *16*; α(M)=1.678×10^{-7} *24*; α(N)=1.111×10^{-8} *16*
5512.5	$1^{(-)}$	5512.3[a] *10*	100	0.0	0^+	E1[a]		0.00217	α(K)=1.112×10^{-5} *16*; α(L)=1.114×10^{-6} *16*; α(M)=1.661×10^{-7} *24*; α(N)=1.099×10^{-8} *16*
5539.7	(10)	1108.3[@] *4*	100[@]	4431.4	8^+	Q[b]		5.54×10^{-4}	α(K)=0.000495 *7*; α(L)=5.10×10^{-5} *8*; α(M)=7.62×10^{-6} *11*; α(N)=5.03×10^{-7} *7* Mult.: from R(DCO) in ^{64}Ni(^{12}C,α2nγ). From $T_{1/2}$

$^{70}_{32}Ge_{38}$-14

$\gamma(^{70}Ge)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α	Comments
								considerations, M2 is more likely. However, assignment to a band structure in $^{64}Ni(^{12}C,\alpha 2n\gamma)$ suggests E2 character. Other: D in $^{65}Cu(^{7}Li,2n\gamma)$, $^{60}Ni(^{12}C,2p\gamma)$.
5552.5	$9^{(-)}$	1253.2[@] 4	100	4299.3	7^-	Q	2.30×10^{-4}	α(K)=0.000190 3; α(L)=1.94×10^{-5} 3; α(M)=2.89×10^{-6} 4; α(N)=1.89×10^{-7} 3 Mult.: Q from angular distribution of oriented nuclei (ADO) ratio in $^{65}Cu(^{7}Li,2n\gamma)$,$^{60}Ni(^{12}C,2p\gamma)$.
5876.9	$1^{(-)}$	5876.6[a] 7	100	0.0	0^+	E1[a]	0.00227	α(K)=1.031×10^{-5} 15; α(L)=1.032×10^{-6} 15; α(M)=1.540×10^{-7} 22; α(N)=1.019×10^{-8} 15
5989.7	$1^{(+)}$	5989.4[a] 7	100	0.0	0^+	M1[a]	1.66×10^{-3}	α(K)=1.272×10^{-5} 18; α(L)=1.276×10^{-6} 18; α(M)=1.90×10^{-7} 3; α(N)=1.262×10^{-8} 18
6006.9		1155[#]	100[#]	4851.9	(8^-)			
6160.1	(11^-)	1252[#]	100[#]	4908.1	(9^-)			
6297.0	1	6296.7[a] 14	100	0.0	0^+	D[a]		
6362.8	1	6362.5[a] 8	100	0.0	0^+	D[a]		
6549.1		1641[#]	100[#]	4908.1	(9^-)			
6572.2	$11^{(-)}$	1273[@]	100	5299.2	$9^{(-)}$	Q		Mult.: from Angular Distribution of Oriented nuclei (ADO) ratio in $^{65}Cu(^{7}Li, 2n\gamma)$, $^{60}Ni(^{12}C, 2p\gamma)$ and level scheme.
6587.7	$1^{(+)}$	6587.4[a] 8	100	0.0	0^+	M1[a]		
6604.2		1305[#]	100[#]	5299.2	$9^{(-)}$			
6636.6	1	6636.3[a] 15	100	0.0	0^+	D[a]		
6702.5	$1^{(-)}$	6702.2[a] 13	100	0.0	0^+	E1[a]		
6716.8	12^+	1474[g]	100	5242.7	10^+	E2		Mult.: Q in $^{65}Cu(^{7}Li, 2n\gamma)$, $^{60}Ni(^{12}C, 2p\gamma)$ and $^{64}Ni(^{12}C,\alpha 2n\gamma)$, assumed E2 from placement in band structure.
6779.7	(12)	1240[g]	100	5539.7	(10)	Q		Mult.: from R(DCO) in $^{64}Ni(^{12}C,\alpha 2n\gamma)$.
6786.1	(13^-)	626[#]	100[#]	6160.1	(11^-)			
7306.3	$1^{(+)}$	7305.9[a] 8	100	0.0	0^+	M1[a]		
7426.0	$1^{(-)}$	7425.6[a] 8	100	0.0	0^+	E1[a]		
7619.7	(14)	840[g]	100	6779.7	(12)	Q		Mult.: from R(DCO) in $^{64}Ni(^{12}C,\alpha 2n\gamma)$.
7753.5	$1^{(-)}$	7753.0[a] 10	100	0.0	0^+	E1[a]		
7767.8	14^+	1051[g]	100	6716.8	12^+	E2		Mult.: Q from R(DCO) in $^{64}Ni(^{12}C,\alpha 2n\gamma)$, E2 from assumed band structure.
8058.1	(15^-)	1272[#]	100[#]	6786.1	(13^-)			
8245.7	(16)	626[g]	100	7619.7	(14)	Q		Mult.: from R(DCO) in $^{64}Ni(^{12}C,\alpha 2n\gamma)$.
8283.7	$1^{(+)}$	8283.2[a] 15	100	0.0	0^+	M1[a]		
8878.5	1	8877.9[a] 14	100	0.0	0^+	D[a]		
9423.7	(18)	1178[g]	100	8245.7	(16)	Q		Mult.: from R(DCO) in $^{64}Ni(^{12}C,\alpha 2n\gamma)$.
9619.2	(17^-)	1561[#]	100[#]	8058.1	(15^-)			
10269.7	(20)	846[g]	100	9423.7	(18)			
11336.2	(19^-)	1717[#]	100[#]	9619.2	(17^-)			
13173	(21^-)	1837[#]	100[#]	11336.2	(19^-)			

$^{70}_{32}Ge_{38}$-15

γ(^{70}Ge) (continued)

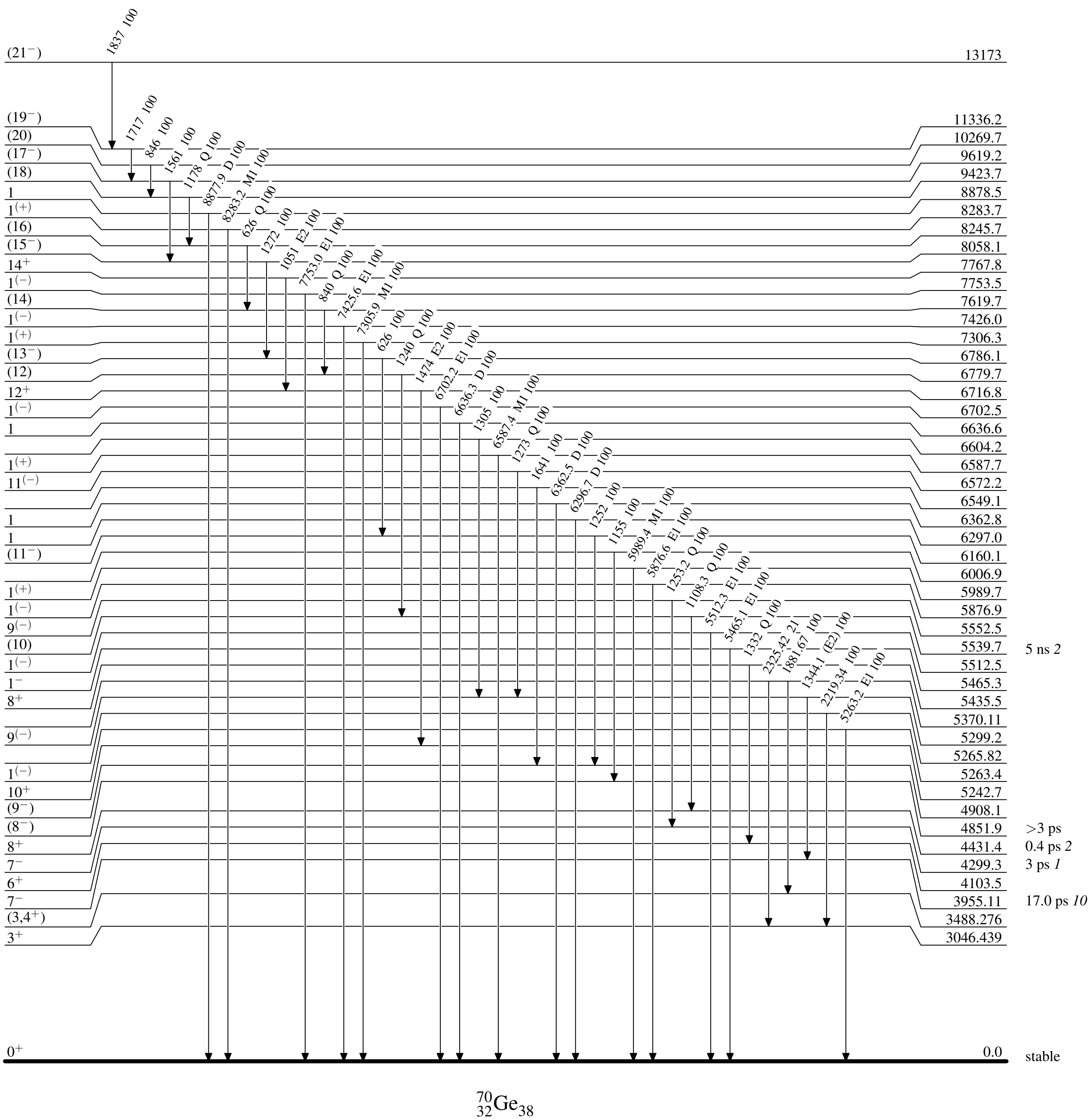
† From ^{72}As ε decay, unless otherwise stated.
‡ From (n,n′γ).
# From ^{46}Ti(^{28}Si, 4pγ).
@ From ^{65}Cu(^{7}Li, 2nγ), ^{60}Ni(^{12}C, 2pγ).
& From ^{68}Zn(α,2nγ), ^{67}Zn(α, nγ).
[a] From ^{70}Ge(pol γ,γ').
[b] From (p,p′γ).
[c] from ^{65}Cu(^{7}Li,2nγ), ^{60}Ni(^{12}C,2pγ) (2010Su05).
[d] From angular distribution and linear-polarization data in ^{68}Zn(α,2nγ), ^{67}Zn(α,nγ).
[e] From angular distribution in ^{68}Zn(α,2nγ), ^{67}Zn(α,nγ) and RUL.
[f] From internal conversion data in (p,p′γ).
[g] From ^{64}Ni(^{12}C,α2nγ).
[h] From $\gamma(\theta)$ in ^{70}As ε decay, cases of D+Q with large, non-zero values for δ have been assumed to be M1+E2 in character.

$^{70}_{32}$Ge$_{38}$-16

Adopted Levels, Gammas

Level Scheme

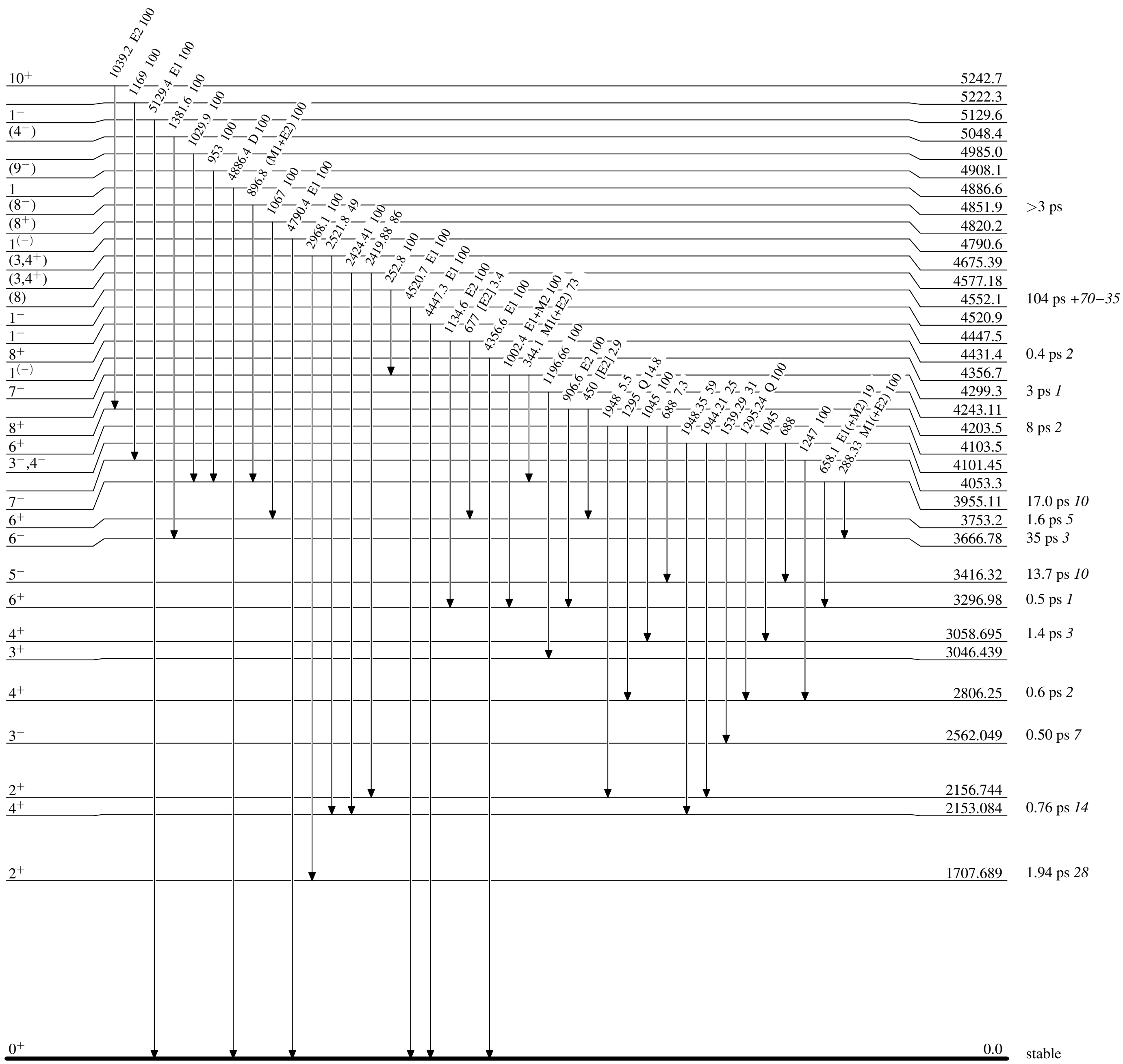
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

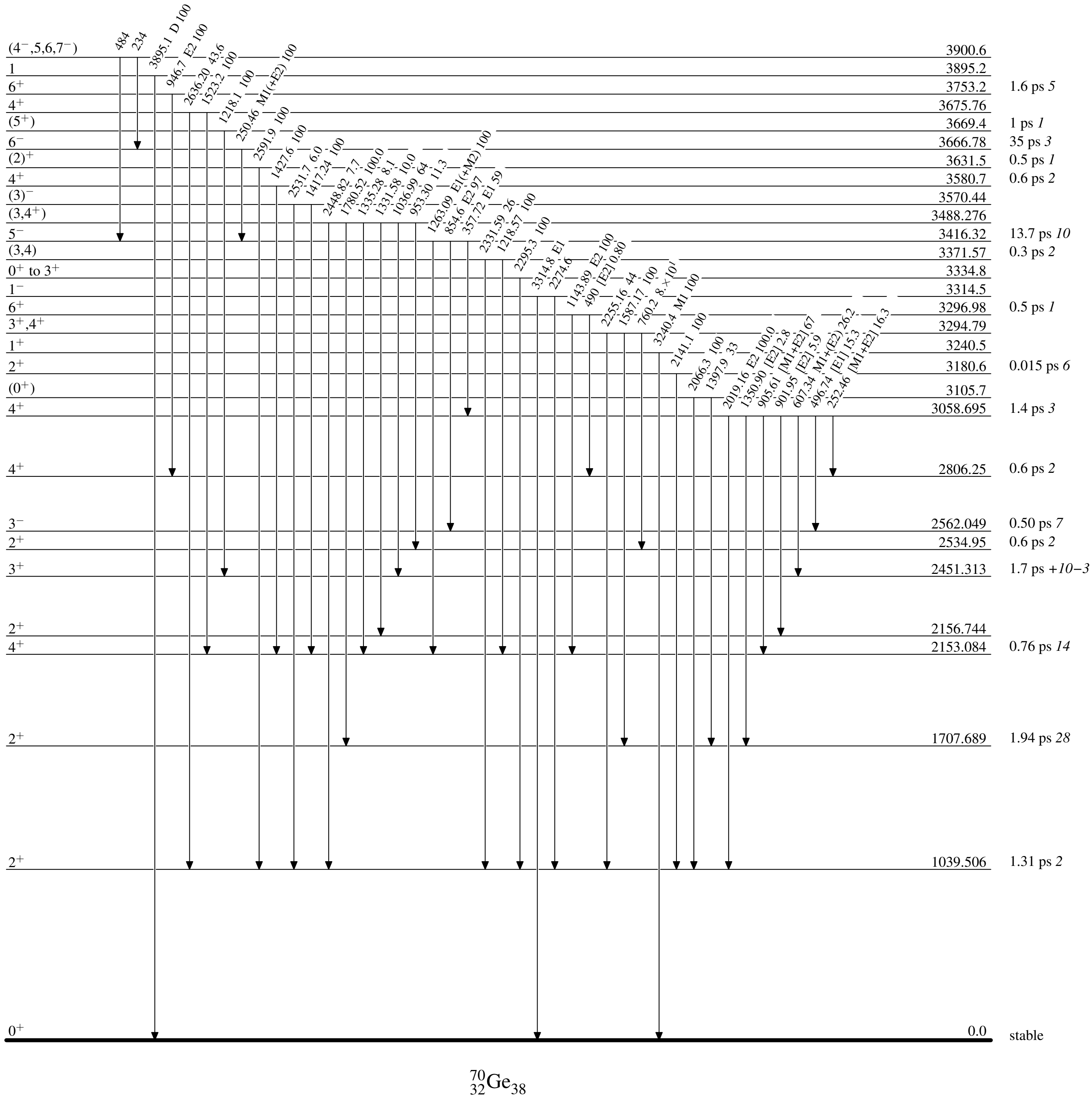


$^{70}_{32}Ge_{38}$

Adopted Levels, Gammas

Level Scheme (continued)

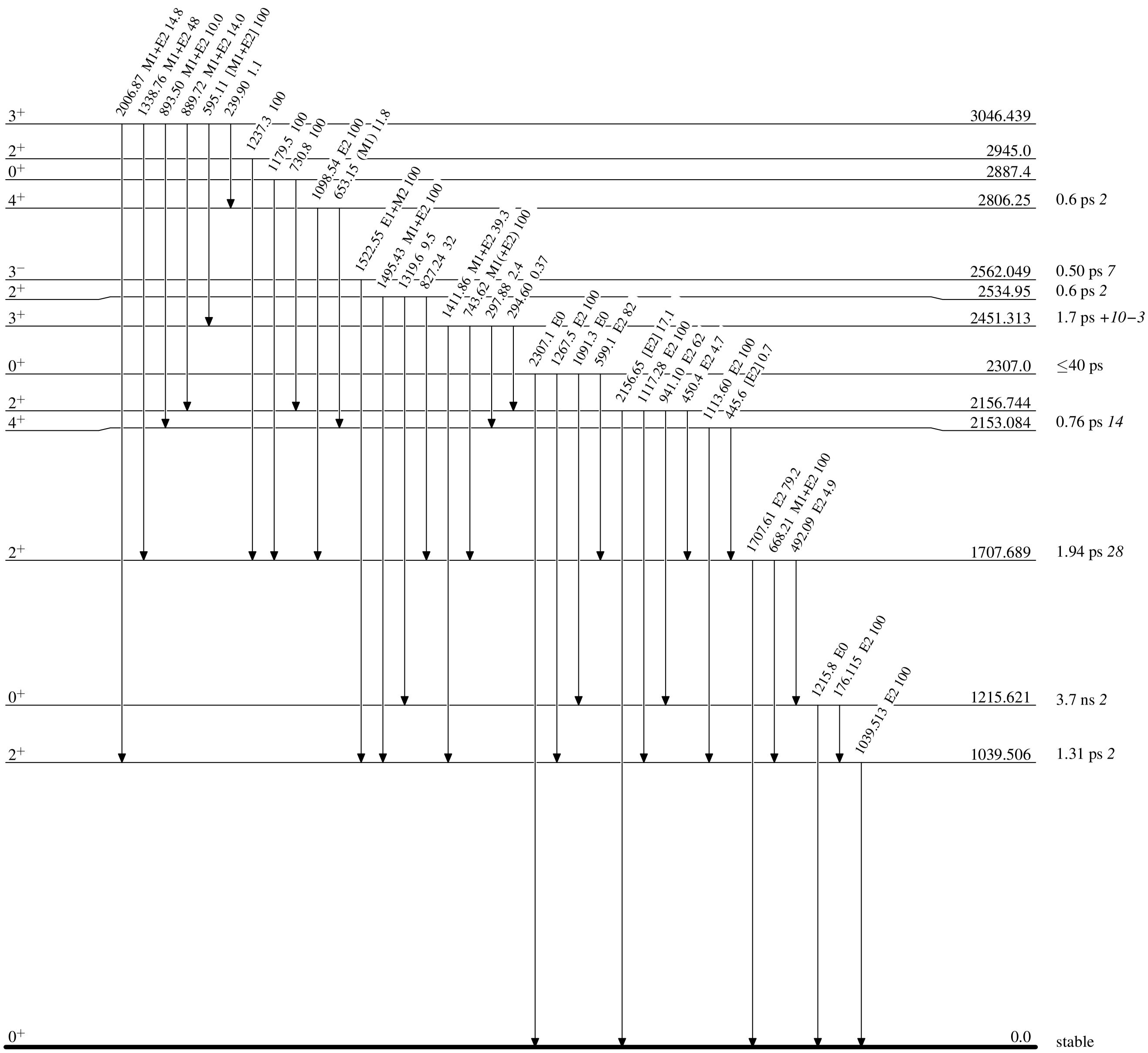
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

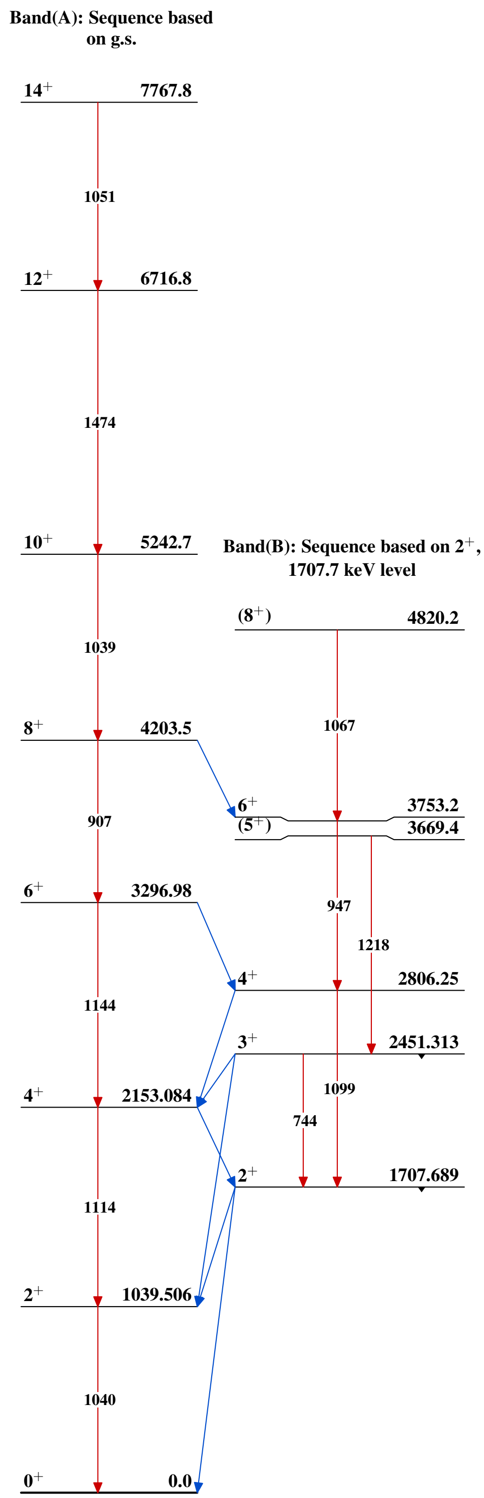
Level Scheme (continued)

Intensities: Relative photon branching from each level



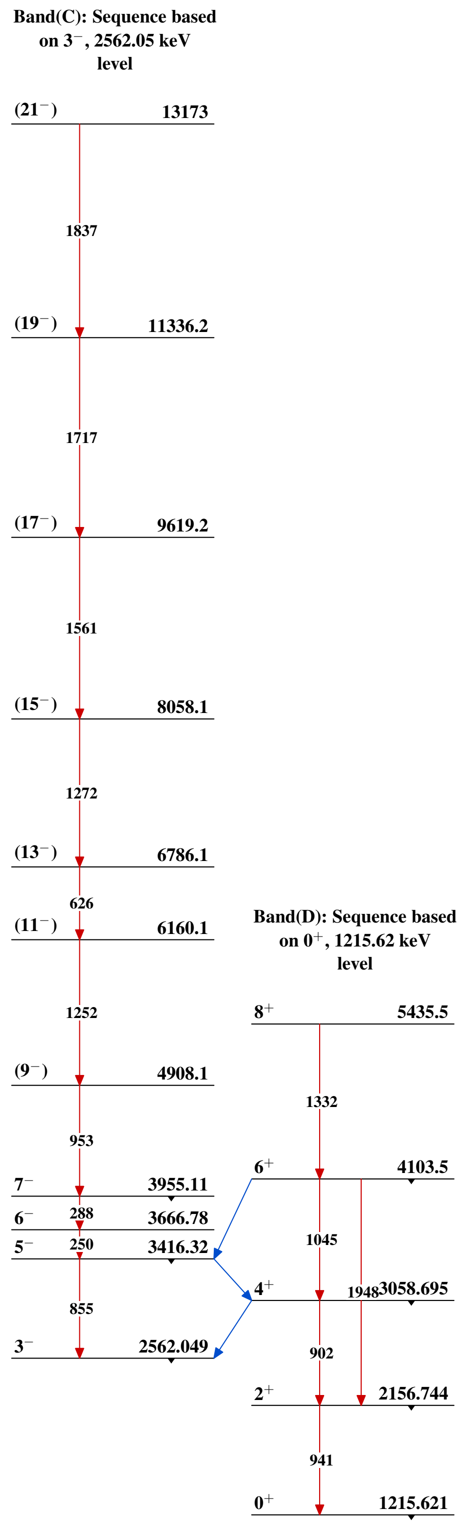
$^{70}_{32}Ge_{38}$

Adopted Levels, Gammas



$^{70}_{32}Ge_{38}$

Adopted Levels, Gammas (continued)



$^{70}_{32}Ge_{38}$

Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	D. Abriola(a), A. A. Sonzogni	NDS 111,1 (2010)	1-May-2009

Q(β^-)=−4356 *4*; S(n)=10750.8 *9*; S(p)=9735.8 *9*; Q(α)=−5004.0 *10* 2012Wa38
Note: Current evaluation has used the following Q record −4356 4 *10750.5 109735.7 10*−5003.8 *11* 2009AuZZ.
α: Additional information 1.

^{72}Ge Levels

Cross Reference (XREF) Flags

A	^{72}Ga β^- decay	I	^{73}Ge(p,d)	Q	^{72}Ge(p,p′γ)
B	^{72}As ε decay	J	^{72}Ge(^{6}Li,^{6}Li′)	R	^{69}Ga(α,p)
C	^{72}Ge(p,p′), (pol p,p′)	K	^{72}Ge(d,d′), (pol d,d′)	S	^{68}Zn(^{6}Li,d)
D	^{71}Ga(^{3}He,d)	L	^{68}Zn(^{6}Li,npγ)	T	^{76}Se(d,^{6}Li)
E	^{72}Ge(α,α′)	M	^{75}As(p,α)	U	^{72}Ge(e,e′), (γ,γ′)
F	^{74}Ge(p,t)	N	Coulomb excitation	V	^{72}Ge(^{16}O,^{16}O′), (^{18}O,^{18}O′)
G	^{70}Ge(t,p)	O	^{72}Ge(n,n′γ)	W	^{72}Ge(α,α′γ)
H	^{70}Zn(α,2nγ), ^{70}Ge(α,^{2}He)	P	^{70}Zn(^{16}O,^{14}C)	X	^{72}Ge(γ,γ′)

E(level)[†]	J$^\pi$	T$_{1/2}$[c]	XREF	Comments
0[e]	0$^+$	stable	ABCDEFGHIJKLMNOPQRSTUVWX	
691.43[f] *4*	0$^+$[‡]	444.2 ns *8*	ABCD FG IJK MNOPQRST VW	T$_{1/2}$: from delayed auto-coincidence of a Ge(Li) detector (1984Br24). Others: 0.40 μs *11* in ^{72}Ga β^- decay; 427 ns *11* in (n,n′γ); 439 ns *4* in (p,p′γ); and 404 ns *45* in (α,α′γ).
834.011[e] *19*	2$^+$[‡]	3.35 ps *5*	ABCDEFGHIJKLMNOPQR TU	Q=−0.13 *6*; μ=+0.77 *5* T$_{1/2}$: from B(E2) in Coul excitation. Others: 3.3 ps *4* ^{72}Ge(γ,γ′); 2.8 ps *+21−7* ^{70}Zn(α,2nγ), DSA; 2.9 ps *2* (e,e′). μ: Weighted average of +0.734 *88*, +0.798 *66* from transient field IPAC (1987La20, 1984Pa20) and +0.74 *18* from IMPAC, recalculation (1989Ra17). Q: Coul excitation reorientation (1980Le16,2005St24).
1463.99[f] *3*	2$^+$[‡]	4.5 ps *+8−6*	ABCDEFGHIJKLMNOPQ	T$_{1/2}$: from Coul excitation. Other: 3 ps *+4−2* in ^{70}Zn(α,2nγ), DSA.
1728.30[e] *3*	4$^+$[#]	1.55 ps *16*	ABCDEFGHIJKLMNOP	T$_{1/2}$: from Coul excitation. Other: 1.2 ps *+14−3* in ^{70}Zn(α,2nγ).
2029 *3*	0$^+$[#]		CD FG	
2049 *10*	4$^+$[‡]		C F I K	XREF: F(2035). J$^\pi$: L(p,p′)=(2) is inconsistent with 4$^+$.
2064.93 *3*	3$^+$	≥2 ps	AB D F H LM O Q	J$^\pi$: from M1+E2 γ to 2$^+$ and $\gamma\gamma(\theta)$ in ^{72}Ga β^- decay.
2116.9 *4*	1[d]	0.41 fs *8*	X	
2396.10 *20*			c gH m r	
2402.30 *3*	2$^+$[‡]		ABcD Fg JK m r	
2463.90[f] *3*	4$^+$[‡]	1.4 ps *+35−7*	ABCD FGH L	
2505 *5*			I	L=1+4 doublet in (p,d).
2514.79[g] *3*	3$^-$[‡]	4.7 ps *9*	ABCDEFGH JKLMN P U	T$_{1/2}$: from B(E3)=0.061 *15* (average of (e,e′) and Coul ex.) and adopted branching. Other: 0.7 ps *+7−4* in (α,2nγ).
2572 *10*			C	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{72}Ge Levels (continued)

E(level)[†]	J^π	$T_{1/2}$[c]	XREF	Comments
2583.4? *4*			A	
2754.27 *12*	(0^+)		ABCD G I S	J^π: from L(t,p) and L(^{6}Li,d). However, $J^\pi=3^-$ to 6^- from L(p,d)=1, and L(^{3}He,d)=1+3 not consistent with 0.
2772.03[e] *14*	6^+	0.7 ps *+7−4*	C H L	J^π: stretched E2 γ to 4^+.
2875.61 *20*			H	
2897 *5*	0^+[#]		CD G	
2939.96 *5*	1^-		ABc I	J^π: $J^\pi=1,2^+$ from γ's to 0^+ and 2^+; L(p,d)=3.
2943.47 *4*	3^-[#]		ABc EFG J	
2950.4 *3*	$1^+,2^+$[@]		AB D K	
3034 *3*	2^+[#]		CDEFG	XREF: E(3024).
3035.64 *4*	2^-		AB I	J^π: from $\gamma\gamma(\theta)$ and circular polarization in β^- decay.
3080.34 *20*	4^+[‡]		CDEFGHIJKL	XREF: E(3062)K(3092).
3089.4 *9*	1[d]	0.38 fs *19*	X	
3094.18 *14*	2^+[‡]		ABCDEF X	
3128.86[g] *11*	5^-[&]	3.5 ps *+7−21*	C E GHI	J^π: E2 γ to 3^- and γ's to 4^+ and 6^+.
3131 *10*	(4^+)[b]		E	
3139 *3*	0^+[‡]		F	
3182 *3*	4^+[‡]		CD F J	
3223 *3*	$+$[@]		D	
3228 *10*	$-$[&]		I	
3250 *4*	$3^+,4^+,5^+$[a]		C	
3325.01 *3*	3^-		ABc E IJ	J^π: from $\gamma\gamma(\theta)$ and E1+M2 γ to 2^+, D(+Q) to 4^+.
3327 *3*	2^+[‡]		cD FG	XREF: D(3324).
3338.0 *3*	$1^{(+)}$[d]	89 ps *21*	AB X	
3341.76 *4*	$(2)^-$		ABC	J^π: from $\gamma\gamma(\theta)$ and E1 γ to 2^+ in β^- decay.
3358.4 *24*	$+$[@]		CD	
3378 *3*	4^+[‡]		F	
3394 *10*	5^-[b]		E i	
3402.06[f] *12*	(6^+)	1 ps *+4−1*	H	(E2) γ to 4^+.
3403 *5*			c G i K	Possibly a doublet: $J^\pi=(4^+)$ from (t,p), (2^+) from (d,d′), (pol d,d′).
3409 *10*	3^-[b]		c E	
3419.79 *18*	2^+[‡]		BCD F	
3427 *5*	4^+[#]		G J	
3439.34 *10*	$+$[@]		A CD	J^π: L(p,p′)=(6).
3455.32 *4*	$2^-,3^-$		AB	J^π: from E1 γ to 2^+ and log *ft*=7.3 from 3^-, ^{72}Ga.
3468 *3*	$0^-,1^-,2^-$[a]		CD	
3509 *3*	2^+[‡]		CD F	
3511 *10*	4^+[b]		E G	
3528 *3*	4^+[‡]		C F	
3536 *10*	1^-[b]		E	
3550.66 *17*	$(1)^-$		BC EF I	J^π: L(p,t)=(1); L(p,d)=1+3. Also L(p,p′)=1 for 3556 *4*, and L(α,α')=(3) for 3551 *10*.
3565.9 *3*	$(^-)$		A CD	J^π: L(p,d)=1+3; probably the L=1 component of the 3554 *10* level.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{72}Ge Levels (continued)

E(level)[†]	J^π	$T_{1/2}$[c]	XREF	Comments
3586 *4*	0^+[‡]		FG	
3591 *4*	$3^+,4^+,5^+$[a]		C	
3619.3 *3*	2^+[‡]		AB D G	
3624 *10*			C F	J^π: L(p,p′)=(1), L(p,t)=(2).
3644 *10*	$(^+)$[b]		C E	
3652 *5*			EFG I	J^π: L(α,α′)=(3) for 3657 *10*.
3666.2 *5*	1^+[d]		X	
3667.26 *23*	6^+	>2.1 ps	c F H	J^π: from $\gamma(\theta)$ and $\gamma\gamma(\theta)$ and yield function in (α,2nγ).
3667.3 *3*	$+$[@]		BcD	
3678.08 *7*	$2^-,3^-$		ABC	J^π: from E1 γ to 2^+ and log *ft*=6.1 from 3^-, ^{72}Ga.
3688 *10*	$6^-,7^-,8^-$[a]		C	
3691 *3*	$1^+,2^+,3^+$[#]		D G	J^π: L(^{3}He,d)=1+3.
3708.5 *5*	2^+[‡]		ABC F	
3722 *10*	3^-[b]		E	
3745 *10*			C	
3757.2 *3*	$-$[&]		A I	
3760.50[e] *22*	8^+	0.8 ps *+5−2*	H L	J^π: stretched E2 γ to 6^+.
3777 *3*	$3^+,4^+,5^+$[a]		CDE G	J^π: L(t,p)=(0+2), L(α,α′)=(2) for 3769 *10*.
3784.18[g] *17*	7^-[&]	≥2.8 ps	C H	J^π: E2 γ to 5^- and yield function in (α,2nγ).
3803.55 *6*	$1,2^+$		BC e I	J^π: γ to 0^+ and 2^+.
3815.4 *3*	$2^-,3^-$		AB De	J^π: L(^{3}He,d)=2+4. γ to 2^+.
3821 *3*	5^-[‡]		c F	
3840.2 *3*	4^+[‡]		c E GH	
3858 *10*	$3^+,4^+,5^+$[a]		CdEF	
3872.2 *4*	2^+[#]		BCde	
3882 *5*	$1^+,2^+,3^+$[#]		C e G	
3892 *10*	(3^-)[b]		c E I	
3895.0 *5*	1[@][d]		cD F X	
3898.48 *21*	(7^-)		C H	J^π: from $\gamma(\theta)$, $\gamma\gamma(\theta)$ in (α,2nγ).
3915 *10*			C	
3937 *10*	$4^-,5^-,6^-$[a]		C E	J^π: 5^- if indeed excited in (α,α′).
3965 *10*	3^-[b]		C E I	XREF: E(3954).
3966 *5*	2^+[#]		cD fG	
3983.75 *16*			Bc ef	
3985.91 *15*			Bc e	
3995 *10*	$0^-,1^-,2^-$[a]		C	
3995.24 *25*	1^+[d]		B d G X	XREF: d(4002). J^π: L(^{3}He,d)=1+3 and (M1) γ to 0^+.
4004 *10*			CdE g	
4017 *6*	4^+[‡]		C F	
4027 *5*	$3^+,4^+,5^+$[#]		c G	
4031 *10*	5^-[b]		c E	
4041.0 *4*	$0^-,1^-,2^-$[a]		BC	Possible multiplet: L(^{3}He,d)=1+3 at 4047 *3* implies $J^\pi=1^+$ to 3^+; L(p,d)=1+3 at 4047 *10* implies $J^\pi=3^-$ to 6^-.
4046 *10*	$+$[@]		cDE	J^π: L(α,α′)=(4).
4047 *10*	$-$[&]		c I	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{72}Ge Levels (continued)

E(level)[†]	J^π	$T_{1/2}$[c]	S	XREF	Comments
4049.6 *3*	1[d]		61 *5*	X	
4065 *10*	5^-[b]			C E	
4075.8 *6*	5^-[‡]			C F	
4077.57 *22*	8^+	0.8 ps *+15−7*		H	J^π: E2 γ to 6^+, M1 γ to 8^+.
4082 *10*	$3^+,4^+,5^+$[a]			Cd	
4090.4 *5*	$+$[@]			B d	
4108 *3*	2^+[‡]			F	
4144 *3*	4^+[‡]			EF	
4147 *5*	$+$[@]			DE	
4171 *3*	$+$[@]			DE	
4191 *3*	0^+[‡]			F	
4194 *5*	$-$[&]			I	
4228 *3*	3^-[b]			DEF	
4245 *5*	$+$[@]			D	
4256.1 *3*	1[d]			X	
4257 *10*	(3^-)[b]			E	
4285 *3*	3^-[b]			EF	XREF: E(4269).
4291.85 *25*	$+$[@]	0.5 ps *+7−1*		D H	
4315 *5*	$+$[@]			D	
4335 *5*				D I	
4358.7 *3*	1[d]			X	
4369 *10*	3^-[b]			E	
4374 *5*	$+$[@]			D	
4419 *5*				DE	J^π: L(^{3}He,d)=(1+3), but L(α,α')=(1).
4454 *3*	$(2)^-$[@]			DE	
4458 *5*	$-$[&]			I	
4483 *5*				De	XREF: e(4498). J^π: L(α,α')=3 for 4498 *10*.
4512 *5*	$(2)^-$[@]			De	XREF: e(4498).
4521.07? *24*				F H	J^π: L(p,t)=(2).
4534 *10*	3^-[b]			E	
4575 *5*				DE	J^π: L(^{3}He,d)=(1+3), but L(α,α')=(3).
4601 *10*				E	
4620 *3*	$+$[@]			DE	
4634 *10*	(5^-)[b]			E	
4650 *5*	$-$[@]			DE	J^π: L(α,α')=(4) for 4659 *10*.
4679 *3*	$-$[@]			DE	J^π: L(α,α')=(4) for 4676 *10*.
4705 *5*	(4^+)[b]			DE	
4724 *10*	(3^-)[b]			E	
4741.34[g] *22*	9^-	0.90 ps *+14−7*		H	J^π: E2 γ to 7^- and yield function in (α,2nγ).
4755 *5*	$-$[@]			D	
4766 *10*	(4^+)[b]			E	
4804 *10*	(4^+)[b]			E	
4820.0[e] *3*	(10^+)	0.51 ps *+7−4*		H L	J^π: stretched E2 γ to 8^+.
4840 *3*	$+$[@]			D	

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Adopted Levels, Gammas (continued)

^{72}Ge Levels (continued)

E(level)[†]	J^{π}	$T_{1/2}$[c]	XREF	Comments
4875	$(^{+})$[@]		DE	J^{π}: L(α,α')=(4).
4903 *5*	$(4)^{+}$		DEF	J^{π}: L(p,t)=4 for 4895, L(α,α')=(4) for 4899 *10*.
4926 *10*			E	
4950.2 *3*			H	
5004 *5*			D	
5076 *5*	$(2)^{-}$[@]		D	
5082.5 *3*			H	
5100 *3*	$-$[@]		D	
5160 *3*	$-$		D	
5164.8 *3*	1^{+}[d]		X	
5199.2 *11*	1[d]		X	
5280.4 *6*	1[d]		X	
5315.0 *6*	1[d]		X	
5395.5? *3*			H	
5421.4? *3*			H	
5435.8 *5*	1^{+}[d]		X	
5837.8[g] *3*	11^{-}	0.9 ps *+4−2*	H	J^{π}: E2 γ to 9^{-} and yield function in (α,2nγ).
5849.8 *3*	$1^{(-)}$[d]		X	
5919.8 *4*	1^{-}[d]		X	
5974.6 *12*	1[d]		X	
6115.0[e] *4*	(12^{+})	0.33 ps *+7−4*	H	J^{π}: stretched E2 γ to (10^{+}).
6131.7 *7*	1[d]		X	
6146.0 *11*	1[d]		X	
6163.5 *4*	$1^{(-)}$[d]		X	
6383.2 *7*	1[d]		X	
6470.0 *7*	1[d]		X	
6629.9 *6*	1[d]		X	
6736.8 *6*	1[d]		X	
6811.7 *12*	1^{-}[d]		X	
7061.2 *10*	1[d]		X	
7450.4 *11*	1[d]		X	
7518.5 *8*	1[d]		X	
7673.7 *4*	1^{-}[d]		X	
7805.0 *13*	$1^{(-)}$[d]		X	
8441.7 *8*	$1^{(-)}$[d]		X	
8486.9 *10*	$1^{(-)}$[d]		X	
8867.9 *5*	1[d]		X	

[†] Level energies with accuracy better than 2 keV are from a least-squares fit to adopted γ-ray energies. Level energies deduced from scattered particles have the following typical accuracies: 3-5 keV ^{74}Ge(p,t), ^{70}Ge(t,p) and ^{71}Ga(^{3}He,d); 5-10 keV ^{73}Ge(p,d), ^{72}Ge(p,p′). Weighted averages have been calculated where possible.

[‡] From L(p,t).

[#] From L(t,p).

[@] From L(^{3}He,d).

[&] From L(p,d).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{72}Ge Levels (continued)

[a] From L(p,p′).
[b] From L(α,α').
[c] From ^{70}Zn(α,2nγ) DSA (1979Mo01), except as noted.
[d] From (γ,γ').
[e] Band(A): Yrast cascade.
[f] Band(B): Cascaded based on $0+_2$.
[g] Band(b): Negative parity cascade.

Adopted Levels, Gammas (continued)

$\gamma(^{72}Ge)$

$E\gamma$ and $I\gamma$ data are mainly from ^{72}Ga β^- decay, ^{72}As ε decay and $^{70}Zn(\alpha,2n\gamma)$. Also included: $^{72}Ge(n,n'\gamma)$ and $^{72}Ge(x,x'\gamma)$. Averages have been calculated.

E_i(level)	J^π_i	E_γ	I_γ	E_f	J^π_f	Mult.†	δ†	α	$I_{(\gamma+ce)}$	Comments
691.43	0^+	689.6 *5*		0	0^+	E0			100	I_γ: totally internally converted E0 transition.
834.011	2^+	142.52 *5*	0.011	691.43	0^+	E2		0.197		α(K)=0.1731 *25*; α(L)=0.0205 *3*; α(M)=0.00303 *5*; α(N)=0.0001690 *24*; α(N+..)=0.0001690 *24* B(E2)(W.u.)=17.8 *3*
		834.01 *2*	100	0	0^+	E2		0.000553 *8*		α(K)=0.000494 *7*; α(L)=5.09×10^{-5} *8*; α(M)=7.59×10^{-6} *11*; α(N)=4.93×10^{-7} *7* α(N+..)=4.93×10^{-7} *7* B(E2)(W.u.)=23.5 *4*
1463.99	2^+	629.95 *3*	100.0 *12*	834.011	2^+	M1+E2	−10.3 *13*	0.001178 *17*		α(K)=0.001051 *15*; α(L)=0.0001094 *16*; α(M)=1.631×10^{-5} *23* α(N)=1.050×10^{-6} *15* B(E2)(W.u.)=62 +*9*−*11*; B(M1)(W.u.)=0.00016 *5* δ: other values: −2.9 *11* from $^{70}Zn(\alpha,2n\gamma)$, and −5 +*3*−*1* from $^{72}Ge(n,n'\gamma)$.
		772.6 *3*	0.134 *11*	691.43	0^+	E2#		0.000674 *10*		α(K)=0.000602 *9*; α(L)=6.22×10^{-5} *9*; α(M)=9.28×10^{-6} *13*; α(N)=6.01×10^{-7} *9* α(N+..)=6.01×10^{-7} *9* B(E2)(W.u.)=0.030 +*5*−*6*
		1463.95 *15*	14.16 *17*	0	0^+	E2#		0.000226 *4*		α(K)=0.0001371 *20*; α(L)=1.393×10^{-5} *20*; α(M)=2.08×10^{-6} *3* α(N+..)=7.32×10^{-5} *1* B(E2)(W.u.)=0.130 +*18*−*24*
1728.30	4^+	894.26 *4*	100	834.011	2^+	E2(+M3)	≈0.0	0.000464		α(K)≈0.000414; α(L)≈4.26×10^{-5}; α(M)≈6.36×10^{-6}; α(N)≈4.14×10^{-7} B(E2)(W.u.)=37 *5* Mult.: Q+O from $\gamma\gamma(\theta)$ in β^- decay; Q in $(\alpha,2n\gamma)$. M2 excluded by RUL. δ: β(M3)(W.u.) from RUL suggests δ≈0.
2064.93	3^+	336.63 *4*	1.93 *5*	1728.30	4^+					
		600.94 *3*	100.0 *15*	1463.99	2^+	M1+E2‡	≈+4.0	0.001327		α(K)≈0.001184; α(L)≈0.0001234; α(M)≈1.84×10^{-5} α(N)≈1.183×10^{-6} B(E2)(W.u.)<150; B(M1)(W.u.)<0.0023 δ: from $\gamma(\theta)$ and $\gamma\gamma(\theta)$ in $(\alpha,2n\gamma)$.
		1230.83 *4*	26.2 *6*	834.011	2^+	D+Q	−2.0 +*15*−*25*			

$^{72}_{32}Ge_{40}$-7

$\gamma(^{72}Ge)$ (continued)

E_i(level)	J^π_i	E_γ	I_γ	E_f	J^π_f	Mult.†	δ†	α	Comments
2116.9	1	2116.9 *4*	100	0	0^+	D			
2396.10		932.1 *2*	100	1463.99	2^+				
2402.30	2^+	938.50 *14*	19.8 *7*	1463.99	2^+				
		1568.19 *7*	51.7 *14*	834.011	2^+				
		1710.90 *6*	100.0 *25*	691.43	0^+				
		2402.2 *3*	6.3 *3*	0	0^+				
2463.90	4^+	735.59 *22*	46.0 *8*	1728.30	4^+	M1‡		0.000592 *9*	α(K)=0.000529 *8*; α(L)=5.41×10^{-5} *8*; α(M)=8.08×10^{-6} *12*; α(N)=5.32×10^{-7} *8* α(N+..)=5.32×10^{-7} *8* B(M1)(W.u.)=0.012 *+6−12*
		999.86 *4*	100.0 *18*	1463.99	2^+	E2‡		0.000354 *5*	α(K)=0.000316 *5*; α(L)=3.24×10^{-5} *5*; α(M)=4.84×10^{-6} *7*; α(N)=3.16×10^{-7} *5* α(N+..)=3.16×10^{-7} *5* B(E2)(W.u.)=15 *+8−15*
		1630 *1*	4.1 *7*	834.011	2^+	[E2]		0.000263 *4*	α(K)=0.0001106 *16*; α(L)=1.122×10^{-5} *16*; α(M)=1.675×10^{-6} *24* α(N)=1.103×10^{-7} *16* B(E2)(W.u.)=0.05 *+3−5*
2514.79	3^-	50.88 *4*	0.15 *2*	2463.90	4^+	[E1]		0.518	α(K)=0.462 *7*; α(L)=0.0488 *7*; α(M)=0.00718 *11*; α(N)=0.000418 *6*; α(N+..)=0.000418 *6* B(E1)(W.u.)=0.00057 *14*
		112.52 *3*	2.1 *5*	2402.30	2^+	[E1]		0.0484	α(K)=0.0433 *6*; α(L)=0.00447 *7*; α(M)=0.000662 *10*; α(N)=4.11×10^{-5} *6*; α(N+..)=4.11×10^{-5} *6* B(E1)(W.u.)=0.00074 *23*
		449.55 *21*	1.4 *3*	2064.93	3^+				
		786.44 *7*	46.2 *8*	1728.30	4^+	E1(+M2)	+0.02 *5*	0.000249 *6*	α(K)=0.000223 *6*; α(L)=2.26×10^{-5} *6*; α(M)=3.37×10^{-6} *9*; α(N)=2.20×10^{-7} *6* α(N+..)=2.20×10^{-7} *6* B(E1)(W.u.)=(4.8×10^{-5} *10*); B(M2)(W.u.)=(0.14 *+71−14*)
		1050.73 *4*	100.0 *13*	1463.99	2^+	E1+M2	−0.31 *5*	0.000182 *14*	α(K)=0.000163 *12*; α(L)=1.66×10^{-5} *13*; α(M)=2.48×10^{-6} *19* α(N+..)=1.63×10^{-7} *1* B(E1)(W.u.)=3.9×10^{-5} *8* B(M2)(W.u.): This mixing ratio leads to a B(M2)(W.u.)=16 *6*, which exceeds the RUL of 1.0.
		1680.75 *6*	12.1 *4*	834.011	2^+				
		2515.1 *3*	3.59 *12*	0	0^+	[E3]		0.000445 *7*	α(K)=7.72×10^{-5} *11*; α(L)=7.84×10^{-6} *11*; α(M)=1.170×10^{-6} *17* α(N+..)=0.000359 *5* B(E3)(W.u.)=29 *6*
2583.4?		2583.4@ *4*	100	0	0^+				
2754.27	(0^+)	1920.21 *13*	100	834.011	2^+				

$^{72}_{32}Ge_{40}$-8

Adopted Levels, Gammas (continued)

γ(^{72}Ge) (continued)

E_i(level)	J^π_i	E_γ	I_γ	E_f	J^π_f	Mult.[†]	δ[†]	α	Comments
2772.03	6^+	1043.8 *2*	100	1728.30	4^+	E2[‡]		0.000320 *5*	α(K)=0.000286 *4*; α(L)=2.93×10^{-5} *5*; α(M)=4.37×10^{-6} *7*; α(N)=2.86×10^{-7} *4* α(N+..)=2.86×10^{-7} *4* B(E2)(W.u.)=37 *+21−37*
2875.61		1411.6 *2*	100	1463.99	2^+				
2939.96	1^-	1475.90 *6*	79.6 *15*	1463.99	2^+				
		2105.90 *17*	100 *4*	834.011	2^+				
		2248.5 *1*	49.6 *19*	691.43	0^+				
		2940.07 *12*	47 *3*	0	0^+				
2943.47	3^-	428.44 *11*	22 *4*	2514.79	3^-				
		479.27 *11*	8.5 *5*	2463.90	4^+				
		878.40 *18*	6.9 *4*	2064.93	3^+				
		1215.14 *4*	76.1 *12*	1728.30	4^+	D+Q			
		2109.52 *8*	100.0 *17*	834.011	2^+				
2950.4	$1^+,2^+$	2116.5[@] *3*	100 *6*	834.011	2^+				
		2950.0[@] *5*	17 *3*	0	0^+				
3035.64	2^-	520.74 *24*	0.210 *18*	2514.79	3^-				
		970.55 *6*	4.3 *1*	2064.93	3^+				
		1571.63 *12*	3.2 *1*	1463.99	2^+				
		2201.69 *5*	100.0 *16*	834.011	2^+	E1(+M2)	−0.05 *4*	0.000810 *12*	α(K)=3.70×10^{-5} *7*; α(L)=3.72×10^{-6} *7*; α(M)=5.54×10^{-7} *10*; α(N)=3.66×10^{-8} *7* α(N+..)=0.000769 *12*
		3034.6 *4*	0.018 *3*	0	0^+	M2		0.000549 *8*	α(K)=5.65×10^{-5} *8*; α(L)=5.72×10^{-6} *8*; α(M)=8.53×10^{-7} *12*; α(N)=5.66×10^{-8} *8* α(N+..)=0.000486 *7*
3080.34	4^+	1015.4 *2*	100	2064.93	3^+				
3089.4	1	3089.3 *9*	100	0	0^+	D			
3094.18	2^+	1029.3 *5*	23.5 *14*	2064.93	3^+				
		2402.89 *21*	95 *4*	691.43	0^+				
		3093.92 *20*	100 *20*	0	0^+	E2		0.000860 *12*	α(K)=3.55×10^{-5} *5*; α(L)=3.57×10^{-6} *5*; α(M)=5.33×10^{-7} *8*; α(N)=3.53×10^{-8} *5* α(N+..)=0.000820 *12*
3128.86	5^-	357.0 *2*	56	2772.03	6^+				
		614.2 *2*	71	2514.79	3^-	E2[‡]		0.001270 *18*	α(K)=0.001133 *16*; α(L)=0.0001180 *17*; α(M)=1.760×10^{-5} *25* α(N)=1.131×10^{-6} *16* B(E2)(W.u.)=29 *+18−6*
		667.0 *5*	29	2463.90	4^+				
		1400.4 *2*	100	1728.30	4^+				
3325.01	3^-	230.6 *6*	0.30 *9*	3094.18	2^+				
		289.31 *7*	2.49 *17*	3035.64	2^-				

Adopted Levels, Gammas (continued)

$\gamma(^{72}Ge)$ (continued)

E_i(level)	J^π_i	E_γ	I_γ	E_f	J^π_f	Mult.†	δ†	α	Comments
3325.01	3^-	381.24 *8*	3.49 *13*	2943.47	3^-				
		810.20 *9*	26.2 *5*	2514.79	3^-				
		861.11 *5*	11.9 *3*	2463.90	4^+				
		1260.10 *7*	14.7 *4*	2064.93	3^+				
		1596.70 *7*	56 *5*	1728.30	4^+	D(+Q)	+0.05 *6*		
		1861.09 *5*	68.4 *10*	1463.99	2^+	D+Q			
		2490.98 *6*	100 *3*	834.011	2^+	E1+M2	+0.15 *4*	0.000974 *16*	α(K)=3.20×10^{-5} *8*; α(L)=3.22×10^{-6} *9*; α(M)=4.80×10^{-7} *13*; α(N)=3.17×10^{-8} *9* α(N+..)=0.000939 *16*
		2633.9 *4*	0.19 *2*	691.43	0^+				
		3324.6 *4*	0.040 *11*	0	0^+				
3338.0	$1^{(+)}$	3337.9 *3*	100	0	0^+	(M1)		0.000866 *13*	α(K)=3.06×10^{-5} *5*; α(L)=3.08×10^{-6} *5*; α(M)=4.60×10^{-7} *7*; α(N)=3.04×10^{-8} *5* α(N+..)=0.000832 *12* B(M1)(W.u.)=6.7×10^{-6} *16*
3341.76	$(2)^-$	306.0 *3*	0.165 *15*	3035.64	2^-				
		401.3 *4*	0.254 *15*	2939.96	1^-				
		587.44 *24*	0.95 *5*	2754.27	(0^+)				
		939.36 *7*	2.03 *5*	2402.30	2^+				
		1276.77 *6*	12.25 *13*	2064.93	3^+				
		1877.90 *21*	1.81 *5*	1463.99	2^+				
		2507.82 *6*	100.0 *15*	834.011	2^+	E1+M2	+0.09 *5*	0.000993 *16*	α(K)=3.10×10^{-5} *8*; α(L)=3.11×10^{-6} *8*; α(M)=4.64×10^{-7} *11*; α(N)=3.07×10^{-8} *8* α(N+..)=0.000958 *16*
3402.06	(6^+)	273.6@ *2*	23	3128.86	5^-				
		937.9 *2*	100	2463.90	4^+	(E2)‡		0.000413 *6*	α(K)=0.000369 *6*; α(L)=3.79×10^{-5} *6*; α(M)=5.65×10^{-6} *8*; α(N)=3.68×10^{-7} *6* α(N+..)=3.68×10^{-7} *6* B(E2)(W.u.)=20 *+21−20*
		1673.6 *2*	93	1728.30	4^+				
3419.79	2^+	905.22 *22*	39 *7*	2514.79	3^-				
		2585.3 *3*	100 *23*	834.011	2^+				
3439.34	$^+$	495.88 *24*	40 *3*	2943.47	3^-				
		924.22 *18*	100 *3*	2514.79	3^-				
		975.5 *5*	23 *7*	2463.90	4^+				
		1037.2 *6*	14.4 *13*	2402.30	2^+				
		1711.15 *15*	32 *7*	1728.30	4^+				
		2605.5 *4*	13 *3*	834.011	2^+				
3455.32	$2^-,3^-$	113.5 *1*	4.3 *7*	3341.76	$(2)^-$				
		940.51 *10*	5.4 *6*	2514.79	3^-				

$^{72}_{32}Ge_{40}$-10

$\gamma(^{72}Ge)$ (continued)

E_i(level)	J^π_i	E_γ	I_γ	E_f	J^π_f	Mult.[†]	α	Comments
3455.32	$2^-,3^-$	1390.44 *5*	62.2 *19*	2064.93	3^+			
		1991.16 *8*	85.6 *20*	1463.99	2^+			
		2621.38 *16*	100.0 *18*	834.011	2^+	E1	0.001063 *15*	α(K)=2.87×10^{-5} *4*; α(L)=2.89×10^{-6} *4*; α(M)=4.30×10^{-7} *6*; α(N)=2.84×10^{-8} *4* α(N+..)=0.001031 *15*
3550.66	$(1)^-$	1148.4 *3*	58 *15*	2402.30	2^+			
		2086.4 *3*	70 *4*	1463.99	2^+			
		2716.7 *4*	58 *12*	834.011	2^+			
		2859.9 *6*	93 *19*	691.43	0^+			
		3550.4 *5*	100 *8*	0	0^+			
3565.9	$(^-)$	1500.9 *5*	9.1 *5*	2064.93	3^+			
		1837.6 *3*	100 *5*	1728.30	4^+			
3619.3	2^+	1155.7[@] *6*	35 *6*	2463.90	4^+			
		2785.1[@] *3*	100 *5*	834.011	2^+			
3666.2	1^+	3666.1 *5*		0	0^+	M1	0.000985 *14*	α(K)=2.64×10^{-5} *4*; α(L)=2.65×10^{-6} *4*; α(M)=3.96×10^{-7} *6*; α(N)=2.62×10^{-8} *4* α(N+..)=0.000956 *14*
3667.26	6^+	538.4 *2*	100	3128.86	5^-	(E1)[‡]	0.000587 *9*	α(K)=0.000525 *8*; α(L)=5.35×10^{-5} *8*; α(M)=7.97×10^{-6} *12*; α(N)=5.19×10^{-7} *8* α(N+..)=5.19×10^{-7} *8* B(E1)(W.u.)<0.0012
3667.3	$^+$	1939.0 *4*	91 *9*	1728.30	4^+			
		2833.2 *6*	100 *18*	834.011	2^+			
3678.08	$2^-,3^-$	738.5 *4*	12.7 *9*	2939.96	1^-			
		1163.11 *13*	19 *3*	2514.79	3^-			
		1613.6 *4*	9.1 *13*	2064.93	3^+			
		2214.19 *15*	46 *5*	1463.99	2^+			
		2843.99 *11*	100 *6*	834.011	2^+	E1	0.001179 *17*	α(K)=2.57×10^{-5} *4*; α(L)=2.58×10^{-6} *4*; α(M)=3.85×10^{-7} *6*; α(N)=2.54×10^{-8} *4* α(N+..)=0.001150 *17*
3708.5	2^+	1193.7 *5*	100	2514.79	3^-			
3757.2	$^-$	317.5 *4*	17.8 *16*	3439.34	$^+$			
		2029.4 *5*	100 *5*	1728.30	4^+			
3760.50	8^+	988.6 *2*	100	2772.03	6^+	E2[‡]	0.000364 *5*	α(K)=0.000325 *5*; α(L)=3.33×10^{-5} *5*; α(M)=4.97×10^{-6} *7*; α(N)=3.24×10^{-7} *5* α(N+..)=3.24×10^{-7} *5* B(E2)(W.u.)=42 *+11−27*
3784.18	7^-	655.4 *2*	100	3128.86	5^-	E2[‡]	0.001055 *15*	α(K)=0.000942 *14*; α(L)=9.79×10^{-5} *14*; α(M)=1.460×10^{-5} *21*; α(N+..)=9.41×10^{-7} B(E2)(W.u.)<47
		1011.9 *2*	100	2772.03	6^+			
3803.55	$1,2^+$	2339.72 *18*	36.4 *21*	1463.99	2^+			
		3112.04 *5*	63 *10*	691.43	0^+			
		3803.40 *21*	100 *6*	0	0^+			
3815.4	$2^-,3^-$	2981.3 *3*	100	834.011	2^+			

$^{72}_{32}Ge_{40}$-11

$\gamma(^{72}Ge)$ (continued)

E_i(level)	J^π_i	E_γ	I_γ	E_f	J^π_f	Mult.[†]	α	Comments
3840.2	4^+	759.9 *2*	100	3080.34	4^+			
3872.2	2^+	3872.1 *4*	100	0	0^+			
3895.0	1	3894.9 *5*		0	0^+	D		
3898.48	(7^-)	1126.6 *2*	100	2772.03	6^+			
3983.75		1581.25 *21*	37 *8*	2402.30	2^+			
		3149.91 *24*	100 *14*	834.011	2^+			
3985.91		950.2 *4*	12 *7*	3035.64	2^-			
		1522.7 *6*	28 *7*	2463.90	4^+			
		2521.83 *17*	100 *5*	1463.99	2^+			
3995.24	1^+	3161.2 *5*	16.1 *16*	834.011	2^+			
		3304.5 *8*	15 *3*	691.43	0^+			
		3995.0 *3*	100.0 *16*	0	0^+	(M1)	0.001101 *16*	α(K)=2.31×10^{-5} *4*; α(L)=2.32×10^{-6} *4*; α(M)=3.46×10^{-7} *5*; α(N)=2.29×10^{-8} *4* α(N+..)=0.001075 *15*
4041.0	$0^-,1^-,2^-$	2577.6 *8*	100 *13*	1463.99	2^+			
		3206.7 *5*	35 *4*	834.011	2^+			
4049.6	1	4049.5 *3*	100	0	0^+	D		
4077.57	8^+	317.2 *2*	16	3760.50	8^+	M1[‡]	0.00406 *6*	α(K)=0.00363 *6*; α(L)=0.000377 *6*; α(M)=5.63×10^{-5} *8*; α(N)=3.69×10^{-6} *6*; α(N+..)=3.69×10^{-6} *6* B(M1)(W.u.)=0.12 *+11−12*
		1305.4 *2*	100	2772.03	6^+	E2[‡]	0.000224 *4*	α(K)=0.0001740 *25*; α(L)=1.772×10^{-5} *25*; α(M)=2.64×10^{-6} *4* α(N+..)=2.95×10^{-5} *5* B(E2)(W.u.)=9 *+8−9*
4090.4	+	3256.0 *8*	75 *13*	834.011	2^+			
		3399.1 *7*	100 *15*	691.43	0^+			
4256.1	1	4256.0 *3*	100	0	0^+	D		
4291.85	+	216.0 *5*		4077.57	8^+			
		1519.8 *2*		2772.03	6^+			
4358.7	1	4358.6 *3*	100	0	0^+	D		
4521.07?		1119.0[@] *2*	100	3402.06	(6^+)			
4741.34	9^-	843.0 *2*	25	3898.48	(7^-)			I_γ: from table 3 in 1979Mo01.
		957.0 *2*	100	3784.18	7^-	E2[‡]	0.000393 *6*	α(K)=0.000351 *5*; α(L)=3.60×10^{-5} *5*; α(M)=5.38×10^{-6} *8*; α(N)=3.51×10^{-7} *5* α(N+..)=3.51×10^{-7} *5* B(E2)(W.u.)=35 *+3−6*
4820.0	(10^+)	1059.5 *2*	100	3760.50	8^+	E2[‡]	0.000309 *5*	α(K)=0.000276 *4*; α(L)=2.83×10^{-5} *4*; α(M)=4.22×10^{-6} *6*; α(N)=2.76×10^{-7} *4* α(N+..)=2.76×10^{-7} *4* B(E2)(W.u.)=47 *+4−7*
4950.2		1166.0 *2*	100	3784.18	7^-			

Adopted Levels, Gammas (continued)

$\gamma(^{72}Ge)$ (continued)

E_i(level)	J^π_i	E_γ	I_γ	E_f	J^π_f	Mult.†	α	Comments
5082.5		1322.0 *2*	100	3760.50	8^+			
5164.8	1^+	5164.6 *3*	100	0	0^+	M1	0.001448 *21*	$\alpha(K)=1.572\times10^{-5}$ *22*; $\alpha(L)=1.577\times10^{-6}$ *22*; $\alpha(M)=2.35\times10^{-7}$ *4*; $\alpha(N+..)=0.001431$
5199.2	1	5199.0 *11*	100	0	0^+	D		
5280.4	1	5280.2 *6*	100	0	0^+	D		
5315.0	1	5314.8 *6*	100	0	0^+	D		
5395.5?		1497.0@ *2*	100	3898.48	(7^-)			
5421.4?		1343.8@ *2*	100	4077.57	8^+			
5435.8	1^+	5435.6 *5*	100	0	0^+	M1	0.001526 *22*	$\alpha(K)=1.460\times10^{-5}$ *21*; $\alpha(L)=1.465\times10^{-6}$ *21*; $\alpha(M)=2.19\times10^{-7}$ *3*; $\alpha(N+..)=0.001510$
5837.8	11^-	1096.5 *2*	100	4741.34	9^-	E2‡	0.000286 *4*	$\alpha(K)=0.000255$ *4*; $\alpha(L)=2.61\times10^{-5}$ *4*; $\alpha(M)=3.90\times10^{-6}$ *6*; $\alpha(N)=2.55\times10^{-7}$ *4* $\alpha(N+..)=2.55\times10^{-7}$ *4* B(E2)(W.u.)=22 *+5−10*
5849.8	$1^{(-)}$	5849.5 *3*	100	0	0^+	(E1)	0.00226 *4*	$\alpha(K)=1.037\times10^{-5}$ *15*; $\alpha(L)=1.038\times10^{-6}$ *15*; $\alpha(M)=1.548\times10^{-7}$ *22*; $\alpha(N)=1.024\times10^{-8}$ *15* $\alpha(N+..)=0.00225$ *4*
5919.8	1^-	5919.5 *4*	100	0	0^+	E1	0.00228 *4*	$\alpha(K)=1.022\times10^{-5}$ *15*; $\alpha(L)=1.023\times10^{-6}$ *15*; $\alpha(M)=1.526\times10^{-7}$ *22*; $\alpha(N)=1.010\times10^{-8}$ *15* $\alpha(N+..)=0.00227$ *4*
5974.6	1	5974.3 *12*	100	0	0^+	D		
6115.0	(12^+)	1295.0 *2*	100	4820.0	(10^+)	E2‡	0.000225 *4*	$\alpha(K)=0.0001770$ *25*; $\alpha(L)=1.80\times10^{-5}$ *3*; $\alpha(M)=2.69\times10^{-6}$ *4*; $\alpha(N+..)=2.71\times10^{-5}$ *4* B(E2)(W.u.)=26 *+4−6*
6131.7	1	6131.4 *7*	100	0	0^+	D		
6146.0	1	6145.7 *11*	100	0	0^+	D		
6163.5	$1^{(-)}$	6163.2 *4*		0	0^+	(E1)		
6383.2	1	6382.9 *7*	100	0	0^+	D		
6470.0	1	6469.7 *7*	100	0	0^+	D		
6629.9	1	6629.6 *6*	100	0	0^+	D		
6736.8	1	6736.5 *6*	100	0	0^+	D		
6811.7	1^-	6811.4 *12*	100	0	0^+	E1		
7061.2	1	7060.8 *10*		0	0^+	D		
7450.4	1	7450.0 *11*	100	0	0^+	D		
7518.5	1	7518.1 *8*	100	0	0^+	D		
7673.7	1^-	7673.3 *4*	100	0	0^+	E1		
7805.0	$1^{(-)}$	7804.5 *13*		0	0^+	(E1)		
8441.7	$1^{(-)}$	8441.2 *8*	100	0	0^+	(E1)		
8486.9	$1^{(-)}$	8486.4 *10*		0	0^+	(E1)		
8867.9	1	8867.3 *5*	100	0	0^+	D		

Adopted Levels, Gammas (continued)

$\gamma(^{72}Ge)$ (continued)

† From $\gamma(\theta)$ and $\gamma\gamma(\theta)$ in ^{72}Ga β^- decay, except as noted.
‡ From $\gamma(\theta)$ and $\gamma\gamma(\theta)$ in $^{70}Zn(\alpha,2n\gamma)$.
# From Coul excitation.
@ Placement of transition in the level scheme is uncertain.

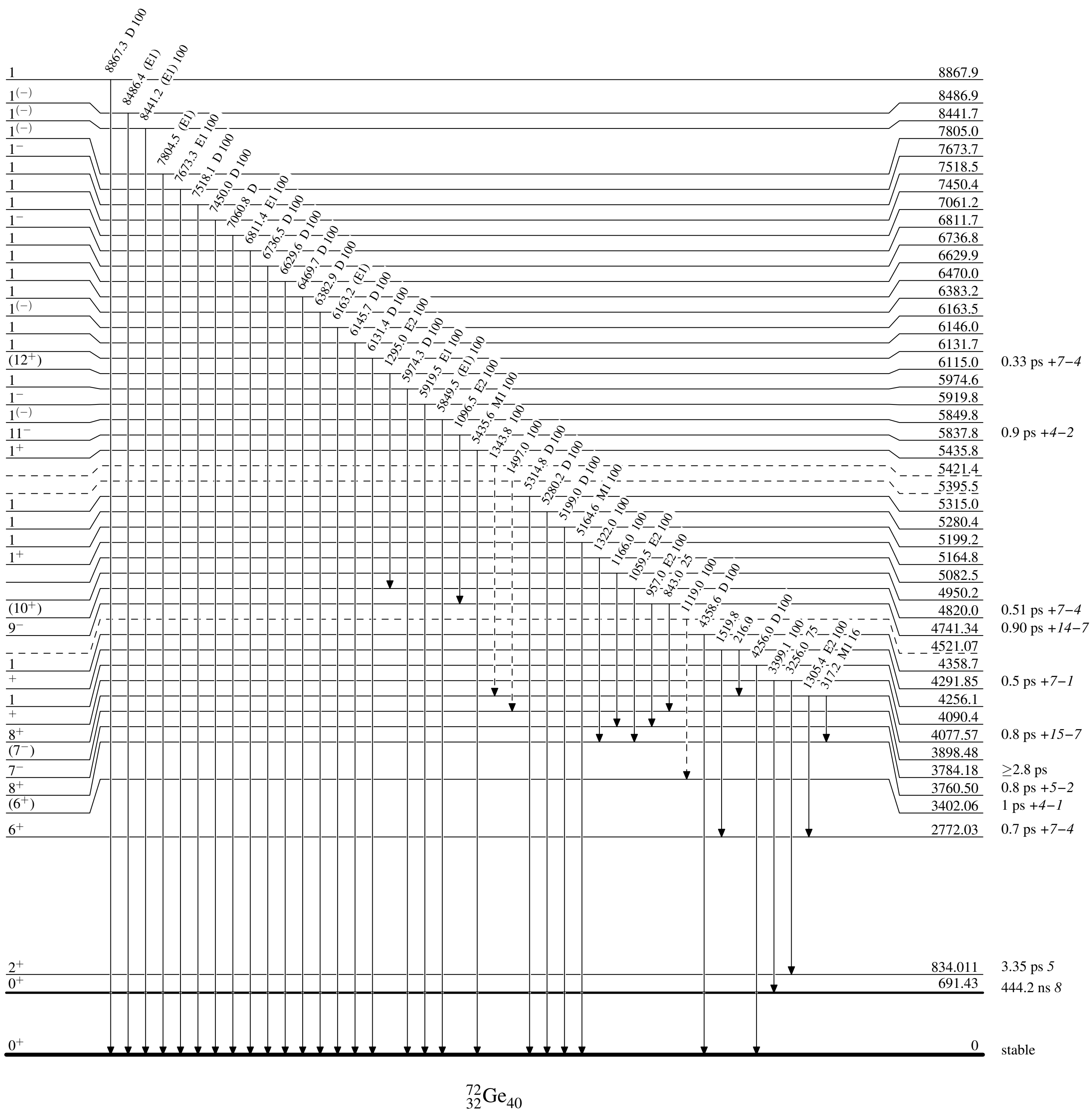
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

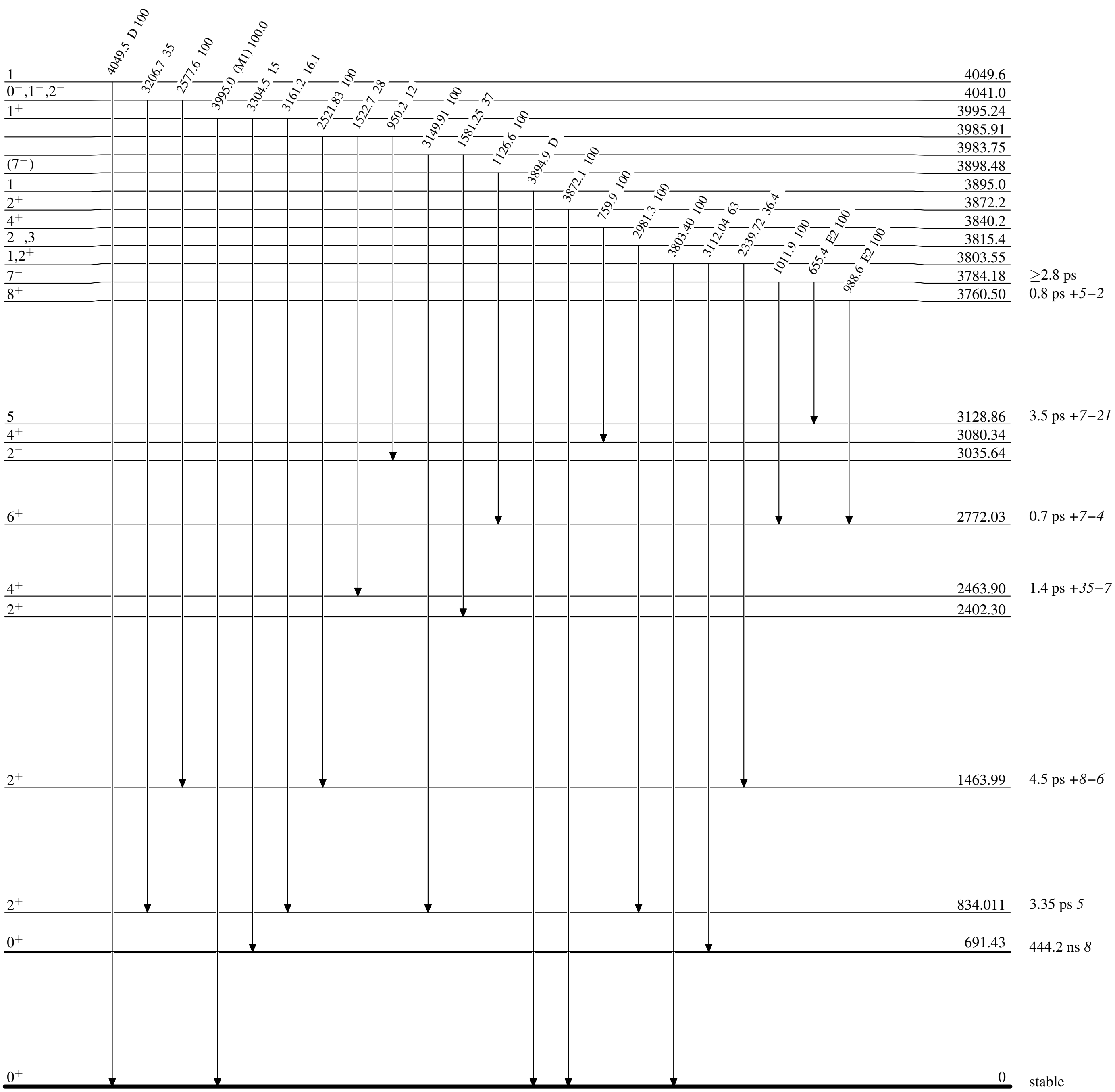
γ Decay (Uncertain)



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

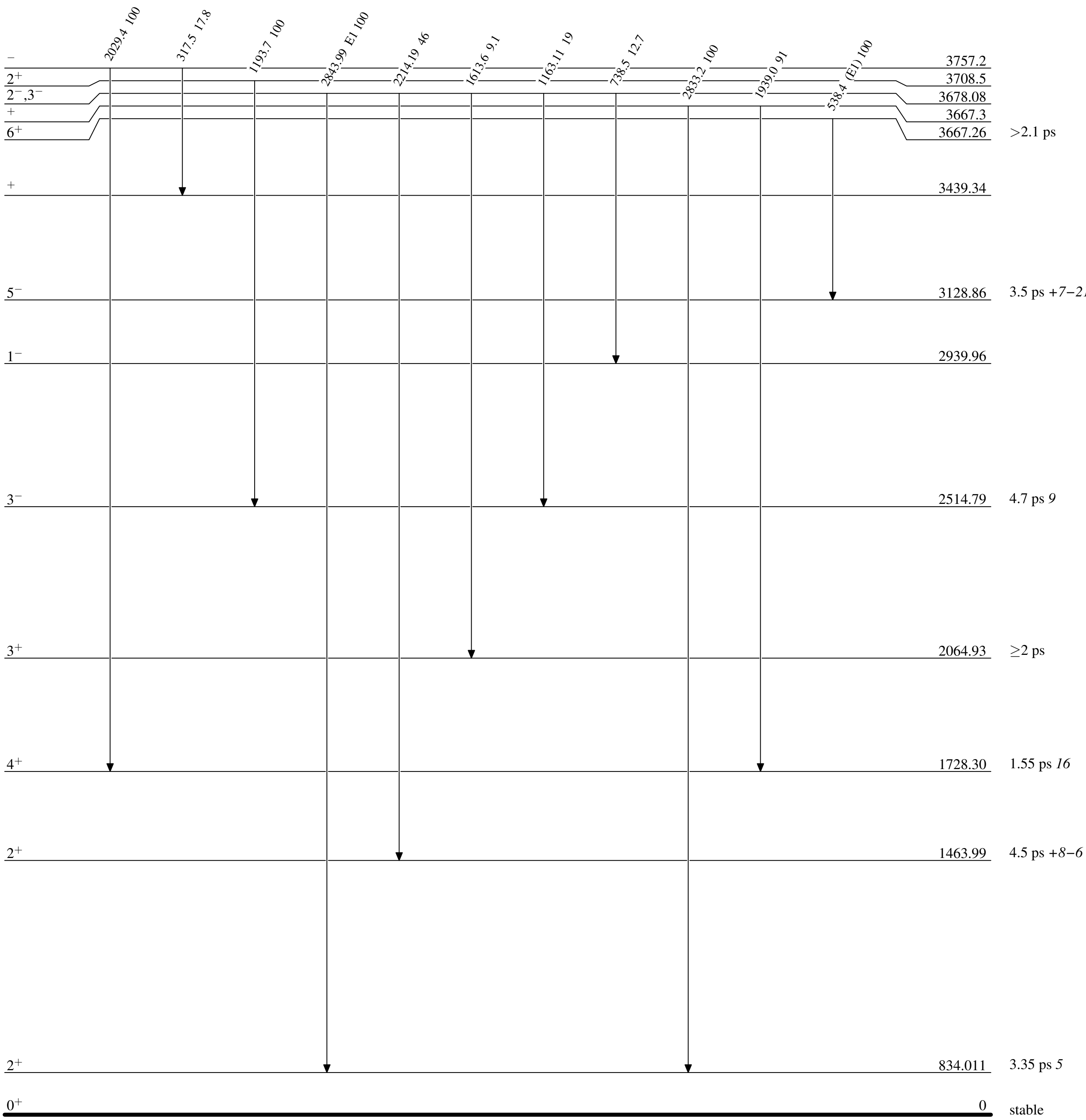


$^{72}_{32}Ge_{40}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

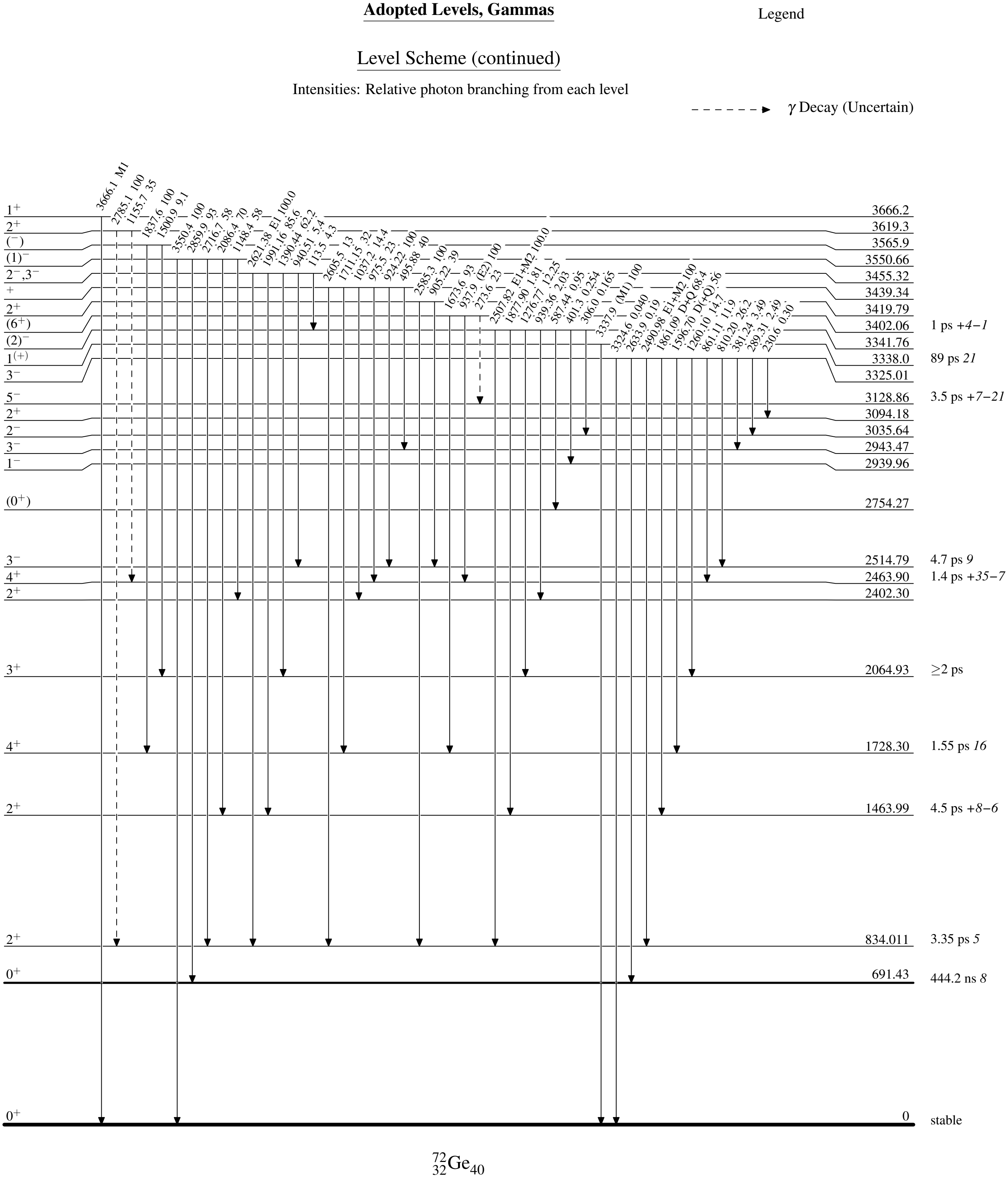


$^{72}_{32}Ge_{40}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



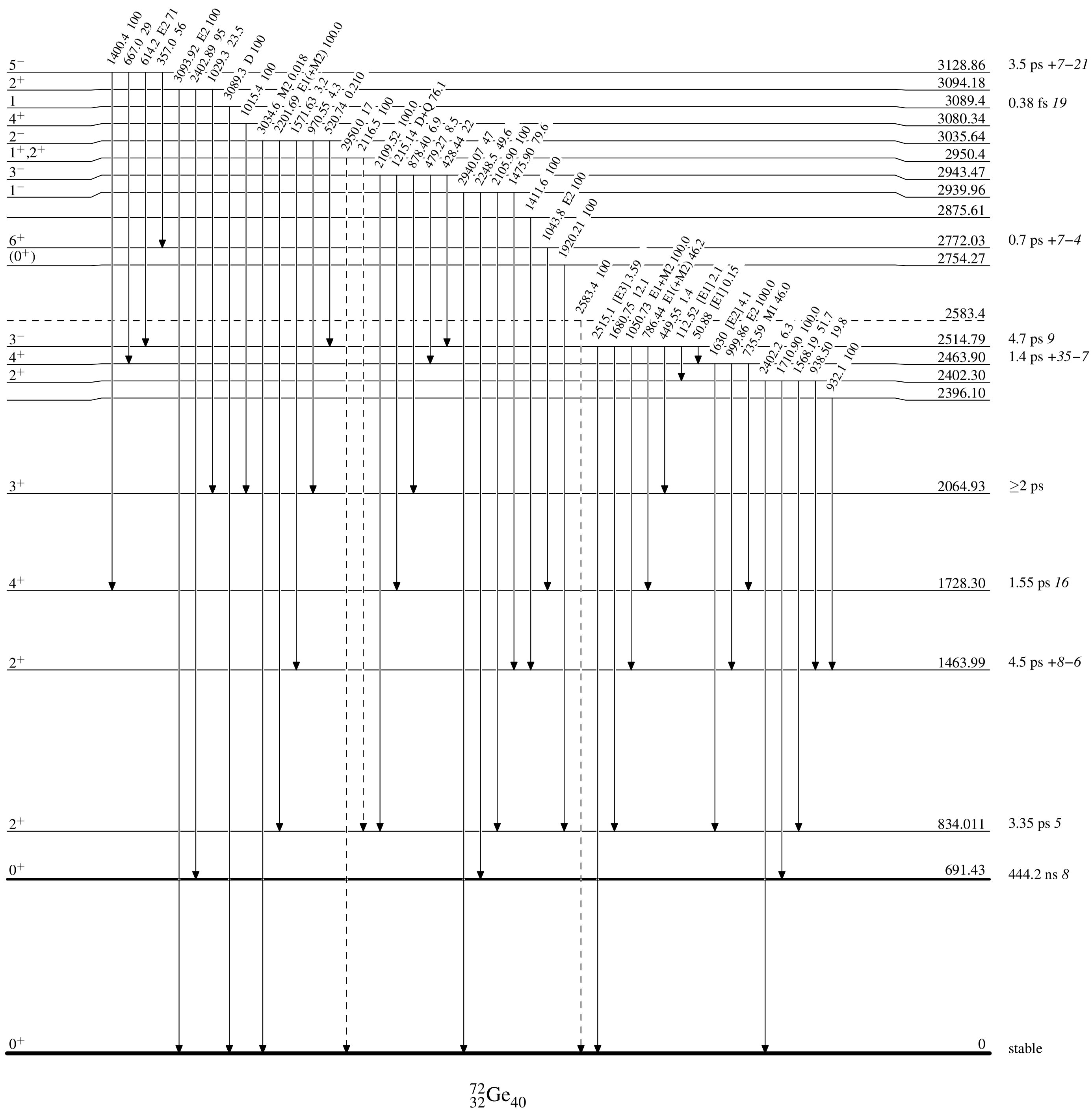
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

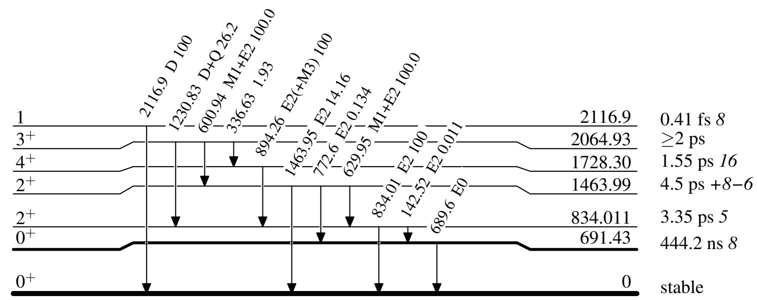
γ Decay (Uncertain)



Adopted Levels, Gammas

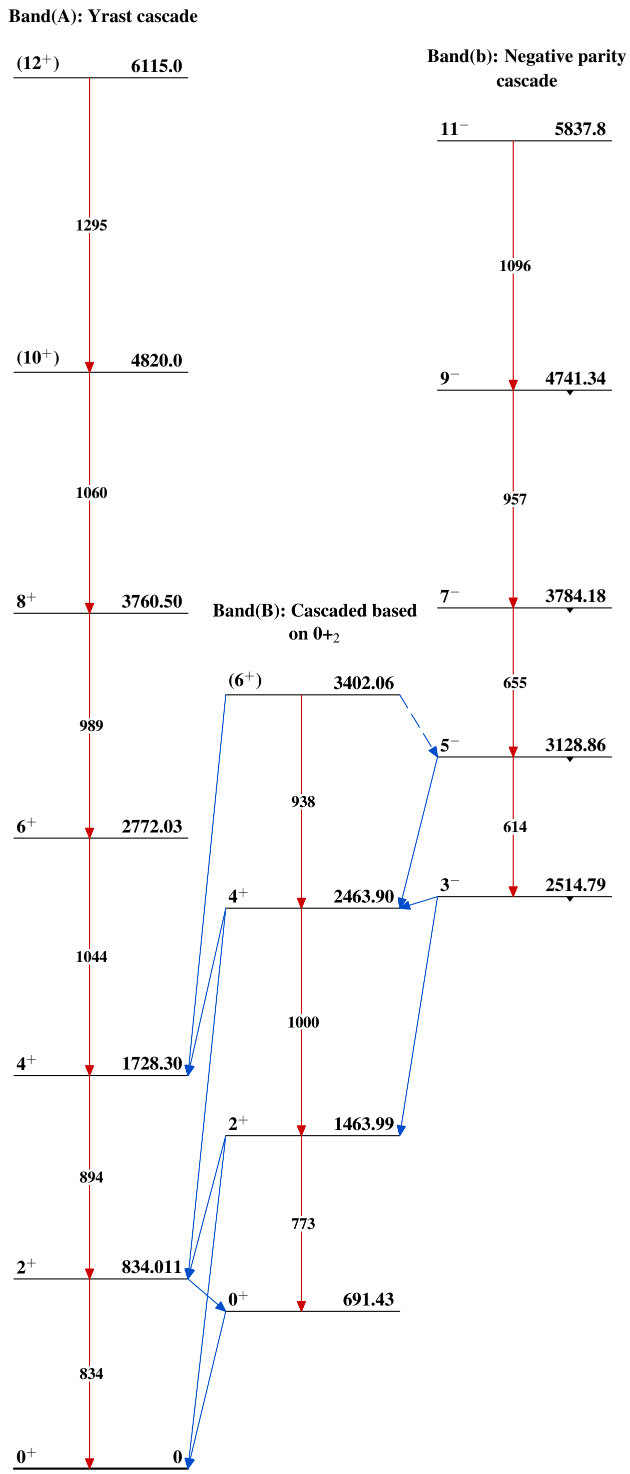
Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{72}_{32}Ge_{40}$

Adopted Levels, Gammas



$^{72}_{32}Ge_{40}$

Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, Ameenah R. Farhan	NDS 107,1923 (2006)	30-Apr-2006

Q(β^-)=−2562.4 *17*; S(n)=10196.24 *6*; S(p)=11012.1 *17*; Q(α)=−6282.6 *20* 2012Wa38
Note: Current evaluation has used the following Q record −2562.5 1710196.22 *6* 11012.123 −6282.725 2003Au03.
Giant-dipole resonance work (photonuclear reactions) has been reported by 1976Ca06, 1975Mc06, 1973McZP, 1973Mc15.
Nuclear structure calculations: 2004Br44.
Additional information 1.
Mass measurements: 1993Hy02, 1985El01, 1977De20, 1976De21, 1964Ba03, 1963Ri07.

^{74}Ge Levels

Levels populated in reactions with XREF=Y:
^{74}Ge(^{6}Li,^{6}Li),(^{6}Li,^{6}Li′): 0, 596.
^{74}Ge(^{16}O,^{16}O′),(^{18}O,^{18}O′): 0, 596, 1200.
^{75}As(n,d): 0, 596, 1200, 1470, 2200.
^{77}Se(n,α) E=th: 0, 596.

Cross Reference (XREF) Flags

A	^{74}Ga β^- decay (8.12 min)	K	^{73}Ge(n,γ) E=290-318 eV	U	^{75}As(d,^{3}He)
B	^{74}As ε decay (17.77 d)	L	^{73}Ge(n,γ) E=332-367 eV	V	^{76}Ge(p,t)
C	^{70}Zn(^{6}Li,d)	M	^{73}Ge(n,γ) E=380-426 eV	W	^{78}Se(d,^{6}Li)
D	^{71}Ga(α,p)	N	^{73}Ge(d,p)	X	^{192}Os(^{82}Se,Xγ)
E	^{72}Ge(t,p)	O	^{74}Ge(γ,γ'),(pol γ,γ')	Y	^{74}Ge(^{6}Li,^{6}Li),(^{6}Li,^{6}Li′)
F	^{72}Ge(α,^{2}He)	P	^{74}Ge(n,n′γ)	Z	^{74}Ge(^{16}O,^{16}O′),(^{18}O,^{18}O′)
G	^{73}Ge(n,γ) E=th	Q	^{74}Ge(p,p′),(pol p,p′)	Others:	
H	^{73}Ge(n,γ) E=102.6 eV	R	^{74}Ge(pol d,d′)	AA	^{75}As(n,d)
I	^{73}Ge(n,γ) E=224 eV	S	^{74}Ge(α,α')	AB	^{77}Se(n,α) E=th
J	^{73}Ge(n,γ) E=240 eV	T	Coulomb excitation		

E(level)[†]	J$^{\pi}$[‡]	$T_{1/2}$[#]	XREF	Comments
0.0[j]	0$^+$	stable	ABCDEFGHIJKLMNOPQRSTUVWXYZ	XREF: Others: AA, AB <r^2>$^{1/2}$=4.0744 fm *12* (2004An14).
595.850[j] *6*	2$^+$	12.41 ps *9*	AB DEFGHI MNOPQRSTUVWXYZ	XREF: Others: AA, AB μ=+0.87 *4* (1984Pa20,1989Ra17) Q=−0.19 *2* (2000To12) μ: transient−field PAC (1984Pa20). Others: +0.70 *4* (1987La20), +0.70 *24* (1977Fa07). See also 2005St24 compilation. Q: reorientation effect in Coul. ex. (2000To12). Other: −0.25 *6* (1980Le16,1989Ra17). See also 2005St24 compilation. β_2=0.290, 0.298 from (^{16}O,^{16}O′) (1979Fe03,1976Co04). β_2(from (pol d,d′))=0.28 (1978Sz08), 0.197 *10* (1985Se05). β_2(from (p,p′))=0.29 (1982Ta16). β_2(from (pol p,p′))=0.208 *10* (1985Se05), 0.27 *1* (1986MoZR). J$^{\pi}$: L=2 in (t,p), (p,p′), (d,d′), (α,α') and (d,^{6}Li). $T_{1/2}$ from B(E2) in Coul. ex. Others: 11.8 ps +*11*−*10* (DSA method in (n,n′γ)) (1988DoZU), 13 ps *2* from (γ,γ') (1956Me13). 2001Ra27 adopted 12.50 ps *25*.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{74}Ge Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$[#]	XREF	Comments
1204.205 *7*	2^+	5.4 ps *8*	AB E GH K OPQRSTUVW Z	XREF: Others: AA, AB μ=+0.82 *24* (1984Pa20,1989Ra17) Q=+0.26 *6* (2000To12) μ: transient-field PAC (1984Pa20). See also 2005St24 compilation. β_2=0.07 from (p,p′) (1982Ta16). J^{π}: L=2 in (t,p), (p,p′), (d,d′), (α,α'), (p,t) and (d,^{6}Li). $T_{1/2}$ from DSA method in (n,n′γ). Other: 5.9 ps *9* from B(E2)′s in Coul. ex.
1463.759[j] *8*	4^+	1.53 ps *10*	AB DEfGHI KLMN PQRSTUVWX	J^{π}: L=4 in (p,p′), (d,d′) and (α,α'). $T_{1/2}$ from B(E2) in Coul. ex. β_4=0.02 from (p,p′) (1982Ta16), −0.015 *15* from (pol p,p′) (1986MoZR).
1482.81 *4*	0^+	6 ps *+15−3*	ABCDEfG OPQ ST VW	J^{π}: $\gamma\gamma(\theta)$ in ^{74}As ε decay and (γ,γ'). L=0 in (t,p), (^{6}Li,d) and (α,α'). $T_{1/2}$ from B(E2) in Coul. ex.
1697.140 *8*	$(3)^+$		AB E GHI L PQ UV	XREF: E(?). J^{π}: L(d,^{3}He)=(1+3) and $\gamma(\theta)$ of 493γ and 1101γ in (n,n′γ).
1724.954 *14*	(0^+)		G R	J^{π}: L(d,d′)=(0) for E=1720 *20*.
1913 *14*	0^+		E N	XREF: N(?). J^{π}: L(t,p)=0.
2165 *4*	(1^-)		E Q V	J^{π}: L(p,t)=1 and L(p,p′)=(1). L(t,p)=0 inconsistent with $J^{\pi}=(1^-)$.
2165.259 *8*	$(3,4)^+$		A GHI LM PQ U	J^{π}: γ to 2^+ and strong primary γ from 4^+, 5^+. The L=3 group in (d,^{3}He) at 2168 *10* probably corresponds to this level rather than to the 2165 level of $J^{\pi}=(1^-)$. L(p,p′)=(1) for a doublet E=2165 *5*, the second component is probably L=4.
2197.933 *24*	2^+		AB E G I OPQR UV	XREF: Others: AA J^{π}: γ′s to 0^+ and 4^+, L=2 in (t,p), (p,p′) and (p,t). L=(4) for a 2210 group in (d,d′) inconsistent with $J^{\pi}=2^+$.
2227.77 *10*	0^+		E G OPQ U	XREF: Others: AA J^{π}: $\gamma\gamma(\theta)$ in (γ,γ') and L(t,p)=0.
2300			C	
2403.5 *4*	1[&]	0.0004 eV *1*	O	
2490? *5*			N	
2536.310 *13*	3^-	0.24[@] ps *+14−10*	A E GH KLMN PQRS V	β_3=0.16 ((p,p′),1982Ta16), 0.15 *1* ((pol p,p′),1986MoZR). B(E3)(p,p′)=0.020 *7* (2002Ki06,evaluation). J^{π}: L=3 in (t,p), (p,p′), (d,d′) and (α,α').
2569.329[j] *14*	(6^+)		G IJ P X	J^{π}: yrast population in (^{82}Se,x).
2572 *5*	4^+		E N Q S V	XREF: E(?). J^{π}: L(p,t)=4; L(α,α')=(4). L(p,p′)=(3) inconsistent with $J^{\pi}=4^+$, but assignment perturbed by ^{70}Ge impurity.
2600.32 *9*	$(1,2,3)^+$	0.31[@] ps *+12−10*	E G OPQ VW	XREF: W(?). J^{π}: L=2 in (p,p′). L=(0) for 2610 in (t,p) and L=(1) for 2605 in (p,t) inconsistent

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Adopted Levels, Gammas (continued)

^{74}Ge Levels (continued)

E(level)†	J^{π}‡	$T_{1/2}$#	XREF	Comments
				with $J^{\pi}=2^{+}$.
2669.62 *4*	4^{+}		E G I N PQRS V	J^{π}: L=4 in (t,p), (p,p′) and (α,α′).
2690.6 *3*	1&	0.0015 eV *3*	O	
2693.68 *4*	$(3,4^{+})$	0.052@ ps *+24−16*	A e GHI K n Pq s v	XREF: e(?). J^{π}: γ′s to 2^{+} and primaries from thermal capture and from two $J^{\pi}=4^{+}$ neutron resonances gives $J^{\pi}=3,4^{+}$. If L(p,p′)=(2+3) for E=2690 *5* corresponds to this level, then $J^{\pi}=(3^{-})$. L(α,α′)=(1) for E=2695 *10* inconsistent with $J^{\pi}=3,4^{+}$.
2696.918 *10*	(2^{+})		e G n Pq s v	XREF: e(?). J^{π}: γ to 4^{+} and no feeding from thermal capture and from any of the five neutron resonances studied. L(α,α′)=(1) for E=2695 *10* inconsistent with $J^{\pi}=2^{+}$.
2711 *6*	(4^{+})		EF	J^{π}: L(t,p)=(4).
2750.61 *23*	0^{+}		C E PQ	J^{π}: L(t,p)=0.
2828.507 *11*	4^{+}		GHIJ LM PQ	J^{π}: L(p,p′)=4.
2833.41 *15*	(2^{+})	0.009@ ps *+4−3*	e Pqr uv	E(level): it appears that 2833 and 2836 are two different levels the first populated in (n,n′γ) and the second in (n,γ) E=th, although, existence of a doublet near this energy does not seem definitive. The γ rays in both reactions proceed to the same final levels but are about 3 keV different in energy. Also the branching ratios are different in the two reactions. J^{π}: L=2 in (t,p) and (p,t) for a probable doublet. L(p,p′)=4 for a doublet E=2833 *5*, the second component is probably L=2.
2835.923 *24*	(2^{+})		e G qr uv	E(level),J^{π}: see comment for 2833 level.
2842 *5*	$(3^{-}$ & $5^{-})$		N S	J^{π}: L(α,α′)=(3+5) and L(d,p)=1.
2856.04 *25*	0^{+}		E PQ UV	XREF: E(?). J^{π}: L(p,t)=0.
2878.14 *17*	(5^{-})		PQ	J^{π}: L(p,p′)=(5).
2925.45 *9*	$(3,4^{+})$		G P	J^{π}: γ to 2^{+}, possible γ to $(3)^{+}$ and primary from thermal capture.
2935.475 *12*	3^{-}		E GHI KLMn P s u	J^{π}: L(d,p)=1 and γ to 4^{+}. L(d,^{3}He)=1+3 and L(α,α′)=(3+5).
2936.8	(5^{-})		n PQ s u	J^{π}: L(p,p′)=(5), L(d,p)=1, L(d,^{3}He)=1+3 and L(α,α′)=(3+5).
2938.7 *2*	2^{+}	0.26@ ps *+15−7*	P V	J^{π}: L(p,t)=2.
2949.48 *10*	(3^{-})		A E G P r	J^{π}: log *ft*=5.7 from (3^{-}) and γ to 2^{+}. L(d,d′)=(3). L(t,p)=4 inconsistent with J^{π}.
2961.0 *2*	(5^{-})		PQrS	J^{π}: L(α,α′)=(5).
2973.472 *13*	(3)		A GH KL PQ	J^{π}: γ to 0^{+}, primaries from thermal capture and from two $J^{\pi}=4^{+}$ neutron resonances.
2999.2	2^{+}		OPQ S U	J^{π}: γ from 1^{-} in (γ,γ′) and L=2 in (p,p′), (α,α′).

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Adopted Levels, Gammas (continued)

^{74}Ge Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
3017 *3*	2^+		E Q S UV	Jπ: L=2 in (t,p), (p,t) and L=(2) in (p,p′). L=1(+3) in (d,^{3}He).
3032.8 *2*	1[&]	0.0112 eV *6*	O	
3034.00 *3*	$(3,4^+)$	0.059[@] ps *+10−7*	A G I K M P	Jπ: γ′s to 2^+ and primaries from thermal capture and from Jπ=4^+ neutron resonance.
3048.564 *24*	4^+		E GH PQ S V	Jπ: L=4 in (t,p), (p,p′), (p,t) and (α,α′).
3060.1 *5*	(2^+ to 6^+)		H K M P	Jπ: primary γ from 4^+.
3081.321 *15*	(3^+)	0.21[@] ps *+7−5*	A GHI KLM PQR UV	Jπ: L=1+3 in (d,^{3}He), L=(3,4) in (d,d′), γ to 4^+ and primaries from thermal capture and from Jπ=4^+ neutron resonance. In (p,p′), either the L=(5) assignment for a 3081 group is incorrect or there is a different level near this energy.
3092.2 *2*	$1^{(+)}$[&]	0.0104 eV *11*	O	
3104.506 *19*	5^-		E GHIJ LM PQ S	Jπ: L=5 in (t,p) and (α,α′).
3118.0 *5*	$3^-,4^-,5^-,6^-$		N P	Jπ: L(d,p)=1.
3139.32 *22*			P	
3140.30 *4*	3^-		A E GHI K PQRS V	Jπ: L=3 in (t,p), (p,p′) and (α,α′).
3175.47 *3*	3^-	0.097[@] ps *+35−28*	A GH PQ S U	Jπ: L=3 in (α,α′) and (p,p′).
3199.5	2^+	0.024 ps *+8−4*	PQ S UV	Jπ: L=2 in (α,α′), (p,t) and (p,p′).
3211.8? *7*			A	
3224.680 *13*	4^+		E G Q S UV	L(p,t)=2+5 unresolved doublet. Jπ: L=4 in (t,p), (α,α′) and (p,p′).
3242 *5*	≤9^+		N	Jπ: L(d,p)=4.
3271.51 *5*	(2^+)		GHI KL Q	Jπ: γ to 4^+, possible γ to 0^+.
3276.3 *2*	1[&]	0.0013 eV *4*	O	
3293 *5*	$3^-,4^-,5^-,6^-$		N	Jπ: L(d,p)=1.
3315.72 *3*	4^+		G S U	Jπ: L(α,α′)=4.
3342.94 *7*	$(3^-,4^+)$		A Q V	Jπ: L(p,t)=3 for E=3342 *10* and L(p,p′)=4 for E=3342 *4*.
3356 *3*	0^+		E	Jπ: L(t,p)=0.
3358.517 *22*	$(2^+,3,4^+)$[b]		G L	
3360 *4*	5^-		Q S V	Jπ: L(p,t)=5.
3372.4 *5*	$2^+,3^+,4^+,5^+,6^+$		G IJ MN	Jπ: L(d,p)=2 and primaries from $4^+,5^+$.
3381.74 *5*	3^-		A GH Q S uV	Jπ: L=3 in (p,p′), (α,α′) and (p,t).
3392.618 *18*	2^+		E G K M Qr uV	E(level): E(p,p′)=3401 *5*, E(p,t)=3400 *10*. Jπ: L=2 in (t,p), (p,t) and (p,p′).
3409.931 *25*	$(3,4^+)$		GHI r U	Jπ: possible γ′s to 4^+, (2^+) and primaries from thermal capture and from Jπ=4^+ neutron resonance.
3423.8 *6*	(2 to 6)[a]		G I M	
3436.3 *9*	(2 to 6)[a]		E G J	Jπ: L=(0,1) in (t,p) inconsistent with J=2 to 6. The level in (t,p) may be different.
3478.37 *3*	$(2,3)^+$		A GHI L Q S UV	E(level): E(p,t)=3490. Jπ: L=1+3 in (d,^{3}He) and γ to 4^+.
3501.4 *10*	4		E LMn QrS V	Jπ: L=4 in (p,p′) and (p,t).

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Adopted Levels, Gammas (continued)

^{74}Ge Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$[#]	XREF	Comments
3515.441 *13*	(3,4$^+$)		GHI K n rS	J$^{\pi}$: γ's to (2$^+$), (4$^+$) and primaries from thermal capture and from two J$^{\pi}$=4$^+$ neutron resonances. If same as L=3 in (d,p) then J$^{\pi}$=(3$^-$). If same as L=(4) in (d,d′) then J$^{\pi}$=(4$^+$).
3557.9 *3*	1$^{(-)}$[&]	0.050 eV *8*	O	
3566.75 *8*	(2$^+$,3,4$^+$)		A	J$^{\pi}$: γ to 2$^+$ and log *ft*=7.3 from (3$^-$).
3578.93 *3*	2$^+$		E G Q S UV	J$^{\pi}$: L=2 in (t,p) and (p,t).
3603? *5*			N	
3617 *7*	0$^+$		C Q S V	J$^{\pi}$: L=0 in (p,t) and (α,α′).
3629 *7*	(6$^+$)		F Q S V	XREF: F(3590). J$^{\pi}$: L=(6) in (α,α′), L=7,6 in (p,t) and L=6+8 or 6+7 in (α,^{2}He). L(p,p′)=(5) inconsistent with J$^{\pi}$.
3639.5? *2*			A	
3642 *2*	(4$^+$)		E	J$^{\pi}$: L(t,p)=(4).
3647[d] *10*	1$^-$		a q S	J$^{\pi}$: L(α,α′)=1.
3647[de] *10*	2$^+$		a g q V	J$^{\pi}$: L(p,t)=2.
3647.9 *7*	1$^+$[&]	0.028 eV *6*	O	
3654.4[e] *11*	(4$^+$,5$^+$)		g L N	J$^{\pi}$: L(d,p)=(0).
3681[j] *1*	(8$^+$)		X	J$^{\pi}$: yrast cascade in (^{82}Se,X).
3683 *4*	5$^-$		E v	J$^{\pi}$: L(t,p)=5.
3685.42 *12*	(2 to 5$^+$)		G q v	J$^{\pi}$: γ to (3$^+$) and primary from thermal capture. If same as L=4 in (p,p′) then J$^{\pi}$=4$^+$.
3691.79 *4*	3$^-$		G q S v	J$^{\pi}$: L(α,α′)=3. L(p,p′)=4 inconsistent with J$^{\pi}$.
3696.59 *9*	(3,4)[c]		A H JKL n s v	J$^{\pi}$: log *ft*=6.6 from (3$^-$). Feeding from 4$^+$ and 5$^+$ resonances.
3700 *10*	(0$^+$)		Q	J$^{\pi}$: L(p,p′)=(0).
3707.20 *14*	(3,4,5)[c]		G IJ n s v	J$^{\pi}$: γ to 3$^-$ and primaries from thermal capture and from 4$^+$ and 5$^+$ resonances.
3716.7 *4*	(1$^-$,2$^+$)[c]		A n s v	J$^{\pi}$: γ's to 0$^+$, (3$^-$).
3720.79 *5*	(3,4$^+$)		A G n	J$^{\pi}$: log *ft*=6.3 from (3$^-$) and primary from thermal capture.
3733 *7*	4$^+$		E n Q S	J$^{\pi}$: L(t,p)=4. L(p,p′)=3 is not consistent with J$^{\pi}$.
3743.348 *23*	(3$^-$,4$^+$)		G n	J$^{\pi}$: γ to 5$^-$ and possible γ to (3,4$^+$).
3748 *5*	2$^+$		n Q S V	J$^{\pi}$: L=2 in (p,t) and (p,p′).
3771.74 *5*	(2$^+$,3,4$^+$)[b]		GH L	
3778 *5*	0$^+$		E Q S V	J$^{\pi}$: L=0 in (t,p) and (p,t).
3783.41 *5*	(2$^+$,3,4$^+$)[b]		G	
3790.90 *8*	(3,4$^+$)		G I	J$^{\pi}$: γ to (2$^+$) and primaries from thermal capture and from J$^{\pi}$=4$^+$,5$^+$ neutron resonances.
3806.772 *23*	3$^-$		GH S	J$^{\pi}$: L(α,α′)=3.
3807.03 *11*			A	
3828.23[f] *10*	(1$^-$ to 4$^+$)[f]		A	J$^{\pi}$: γ's to 2$^+$ and 3$^-$.
3832.23[f] *5*	(2$^+$,3,4$^+$)[bf]		G	
3835.27[f] *4*	(2$^+$,3,4$^+$)[bf]		GHI KL	
3853 *10*			S	
3870	(6$^+$,7$^-$,8$^+$)		F	J$^{\pi}$: L(α,^{2}He)=6+7 or 6+8 for 3590+3870.
3874.17 *4*	2$^+$		E G Q V	J$^{\pi}$: γ to 3$^-$; L(p,t)=2; L(p,p′)=(2) assuming the same levels are populated in (p,t), (p,p′) and (n,γ) E=th.

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Adopted Levels, Gammas (continued)

^{74}Ge Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$[#]	XREF	Comments
3874.9 *3*	1^{+}[&]	0.099 eV *18*	O	
3876[h] *10*	3^{-}		S	J$^{\pi}$: L(α,α')=3.
3889.69 *3*	(2^{+},3,4^{+})		G	J$^{\pi}$: γ to 4^{+}.
3895.01 *6*	(2,3,4^{+})		A	J$^{\pi}$: γ's to 2^{+}, (3)$^{+}$ and (3^{-},4^{+}).
3897.98 *4*	(2^{+} to 6^{+})		G	J$^{\pi}$: possible γ to 4^{+}.
3916 *5*	0^{+}		E Q V	J$^{\pi}$: L=0 in (t,p), (p,t).
3932.98[g] *4*	(1^{+},2,3,4^{+})[g]		G	J$^{\pi}$: γ to (2^{+},3,4^{+}).
3941.09[g] *16*	(2^{+},3^{-})[g]		G	J$^{\pi}$: γ's to (3)$^{+}$ and (4)$^{+}$.
3949.80[g] *10*	(2^{+},3,4^{+})[bg]		A	
3958.03 *20*	3^{-}		GHI L S	J$^{\pi}$: L(α,α')=3.
3975.86 *9*	(2^{+})		G	J$^{\pi}$: γ's to 0^{+}, (3^{+}), (3^{-}).
3976.23 *9*	(2,3,4^{+})		A	J$^{\pi}$: γ's to 2^{+}, (3)$^{+}$ and log *ft*=6.0 from (3^{-}).
3995.05 *10*	(2^{+},3,4^{+})		A	J$^{\pi}$: γ to 2^{+} and log *ft* 6.7 from (3^{-}).
3995.83 *6*	(2^{+})		GHI n	J$^{\pi}$: γ's to 0^{+}, 2^{+} and 4^{+}.
3999 *10*	5^{-}		n S	J$^{\pi}$: L(α,α')=5.
4006.8 *4*	1[&]	0.044 eV *6*	O	
4008 *10*	(0^{+})		Q S	J$^{\pi}$: L(p,p$'$)=(0).
4022.94 *7*	2^{+}		E G	J$^{\pi}$: L(t,p)=2.
4024 *7*	5^{-}		Q S V	J$^{\pi}$: L=5 in (α,α') and (p,t).
4030.1 *5*	(2^{+},3,4^{+})[b]		G L	
4045.43 *4*			G S	XREF: G(?).
4064.66 *3*	(2 to 5)[a]		G	J$^{\pi}$: γ to 3.
4069 *5*	3^{-},4^{-},5^{-},6^{-}		N	J$^{\pi}$: L(d,p)=1.
4083 *10*	(0^{+})		Q	J$^{\pi}$: L(p,p$'$)=(0).
4084.9 *5*	1^{+}[&]	0.060 eV *8*	O	
4085 *10*	4^{+}		E Q S V	J$^{\pi}$: L=4 in (α,α'). $\sigma(\theta)$ for (p,t) and (t,p) peaks can'T$_{1/2}$ be fit by a single L value.
4093 *10*	(5^{-})		G Q	E(level): E=4094.02 *4* for a tentative level in (n,γ). J$^{\pi}$: L(p,p$'$)=(5).
4119 *5*	3^{-},4^{-},5^{-},6^{-}		G N	E(level): E=4114.16 *4* for a tentative level in (n,γ). J$^{\pi}$: L(d,p)=1.
4130	(7^{-},8^{+})		F	J$^{\pi}$: L(α,^{2}He)=(7,8).
4138 *10*	2^{+}		G Q V	E(level): E=4137.27 *6* for a tentative level in (n,γ). J$^{\pi}$: L(p,t)=2.
4144.48?[i] *10*			G	
4155.25?[i] *13*			G	
4164 *10*	2^{+}		Q V	J$^{\pi}$: L(p,t)=2.
4171.5 *3*	1[&]		O	
4174 *4*	3^{-}		E N Q	J$^{\pi}$: L(t,p)=3 and L(d,p)=1.
4191.32?[i] *5*			G	
4201.55 *8*	2^{+}		A E Q V	J$^{\pi}$: L(t,p)=2.
4202.94?[i] *5*			G	
4204.67 *16*	(2^{+} to 5^{-})		G KL	J$^{\pi}$: γ's to 4^{+} and 3^{-}.
4217.30 *5*	(2^{+},3,4^{+})[b]		G	
4222.9 *3*	(2^{+},3^{+},4^{+})		A	J$^{\pi}$: log *ft*=7.1 from (3^{-}).
4224.9 *8*	1^{-}[&]	0.090 eV *10*	O	
4234.77 *6*	(3,4^{+})		GH L	E(level): this level may be the same as 4235.33 seen in. J$^{\pi}$: primary γ's from thermal capture and from J^{π}=4^{+} neutron resonance.

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Adopted Levels, Gammas (continued)

^{74}Ge Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$[#]	XREF	Comments
4235.33 13	$(2,3,4)^+$		A N Q	J^{π}: γ to 2^+ and L(d,p)=2.
4239 10	0^+		G V	E(level): E=4238.19 6 for a tentative level in (n,γ). J^{π}: L(p,t)=0.
4273 10	(0^+)		Q V	J^{π}: L(p,t)=(0).
4276.4?[i] 3			G	
4290 7	2^+		E G V	E(level): E=4292.28 6 for a tentative level in (n,γ). J^{π}: L=2 in (t,p) and (p,t).
4305.8 13	1[&]	0.047 eV 7	O	
4320 10	4^+		E Q V	J^{π}: L=4 in (p,t) and L=(4) in (t,p).
4339.67 5	(2^+)		G	J^{π}: γ to 0^+.
4342.6 3	1[&]		O	
4344.25?[i] 5			G	
4353 5	4^+		E N Q	J^{π}: L(t,p)=4.
4367.2 5	$(1^-$ to $5^-)$		A	J^{π}: γ to (3^-).
4368.15 7	(2^+)		G q	J^{π}: γ to 0^+.
4387 5	2^+		E N q V	J^{π}: L=2 in (p,t), L=(2) in (t,p) and (d,p).
4408.58 10	(4^+)[a]		G V	J^{π}: L(p,t)=0,4.
4413.54 10	2^+		E G N	J^{π}: L=2 in (t,p) and (d,p).
4439.98 5	(2,3,4)[a]		G	J^{π}: γ to (2^+).
4442.18 5	$(2^+,3,4^+)$[b]		G	
4477.49 6	$(0^+$ to $4^+)$		A	J^{π}: γ to 2^+.
4493 7	4^+		E N V	J^{π}: L=4 in (t,p) and (p,t).
4527.89 4	(2^+)		G	J^{π}: γ to 0^+.
4535 10	0^+		V	J^{π}: L(p,t)=0.
4538 10	2^+		E	J^{π}: L(t,p)=2.
4544 5	$4^+,5^+$		N	J^{π}: L(d,p)=0.
4586 9	4^+		E	J^{π}: L(t,p)=4.
4591 10	2^+		V	J^{π}: L(p,t)=2.
4594 5	$3^-,4^-,5^-,6^-$		N	J^{π}: L(d,p)=1.
4611.42 16	$(2^-,3^-,4^-)$		A	J^{π}: log *ft*=5.7 from (3^-).
4630.43 7	(2^+)		E G N V	J^{π}: L(p,t)=(2).
4664 10	4^+		V	J^{π}: L(p,t)=4.
4685 6	(0^+)		E V	J^{π}: L(p,t)=(0).
4698.29 13	$(2^-,3^-,4^-)$		A	J^{π}: log *ft*=5.0 from (3^-).
4731 5	$4^+,5^+$		N	J^{π}: L(d,p)=0.
4767 11	$(0^+,1^-)$		E	J^{π}: L(t,p)=(0,1).
4824 5	$4^+,5^+$		N	J^{π}: L(d,p)=0.
4840.92 13	(2^+)		G	J^{π}: γ to 0^+.
4853 8	$(0^+,2^+)$		E	J^{π}: L(t,p)=(0+2).
4874 5			N	
4920 10	(2^+)		V	J^{π}: L(p,t)=(2).
4951 10	(2^+)		V	J^{π}: L(p,t)=(2).
4972.55 9	(2^+)		G	J^{π}: γ to 0^+.
4981 5			N	
5021 10	(2^+)		V	J^{π}: L(p,t)=(2).
5062 5	$4^+,5^+$		N	J^{π}: L(d,p)=0.
5107.82?[i] 5			G	
5131.45 8	(2 to 6)[a]		G	
5147 5	$4^+,5^+$		N V	J^{π}: L(d,p)=0. L(p,t)=5 is reported by 1972IsZV for E=5313; however, in the work of 1977Gu12, the 5148 peak is not fit by any single L value.
5288.5			G	J^{π}: $(2^+,3^+)$ proposed by 2000PoZV in (n,γ).

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Adopted Levels, Gammas (continued)

^{74}Ge Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$#	XREF	Comments
5323 *5*	$4^+,5^+$		N	Jπ: L(d,p)=0.
5352 *10*			V	
5434.8 *5*	1^-&	0.40 eV *3*	O	
5435.76?i *7*			G N	XREF: N(5440).
5485.1 *12*	1&	0.075 eV *11*	O	
5493.1 *10*	1&	0.087 eV *17*	O	
5510.3			G	Jπ: ($3^-,4^-$) proposed by 2000PoZV in (n,γ).
5514.8 *8*	1&	0.23 eV *4*	O	
5580 *10*	(0^+)		V	Jπ: L(p,t)=(0).
5617 *5*			N	
5717 *5*			N	
5743.7 *10*	1&	0.110 eV *13*	O	
5758.76?i *4*			G	
5766.7 *4*	$1^{(+)}$&	0.167 eV *26*	O	
5787 *5*			N	
5850 *5*			N	
5926.86?i *6*			G N	XREF: N(5930).
5934.16?i *9*			G	
6017.4 *24*	1^-&	0.120 eV *15*	NO	XREF: N(?). Γ from 1970Mo26.
6190?			N	
6200	($6^+,8^+$)		F	Jπ: L(α,^{2}He)=(6,8).
6330?	($4^+,5^+$)		N	Jπ: L(d,p)=(0).
6445.1 *11*	1&	0.39 eV *11*	O	
6477.9 *6*	1^-&	0.226 eV *21*	O	
6530?			N	
6650.3 *3*	1^-&	0.92 eV *7*	O	
6660.5 *5*	1^-&	0.337 eV *20*	O	
6680?			N	
6732.7 *8*	1^+&	0.29 eV *3*	O	
6862.00?i *7*			G	
6942.6 *6*	1^-&	0.35 eV *3*	O	
6992.70?i *6*			G	
7150.8 *16*	1^-&	0.58 eV *9*	O	
7173.18?i *4*			G	
7264.6 *6*	1^-&	0.81 eV *3*	O	
7275.90?i *4*			G	
7359.39?i *9*			G	
7379.9 *10*	1&	0.25 eV *4*	O	
7445.3 *11*	1&		O	
7493.60?i *6*			G	
7506.7 *10*	$1^{(-)}$&	0.40 eV *3*	O	
7550.7 *7*	1^-&	0.80 eV *11*	O	
7578.96?i *5*			G	
7616.0 *8*	1&		O	
7621.77?i *7*			G	
7652.1 *6*	1^-&	1.51 eV *12*	O	
7702.02?i *5*			G	

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Adopted Levels, Gammas (continued)

^{74}Ge Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$[#]	XREF
7882.23?[i] *4*			G
7980.64?[i] *6*			G
8219.0 *8*	1[&]	0.36 eV *5*	O
8250.2 *8*	1[&]	0.33 eV *8*	O
8361.1 *12*	1[&]	0.88 eV *18*	O
8375.70?[i] *8*			G
8440.13?[i] *9*			G
8560.09?[i] *6*			G
8873.33?[i] *7*			G
8928.00?[i] *8*			G
9004.38?[i] *6*			G
9133.79?[i] *8*			G
9457.91?[i] *5*			G

† In (p,p′), level energies above 3600 are too high by 10-30 keV, the evaluators have considered this deviation in establishing the level correspondences. See (n,γ) E=th for many additional levels that are considered as tentative. The 2630 and 3050 groups in (α,^{2}He) cannot be associated uniquely with any of the levels here due to the poor resolution in this reaction and high level density in this energy region.

‡ When arguments are based on L values in particle-transfer reactions, L(d,p) is from $9/2^+$ ^{73}Ge target; and L(d,^{3}He) is from $3/2^-$ ^{75}As target.

\# Γ are from (γ,γ').

@ From (n,n′γ).

& From $\gamma\gamma(\theta)$ and γ(pol) in (γ,γ'),(pol γ,γ').

a Primary γ from 4^+,5^+.

b γ's to 2^+ and 4^+.

c L(p,t)=(2) for E=3607 *10*.

d E=3639.77 *10* with probable J^{π}=1,2^+ is reported in β^- decay.

e E=3651.93 *3* with probable J^{π}=1^+,2,3,4,5^+ is reported in (n,γ) E=th.

f L=2 for E(t,p)=3824 *5*, L=(2) for E(p,p′)=3825 *10*, L=4 for E(p,p′)=3849 *10*, L=3+5 for E(α,α')=3836 *10*, L=1+3 for E(d,^{3}He)=3837 *10* and L=1 for E(d,p)=3841 *5* probably correspond to any of these levels.

g L=2 for E(t,p)=3953 *8*, L=4 for E(p,p′)=3966 *10*, L=(3+5) for E(α,α')=3948 *10*, L=3 for E(p,t)=3935 *3* and L=3 for E(p,t)=3950 *3* probably correspond to any of these levels.

h E=3874.17 *4* is reported in (n,γ), and probably corresponds to either the 3874 or 3876 levels.

i For γ rays from this level see ^{73}Ge(n,γ) E=th.

j Band(A): g.s. band.

$\gamma(^{74}Ge)$

Gammas are known mainly from ^{74}Ga β^- decay and ^{73}Ge(n,γ) E=thermal. Low energy γ's are from curved-crystal spectrometer data in (n,γ). See (n,γ) E=th for many additional γ rays from tentative levels.

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.†	δ	Comments
595.850	2+	595.847 *6*	100	0.0	0+	E2		B(E2)(W.u.)=33.0 *4* Mult.: from γ(pol,θ).
1204.205	2+	608.353 *5*	100 *1*	595.850	2+	E2+M1	+3.4 *4*	B(M1)(W.u.)=0.00099 *15*; B(E2)(W.u.)=43 *6* δ: from $\gamma\gamma(\theta)$ in ^{74}As ε decay. Other: +2.2 *3* from (n,n′γ).
		1204.208 *12*	46 *3*	0.0	0+	E2		B(E2)(W.u.)=0.71 *11*
1463.759	4+	867.898 *6*	100	595.850	2+	E2		B(E2)(W.u.)=41 *3*
1482.81	0+	887.19 *7*	100	595.850	2+	E2		B(E2)(W.u.)=9 *+9−6*
		1482.6		0.0	0+	E0		From ce data (1983Pa10). $I_{(\gamma+ce)}$: <0.006 from ^{74}As ε decay. q_K^2(E0/E2)<0.12, X(E0/E2)<0.052, ρ^2(E0)>0.032 (2005Ki02, evaluation).
1697.140	(3)+	233.395 *12*	2.1 *2*	1463.759	4+			
		492.936 *6*	58 *1*	1204.205	2+	(M1+E2)	+1.3 *4*	δ: from $\gamma(\theta)$ in (n,n′γ) (1970Ch15). Other: 2.0 *+3−6* or 0.75 *+15−6* (1987Do14). Mult.: D+Q from $\gamma(\theta)$. ΔJ^π=no from placement in level scheme.
		1101.267 *12*	100 *1*	595.850	2+	(M1+E2)	+0.34 *5*	δ: from $\gamma(\theta)$ in (n,n′γ) (1970Ch15). Other: 0.47 *5* (1987Do14). Mult.: D+Q from $\gamma(\theta)$. ΔJ^π=no from placement in level scheme.
1724.954	(0+)	520.744 *12*	100	1204.205	2+			
2165.259	(3,4)+	468.11 *3*	6.5 *3*	1697.140	(3)+			
		701.487 *6*	42.7 *3*	1463.759	4+			
		961.055 *10*	100 *1*	1204.205	2+	(M1(+E2))	0.01 *1*	δ: from $\gamma(\theta)$ in (n,n′γ) (1987Do14). Mult.: D+Q from $\gamma(\theta)$. ΔJ^π=no from placement in level scheme.
2197.933	2+	715.17 *3*	35 *2*	1482.81	0+			
		734.17 *4*	25 *4*	1463.759	4+			
		993.67 *6*	100 *5*	1204.205	2+	(E2+M1)	−2.8 *2*	δ: $\gamma\gamma(\theta)$ in ^{74}As ε. Mult from ΔJ^π. Mult.: D+Q from $\gamma(\theta)$. ΔJ^π=no from placement in level scheme.
		1602.0 *2*	45 *4*	595.850	2+			
		2197.95 *8*	82 *10*	0.0	0+			
2227.77	0+	1021.9 *1*	38	1204.205	2+			
		1631.89 *12*	100	595.850	2+			
2403.5	1	2403.5 *4*		0.0	0+			
2536.310	3−	839.152 *14*	2.8 *3*	1697.140	(3)+			
		1332.12 *7*	31 *2*	1204.205	2+			
		1940.53 *15*	100 *2*	595.850	2+	(E1(+M2))	+0.02 *2*	δ: from $\gamma(\theta)$ in (n,n′γ) (1987Do14). Mult.: D+Q from $\gamma(\theta)$. ΔJ^π=yes from placement in level scheme.
2569.329	(6+)	1105.562 *12*	100	1463.759	4+			
2600.32	(1,2,3)+	2004.45 *9*	100 *9*	595.850	2+			
2669.62	4+	972.38 *5*	22 *1*	1697.140	(3)+			

Adopted Levels, Gammas (continued)

$\gamma(^{74}Ge)$ (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π
2669.62	4^+	1205.88 *9*	74 *9*	1463.759	4^+
		2073.85 *7*	100 *10*	595.850	2^+
2690.6	1	2690.6 *3*		0.0	0^+
2693.68	$(3,4^+)$	1489.35 *5*	100 *2*	1204.205	2^+
		2098.00 *7*	31 *3*	595.850	2^+
2696.918	(2^+)	531.650 *9*	8.3 *2*	2165.259	$(3,4)^+$
		999.781 *12*	100 *1*	1697.140	$(3)^+$
		1233.23 *15*	6.0 *6*	1463.759	4^+
2750.61	0^+	1546.4 *3*	100 *15*	1204.205	2^+
		2154.6 *3*	100 *15*	595.850	2^+
2828.507	4^+	663.19 *6*	1.2 *1*	2165.259	$(3,4)^+$
		1131.360 *9*	100 *2*	1697.140	$(3)^+$
2833.41	(2^+)	667.8 *3*	35 *3*	2165.259	$(3,4)^+$
		1135.9 *2*	20 *3*	1697.140	$(3)^+$
		2237.9 *2*	100 *4*	595.850	2^+
2835.923	(2^+)	670.59 *7*	5.8 *6*	2165.259	$(3,4)^+$
		1138.79 *6*	100 *6*	1697.140	$(3)^+$
		2240.1 *3*	23 *3*	595.850	2^+
2856.04	0^+	1651.8 *3*	100 *20*	1204.205	2^+
		2260.0 *4*	100 *20*	595.850	2^+
2878.14	(5^-)	712.8 *2*	100 *13*	2165.259	$(3,4)^+$
		1414.4 *2*	67 *13*	1463.759	4^+
2925.45	$(3,4^+)$	1228.29 *9*	100 *4*	1697.140	$(3)^+$
		1721.3 *2*	19 *1*	1204.205	2^+
2935.475	3^-	399.08 *3*	0.42 *3*	2536.310	3^-
		770.212 *12*	14.0 *2*	2165.259	$(3,4)^+$
		1471.72 *3*	100 *1*	1463.759	4^+
2938.7	2^+	2342.8 *2*	100	595.850	2^+
2949.48	(3^-)	784.3[#] *2*	1.5 *2*	2165.259	$(3,4)^+$
		1744.9 *2*	10.8 *3*	1204.205	2^+
		2353.46 *19*	100 *3*	595.850	2^+
2961.0	(5^-)	1756.7 *2*	100	1204.205	2^+
2973.472	(3)	437.20[‡] *3*	0.8 *1*	2536.310	3^-
		808.23[‡] *2*	33 *1*	2165.259	$(3,4)^+$
		1509.66 *9*	100 *2*	1463.759	4^+
		2973.1[‡] *4*	2.5 *3*	0.0	0^+
2999.2	2^+	777[@] *4*		2227.77	0^+
		1794.3 *1*	30 *5*	1204.205	2^+
		2402.7 *1*	100 *8*	595.850	2^+
		2999 *1*	25 *5*	0.0	0^+
3032.8	1	1828.6		1204.205	2^+
		3032.8 *2*		0.0	0^+
3034.00	$(3,4^+)$	497.62 *10*	51 *5*	2536.310	3^-
		1337.18[#c] *10*	<85	1697.140	$(3)^+$
		1570.26 *10*	51 *2*	1463.759	4^+
		1829.86 *10*	100 *3*	1204.205	2^+
		2438.45[#] *14*	14 *2*	595.850	2^+
3048.564	4^+	850.64 *5*	33 *1*	2197.933	2^+
		883.25 *3*	100 *3*	2165.259	$(3,4)^+$
		1844.62 *10*	100 *10*	1204.205	2^+
		3048.5 *4*	9 *2*	0.0	0^+
3060.1	$(2^+$ to $6^+)$	1596 *1*	100	1463.759	4^+
3081.321	(3^+)	545.01[‡] *1*	11.8 *3*	2536.310	3^-
		916.07[‡] *5*	20 *1*	2165.259	$(3,4)^+$
		1384.11[‡] *8*	57 *3*	1697.140	$(3)^+$
		1617.64 *8*	100 *4*	1463.759	4^+
3092.2	$1^{(+)}$	1888.0		1204.205	2^+
		3092.2 *2*		0.0	0^+
3104.506	5^-	939.23 *2*	100 *2*	2165.259	$(3,4)^+$
		1640.8 *1*	47 *3*	1463.759	4^+
3118.0	$3^-,4^-,5^-,6^-$	182.4 *2*	100 *5*	2935.475	3^-
		1654.1 *2*	12 *2*	1463.759	4^+
3139.32		1675.6 *2*	100	1463.759	4^+
3140.30	3^-	604.21 *10*	100 *7*	2536.310	3^-
		942.47 *7*	45 *2*	2197.933	2^+
		975.1 *3*	9.4 *10*	2165.259	$(3,4)^+$
		1443.38[dc] *7*	<125[d]	1697.140	$(3)^+$
		1676.77 *14*	25 *1*	1463.759	4^+
3175.47	3^-	141.52[‡] *3*	21 *6*	3034.00	$(3,4^+)$
		481.7[‡&e] *1*	56 *12*	2693.68	$(3,4^+)$
		639.10[#] *10*	65 *4*	2536.310	3^-
		1478.2 *3*	24 *3*	1697.140	$(3)^+$
		1971.0 *2*	16 *4*	1204.205	2^+
		2580.07[a] *10*	100 *5*	595.850	2^+
3199.5	2^+	663.2 *2*	100 *10*	2536.310	3^-
		2603.6 *2*	100 *10*	595.850	2^+
3211.8?		2616.67[e] *9*		595.850	2^+
		3211.11[de] *11*	[d]	0.0	0^+
3224.680	4^+	251.22 *1*	34 *1*	2973.472	(3)
		289.19 *1*	100 *2*	2935.475	3^-

$\gamma(^{74}$Ge) (continued)

E_i(level)	J^π_i	E_γ	I_γ	E_f	J^π_f
3224.680	4^+	396.18 3	26 2	2828.507	4^+
3271.51	(2^+)	1043.6 3	8 2	2227.77	0^+
		1546.7 4	4 1	1724.954	(0^+)
		1807.5 1	100 10	1463.759	4^+
3276.3	1	3276.3 2		0.0	0^+
3315.72	4^+	746.40 4	13 1	2569.329	(6^+)
		1150.43 4	100 3	2165.259	$(3,4)^+$
3342.94	$(3^-,4^+)$	1177.42 18	29 3	2165.259	$(3,4)^+$
		2138.62 10	100 5	1204.205	2^+
		2747.13 10	100 6	595.850	2^+
3358.517	$(2^+,3,4^+)$	530.01 2	100 4	2828.507	4^+
		1160.5 2	98 10	2197.933	2^+
3381.74	3^-	2785.83 5	100	595.850	2^+
3392.618	2^+	311.32 3	16 1	3081.321	(3^+)
		556.68 3	7.5 6	2835.923	(2^+)
		695.69 2	30.0 6	2696.918	(2^+)
		1227.2 2	100 1	2165.259	$(3,4)^+$
3409.931	$(3,4^+)$	574.03 4	5.1 4	2835.923	(2^+)
		581.47 4	3.1 6	2828.507	4^+
		712.99 5	7.4 4	2696.918	(2^+)
		1712.96 12	100 6	1697.140	$(3)^+$
		1945.9 2	16 2	1463.759	4^+
3478.37	$(2,3)^+$	302.98 3	10 2	3175.47	3^-
		429.73[‡] 5	8 2	3048.564	4^+
		444.2[#] 5	4 2	3034.00	$(3,4^+)$
		942.15[‡] 10	7 3	2536.310	3^-
		1312.81 11	51 4	2165.259	$(3,4)^+$
		2014.50 6	100 5	1463.759	4^+
3515.441	$(3,4^+)$	541.96 1	76 2	2973.472	(3)
		579.97 1	96 2	2935.475	3^-
		679.4 1	8 2	2835.923	(2^+)
		686.90 6	9 1	2828.507	4^+
		1350.19 12	100 7	2165.259	$(3,4)^+$
3557.9	$1^{(-)}$	2962.1		595.850	2^+
		3557.9 3		0.0	0^+
3566.75	$(2^+,3,4^+)$	2362.36 13	15 2	1204.205	2^+
		2970.92 10	100 4	595.850	2^+
3578.93	2^+	643.44 3	64 3	2935.475	3^-
		2115.5 4	51 6	1463.759	4^+
		3578.9 2	100 6	0.0	0^+
3639.5?		3043.6[e] 4	100 20	595.850	2^+
3639.5?		3639.45[de] 13	<160[d]	0.0	0^+
3647.9	1^+	3647.9 7		0.0	0^+
3681	(8^+)	1112		2569.329	(6^+)
3685.42	$(2\text{ to }5^+)$	604.10 12	100	3081.321	(3^+)
3691.79	3^-	657.84 4	5.2 3	3034.00	$(3,4^+)$
		756.24 9	4.6 5	2935.475	3^-
		1022.05 10	10 2	2669.62	4^+
3696.59	(3,4)	521.0 5	19 4	3175.47	3^-
		1160.33 10	100 7	2536.310	3^-
		1999.3 2	64 6	1697.140	$(3)^+$
		2231.9 5	16 15	1463.759	4^+
3707.20	(3,4,5)	1170.88 14	100	2536.310	3^-
3716.7	$(1^-,2^+)$	540.9 5	100 18	3175.47	3^-
		3717.1 7	18 6	0.0	0^+
3720.79	$(3,4^+)$	545.5[#] 5	3.7 11	3175.47	3^-
		1184.4[#] 2	16 2	2536.310	3^-
		2023.6 3	30 7	1697.140	$(3)^+$
		2257.0 1	100 3	1463.759	4^+
3743.348	$(3^-,4^+)$	472.04 16	32 10	3271.51	(2^+)
		567.92 7	8 3	3175.47	3^-
		638.83 2	100 3	3104.506	5^-
3771.74	$(2^+,3,4^+)$	723.21 5	7.7 7	3048.564	4^+
		1573.75 9	100 4	2197.933	2^+
		2307.5 6	3.6 7	1463.759	4^+
		2567.4 1	24 3	1204.205	2^+
3783.41	$(2^+,3,4^+)$	467.68 6	43 10	3315.72	4^+
		2579.15[b] 8	100	1204.205	2^+
3790.90	$(3,4^+)$	519.47 9	5.4 14	3271.51	(2^+)
		1254.47 10	100 3	2536.310	3^-
3806.772	3^-	291.33 2	24 3	3515.441	$(3,4^+)$
		2342.89 12	75 1	1463.759	4^+
		3210.94 8	100 4	595.850	2^+
3807.03		2109.8[e] 6		1697.140	$(3)^+$
		3211.11[d] 11	[d]	595.850	2^+
3828.23	$(1^-\text{ to }4^+)$	484.9 3	100 5	3342.94	$(3^-,4^+)$
		652.5 5	6 3	3175.47	3^-
		1134.5 3	36 4	2693.68	$(3,4^+)$
		1630.7 10	9 8	2197.933	2^+
		2131.5 4	19 1	1697.140	$(3)^+$
		2625.3[e] 4	7 1	1204.205	2^+
		3232.34 11	56 7	595.850	2^+

$^{74}_{32}$Ge$_{42}$-12

Adopted Levels, Gammas (continued)

$\gamma(^{74}Ge)$ (continued)

E_i(level)	J^π_i	E_γ	I_γ	E_f	J^π_f
3832.23	$(2^+,3,4^+)$	560.68 3	13 1	3271.51	(2^+)
		692.46[c] 8	10 2	3140.30	3^-
		996.1 3	24 7	2835.923	(2^+)
		1003.5 2	55 14	2828.507	4^+
		2368.17 9	100 10	1463.759	4^+
3835.27	$(2^+,3,4^+)$	476.75 5	23 6	3358.517	$(2^+,3,4^+)$
		786.8 3	13 2	3048.564	4^+
		2630.96 20	24 3	1204.205	2^+
		3239.35 7	100 4	595.850	2^+
3874.17	2^+	182.40 2	6.1 5	3691.79	3^-
		1338.05 8	100 10	2536.310	3^-
3874.9	1^+	3874.9 3		0.0	0^+
3889.69	$(2^+,3,4^+)$	146.33 3	17 4	3743.348	$(3^-,4^+)$
		841.1 2	100 8	3048.564	4^+
3895.01	$(2,3,4^+)$	551.8 5	11 3	3342.94	$(3^-,4^+)$
		1357.9[c] 2	32 3	2536.310	3^-
		2197.95 10	33 3	1697.140	$(3)^+$
		2690.96 9	100 3	1204.205	2^+
		3298.93 10	35 4	595.850	2^+
		3895.0[e] 4	4 1	0.0	0^+
3897.98	$(2^+$ to $6^+)$	419.61 2	100	3478.37	$(2,3)^+$
3932.98	$(1^+,2,3,4^+)$	189.63 3	6 1	3743.348	$(3^-,4^+)$
		212.17 5	9 2	3720.79	$(3,4^+)$
		1236.12 17	100 18	2696.918	(2^+)
		1767.7 7	13 1	2165.259	$(3,4)^+$
3941.09	$(2^+,3^-)$	1112.6 2	100 13	2828.507	4^+
		1776.1 4	99 10	2165.259	$(3,4)^+$
		2243.7 3	32 3	1697.140	$(3)^+$
3949.80	$(2^+,3,4^+)$	471.1 5	55 7	3478.37	$(2,3)^+$
		809.3 3	42 9	3140.30	3^-
		999.9 2	37 13	2949.48	(3^-)
		2486.3 4	11 6	1463.759	4^+
		3354.03 12	100 8	595.850	2^+
3958.03	3^-	1261.1 2	100	2696.918	(2^+)
3975.86	(2^+)	1282.1 3	100 15	2693.68	$(3,4^+)$
		2278.7 1	12 2	1697.140	$(3)^+$
		2771.6 3	65 6	1204.205	2^+
		3975.7 2	50 4	0.0	0^+
3976.23	$(2,3,4^+)$	2279.05 9	100 4	1697.140	$(3)^+$
		2771.8 4	4.7 8	1204.205	2^+
3995.05	$(2^+,3,4^+)$	2790.79 10	100 9	1204.205	2^+

E_i(level)	J^π_i	E_γ	I_γ	E_f	J^π_f
3995.05	$(2^+,3,4^+)$	3992.4[e] 10	7 2	0.0	0^+
3995.83	(2^+)	212.40[‡] 7	6 2	3783.41	$(2^+,3,4^+)$
		2532.03[‡] 7	100 10	1463.759	4^+
		2790.4[c] 4	11 1	1204.205	2^+
		3996.1 2	21 2	0.0	0^+
4006.8	1	4006.8 4		0.0	0^+
4022.94	2^+	443.94 12	22 6	3578.93	2^+
		1087.56 10	100 10	2935.475	3^-
		3426.95 11	57 3	595.850	2^+
4030.1	$(2^+,3,4^+)$	1460.8 6	100 29	2569.329	(6^+)
		3434.2 6	12 4	595.850	2^+
4064.66	(2 to 5)	174.96 1	17 3	3889.69	$(2^+,3,4^+)$
		654.79 4	46 2	3409.931	$(3,4^+)$
		2601.0 2	100 13	1463.759	4^+
4084.9	1^+	4084.9 5		0.0	0^+
4171.5	1	4171.5 3		0.0	0^+
4201.55	2^+	504.7 5	15 4	3696.59	(3,4)
		1024.6[c] 5	21 4	3175.47	3^-
		2004.6[c] 2	76 7	2197.933	2^+
		2036.2 4	25 6	2165.259	$(3,4)^+$
		2504.2 2	100 11	1697.140	$(3)^+$
		2737.86 16	15 2	1463.759	4^+
		2997.2 5	15 2	1204.205	2^+
		3605.35 12	55 7	595.850	2^+
4204.67	$(2^+$ to $5^-)$	159.28 3	40 9	4045.43	
		933.4 4	74 32	3271.51	(2^+)
		1269.2 2	100 13	2935.475	3^-
		1534.9 3	32 6	2669.62	4^+
4217.30	$(2^+,3,4^+)$	1136.0 3	24 5	3081.321	(3^+)
		1381.6 2	28 4	2835.923	(2^+)
		2019.1 2	64 9	2197.933	2^+
		2753.62 12	100 9	1463.759	4^+
4222.9	$(2^+,3^+,4^+)$	3018.8 4	100 15	1204.205	2^+
		3626.7 4	50 22	595.850	2^+
4224.9	1^-	4224.9 8		0.0	0^+
4235.33	$(2,3,4)^+$	258.8 5	67 17	3976.23	$(2,3,4^+)$
		3030.3 5	100 28	1204.205	2^+
		3639.45[d] 13	<44[d]	595.850	2^+
4305.8	1	4305.8 13		0.0	0^+
4339.67	(2^+)	122.37 2	6.5 13	4217.30	$(2^+,3,4^+)$
		618.90 8	4.8 11	3720.79	$(3,4^+)$

$^{74}_{32}Ge_{42}$-13

Adopted Levels, Gammas (continued)

$\gamma(^{74}Ge)$ (continued)

E_i(level)	J^π_i	E_γ	I_γ	E_f	J^π_f
4339.67	(2^+)	648.2 2	4.8 11	3691.79	3^-
		1258.37 8	100 4	3081.321	(3^+)
		1739.2 6	67 16	2600.32	$(1,2,3)^+$
		2111.9 2	20 2	2227.77	0^+
4342.6	1	4342.6 3		0.0	0^+
4367.2	$(1^-$ to $5^-)$	1024.3 5	100 20	3342.94	$(3^-,4^+)$
		1417.6 7	80 7	2949.48	(3^-)
4368.15	(2^+)	1009.64 8	47 10	3358.517	$(2^+,3,4^+)$
		1263.6 3	100 13	3104.506	5^-
		1394.8 5	27 7	2973.472	(3)
		1539.58 10	32 3	2828.507	4^+
		2202.4 7	8 2	2165.259	$(3,4)^+$
		4368.4 5	5.7 10	0.0	0^+
4413.54	2^+	606.87[d] 13	100[d] 24	3806.772	3^-
		2716.2 2	11 1	1697.140	$(3)^+$
		2949.6 2	22 3	1463.759	4^+
4439.98	(2,3,4)	100.31 1	16 4	4339.67	(2^+)
		1058.0 3	24 5	3381.74	3^-
		1839.9 4	45 5	2600.32	$(1,2,3)^+$
		2742.9 2	100 10	1697.140	$(3)^+$
4442.18	$(2^+,3,4^+)$	606.87[d] 13	100[d] 24	3835.27	$(2^+,3,4^+)$
		750.37 5	10 1	3691.79	3^-
		1049.50[d] 9	21[d] 2	3392.618	2^+
		1303.0[dc] 3	15[d] 2	3140.30	3^-
		1393.3[d] 3	16[d] 3	3048.564	4^+
		1872.82 13	38 3	2569.329	(6^+)
4477.49	$(0^+$ to $4^+)$	999.9[c] 2		3478.37	$(2,3)^+$
		1134.5 3		3342.94	$(3^-,4^+)$
		1337.18 10		3140.30	3^-
		1443.38[d] 7	[d]	3034.00	$(3,4^+)$
		3274.1 12		1204.205	2^+
4527.89	(2^+)	784.55 3	100 2	3743.348	$(3^-,4^+)$
		1049.50[d] 9	71[d] 6	3478.37	$(2,3)^+$
		1303.0[d] 3	49[d] 6	3224.680	4^+
		1958.1 4	16 3	2569.329	(6^+)
		2362.7 4	24 3	2165.259	$(3,4)^+$
		3044.8 2	47 5	1482.81	0^+
		3064.5 9	8 3	1463.759	4^+
4611.42	$(2^-,3^-,4^-)$	1471.7 2	72 8	3140.30	3^-

E_i(level)	J^π_i	E_γ	I_γ	E_f	J^π_f
4611.42	$(2^-,3^-,4^-)$	2074.14[c] 25	100 14	2536.310	3^-
4630.43	(2^+)	516.27 12	100 33	4119	$3^-,4^-,5^-,6^-$
		2094.0 2	9 1	2536.310	3^-
		2905.23 9	23 2	1724.954	(0^+)
		4034.70 10	16 1	595.850	2^+
		4630.6 7	1.7 6	0.0	0^+
4698.29	$(2^-,3^-,4^-)$	1131.52 14	100 6	3566.75	$(2^+,3,4^+)$
		2004.6 2	57 6	2693.68	$(3,4^+)$
4840.92	(2^+)	685.66 3	21 1	4155.25?	
		966.7 2	48 9	3874.17	2^+
		1482.5 4	100 19	3358.517	$(2^+,3,4^+)$
		1735.9[dc] 9	90[d] 24	3104.506	5^-
		2171.3 2	8.6 3	2669.62	4^+
		2675.9 4	14 3	2165.259	$(3,4)^+$
		3377.0 2	40 3	1463.759	4^+
		4245.0 5	32 6	595.850	2^+
		4840.9 9	71 3	0.0	0^+
4972.55	(2^+)	1200.9[d] 2	100[d] 33	3771.74	$(2^+,3,4^+)$
		1393.3[d] 3	13[d] 2	3578.93	2^+
		2037.03 11	38 3	2935.475	3^-
		3275.5 3	6 1	1697.140	$(3)^+$
		3489.9 3	10 2	1482.81	0^+
		4972.0 4	20 2	0.0	0^+
5131.45	(2 to 6)	691.48 8	10 3	4439.98	(2,3,4)
		1735.9[d] 9	100[d] 26	3392.618	2^+
		2082.3 6	15 3	3048.564	4^+
		2562.13 13	95 8	2569.329	(6^+)
		2965.9 3	33 4	2165.259	$(3,4)^+$
		3668.0 4	37 6	1463.759	4^+
5434.8	1^-	5434.8 5		0.0	0^+
5485.1	1	5485.1 12		0.0	0^+
5493.1	1	5493.1 10		0.0	0^+
5514.8	1	5514.8 8		0.0	0^+
5743.7	1	5743.7 10		0.0	0^+
5766.7	$1^{(+)}$	5766.7 4		0.0	0^+
6017.4	1^-	3017 4	4.9 25	2999.2	2^+
		3418 4	2.4 12	2600.32	$(1,2,3)^+$
		3789 4	9.8 24	2227.77	0^+
		3818 4	22.0 24	2197.933	2^+

Adopted Levels, Gammas (continued)

$\gamma(^{74}\mathrm{Ge})$ (continued)

E_i(level)	J^π_i	E_γ	I_γ	E_f	J^π_f	Mult.[†]
6017.4	1^-	4301[e] *4*		1724.954	(0^+)	
		4532 *4*	14.6 *24*	1482.81	0^+	
		4812 *4*	39 *5*	1204.205	2^+	
		5422 *4*	100 *10*	595.850	2^+	E1
		6018 *4*	46 *5*	0.0	0^+	E1
6445.1	1	6445.1 *11*		0.0	0^+	
6477.9	1^-	6477.9 *6*		0.0	0^+	
6650.3	1^-	6650.3 *3*		0.0	0^+	
6660.5	1^-	6660.5 *5*		0.0	0^+	
6732.7	1^+	6732.7 *8*		0.0	0^+	
6942.6	1^-	6942.6 *6*		0.0	0^+	

E_i(level)	J^π_i	E_γ	E_f	J^π_f
7150.8	1^-	7150.8 *16*	0.0	0^+
7264.6	1^-	7264.6 *6*	0.0	0^+
7379.9	1	7379.9 *10*	0.0	0^+
7445.3	1	7445.3 *11*	0.0	0^+
7506.7	$1^{(-)}$	7506.7 *10*	0.0	0^+
7550.7	1^-	7550.7 *7*	0.0	0^+
7616.0	1	7616.0 *8*	0.0	0^+
7652.1	1^-	7652.1 *6*	0.0	0^+
8219.0	1	8219.0 *8*	0.0	0^+
8250.2	1	8250.2 *8*	0.0	0^+
8361.1	1	8361.1 *12*	0.0	0^+

[†] From measured $T_{1/2}$ of levels and RUL of Weisskopf estimates for transitions of E2 or M2 multipolarity.
[‡] Reported in (n,γ) E=th only.
[#] Reported in ^{74}Ga β^- only.
[@] Reported in (γ,γ') only.
[&] Placement in (n,γ) uncertain since no γ seen in ^{74}Ga β^-.
[a] Poor energy fit. Possible a doublet. See 3783 level.
[b] Most probably a doublet. The second component belongs with the 3175 level.
[c] Poor energy fit.
[d] Multiply placed with undivided intensity.
[e] Placement of transition in the level scheme is uncertain.

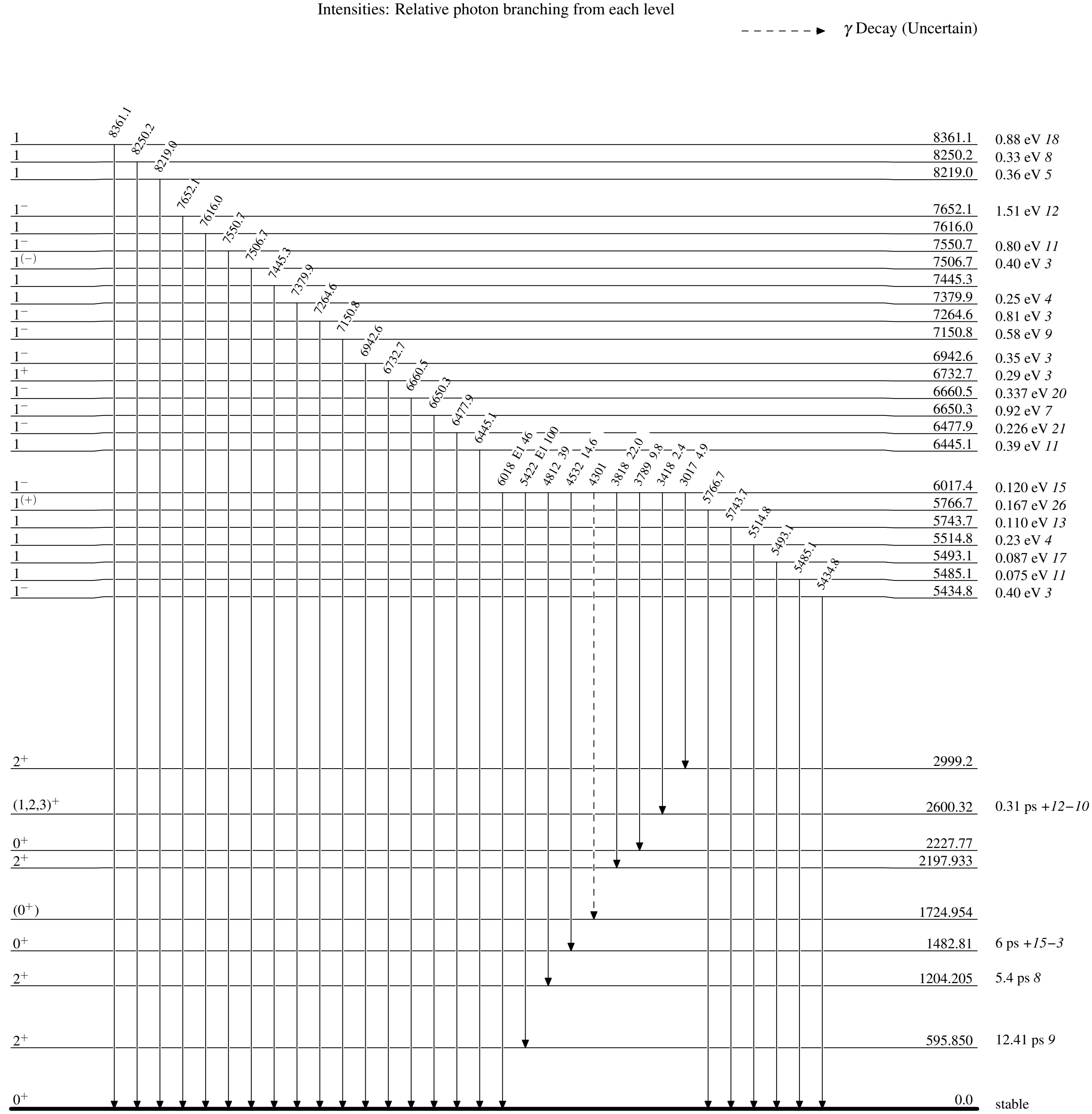
$^{74}_{32}\mathrm{Ge}_{42}$-15

Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

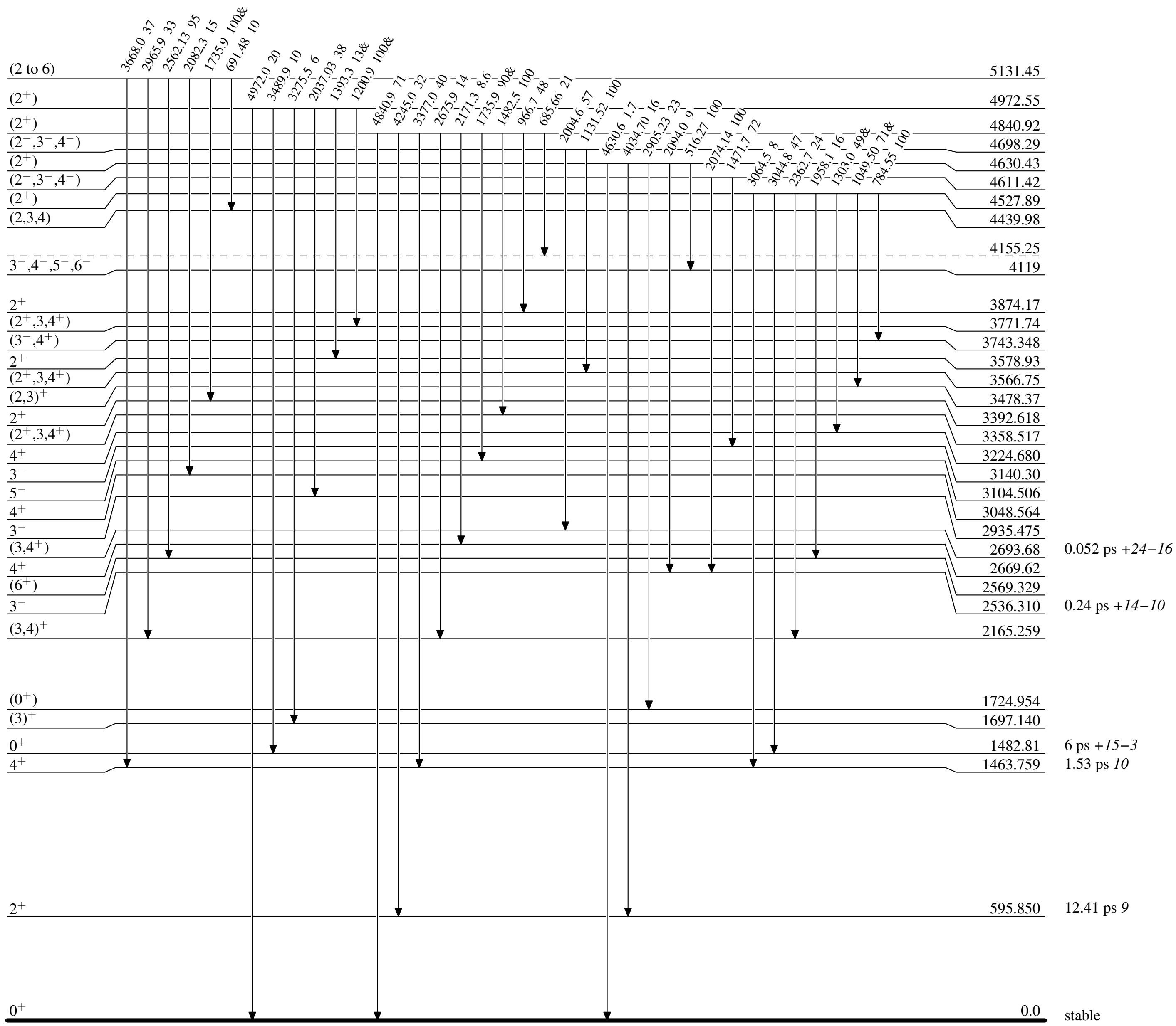


$^{74}_{32}Ge_{42}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

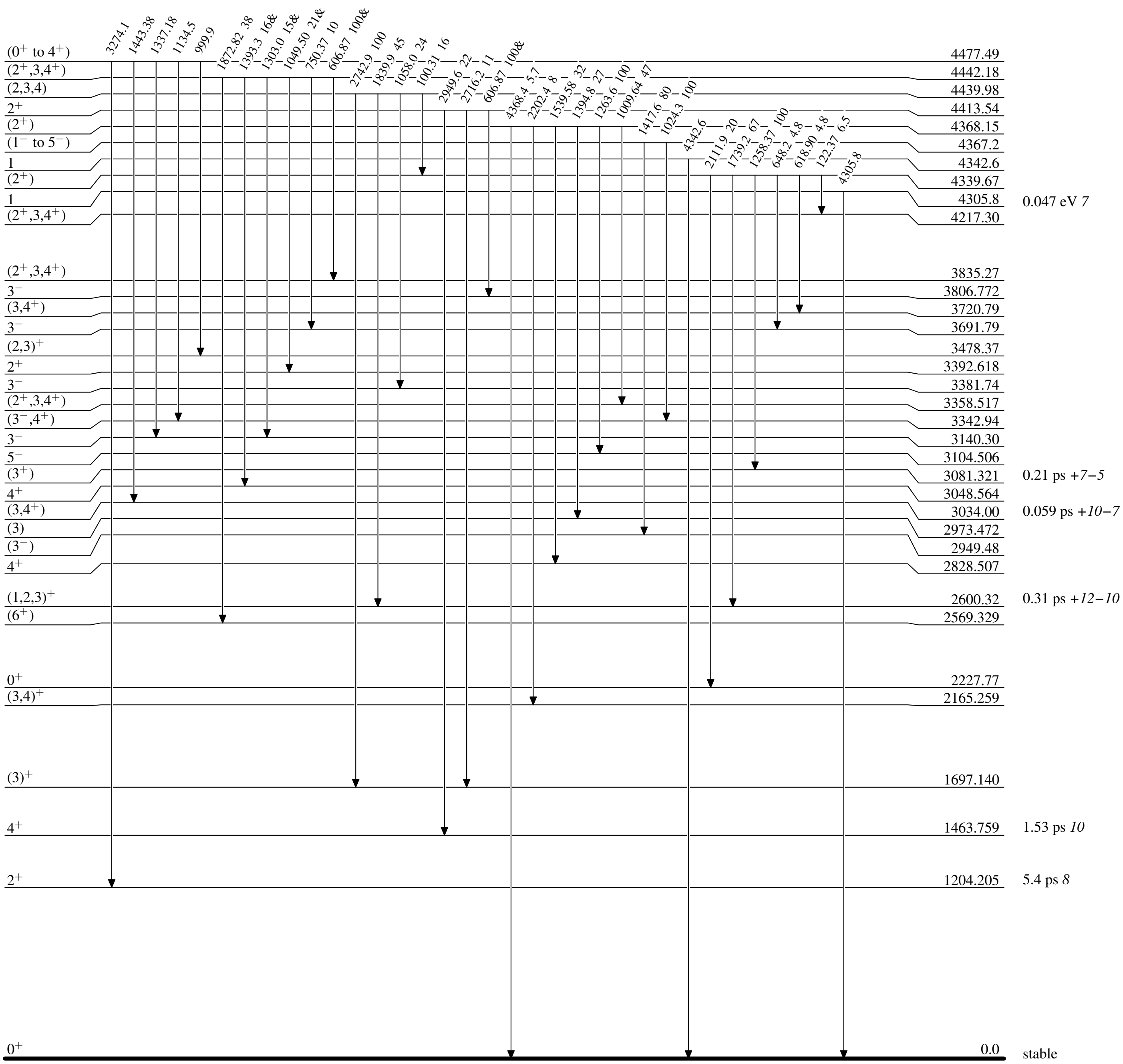


$^{74}_{32}Ge_{42}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

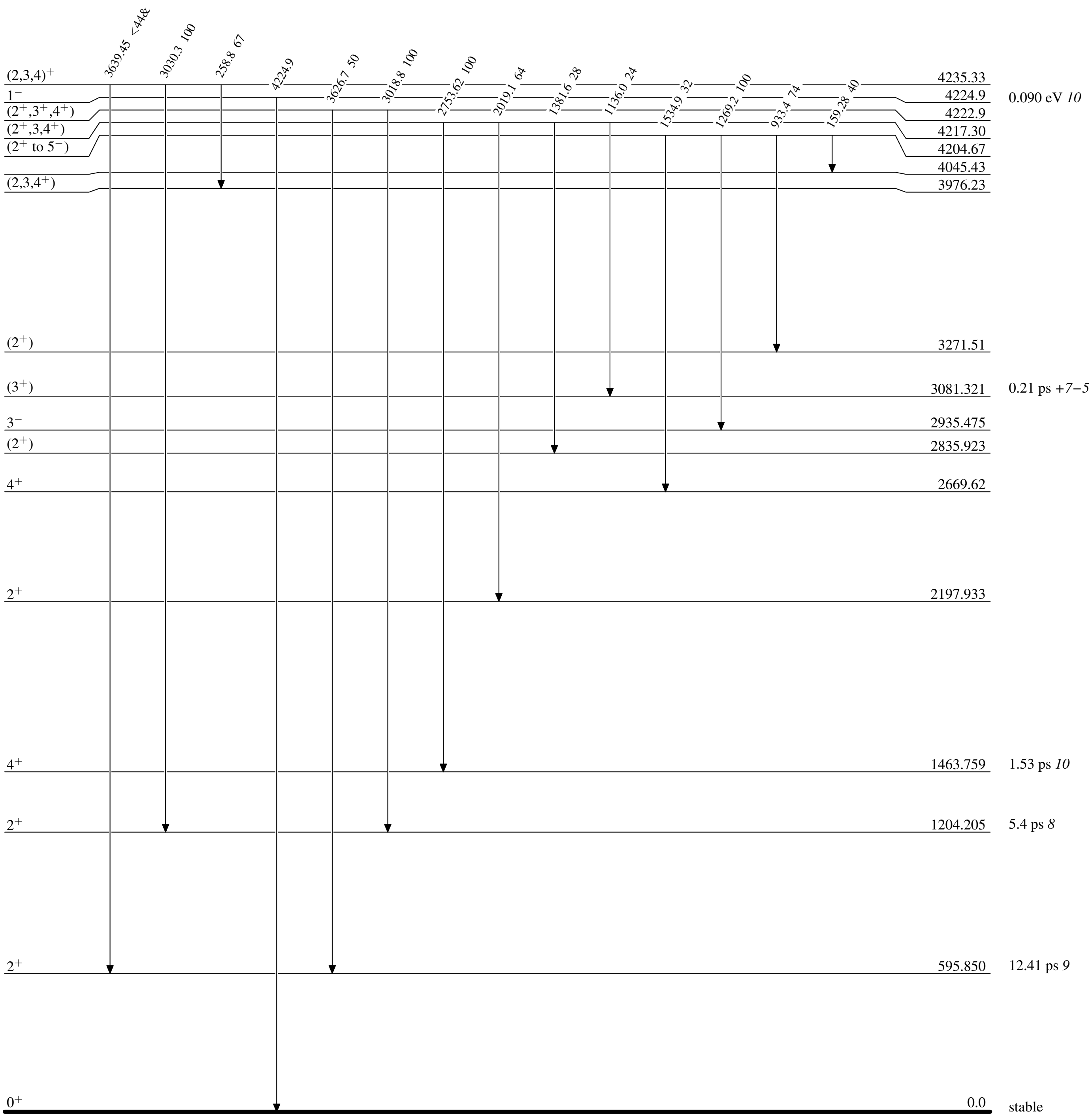


$^{74}_{32}Ge_{42}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

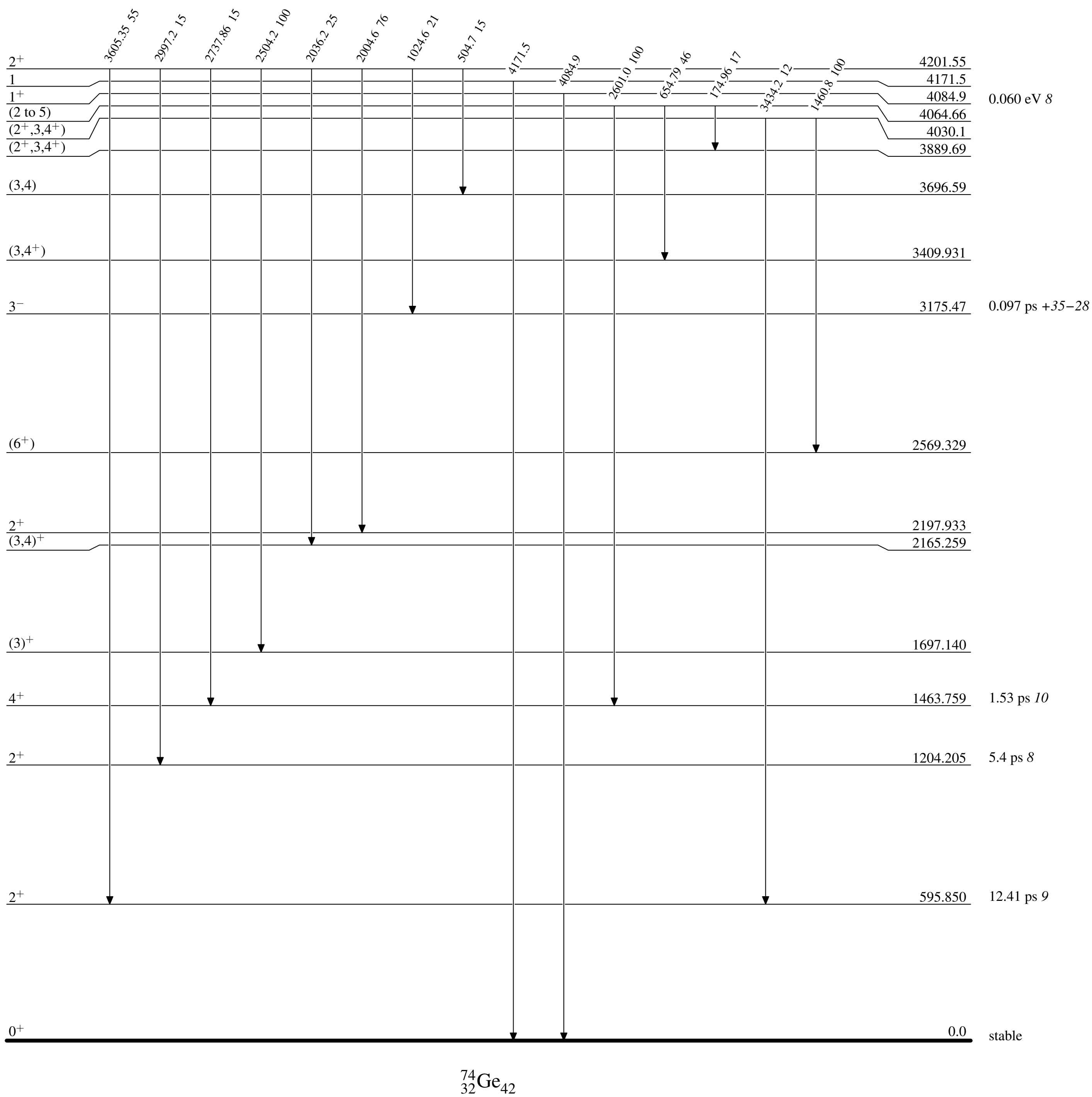


$^{74}_{32}Ge_{42}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

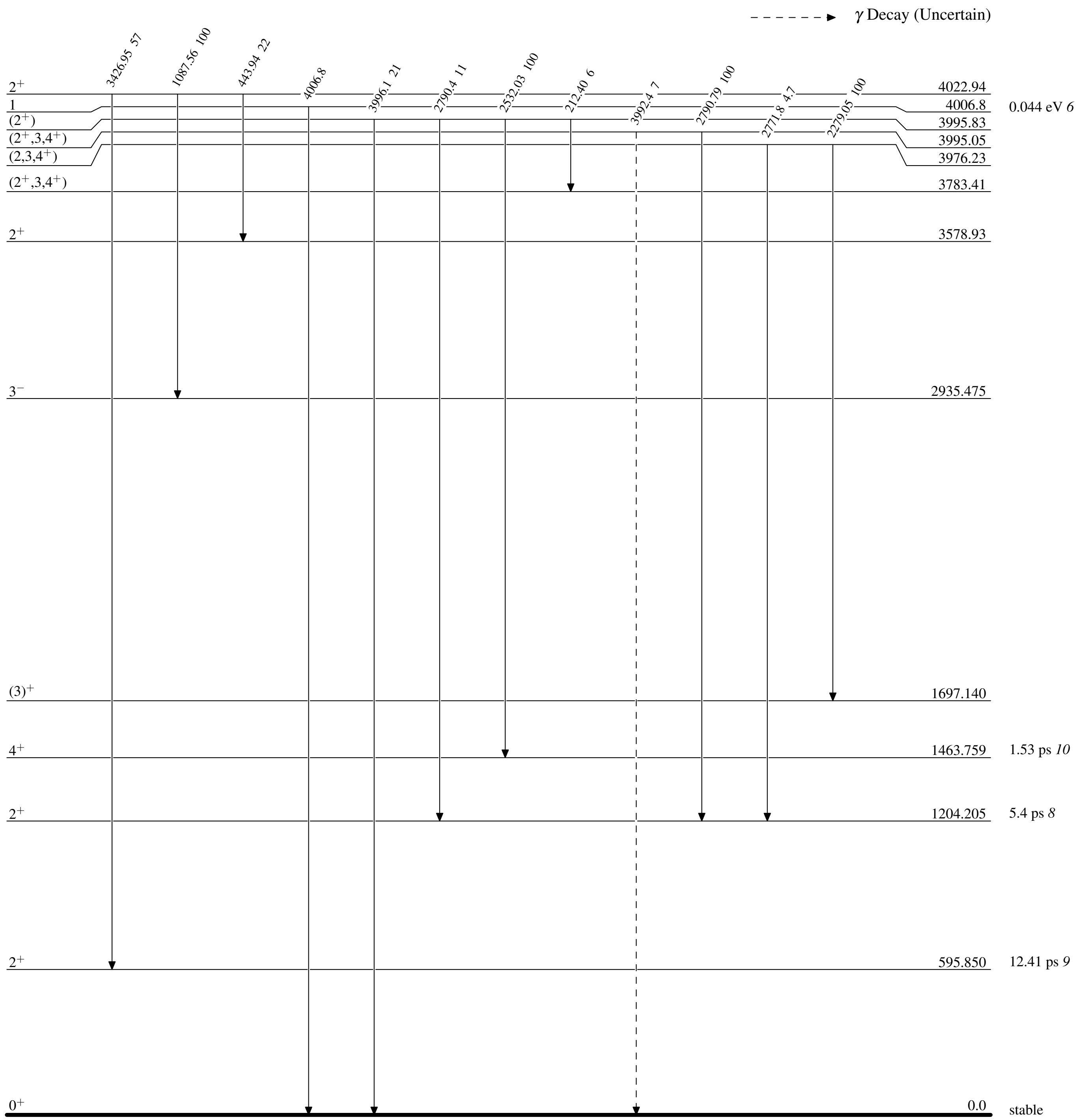


Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

Legend

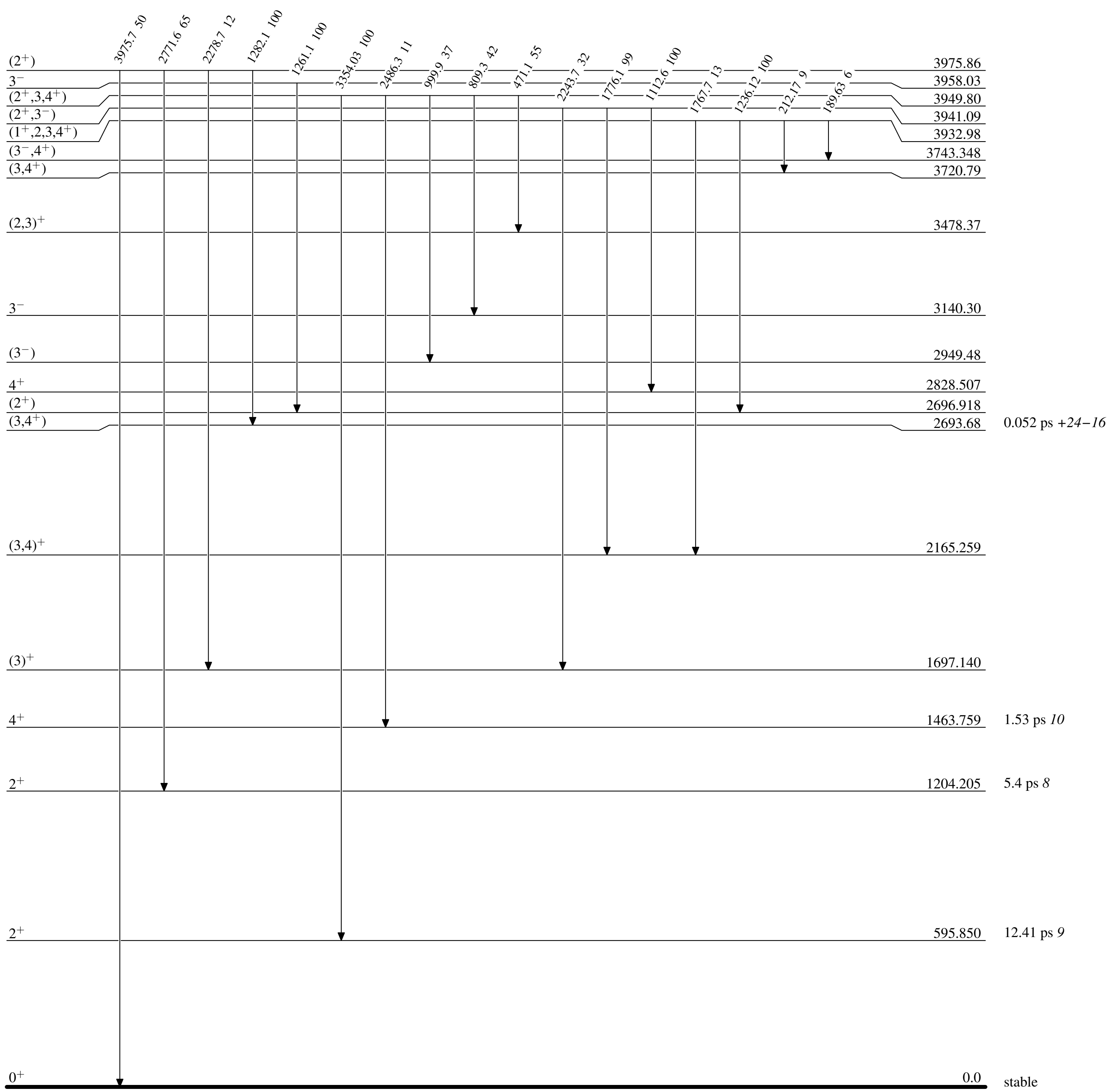


$^{74}_{32}Ge_{42}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

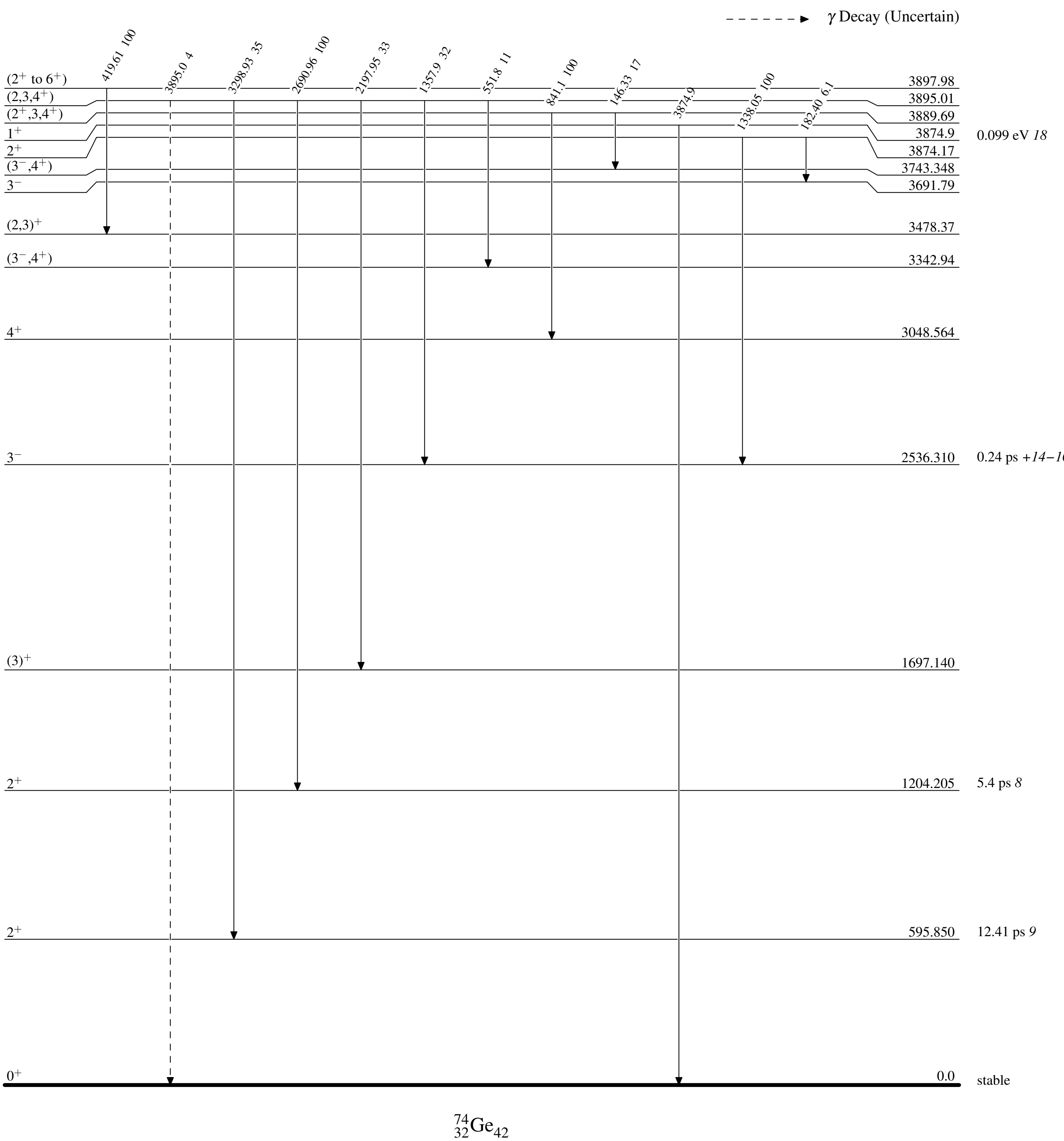


$^{74}_{32}Ge_{42}$

Adopted Levels, Gammas

Level Scheme (continued)

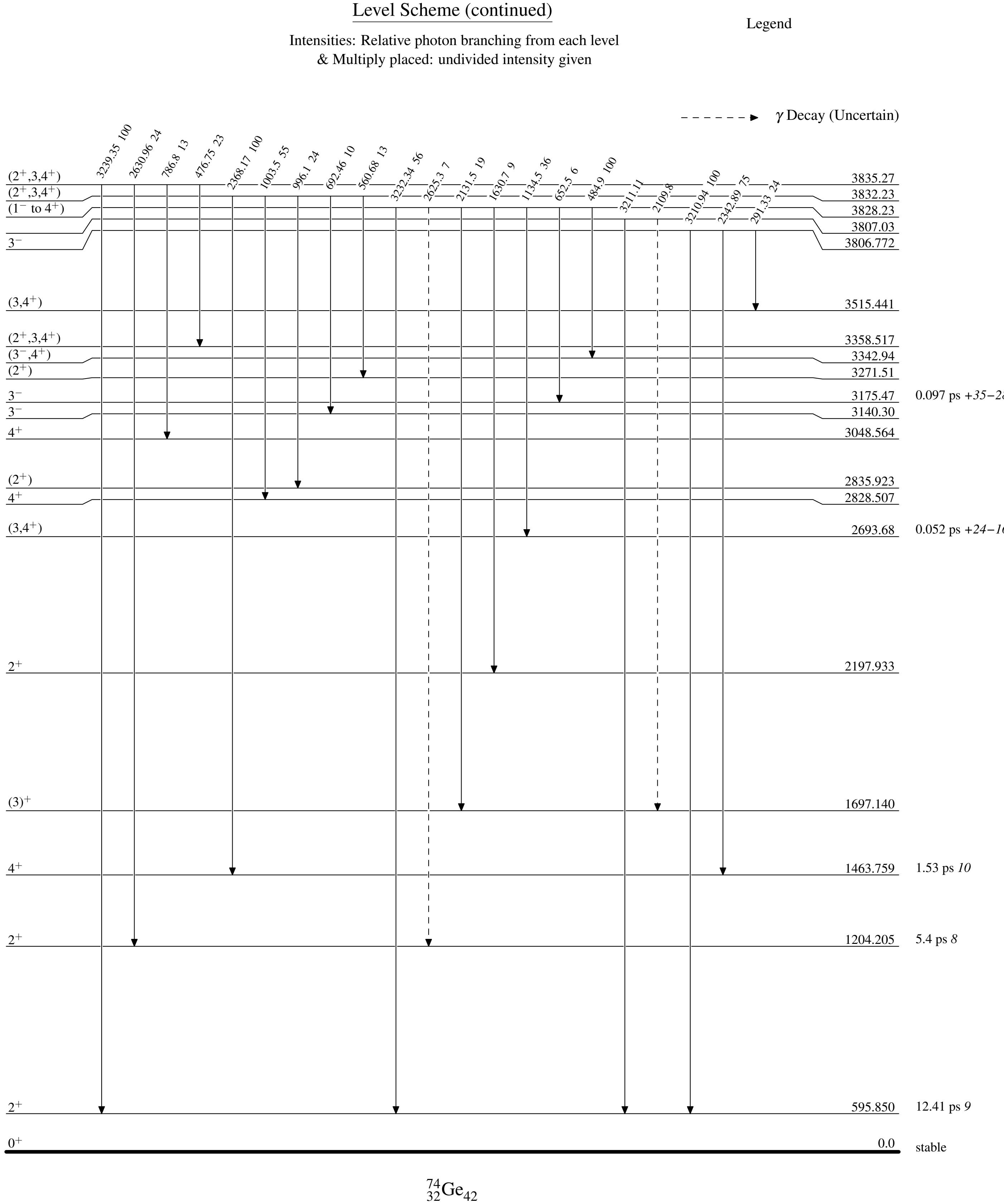
Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



Adopted Levels, Gammas

Level Scheme (continued)

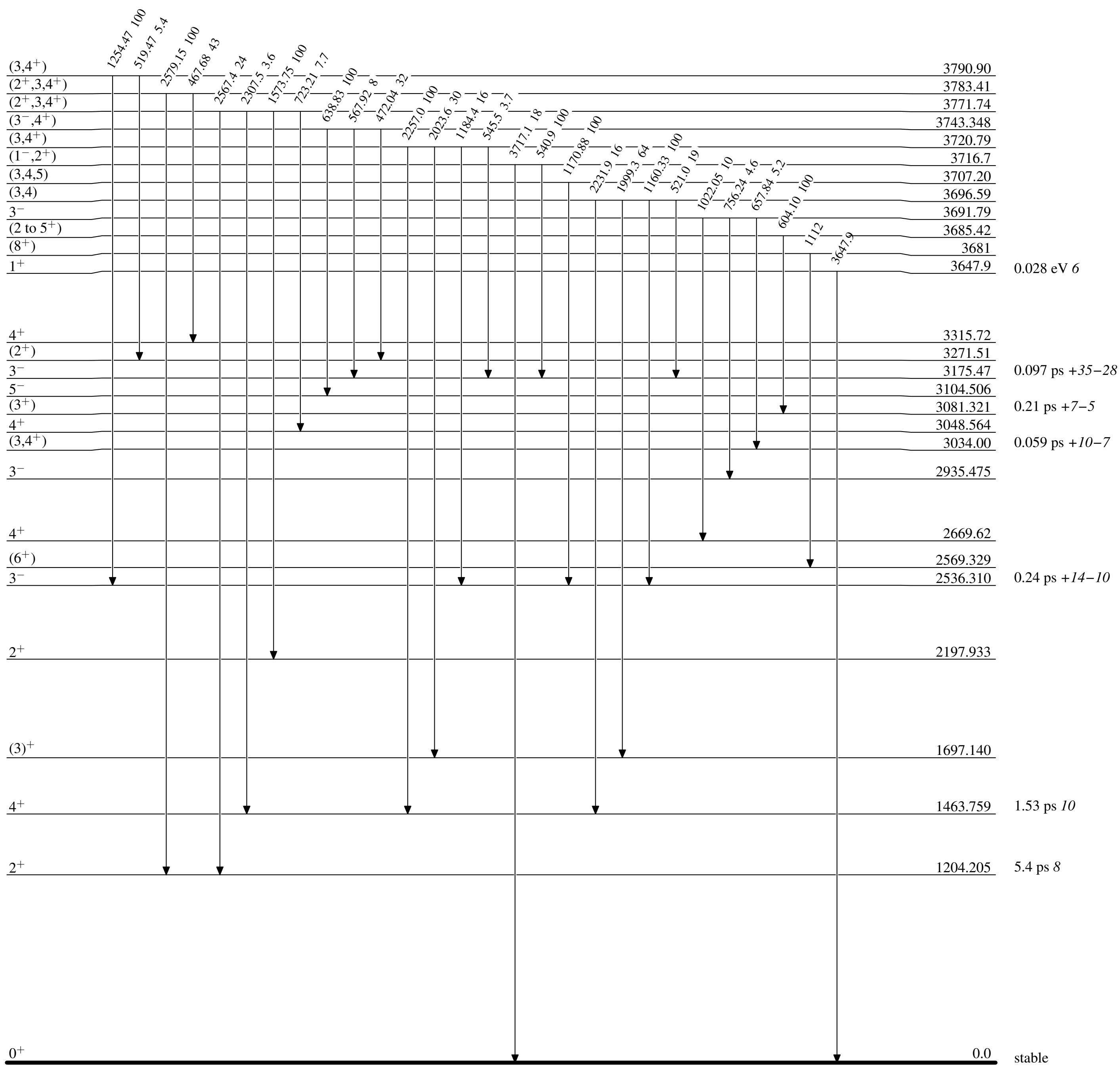
Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



$^{74}_{32}Ge_{42}$

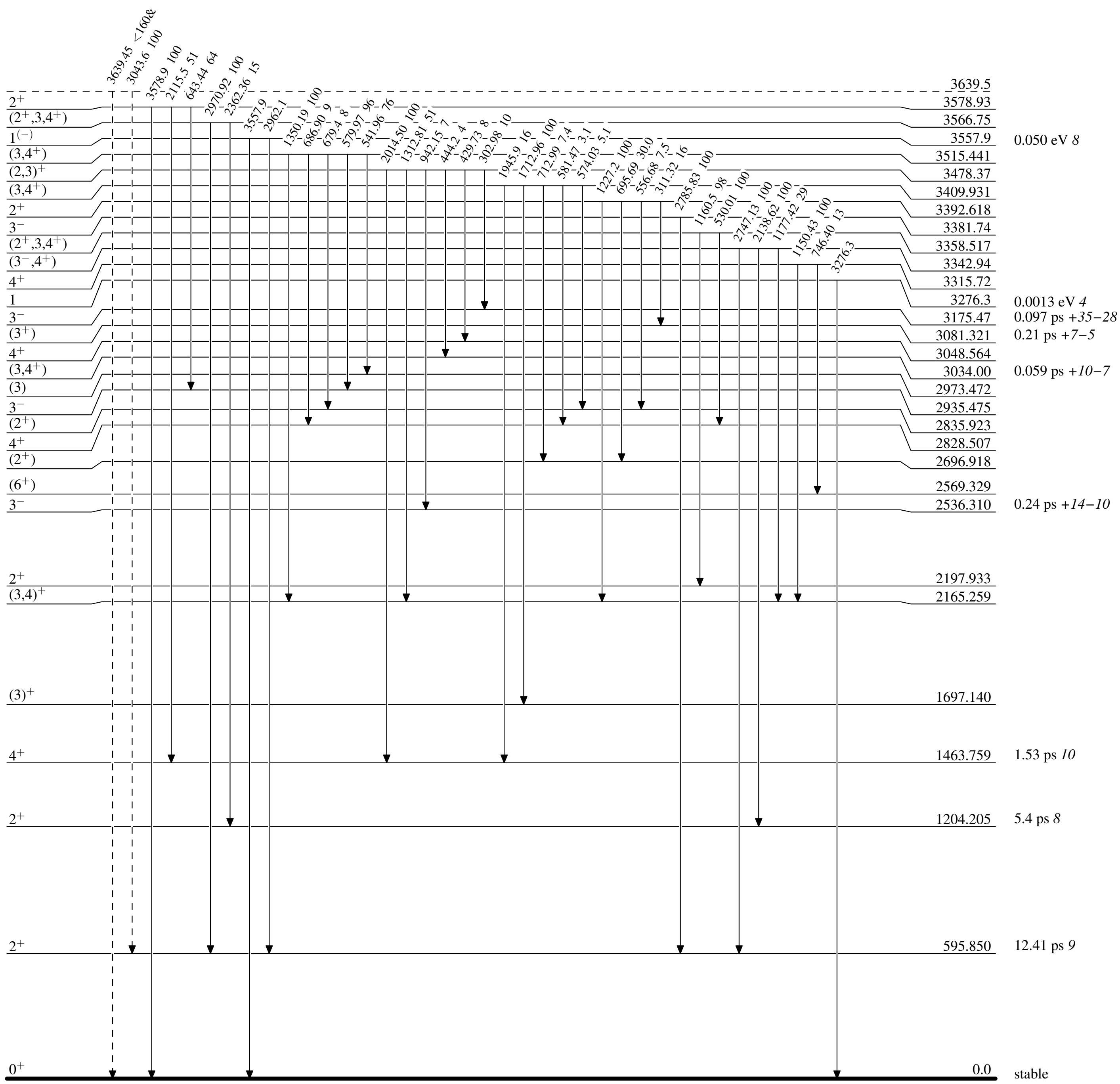
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

γ Decay (Uncertain)



$^{74}_{32}Ge_{42}$

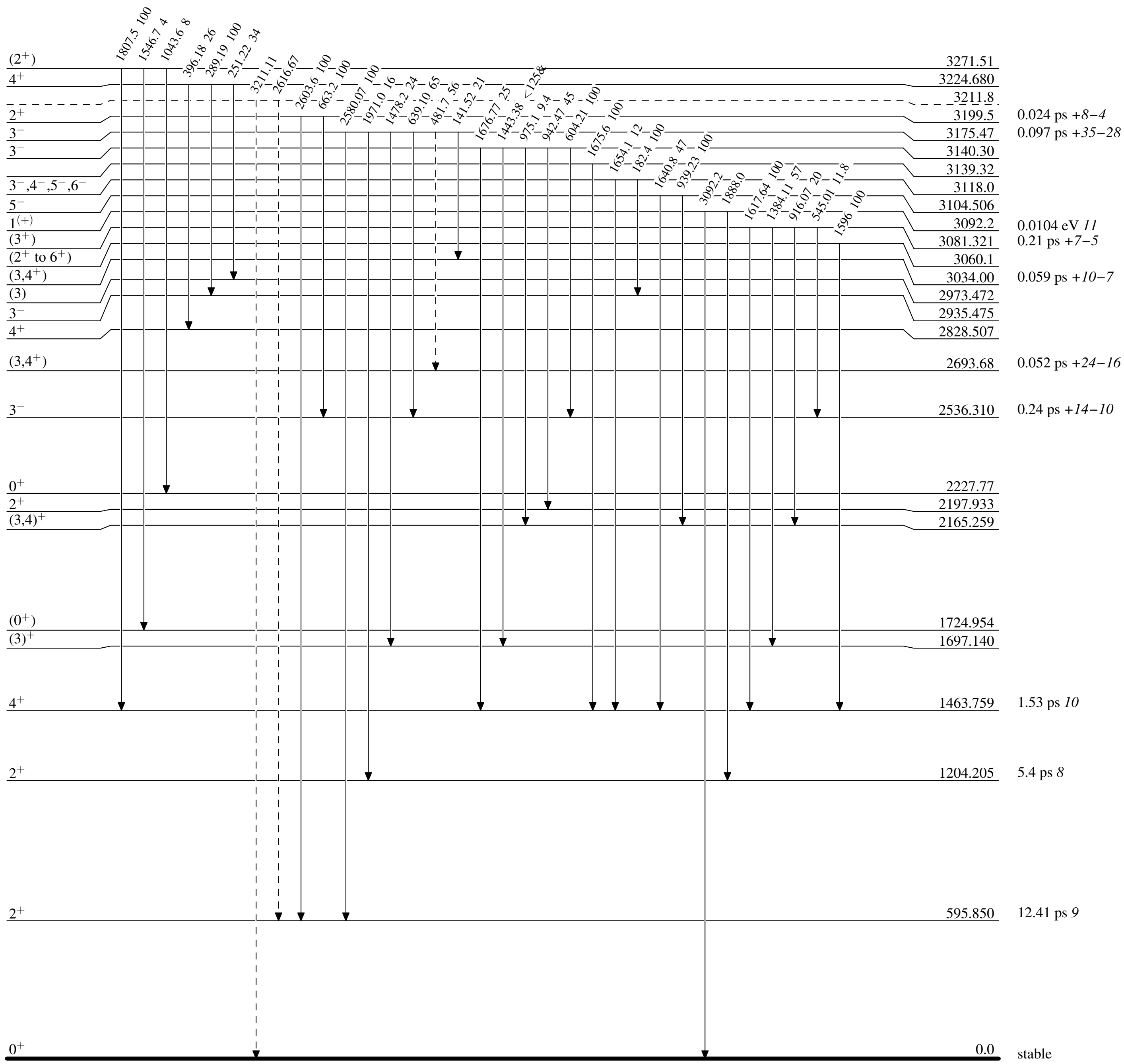
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

Legend

γ Decay (Uncertain)

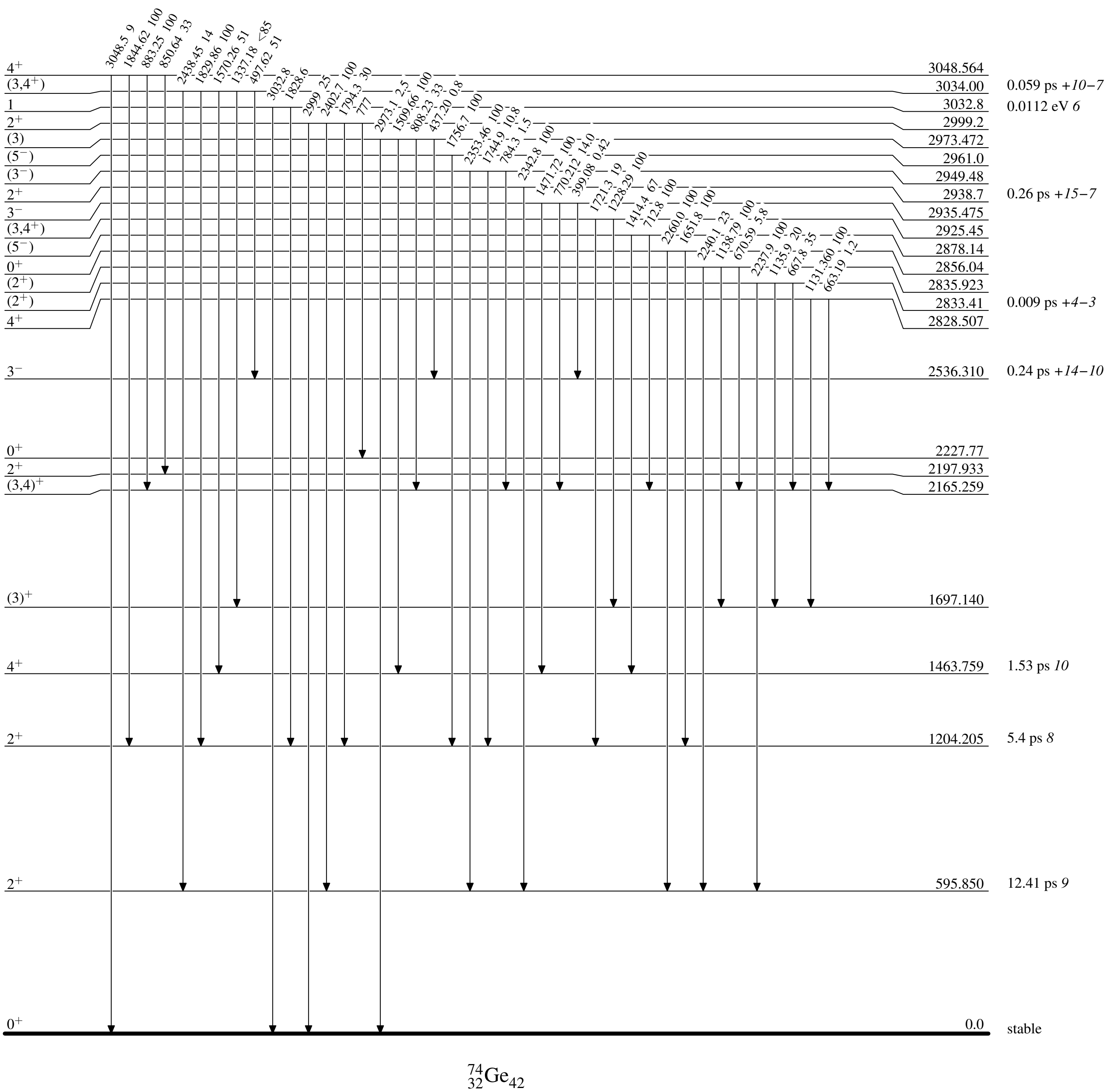


$^{74}_{32}Ge_{42}$

Adopted Levels, Gammas

Level Scheme (continued)

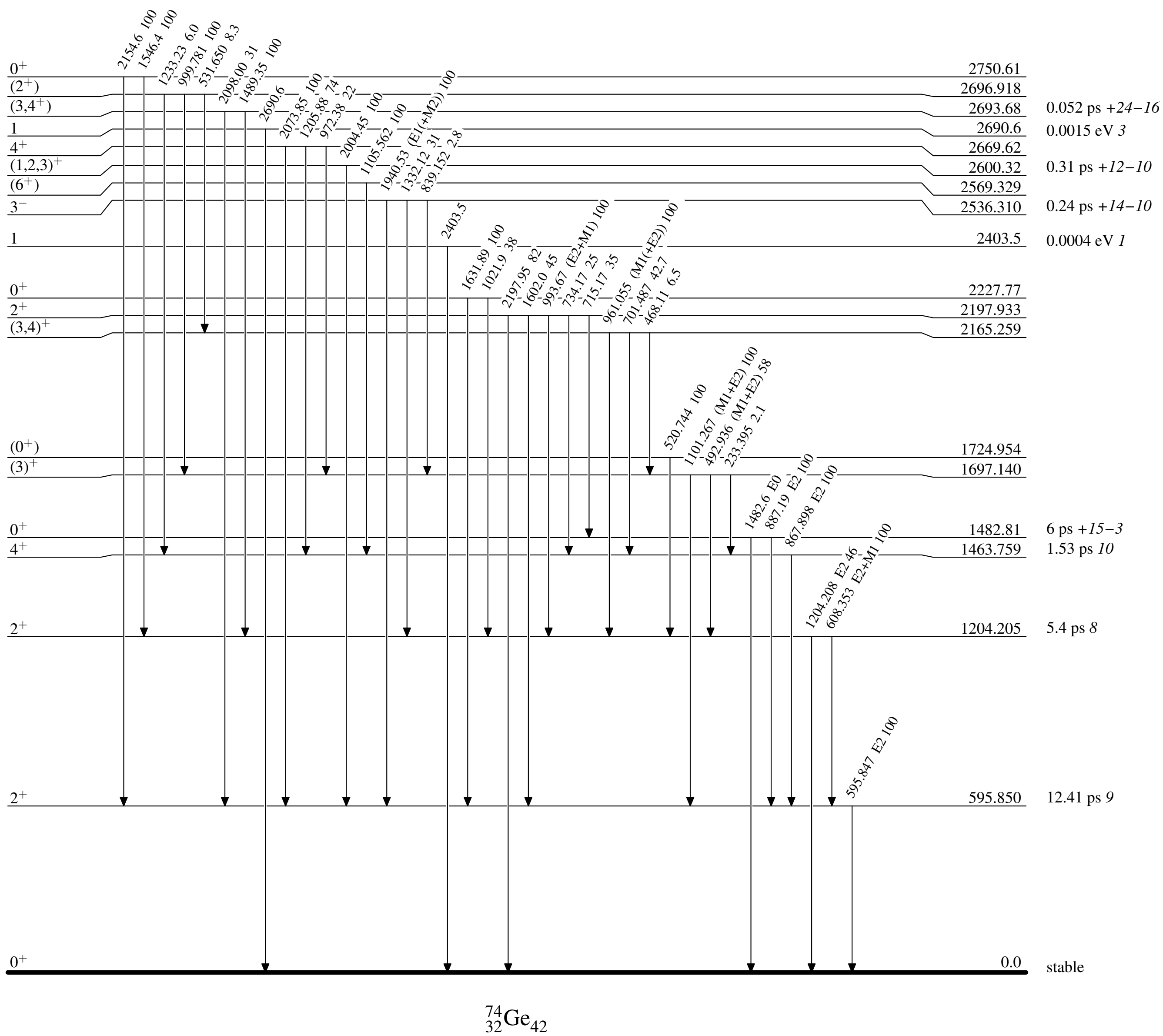
Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



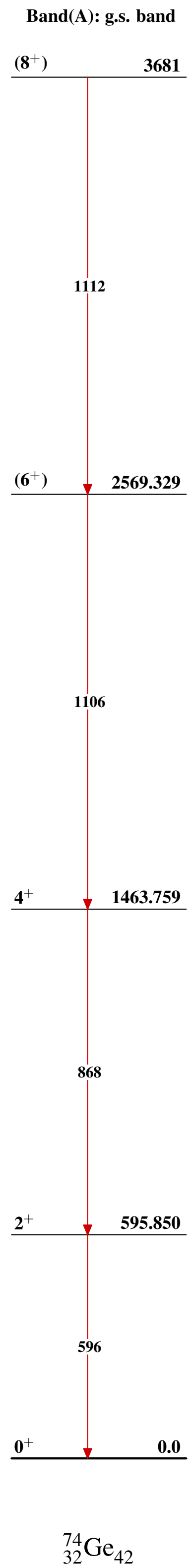
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



Adopted Levels, Gammas



Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, Jun Chen and Ameenah R. Farhan	NDS 194,3 (2024)	8-Jan-2024

Q(β^-)=−921.5 *9*; S(n)=9427.24 *5*; S(p)=12041.2 *7*; Q(α)=−7492.3 *21* 2021Wa16
Q($2\beta^-$)=2039.06 *1*, S(2n)=15933.08 *2*, S(2p)=22034.1 *25* (2021Wa16).
^{76}Ge $2\beta^-$ decay (to ^{76}Se) by $0\nu\beta\beta$ or $2\nu\beta\beta$ decay modes:
^{76}Ge $2\beta^-$ decay (experimental): 2013Ag11 (also 2013Ag02), 2013Ac01, 2008Me06, 2008Ra09, 2006Gr17, 2005Ba60, 2004Kl03 (also 2005Kl02,2003Do12,2002Kl12,2001Kl11), 2003Aa01 (also 2000Aa01,1999Aa01, 1999Aa02,1996Aa02), 2001Kl12 (also 2002Kl10,2001Va29,2000Va23), 2000Go25, 1999Bb30, 1997Ba70, 1997Gu13, 1996He31, 1995Ba44, 1995Ba84 (also 1994Ba15), 1994Ma70, 1993Br22, 1993Be14, 1992Re03 (also 1991Tr07, 1987Fi05,1984Fo06), 1992Be20 (also 1992Ba25), 1991Mo28 (also 1991Mo27, 1991Mo23,1988Mo35,1985Hu01,1983Le27), 1991Ca34 (also 1987Ca21, 1986Ca07), 1991Av04 (also 1991Av01,1990Mi23,1987Av05,1987Av01,1986Av03, 1985Av02,1983Av01,1979Av01,1978Pi07), 1991Hy01 (also 1993Hy02, 1984El01), 1990Bu15, 1990Va18, 1988Ok01 (also 1987Ej01,1986Ka33, 1986Ej01), 1986Zd01 (also 1985Zd01), 1984Si08, 1984Fi16 (also 1984Be48, 1983Be65, 1982Be20,1973Fi01,1970Fi09,1967Fi14), 1952Fr23.
Additional information 1.
^{76}Ge(e,e),E=225 MeV: 1990Kh03.
^{76}Ge(γ,α) E=18-25 MeV: 1990An13, measured emission of α particles in GDR region.
Giant dipole resonances in (γ,xn): 1976Ca06.
Mass measurement: 2010Mo03, 2008Ra09, 2001Do08, 2001Fr25, 1977De20, 197 1964Ba03, 1963Ri07.
Measurement of mass difference (^{76}Ge-^{76}Se): 1991Hy01 (also 1993Hy02, 1985El01, 1984El01, 1984ElZY).

^{76}Ge Levels

Cross Reference (XREF) Flags

A	^{76}Ga β^- decay (30.5 s)	G	^{76}Ge(n,n′γ)	M	^{80}Se(d,^{6}Li)
B	^{76}As ε decay (26.254 h)	H	^{76}Ge(p,p′),(pol p,p′)	N	^{192}Os(^{82}Se,Xγ)
C	^{74}Ge(t,p)	I	^{76}Ge(pol d,d′)	O	Pb(^{76}Ge,^{76}Ge′γ):inelastic
D	^{74}Ge(^{18}O,^{16}O)	J	^{76}Ge(α,α′)	P	^{238}U(^{76}Ge,^{76}Ge′γ)
E	^{76}Ge(γ,γ′)	K	^{76}Ge(^{16}O,^{16}O′),(^{18}O,^{18}O′)		
F	^{76}Ge(n,n′)	L	Coulomb excitation		

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$ or Γ[#]	XREF	Comments
0.0[b]	0$^+$	1.926×10^{21} y *94*	ABCDEFGHIJKLMNOP	%2β^-=100 XREF: B(?). RMS charge radius (<r^2>)$^{1/2}$=4.0811 fm *12* (2013An02 evaluation). Spin 0 is consistent with microwave absorption measurement (1949To09). T$_{1/2}$: for 2$\nu\beta\beta$ decay, from GERDA collaboration (2015Ag06, see also 2015Ag10, 2015Ag01,2013Ag02). Others: 1.5×10^{21} y *1* (as recommended in evaluation by 2010Ba07 and 2011Ba28; see values and references therein for input data), 1.43×10^{21} y *53* in $\beta\beta$ decay database at NNDC-BNL, 1.88×10^{21} y *8* in 2021Ko07; >7.5×10^{23} y (2021Ar01); >2.022×10^{21} y (2023Ag05). T$_{1/2}$ for 0$\nu\beta\beta$ decay mode: >8.3×10^{25} y (2023Ar02); >5.62×10^{22} y (2022Da13); >9.0×10^{25} y (2020Da08); >1.8×10^{26} (2020Ag05); >4.8×10^{25} y (2019Al24); >1.9×10^{25} y (2018Aa02); >8.0×10^{25} y (2018Ag03,2017Ag04); >2.1×10^{25} y (2013Ag11, GERDA) at 90% confidence level, authors give T$_{1/2}$>3.0×10^{25} y by combining results from measurements by 2001Kl11 and 2002Aa01. 2012Zu07 compilation lists T$_{1/2}$>1.9×10^{25} or 2.23×10^{25} *+44−31*, both at 90% confidence level. First value is also quoted in article

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Adopted Levels, Gammas (continued)

^{76}Ge Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$ or Γ[#]	XREF	Comments
				by 2013Ac01. The source reference for the second value needs to be confirmed. $T_{1/2}$ for one Majoron emission $0\nu\beta\beta$ decay mode, measured $T_{1/2}>4.2\times10^{23}$ y (2015He19, GERDA collaboration). See also 2011Ba28 for a review of experimental half-life measurements for different 2β decay modes. Consult NSR database at www.nndc.bnl.gov for an extensive list of experimental and theoretical articles on 2β decay of ^{76}Ge. Additional information 2. 2009Ka06: deduced occupancy of valence neutron and proton orbitals from single-particle transfer reaction studies using ^{76}Ge target.
562.917[b] *23*	2^+	18.14 ps *13*	ABCDEFGHIJKLMNOP	μ=+0.53 *8* (2013Gu23,2020StZV) Q=−0.19 *6* (2001To13,2021StZZ) XREF: B(?). J^{π}: L(t,p)=2 from 0^+. μ: transient-field technique in Coulomb excitation (2019Mc05), measured g^{76}Ge/g^{74}Ge=0.88 *5* for the first 2^+ states. Other: +0.64 *2* (transient-field technique in Coulomb excitation, 2013Gu23); +0.838 *46* from $\gamma(\theta$,H) in Coul. ex. (1984Pa20), +0.67 *8* ($\gamma(\theta$,H) in Coul. ex.,1987La20); +0.56 *12* (IMPAC,1969He11,1974Hu01,1977Fa07). Weighted average (NRM method) of all the four values is 0.67 5. Q: reorientation effect in Coul. ex. (2001To13, previous value from authors was −0.19 *2* in 2000To12). Other: −0.19 *6* for constructive interference and −0.03 *6* for destructive interference (1980Le16), 1972Gr37, 1969Si15. 2016St14 give −0.19 *6* from 1980Le16 and 2000To12. β_2(pol p,p′)=0.25 *1* (1993Mo05). See also other values in (p,p′). β_2(pol d,d′)=0.197 *10* (1985Se05). $\beta_2(\alpha,\alpha')$=0.265 (1988Ba70), deduced from β_2R=1.313. β_2((^{16}O,^{16}O′),(^{18}O,^{18}O′))=0.26 (Coulomb), 0.23 (nuclear) (1976Co04). β_2(Coul.ex.)=0.267 (1980Le24). $T_{1/2}$: from B(E2)↑=0.276 *2*, weighted average of 0.277 *2* (2023Ay02), 0.278 *3* (1980Le16), 0.27 *2* (1972Sa27), 0.260 *5* (1969Si15), 0.263 *+32−24* (1962St02), 0.29 *3* (1960Wi18), 0.230 *35* (1956Te26) from various Coulomb excitation measurements. Other Coulomb excitation measurements with beam energies above the Coulomb barrier: B(E2)↑=0.299 *27* (2006Pe13), 0.292 *35* (2005Di05), 0.280 *42* (1962Er05). Lifetime measurements $T_{1/2}$=18.4 ps *21* (2013Lo04,RDM), and 18.2 ps *21* (1988DoZU,$\gamma\gamma$(t)) are in a good agreement. 2008StZT: measured attenuation parameters G_2 and G_4.
1108.416[c] *27*	2^+	9.9 ps *9*	A C E GH J LM OP	μ=+0.64 *10* (2013Gu23,2020StZV) Q=+0.28 *6* (2001To13) J^{π}: L(t,p)=2. $T_{1/2}$: from B(E2) in Coul. ex. and adopted γ branching ratios. β_2(pol p,p′)=0.058 (1993Mo05,1986MoZR). See (p,p′) for other values. $\beta_2(\alpha,\alpha')$=−0.057 (1988Ba70). β_2(coul.ex.)=0.047 (1980Le24). μ: transient-field method in Coul. ex. (2013Gu23), measured value of +0.78 *10* is re−evaluated to +0.64 *10* in 2020StZV. Q: reorientation effect in Coul. ex. (2001To13).
1409.982[b] *34*	4^+	1.86 ps *4*	A C GH J LMNOP	μ=+0.8 *6* (2013Gu23,2020StZV)

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Adopted Levels, Gammas (continued)

^{76}Ge Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$ or Γ[#]	XREF	Comments
				Q=−0.01 *5* (2001To13) J^{π}: L(t,p)=4. $T_{1/2}$: from B(E2) in Coul. ex. β_4(pol p,p′)=0.064 *11*, 0.024 *6*, 0.020 *20*, 0.001 (1993Mo05,1986MoZR), 0.02 ((p,p′),1983Ra32). μ: transient-field method in Coul. ex. (2013Gu23), measured value of +1.0 *7* is re−evaluated to +0.8 *6* in 2020StZV. Q: reorientation effect in Coul. ex. (2001To13).
1539.383[d] *33*	3^+	35 ps *7*	A GH L P	J^{π}: spin from 976γ(θ) in (n,n′γ); M1+E2 gammas to 2^+. $T_{1/2}$: from B(E2) in Coul. ex.
1911.12 *6*	0^+	1.77 ps *8*	A C GH J L	J^{π}: L(t,p)=0. $T_{1/2}$: from B(E2) in Coul. ex. Other: 1.25 ps *+62−35* from DSAM in (n,n′γ). Intruder spherical state based on very small value of expectation value of <Q^2>=0.01 *2* deduced by 2001To13 in their Coul. ex. experiment.
2021.68[c] *4*	4^+	1.6 ps *4*	A C GH LM P	XREF: M(1970). J^{π}: γγ(θ) (^{76}Ge,^{76}Ge′γ); E2 γ to 2^+. $T_{1/2}$: from B(E2) in Coul. ex. Other: 1.5 ps *+10−4* from DSAM in (n,n′γ).
2203.84 *5*	$(1,2^+)$	0.010 ps *4*	G	J^{π}: γ to 0^+.
2284.22 *24*	$(3)^-$		A H	J^{π}: L(p,p′)=3.
2453.74[b] *6*	6^+	0.47 ps *+19−16*	GH L N P	J^{π}: E2 γ to 4^+; g.s. band member. $T_{1/2}$: weighted average of 0.59 ps *+19−12* from B(E2) in Coul. ex. and 0.26 ps *+29−10* from DSAM in (n,n′γ).
2478.2 *5*	$(1,2^+)$		G	J^{π}: γ to 0^+.
2487.07[d] *9*	5^+	1.04 ps *+55−28*	G L P	J^{π}: E2 γ to 3^+; M1+E2 γ to 4^+.
2504.10 *4*	2^+	0.7 ps *5*	C E GH L	J^{π}: L(t,p)=2. $T_{1/2}$: other: 0.15 ps *2* from B(E2)↓ of 2504γ in Coul. ex.
2554? *5*			H	
2591.04 *16*	$(1^+,2^+)$		A G	J^{π}: γ rays to 0^+ and 3^+.
2624? *5*			H	
2654.51 *20*	$(0^+,1^+)$		A G	J^{π}: γ to 2^+ suggests 0^+,1,2,3,4^+. J^{π}=0^+,1^+ suggested (1984KoZN) from (n,n′γ) excitation functions.
2655.15 *30*	(1)		E	J^{π}: from γγ(θ) in (γ,γ′).
2669.12 *5*	3^+,4^+	1.9 ps *+14−6*	G P	J^{π}: M1+E2 γs to 3^+ and 4^+.
2692.347 *33*	3^-	0.162 ps *14*	A C GH J L	J^{π}: L(t,p)=L(α,α′)=3. $T_{1/2}$: other: values from B(E1)↓ in Coul. ex. are about 3 fs, which are discrepant. β_3(pol p,p′)=0.15 *1* (1993Mo05,1986MoZR). See also other values in (p,p′). β_3(α,α′)=0.11 (1988Ba70).
2697.20 *4*	$(0)^+$	0.70 ps *+36−18*	G	J^{π}: proposed in (n,n′γ); E2 γ to 2^+.
2733.23 *5*	4^+	0.33 ps *8*	C GH j L P	J^{π}: L(t,p)=L(p,p′)=4. $T_{1/2}$ from DSAM in (n,n′γ) (1987Do14,1990DoZU).
2747.75 *5*	$(2)^+$	0.182 ps *21*	A GH j	J^{π}: M1+E2 γs to 2^+ and 3^+. Excitation function analysis in (n,n′γ) supports 2^+,4^+.
2766.68 *5*	2^+	14.6 fs *21*	c Gh j l	XREF: c(2766)h(2768)j(2769)l(2767). J^{π}: L(t,p)=L(α,α′)=2.
2768.73 *14*	2^+		A c h j l	XREF: c(2766)h(2768)j(2769)l(2767). E(level): 2766.7 and 2768.8 levels could be the same level. J^{π}: L(t,p)=L(α,α′)=2.
2841.61 *10*	2^+	0.0277 ps *28*	A C GH L	J^{π}: L(t,p)=L(p,p′)=2.
2856.79 *10*	4^+	97 fs *8*	G	J^{π}: M1(+E2) γ to 4^+; 4^+ proposed in (n,n′γ) based on excitation function.

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Adopted Levels, Gammas (continued)

^{76}Ge Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$ or Γ[#]	XREF	Comments
2897.55 *9*	0^+	0.310 ps *+56−44*	C GH L	Jπ: L(t,p)=0.
2919.74 *8*	1^+	0.154 ps *14*	A E G	Jπ: M1γ to 0^+; γγ(θ) in (γ,γ′). $T_{1/2}$: other: 0.30 ps *+20−9* from Γ=0.0015 eV *6* from (γ,γ′).
2921 *5*	3^-		H J	Jπ: L(α,α′)=L(p,p′)=3. 2921 level is treated as different from 2920 level since an intense g.s. transition from 2920 level is inconsistent with L(α,α′)=3 for a 2921 group.
2958.06[e] *16*	5^-		C GH J P	Jπ: E2 γ to 3^-, E1 γ to 4^+. Also supported by L(t,p)=5 and L(α,α′)=(5). But L(p,p′)=3 suggests 3^-.
2986.08 *7*	$(2^+,3^+)$	99.8 fs *62*	G	Jπ: proposed in (n,n′γ) based on excitation functions.
2988.09 *21*			P	Jπ: γs to 5^+ and 6^+.
2993.89 *4*	4^+	0.50 ps *+13−8*	C GH J	Jπ: L(t,p)=L(α,α′)=4.
3004.73 *8*	$(0)^+$	0.214 ps *+38−28*	G	Jπ: proposed in (n,n′γ); E2 γ to 2^+.
3007.16 *6*	1^+	19 fs *7*	E G	Jπ: M1 γ to 0^+.
3014.2 *4*	1[&]	0.0016 eV *2*	E	
3021.14 *7*	$(2^+,3^+)$[a]	0.340 ps *+47−36*	G	
3033.75[c] *18*	(6^+)		L P	Jπ: γ to 4^+; γs to 6^+ and 5^+; band member.
3041.37 *8*	2^+	0.0638 ps *42*	C GH	Jπ: L(t,p)=2.
3052.55 *10*	$2^+,3^+,4^+$	0.035 ps *5*	GH	Jπ: M1+E2 γ to 3^+.
3062.13 *9*	$(4^+,5^+)$[a]	0.122 ps *22*	G	
3066.86 *10*	$(2^+,3^+,4^+)$[a]	0.90 ps *+56−28*	G	
3070.41 *11*	4^+[a]	0.76 ps *+49−21*	GH	Jπ: M1+E2 γ to 4^+.
3088.4 *7*	1[&]	0.0017 eV *5*	E	
3092.10 *10*	$(3^+,5^+)$[a]	0.268 ps *+42−32*	GH	XREF: H(3090?).
3129.86 *8*	2^+	0.245 ps *+26−24*	GH L	Jπ: E2 γ to 0^+. $T_{1/2}$: other: 0.26 ps *+36−11* from B(E2)↓ of 3129.8γ in Coul. ex.
3141.39 *6*	1^+	119 fs *+14−10*	A C E G	Jπ: γγ(θ) in (γ,γ′); L(t,p)=L(p,p′)=2 with assumed S=1. $T_{1/2}$ from DSAM in (n,n′γ) (2015Cr06). Other: 0.06 ps *+7−4* (1990DoZU).
3147.54 *10*	$(2)^+$	118 fs *13*	GH	Jπ: L(p,p′)=2.
3162.65 *6*	$(4)^+$[a]	14.6 fs *21*	GH L	Jπ: E2+M1 γ to 4^+.
3181.95 *6*	$(2^+,3^+)$[a]	0.59 ps *+42−18*	G	
3182.19 *6*	(2^+)	0.25 ps *+35−11*	A G O	Jπ: L(p,p′)=2+5 for a 3195 group; L(p,t)=(2,3).
3191.05 *4*	2^+	0.128 ps *14*	C Gh	XREF: h(3195). Jπ: E2 γ to 0^+.
3195 *5*	$(4^-,5^-,6^-)$		h	Jπ: L(p,p′)=2+5 for a 3195 *5* level.
3200.01 *13*	$(3)^+$[a]	0.7 ps *+16−3*	G	Jπ: M1+E2 γ to 2^+.
3200.07 *20*	$(1,2^+)$		E	Jπ: γ to 0^+.
3224 *5*			H	
3231.8 *4*	4^+		A C H J	XREF: A(?)H(3240). Jπ: L(t,p)=L(α,α′)=4.
3236.02 *9*	$(5)^+$[a]	30.5 fs *+35−28*	G P	Jπ: M1+E2 γ to 4^+, γ to 6^+. Other: (6^+) in (^{76}Ge,^{76}Ge′).
3243.79 *7*	1^+	40.9 fs *+35−28*	G	Jπ: M1 γ to 0^+.
3268 *5*	(4^+)		H J	Jπ: L(α,α′)=(4). But L(p,p′)=(5) suggests $4^-,5^-,6^-$.
3312.29 *11*	3^-		A c h J	Jπ: L(α,α′)=3. Also L(p,p′)=0+3 for a doublet. L(t,p)=0,1 and 3,4 also indicates a doublet with Jπ=0^+ or 1^- and 3^- or 4^+.
3317 *5*	(0^+)		c h	Jπ: L(p,p′)=0+3 for a doublet and L(t,p)=0,1 and

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Adopted Levels, Gammas (continued)

^{76}Ge Levels (continued)

E(level)[†]	J^π[‡]	$T_{1/2}$ or Γ[#]	XREF	Comments
				3,4 for a doublet. L=3 component is associated with the 3312 level.
3322.80 *6*	(2+)	0.16 ps +*14*−*6*	A G	J^π: γs to 2+ and 4+. Excitation function analysis in (n,n′γ) suggests 2+.
3349 *5*			H	
3391 *5*	(4+,5−)		C H J	J^π: L(p,p′)=5 but L(t,p)=(4).
3409.19 *18*	(1,2,3)[@]		A H	XREF: H(3402).
3419.47 *31*	1+		E G	J^π: γ to 0+; γγ(θ) in (pol γ,γ′).
3436.9 *4*			H P	
3453 *5*	(4)+		H	J^π: L(p,p′)=4.
3477.62 *17*	(2+,3)[@]		A C	E(level),J^π: L(t,p)=1 or 0 (and L>1); γ from 4+. Probably a doublet with 1− or 0+ for one of the components.
3484.0 *7*	3−		GH J	J^π: L(α,α′)=3.
3506 *5*			H	
3532.81[d] *30*	(7+)		h P	J^π: γ to 5+; member of γ band.
3536.0 *4*			h P	
3543.27[b] *34*	8+		L N P	J^π: γ to 6+; g.s. band member.
3545 *5*	2+		C H J	J^π: L(α,α′)=2. But L(t,p)=0,1 and 3,4 suggests 0+ or 1− and 3− or 4+ for a doublet.
3576.96 *26*		30 fs +*6*−*5*	G	
3585 *5*	(2)+		H J	J^π: L(α,α′)=(2) and L(p,p′)=2.
3596.79 *31*	2+[&]		E	
3606 *5*			H	
3632.92 *10*	(2+)		A P	J^π: γ rays to 0+ and (4+).
3640 *5*	(4−,5−,6−)		c H j	XREF: c(3648). J^π: L(p,p′)=5. But L(t,p)=(2) for 3648 suggests 2+.
3658 *5*			c H j	XREF: c(3648).
3680.70 *10*	1−[&]		E	
3691 *5*			H	
3721 *5*	(5)−		C H J	J^π: L(α,α′)=(5) and L(p,p′)=5.
3727.83[e] *26*	(7−)		P	J^π: γ rays to 6+ and (5)−; possible band member.
3748 *5*	2+		H J	J^π: L(α,α′)=2.
3763.40 *18*	1+[&]		E	
3783.57 *28*	(4+,5,6,7−)		H P	J^π: γ rays to (5−) and 6+.
3805 *5*			C H	
3815 *5*			H	
3848 *5*			H	
3868 *5*			H	
3883 *5*			c H J	XREF: J(3871).
3886.97 *19*	(3−)		A c H J	XREF: H(3904)J(3893). J^π: L(α,α′)=L(p,p′)=3.
3951.88 *7*	1−	28 fs *5*	A E G	J^π: from (pol γ,γ′) data at HIGS-TUNL facility (priv. comm. of Feb 20, 2016 from W. Tornow); also γs to 0+, 2+ and 3−. $T_{1/2}$ from DSAM in (n,n′γ) (2015Cr06).
3972 *5*	(4+)		H J	XREF: J(3952). J^π: L(α,α′)=(4).
3997 *5*	4+		H J	XREF: J(3978). J^π: L(α,α′)=L(p,p′)=4.
4024.11 *20*	1(−)[&]	0.0055 eV *11*	E H	XREF: H(?).
4035.12 *20*	1[&]	0.0053 eV *20*	E	
4057? *5*			H	
4073 *5*			H J	XREF: J(4052).

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Adopted Levels, Gammas (continued)

^{76}Ge Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$ or Γ#	XREF	Comments
4099 *5*	5^-		H J	XREF: J(4073).
4116.02 *20*	1[&]		E	
4122.28? *31*	(1,2$^+$)		A H	Jπ: γ to 0$^+$.
4129.8[c] *5*	8^+		L P	Jπ: γ to 6$^+$; member of γ band.
4130.6 *4*			P	
4153 *5*			H J	XREF: J(4126). Jπ: L(p,p′)=4 suggests 3$^+$,4$^+$,5$^+$ but L(α,α′)=(1) suggests 1$^-$.
4192.80? *12*	(2$^+$,3)		A H	Jπ: γ rays to 4$^+$ and 1.
4209 *5*	3^-		H J	XREF: J(4180). Jπ: L(α,α′)=L(p,p′)=3.
4239.36 *14*	(1,2,3)[@]		A H	
4249 *5*	4^+		H J	XREF: J(4220). Jπ: L(α,α′)=4.
4250.93 *30*	1[&]		E	
4272 *5*			H	
4311.1 *4*			P	
4326.43 *16*	(1,2,3)[@]		A H	
4331.3 *12*	1[&]	0.050 eV *10*	E	
4363.47 *19*	4^+		A H J	XREF: J(4332). Jπ: L(α,α′)=L(p,p′)=4.
4399 *5*	(3$^+$,4$^+$,5$^+$)		H J	XREF: J(4367). Jπ: L(p,p′)=4.
4426 *10*			H J	XREF: J(4402).
4444 *10*	(3$^+$,4$^+$,5$^+$)		H	Jπ: L(p,p′)=(4).
4476.67? *21*	(≤4)		A H	XREF: H(4468). Jπ: γ to 2$^+$ suggests 0$^+$,1,2,3,4$^+$.
4488 *10*	3^-		H J	XREF: J(4453). Jπ: L(α,α′)=3.
4536 *10*	(3$^+$,4$^+$,5$^+$)		H J	XREF: J(4500). Jπ: L(p,p′)=4. L(α,α′)=(3,4) suggests a doublet with 3$^-$ and 4$^+$.
4546.8[d] *5*	9^+		P	Jπ: γ to 7$^+$; member of γ band.
4570 *10*			H J	XREF: J(4530). Jπ: L(α,α′)=(3,5) suggests a doublet with 3$^-$ and 5$^-$.
4611 *10*	(3$^-$)		A H J	XREF: J(4570). Jπ: L(α,α′)=(3).
4613.0[b] *5*	10^+		P	Jπ: γ to 8$^+$; band member.
4623.7 *11*	1^+[&]		E	
4659 *10*	(5$^-$)		H J	XREF: J(4615). Jπ: L(α,α′)=(5).
4661.2 *4*	1[&]		E	
4678.26 *10*	1[&]		E	
4686.8[e] *4*	(9$^-$)		P	Jπ: γ rays to 8$^+$ and (7$^-$); possible band member.
4698 *10*			H	
4719.88 *18*	(2$^+$,3,4$^+$)		A	Jπ: γ rays to (2$^+$) and (4$^+$).
4720.5 *4*			P	
4722.36 *20*	(1)[&]		E	
4736 *10*			H	
4741.16 *20*			E	
4767 *10*			H	
4784.04? *26*	(1,2,3)[@]		A	
4789.06 *30*			E	

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Adopted Levels, Gammas (continued)

^{76}Ge Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$ or Γ[#]	XREF				Comments
4812.47? *18*	(2+,3)		A		h		J^{π}: γ rays to 4+ and 1.
4814.92? *27*	(1,2,3)[@]		A		h		
4837.2 *4*	(1)[&]			E			
4839 *10*	(3+,4+,5+)				H		J^{π}: L(p,p′)=(4).
4846.07 *30*	1[&]			E			
4874.67 *20*				E	H		
4917.2 *6*	1[&]			E			
4936.07 *20*	1[&]		A	E	H		
5116.59 *20*	1[&]			E			
5122.47 *14*	(1,2,3)[@]		A				
5166.89 *20*	(1)[&]			E			
5185.99 *10*	(1)[&]			E			
5202.49 *20*	1[&]			E			
5222.19 *30*				E			
5267.00 *30*	1			E	h		XREF: h(5276).
5273.8 *6*	(1)[&]			E	H		
5285.10 *20*	1[&]			E	h		XREF: h(5276).
5304.30 *30*	1[&]			E			
5365.80 *30*	1[&]		A	E			XREF: A(5350).
5379.7 *4*	1[&]			E			
5390.8 *5*	(1)[&]			E			
5418.8 *4*	(1)[&]			E			
5434.51 *30*	1[&]			E			
5450.0?[b] *7*	(12+)					P	J^{π}: possible band member.
5522.58 *20*	(1,2,3)[@]		A				
5540.42 *20*	1[&]	0.103 eV *18*		E			
5567.62 *20*	(1)[&]			E			
5579.0 *5*	1[&]			E			
5626.7 *8*	1[&]	0.133 eV *20*		E			
5663.32 *14*	(2+)		A				J^{π}: γ rays to 0+ and 4+.
5665.43 *30*	1[&]			E			
5677.83 *30*	1[&]			E			
5699.03 *20*	1−[&]	0.256 eV *22*		E			
5708.6 *6*	(1)[&]			E			
5748.53 *10*	1−[&]	0.166 eV *24*		E			
5749.90? *32*	(1,2,3)[@]		A				
5785.24 *20*	1[&]			E			
5794.34 *20*	1[&]			E			
5821.0 *6*				E			
5825.5 *8*	1[&]			E			
5843.2[e] *6*	(11−)					P	J^{π}: γ to (9−); possible band member.
5846.7 *7*				E			
5865.0 *6*				E			
5882.92? *24*	(1,2,3)[@]		A				
5909.05 *30*				E			
5955.9 *8*	1[&]	0.194 eV *23*		E			

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Adopted Levels, Gammas (continued)

^{76}Ge Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$ or Γ[#]	XREF
5983.25 *20*	1^{-}[&]	0.150 eV *20*	E
6021.13? *28*	(1,2,3)[@]		A
6048.7 *4*	1[&]		E
6065.1? *4*	(1,2,3)[@]		A
6081.7 *4*	(1)[&]		E
6102.3 *9*			E
6113.86 *30*	1[&]		E
6130.57 *20*	1[&]		E
6145.87 *20*	1[&]		E
6162.7 *9*			E
6191.57 *20*	1[&]		E
6223.7 *7*			E
6228.5 *4*	1[&]		E
6235.1 *9*			E
6240.98 *30*	1[&]		E
6272.98 *30*	1[&]		E
6285.58 *20*	1[&]		E
6315.7 *4*	1[&]		E
6330.48 *20*	1[&]		E
6366.5 *11*			E
6393.5 *5*	1[&]		E
6408.4 *5*	1[&]		E
6436.4 *9*			E
6448.6 *11*			E
6472.50 *30*	1[&]		E
6498.20 *30*	1[&]		E
6513.6 *4*	1[&]		E
6572.3 *6*			E
6601.51 *20*	1[&]		E
6611.4 *6*			E
6629.31 *30*	1[&]		E
6642.2 *5*			E
6661.7 *9*			E
6670.91 *30*	1[&]		E
6741.9 *6*	(1)[&]		E
6765.1 *4*	1[&]		E
6787.03 *20*	1[&]		E
6816.83 *30*	1[&]		E
6835.83 *20*	1[&]		E
6846.53 *30*	1[&]		E
6880.6 *4*	1[&]		E
6884.5 *10*			E
6899.2 *5*	1[&]		E
6908.3 *18*			E
6938.9 *7*	1[&]		E
6960.24 *30*	1[&]		E

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Adopted Levels, Gammas (continued)

^{76}Ge Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$ or Γ[#]	XREF	E(level)[†]	J^{π}[‡]	$T_{1/2}$ or Γ[#]	XREF
6985.4 *5*	1[&]		E	8018.0 *14*	(1)[&]		E
6999.05 *30*	1^-[&]	0.28 eV *4*	E	8027.0 *8*	(1)[&]		E
7011.4 *9*	1		E	8049.8 *6*	(1)[&]		E
7026.35 *30*	$1^{(-)}$[&]	0.39 eV *4*	E	8063.9 *8*	1		E
7048.3 *9*	1[&]		E	8094.7 *8*			E
7081.6 *9*	1[&]		E	8103.3 *5*			E
7091.8 *4*	1[&]		E	8110.0 *8*			E
7102.8 *6*	1[&]		E	8135.0 *11*			E
7121.66 *30*	1[&]		E	8152.3 *5*	$1^{(-)}$[&]	0.71 eV *7*	E
7130.46 *30*	1[&]		E	8160.7 *9*			E
7147.7 *4*	1[&]		E	8178.3 *4*	1[&]		E
7172.0 *9*			E	8188.3 *5*	1[&]		E
7250.9 *7*	1^-[&]		E	8236.9 *4*	(1)[&]		E
7290.1 *4*			E	8253.4 *9*			E
7301.08 *30*	1^-[&]		E	8260.1 *6*	(1)[&]		E
7407.09 *30*	1[&]		E	8284.99 *30*	(1)[&]		E
7416.0 *4*			E	8294.8 *12*			E
7452.6 *5*			E	8304.0 *5*	1[&]		E
7479.0 *5*			E	8318.29 *30*	1[&]		E
7485.40 *30*	1[&]		E	8329.4 *7*	1[&]		E
7521.6 *5*	1[&]		E	8348.2 *9*			E
7537.0 *4*	(1)[&]		E	8357.9 *7*	(1)[&]		E
7549.2 *7*	(1)[&]		E	8397.8 *5*			E
7585.0 *4*	1[&]		E	8418.5 *15*			E
7643.0 *4*	1[&]		E	8425.70 *30*	1[&]	0.29 eV *5*	E
7651.2 *4*	1[&]		E	8446.6 *7*	(1)[&]		E
7678.1 *4*	1[&]		E	8462.4 *9*			E
7694.6 *11*	1[&]	0.30 eV *5*	E	8500.51 *30*	1[&]		E
7723.1 *4*	(1)[&]		E	8521.2 *6*			E
7777.3 *7*	(1)[&]		E	8535.6 *5*	1[&]		E
7784.2 *9*			E	8546.6 *5*	1^-[&]	0.76 eV *9*	E
7797.0 *4*	1[&]		E	8552.8 *8*	1[&]		E
7804.1 *6*	1[&]		E	8567.42 *30*	1[&]		E
7814.7 *7*	1[&]		E	8602.8 *5*			E
7817.63 *20*			E	8626.2 *7*	1[&]		E
7836.7 *6*			E	8649.6 *8*			E
7849.7 *5*	(1)[&]		E	8662.5 *4*	(1)[&]		E
7861.6 *4*	1[&]		E	8696.7 *7*			E
7883.7 *10*	1[&]		E	8741.2 *4*	(1)[&]		E
7894.0 *12*			E	8753.2 *6*	1^-[&]		E
7916.2 *24*	1^-[&]	0.72 eV *17*	E	8768.9 *9*	1[&]		E
7950.35 *20*	1[&]		E	8806.8 *5*			E
7976.1 *7*	(1)[&]		E	8844.3 *4*	1[&]		E
7996.3 *4*	(1)[&]		E	8889.1 *9*			E

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Adopted Levels, Gammas (continued)

^{76}Ge Levels (continued)

E(level)†	Jπ‡	T1/2 or Γ#	XREF	E(level)†	Jπ‡	XREF
9014.2 *14*	1^-&	0.71 eV *8*	E	9305.6 *4*		E
9020.1 *10*	(1)&		E	9316.4 *4*		E
9033.7 *9*			E	9338.4 *6*		E
9052.3 *12*	(1)&		E	9355.1 *8*	(1)&	E
9059.1 *11*			E	9366.5 *5*	1&	E
9163.9 *9*	1&		E	9378.5 *4*	(1)&	E
9176.1 *8*	1&		E	9400.0 *6*	1&	E
9188.0 *4*	1&		E	9410.5 *4*	1&	E
9255.2 *7*			E	9418.2 *5*	1&	E
9264.7 *6*			E	9557.2 *5*	1&	E

† For levels populated in γ-ray studies, E(level) values are from least-squares fit to Eγ data, assuming 0.5 keV uncertainty when stated. Normalized χ^2=1.1. In other cases values are averages from different reaction studies. In (p,p′) and (α,α'), values for similar levels differ systematically (higher by 12 keV to 45 keV in the 3700-4600 range). Values from (p,p′) are adopted here (since many more levels are reported in (p,p′) than in (α,α')), although, it is difficult to know as to which dataset is more accurate.

‡ Log *ft* values from ^{76}Ga decay have not been used in assigning J^π values since J^π(^{76}Ga g.s.)=(3^-) is only tentative. Moreover, several γ-ray placements remain uncertain. For levels above ≈3000, values are given in parentheses when available only from L(p,p′) and/or L(t,p) due to following reasons: 1. The agreement of $\sigma(\theta)$ fits to DWBA is not good over the whole angular range. 2. The correspondence between levels in different reactions is not unique due to large level density and large uncertainties in E(level) from particle reactions.

\# From DSA in (n,n′γ) (1990DoZU,1984KoZN,2015Cr06) for levels above 2.1 MeV, unless otherwise stated. Below this energy, values are deduced by the evaluators from B(E2) values in Coul. ex. Level widths are from ^{76}Ge(γ,γ'),(pol γ,γ').

@ Possible β^- feeding from $2^{(-)}$ (see ^{76}Ga β^- decay). Since the level scheme is not well established, the J^π assignment is considered as tentative.

& From $\gamma\gamma(\theta)$ in (γ,γ'), parity from (pol γ,γ').

a Proposed in (n,n′γ) based on excitation functions and γ decay pattern.

b Band(A): The g.s. band.

c Band(B): γ band, even spin.

d Band(b): γ band, odd spin.

e Band(C): Band based on 5^-.

$\gamma(^{76}Ge)$

Additional information 3.

E_i(level)	J^π_i	E_γ[‡]	I_γ[‡]	E_f	J^π_f	Mult.[#]	δ[#]	α[†]	Comments
562.917	2^+	562.93 *3*	100	0.0	0^+	E2		1.64×10^{-3} *2*	B(E2)(W.u.)=28.81 *21* α(K)=0.001463 *20*; α(L)=0.0001529 *21*; α(M)=2.279×10^{-5} *32* α(N)=1.460×10^{-6} *20*
1108.416	2^+	545.51 *3*	100 *3*	562.917	2^+	E2+M1	+2.4 *2*	1.70×10^{-3} *3*	B(M1)(W.u.)=0.00119 *+24−18*; B(E2)(W.u.)=31.0 *+34−29* α(K)=0.001520 *25*; α(L)=0.0001588 *27*; α(M)=2.37×10^{-5} *4* α(N)=1.519×10^{-6} *25* δ: weighted average of +2.5 *2* from $\gamma(\theta)$ in (n,n′γ) and +2.1 *4* from $\gamma\gamma(\theta)$ in (^{76}Ge,^{76}Ge′).
		1108.41 *8*	70 *4*	0.0	0^+	E2		0.000280 *4*	B(E2)(W.u.)=0.74 *+8−7* α(K)=0.0002491 *35*; α(L)=2.55×10^{-5} *4*; α(M)=3.80×10^{-6} *5* α(N)=2.487×10^{-7} *35*; α(IPF)=1.013×10^{-6} *14*
1409.982	4^+	847.11 *5*	100	562.917	2^+	E2		0.000531 *7*	B(E2)(W.u.)=36.5 *8* α(K)=0.000475 *7*; α(L)=4.89×10^{-5} *7*; α(M)=7.29×10^{-6} *10* α(N)=4.74×10^{-7} *7*
1539.383	3^+	430.95 *5*	69 *5*	1108.416	2^+	M1+E2	+1.86 *+17−11*	0.00336 *7*	α(K)=0.00300 *6*; α(L)=0.000316 *7*; α(M)=4.71×10^{-5} *10* α(N)=2.99×10^{-6} *6* B(M1)(W.u.)=7.2×10^{-4} *+19−15*; B(E2)(W.u.)=18.0 *+46−31* I_γ: from ^{238}U(^{76}Ge,^{76}Ge′γ) (2013To05). Value of 75 from (n,n′γ) is in agreement, but 200 *15* in β^- decay (1971Ca39) is in severe disagreement. Value from 2013To05 is preferred here as the branching ratio in this work is supported by $\gamma\gamma$-coin data, whereas no coincidence data were obtained in 1971Ca39. Moreover, there are many contaminants present in γ-ray spectrum from ^{76}Ga decay obtained by 1971Ca39. δ: weighted average of +1.8 *4* from (^{76}Ge,^{76}Ge′γ) and +1.87 *+17−11* from (n,n′γ). The smaller values in those datasets are less likely.
		976.48 *5*	100 *3*	562.917	2^+	M1+E2	+2.61 *20*	0.000368 *5*	α(K)=0.000329 *5*; α(L)=3.37×10^{-5} *5*; α(M)=5.03×10^{-6} *7* α(N)=3.29×10^{-7} *5* B(M1)(W.u.)=5.1×10^{-5} *+16−10*; B(E2)(W.u.)=0.49 *+12−8* δ: weighted average of +2.5 *2* from (^{76}Ge,^{76}Ge′γ) and +2.72 *20* from (n,n′γ).
1911.12	0^+	1348.19 *6*	100	562.917	2^+	E2		0.0002213 *31*	B(E2)(W.u.)=3.75 *+18−16* α(K)=0.0001625 *23*; α(L)=1.654×10^{-5} *23*;

$^{76}_{32}Ge_{44}$-11

$\gamma(^{76}Ge)$ (continued)

E_i(level)	J^π_i	E_γ‡	I_γ‡	E_f	J^π_f	Mult.#	δ#	α†	Comments
									α(M)=2.469×10^{-6} *35* α(N)=1.621×10^{-7} *23*; α(IPF)=3.96×10^{-5} *6*
2021.68	4^+	482.33 *5*	14.2 *15*	1539.383	3^+	M1+E2		0.0021 *6*	α(K)=0.0018 *5*; α(L)=1.9×10^{-4} *5*; α(M)=2.9×10^{-5} *8* α(N)=1.9×10^{-6} *5* δ: +0.48 *+9−7* or +2.9 *1* from (n,n′γ) (2017Mu03). B(M1)(W.u.)=0.0096 *+34−22* if M1, B(E2)(W.u.)=55 *+20−13* if E2.
		611.72 *4*	67.9 *33*	1409.982	4^+	M1+E2	+0.50 *8*	0.000965 *25*	α(K)=0.000862 *22*; α(L)=8.88×10^{-5} *23*; α(M)=1.326×10^{-5} *35* α(N)=8.68×10^{-7} *22* B(M1)(W.u.)=0.018 *+6−4*; B(E2)(W.u.)=16 *+7−5* δ: from $\gamma\gamma(\theta)$ in (^{76}Ge,^{76}Ge′).
		913.2 *4*	100 *4*	1108.416	2^+	E2		0.000440 *6*	B(E2)(W.u.)=16 *+6−3* α(K)=0.000394 *6*; α(L)=4.04×10^{-5} *6*; α(M)=6.03×10^{-6} *8* α(N)=3.93×10^{-7} *6* E_γ: from (^{76}Ge,^{76}Ge′γ). Other: 913.2 *5* in (n,n′γ). Eγ=911.40 *11* from β^- decay is inconsistent.
2203.84	(1,2^+)	1097.4 *5*		1108.416	2^+				
		2203.79		0.0	0^+				
2284.22	$(3)^-$	1175.7 *5*	100	1108.416	2^+				
2453.74	6^+	1043.75 *5*	100	1409.982	4^+	E2		0.000320 *4*	B(E2)(W.u.)=51 *+26−15* α(K)=0.000286 *4*; α(L)=2.93×10^{-5} *4*; α(M)=4.37×10^{-6} *6* α(N)=2.86×10^{-7} *4*
2478.2	(1,2^+)	1915 *1*		562.917	2^+				
		2478.2 *5*		0.0	0^+				
2487.07	5^+	465.33 *10*	10.9 *10*	2021.68	4^+	M1+E2		0.0023 *7*	α(K)=0.0020 *6*; α(L)=2.1×10^{-4} *6*; α(M)=3.2×10^{-5} *9* α(N)=2.1×10^{-6} *6* δ: +0.65 *+93−18* or +1.4 *10* (2017Mu03) in (n,n′γ). B(M1)(W.u.)=0.020 *+8−7* if M1, B(E2)(W.u.)=123 *+46−42* if E2.
		947.77 *17*	100.0 *33*	1539.383	3^+	E2		0.000402 *6*	α(K)=0.000359 *5*; α(L)=3.69×10^{-5} *5*; α(M)=5.51×10^{-6} *8* α(N)=3.59×10^{-7} *5* B(E2)(W.u.)=32 *+12−11*
		1077.2[d] *4*	5 *5*	1409.982	4^+	[M1,E2]		0.000282 *16*	α(K)=0.000252 *14*; α(L)=2.57×10^{-5} *15*; α(M)=3.84×10^{-6} *23* α(N)=2.52×10^{-7} *14* B(M1)(W.u.)<0.002 if M1, B(E2)(W.u.)<2.3 if E2.
2504.10	2^+	964.68 *5*	16.0 *14*	1539.383	3^+	E2+M1		0.000360 *26*	α(K)=0.000322 *23*; α(L)=3.29×10^{-5} *25*; α(M)=4.9×10^{-6} *4* α(N)=3.22×10^{-7} *23* δ: +2.8 *+11−8* or +0.57 *+18−12* (2017Mu03) in (n,n′γ). B(M1)(W.u.)=0.0033 *+40−15* if M1, B(E2)(W.u.)=5 *+6−2* if E2.
		1094.22 *12*	20.2 *14*	1409.982	4^+	E2		0.000287 *4*	α(K)=0.000257 *4*; α(L)=2.62×10^{-5} *4*; α(M)=3.92×10^{-6} *5*

$^{76}_{32}Ge_{44}$-12

Adopted Levels, Gammas (continued)

$\gamma(^{76}$Ge) (continued)

E_i(level)	J^{π}_i	E_γ [‡]	I_γ [‡]	E_f	J^{π}_f	Mult. [#]	δ [#]	α [†]	Comments
									α(N)=2.56×10^{-7} *4* B(E2)(W.u.)=3.2 *+38−14*
2504.10	2$^+$	1395.66 *5*	100 *5*	1108.416	2$^+$	E2+M1		0.000210 *11*	α(K)=0.000147 *5*; α(L)=1.49×10^{-5} *5*; α(M)=2.23×10^{-6} *7* α(N)=1.47×10^{-7} *4*; α(IPF)=4.6×10^{-5} *6* δ: +1.9 *2* or +0.08 *4* (2017Mu03) in (n,n′γ). B(M1)(W.u.)=0.007 *+8−3* if M1, B(E2)(W.u.)=5 *+6−2* if E2.
		2504.08 *6*	35.3 *17*	0.0	0$^+$	E2		0.000611 *9*	B(E2)(W.u.)=0.09 *+11−4* α(K)=5.04×10^{-5} *7*; α(L)=5.09×10^{-6} *7*; α(M)=7.59×10^{-7} *11* α(N)=5.02×10^{-8} *7*; α(IPF)=0.000555 *8*
2591.04	(1$^+$,2$^+$)	1051.7 *2*	95 *14*	1539.383	3$^+$				
		1482.5 *3*	100 *15*	1108.416	2$^+$				
		2591.0 *4*	55 *10*	0.0	0$^+$				
2654.51	(0$^+$,1$^+$)	1546.0 *4*	100 *20*	1108.416	2$^+$				
		2091.9 *4*	42 *10*	562.917	2$^+$				
2655.15	(1)	2655.1 *3*		0.0	0$^+$				
2669.12	3$^+$,4$^+$	647.44 *4*	25.6 *20*	2021.68	4$^+$	M1+E2		0.00094 *16*	α(K)=0.00084 *14*; α(L)=8.6×10^{-5} *15*; α(M)=1.29×10^{-5} *22* α(N)=8.4×10^{-7} *14* δ: −0.01 *10* or +1.1 *2* (2017Mu03) in (n,n′γ). B(M1)(W.u.)=0.0059 *+28−24* if M1, B(E2)(W.u.)=19 *+9−8* if E2.
		1129.79 *10*	100 *6*	1539.383	3$^+$	M1(+E2)	+0.01 *2*	0.0002434 *34*	α(K)=0.0002166 *30*; α(L)=2.200×10^{-5} *31*; α(M)=3.29×10^{-6} *5* α(N)=2.171×10^{-7} *30*; α(IPF)=1.330×10^{-6} *19* B(M1)(W.u.)=0.0043 *+23−20*; B(E2)(W.u.)<0.0063
		1259.12 *5*	59.7 *22*	1409.982	4$^+$	M1+E2		0.000219 *10*	α(K)=0.000181 *7*; α(L)=1.84×10^{-5} *8*; α(M)=2.75×10^{-6} *11* α(N)=1.81×10^{-7} *7*; α(IPF)=1.66×10^{-5} *25* δ: −0.002 *63* or +1.09 *2* (2017Mu03) in (n,n′γ). B(M1)(W.u.)=0.0019 *+9−8* if M1, B(E2)(W.u.)=1.6 *+8−6* if E2.
2692.347	3$^-$	1282.36[c] *4*	<14[c]	1409.982	4$^+$	E1		0.0002001 *28*	B(E1)(W.u.)<1.4×10^{-4} α(K)=8.68×10^{-5} *12*; α(L)=8.77×10^{-6} *12*; α(M)=1.308×10^{-6} *18* α(N)=8.60×10^{-8} *12*; α(IPF)=0.0001032 *14*
		1583.93 *3*	6.5 *7*	1108.416	2$^+$	E1		0.000388 *5*	B(E1)(W.u.)=3.16×10^{-5} *+48−43* α(K)=6.09×10^{-5} *9*; α(L)=6.14×10^{-6} *9*; α(M)=9.16×10^{-7} *13* α(N)=6.03×10^{-8} *8*; α(IPF)=0.000320 *4*
		2129.38 *6*	100 *3*	562.917	2$^+$	E1		0.000765 *11*	B(E1)(W.u.)=2.00×10^{-4} *+21−18* α(K)=3.86×10^{-5} *5*; α(L)=3.88×10^{-6} *5*; α(M)=5.80×10^{-7} *8* α(N)=3.82×10^{-8} *5*; α(IPF)=0.000722 *10*
		2691.6[d] *4*	6.9 *18*	0.0	0$^+$	[E3]		0.000501 *7*	α(K)=6.77×10^{-5} *9*; α(L)=6.86×10^{-6} *10*; α(M)=1.024×10^{-6}

Adopted Levels, Gammas (continued)

$\gamma(^{76}Ge)$ (continued)

E_i(level)	J^{π}_i	E_{γ}‡	I_{γ}‡	E_f	J^{π}_f	Mult.#	δ#	α†	Comments
									14 α(N)=6.77×10^{-8} *9*; α(IPF)=0.000425 *6* Tentative B(E3)(W.u.)=700 *350*. I_{γ}: this value is questionable since reduced transition probability is 9.4 W.u. in (p,p′); and 11.7 W.u. in (α,α′), which suggest Iγ≈0.1. This γ ray was reported in ^{76}Ga β^- decay only, where it may have been contributed mainly by a sum line. B(E3)(W.u.)=1.22×10^{3} *32* exceeds RUL=100.
2697.20	(0)$^+$	1588.76 *4*	26.7 *13*	1108.416	2$^+$	E2		0.0002517 *35*	α(K)=0.0001163 *16*; α(L)=1.181×10^{-5} *17*; α(M)=1.762×10^{-6} *25* α(N)=1.160×10^{-7} *16*; α(IPF)=0.0001217 *17* B(E2)(W.u.)=0.88 *+32−29*
		2134.25 *5*	100 *4*	562.917	2$^+$	E2		0.000451 *6*	α(K)=6.67×10^{-5} *9*; α(L)=6.75×10^{-6} *9*; α(M)=1.007×10^{-6} *14* α(N)=6.65×10^{-8} *9*; α(IPF)=0.000376 *5* B(E2)(W.u.)=0.75 *+27−25*
2733.23	4$^+$	1193.92 *12*	63 *27*	1539.383	3$^+$	E2+M1		0.000233 *11*	α(K)=0.000202 *9*; α(L)=2.06×10^{-5} *10*; α(M)=3.08×10^{-6} *14* α(N)=2.02×10^{-7} *9*; α(IPF)=6.7×10^{-6} *11* δ: +4.3 *9* or +0.36 *+6−5* (2017Mu03) in (n,n′γ). B(M1)(W.u.)=0.015 *+6−5* if M1, B(E2)(W.u.)=14 *+6−5* if E2.
		1624.78 *5*	100 *4*	1108.416	2$^+$	E2		0.000262 *4*	α(K)=0.0001113 *16*; α(L)=1.129×10^{-5} *16*; α(M)=1.686×10^{-6} *24* α(N)=1.110×10^{-7} *16*; α(IPF)=0.0001372 *19* B(E2)(W.u.)=4.9 *+20−11*
2747.75	(2)$^+$	1208.19 *17*	32 *5*	1539.383	3$^+$	M1+E2	+0.09 *5*	0.0002191 *31*	α(K)=0.0001896 *27*; α(L)=1.924×10^{-5} *27*; α(M)=2.87×10^{-6} *4* α(N)=1.899×10^{-7} *27*; α(IPF)=7.17×10^{-6} *11* B(M1)(W.u.)=0.0155 *+28−26*; B(E2)(W.u.)=0.12 *+16−9*
		1639.31 *5*	100.0 *24*	1108.416	2$^+$	M1(+E2)	−0.002 *29*	0.0002321 *32*	α(K)=0.0001053 *15*; α(L)=1.065×10^{-5} *15*; α(M)=1.590×10^{-6} *22* α(N)=1.052×10^{-7} *15*; α(IPF)=0.0001145 *16* B(M1)(W.u.)=0.0195 *+36−29*; B(E2)(W.u.)<0.011
		2185.02 *19*	8.5 *7*	562.917	2$^+$	M1+E2		0.000442 *31*	α(K)=6.32×10^{-5} *12*; α(L)=6.38×10^{-6} *12*; α(M)=9.53×10^{-7} *18* α(N)=6.30×10^{-8} *11*; α(IPF)=0.000371 *30* δ: +2.9 *+23−11* or −0.07 *+15−6* (2017Mu03) in (n,n′γ). B(M1)(W.u.)=7.0×10^{-4} *+11−9* if M1, B(E2)(W.u.)=0.198 *+32−26* if E2.
2766.68	2$^+$	2203.71 *6*	100 *4*	562.917	2$^+$	E2+M1	−0.09 *2*	0.000419 *6*	α(K)=6.15×10^{-5} *9*; α(L)=6.21×10^{-6} *9*; α(M)=9.27×10^{-7} *13* α(N)=6.14×10^{-8} *9*; α(IPF)=0.000350 *5*

$^{76}_{32}Ge_{44}$-14

$\gamma(^{76}Ge)$ (continued)

E_i(level)	J^π_i	E_γ[‡]	I_γ[‡]	E_f	J^π_f	Mult.[#]	δ[#]	α[†]	Comments
									B(M1)(W.u.)=0.136 +23−17; B(E2)(W.u.)=0.31 +17−13 E_γ,I_γ: from (n,n′γ). δ: from (n,n′γ).
2766.68	2^+	2766.65 *8*	2.7 *8*	0.0	0^+	E2		0.000724 *10*	α(K)=4.26×10⁻⁵ *6*; α(L)=4.30×10⁻⁶ *6*; α(M)=6.41×10⁻⁷ *9* α(N)=4.24×10⁻⁸ *6*; α(IPF)=0.000676 *9* B(E2)(W.u.)=0.33 +12−10 E_γ,I_γ: from (n,n′γ).
2768.73	2^+	1358.9 *6*	24 *8*	1409.982	4^+				
		1660.30 *14*	100 *7*	1108.416	2^+				
2841.61	2^+	1732.97 *16*	100 *4*	1108.416	2^+	E2+M1	+0.01 +3−2	0.000255 *4*	α(K)=9.49×10⁻⁵ *13*; α(L)=9.60×10⁻⁶ *13*; α(M)=1.433×10⁻⁶ *20* α(N)=9.48×10⁻⁸ *13*; α(IPF)=0.0001494 *21* B(M1)(W.u.)=0.100 +20−16; B(E2)(W.u.)<0.086
		2278.82 *14*	52 *9*	562.917	2^+	E2+M1		0.000480 *33*	α(K)=5.87×10⁻⁵ *11*; α(L)=5.93×10⁻⁶ *11*; α(M)=8.84×10⁻⁷ *17* α(N)=5.85×10⁻⁸ *10*; α(IPF)=0.000415 *32* δ: +3.0 +9−5 or −0.08 *6* (2017Mu03) in (n,n′γ). B(M1)(W.u.)=0.0230 +37−35 if M1, B(E2)(W.u.)=6.0 +10−9 if E2.
2856.79	4^+	1446.79 *9*	100	1409.982	4^+	M1(+E2)	−0.08 *8*	0.0002012 *28*	α(K)=0.0001334 *19*; α(L)=1.351×10⁻⁵ *19*; α(M)=2.017×10⁻⁶ *28* α(N)=1.334×10⁻⁷ *19*; α(IPF)=5.22×10⁻⁵ *8* B(M1)(W.u.)=0.075 *7*; B(E2)(W.u.)<1.3
2897.55	0^+	1789.23 *13*	38.1 *19*	1108.416	2^+	E2		0.000314 *4*	α(K)=9.24×10⁻⁵ *13*; α(L)=9.36×10⁻⁶ *13*; α(M)=1.397×10⁻⁶ *20* α(N)=9.21×10⁻⁸ *13*; α(IPF)=0.0002105 *29* B(E2)(W.u.)=1.44 +25−23
		2334.51 *11*	100 *4*	562.917	2^+	E2		0.000537 *8*	α(K)=5.69×10⁻⁵ *8*; α(L)=5.75×10⁻⁶ *8*; α(M)=8.58×10⁻⁷ *12* α(N)=5.67×10⁻⁸ *8*; α(IPF)=0.000474 *7* B(E2)(W.u.)=1.00 *16*
2919.74	1^+	1811.22 *18*	14 *5*	1108.416	2^+	M1+E2	−0.8 +63−6	0.000295 *26*	α(K)=8.86×10⁻⁵ *20*; α(L)=8.96×10⁻⁶ *22*; α(M)=1.338×10⁻⁶ *32* α(N)=8.84×10⁻⁸ *19*; α(IPF)=0.000196 *24* B(M1)(W.u.)=0.0015 +21−14; B(E2)(W.u.)<1.4
		2356.81 *13*	27.4 *12*	562.917	2^+	M1+E2	+1.3 +50−9	0.000522 *34*	α(K)=5.55×10⁻⁵ *10*; α(L)=5.60×10⁻⁶ *10*; α(M)=8.36×10⁻⁷ *15* α(N)=5.53×10⁻⁸ *10*; α(IPF)=0.000460 *33* B(M1)(W.u.)=8×10⁻⁴ +11−6; B(E2)(W.u.)=0.32 +15−26
		2919.72 *13*	100 *4*	0.0	0^+	M1		0.000705 *10*	α(K)=3.81×10⁻⁵ *5*; α(L)=3.83×10⁻⁶ *5*; α(M)=5.72×10⁻⁷ *8* α(N)=3.79×10⁻⁸ *5*; α(IPF)=0.000662 *9* B(M1)(W.u.)=0.00406 +44−37

$^{76}_{32}Ge_{44}$-15

γ(^{76}Ge) (continued)

E_i(level)	J^{π}_i	E_{γ}[‡]	I_{γ}[‡]	E_f	J^{π}_f	Mult.[#]	δ[#]	α[†]	Comments
2958.06	5^-	265.3 *5*	3.6 *6*	2692.347	3^-	E2		0.01991 *31*	α(K)=0.01768 *27*; α(L)=0.001930 *30*; α(M)=0.000287 *4* α(N)=1.745×10^{-5} *27*
		1548.02 *18*	100 *4*	1409.982	4^+	E1		0.000362 *5*	α(K)=6.32×10^{-5} *9*; α(L)=6.37×10^{-6} *9*; α(M)=9.51×10^{-7} *13* α(N)=6.26×10^{-8} *9*; α(IPF)=0.000291 *4*
2986.08	(2^+,3^+)	1576.02 *8*	23.2 *14*	1409.982	4^+	[E2]		0.0002484 *35*	α(K)=0.0001182 *17*; α(L)=1.200×10^{-5} *17*; α(M)=1.791×10^{-6} *25* α(N)=1.179×10^{-7} *16*; α(IPF)=0.0001163 *16* B(E2)(W.u.)=5.7 *+6−5*
		1877.76 *12*	100 *4*	1108.416	2^+	[M1,E2]		0.000323 *24*	α(K)=8.32×10^{-5} *17*; α(L)=8.41×10^{-6} *18*; α(M)=1.255×10^{-6} *26* α(N)=8.29×10^{-8} *16*; α(IPF)=0.000230 *22* B(M1)(W.u.)=0.0270 *+18−16* if M1, B(E2)(W.u.)=10.4 *7* if E2.
2988.09		319.0[a] *3*	100	2669.12	3^+,4^+				
		500.9[a] *4*	8 *3*	2487.07	5^+				
		534.4[a] *4*	25 *10*	2453.74	6^+				
2993.89	4^+	972.30 *6*	86.3 *34*	2021.68	4^+	M1+E2	−0.61 *+7−5*	0.000342 *5*	α(K)=0.000306 *5*; α(L)=3.12×10^{-5} *5*; α(M)=4.66×10^{-6} *7* α(N)=3.07×10^{-7} *5* B(M1)(W.u.)=0.0149 *+32−30*; B(E2)(W.u.)=7.9 *+18−22* δ: −5.2 *+75−36* or −0.08 *+13−59* (2017Mu03) in (n,n′γ).
		1454.37 *9*	15.8 *16*	1539.383	3^+	M1+E2		0.000213 *12*	α(K)=0.000135 *4*; α(L)=1.37×10^{-5} *4*; α(M)=2.05×10^{-6} *6* α(N)=1.35×10^{-7} *4*; α(IPF)=6.2×10^{-5} *8* B(M1)(W.u.)=0.00111 *25* if M1, B(E2)(W.u.)=0.71 *16* if E2.
		2430.91 *5*	100 *5*	562.917	2^+	E2		0.000579 *8*	α(K)=5.31×10^{-5} *7*; α(L)=5.36×10^{-6} *7*; α(M)=7.99×10^{-7} *11* α(N)=5.28×10^{-8} *7*; α(IPF)=0.000520 *7* B(E2)(W.u.)=0.35 *7*
3004.73	$(0)^+$	2441.77 *7*	100	562.917	2^+	E2		0.000584 *8*	α(K)=5.27×10^{-5} *7*; α(L)=5.32×10^{-6} *7*; α(M)=7.93×10^{-7} *11* α(N)=5.24×10^{-8} *7*; α(IPF)=0.000525 *7* B(E2)(W.u.)=1.59 *24*
3007.16	1^+	1898.73 *6*	100 *4*	1108.416	2^+	M1(+E2)	−0.8 *+18−7*	0.000325 *15*	α(K)=8.12×10^{-5} *13*; α(L)=8.21×10^{-6} *14*; α(M)=1.226×10^{-6} *21* α(N)=8.10×10^{-8} *13*; α(IPF)=0.000234 *14* B(M1)(W.u.)=0.07 *+11−4*; B(E2)(W.u.)<45

γ(^{76}Ge) (continued)

E_i(level)	J^π_i	E_γ[‡]	I_γ[‡]	E_f	J^π_f	Mult.[#]	δ[#]	α[†]	Comments
3007.16	1^+	3007.02 *13*	57.7 *29*	0.0	0^+	M1		0.000739 *10*	α(K)=3.63×10^{-5} *5*; α(L)=3.65×10^{-6} *5*; α(M)=5.45×10^{-7} *8* α(N)=3.61×10^{-8} *5*; α(IPF)=0.000699 *10* B(M1)(W.u.)=0.016 +*10*−*4*
3014.2	1	3014.1 *4*	100	0.0	0^+				
3021.14	(2^+,3^+)	1481.73 *9*	78 *4*	1539.383	3^+	[M1,E2]		0.000216 *13*	α(K)=0.000131 *4*; α(L)=1.32×10^{-5} *4*; α(M)=1.98×10^{-6} *6* α(N)=1.304×10^{-7} *35*; α(IPF)=7.1×10^{-5} *9* B(M1)(W.u.)=0.0073 *9* if M1, B(E2)(W.u.)=4.5 *6* if E2.
		1611.36 *16*	33.5 *19*	1409.982	4^+	[E2]		0.000258 *4*	α(K)=0.0001131 *16*; α(L)=1.148×10^{-5} *16*; α(M)=1.713×10^{-6} *24* α(N)=1.128×10^{-7} *16*; α(IPF)=0.0001314 *18* B(E2)(W.u.)=1.27 *17*
		1912.59 *13*	100 *4*	1108.416	2^+	[M1,E2]		0.000335 *25*	α(K)=8.04×10^{-5} *16*; α(L)=8.13×10^{-6} *17*; α(M)=1.213×10^{-6} *25* α(N)=8.02×10^{-8} *15*; α(IPF)=0.000245 *23* B(M1)(W.u.)=0.0044 *6* if M1, B(E2)(W.u.)=1.60 *20* if E2.
3033.75	(6^+)	546.6[a] *4*	20 *20*	2487.07	5^+				
		580.1[a] *4*	60 *15*	2453.74	6^+	(M1+E2)	+1 *4*	0.00125 *23*	α(K)=0.00111 *21*; α(L)=0.000116 *22*; α(M)=1.72×10^{-5} *33* α(N)=1.12×10^{-6} *20*
		1012.2[a] *4*	100	2021.68	4^+				
		1623.8[a] *4*	40 *15*	1409.982	4^+				
3041.37	2^+	1130.24		1911.12	0^+				
		2478.8 *11*	100	562.917	2^+	[M1,E2]		0.00056 *4*	α(K)=5.07×10^{-5} *9*; α(L)=5.12×10^{-6} *9*; α(M)=7.64×10^{-7} *14* α(N)=5.05×10^{-8} *9*; α(IPF)=0.00051 *4* B(M1)(W.u.)=0.0227 +*16*−*14* if M1, B(E2)(W.u.)=4.95 +*35*−*31* if E2.
3052.55	2^+,3^+,4^+	1513.15 *9*	100	1539.383	3^+	M1+E2		0.000221 *14*	α(K)=0.0001253 *34*; α(L)=1.27×10^{-5} *4*; α(M)=1.90×10^{-6} *5* α(N)=1.251×10^{-7} *32*; α(IPF)=8.1×10^{-5} *10* δ: −0.05 +*6*−*5* or +1.64 *2* (2017Mu03) in (n,n′γ). B(M1)(W.u.)=0.182 +*31*−*23* if M1, B(E2)(W.u.)=107 +*18*−*14* if E2.
3062.13	(4^+,5^+)	1652.13 *8*	100	1409.982	4^+	[M1,E2]		0.000252 *18*	α(K)=0.0001057 *25*; α(L)=1.071×10^{-5} *26*; α(M)=1.60×10^{-6} *4* α(N)=1.055×10^{-7} *24*; α(IPF)=0.000134 *15* B(M1)(W.u.)=0.040 +*9*−*6* if M1, B(E2)(W.u.)=19.7 +*44*−*31* if E2.
3066.86	(2^+,3^+,4^+)	1527.46 *9*	100	1539.383	3^+	[M1,E2]		0.000224 *14*	α(K)=0.0001230 *33*; α(L)=1.248×10^{-5} *35*; α(M)=1.86×10^{-6} *5* α(N)=1.228×10^{-7} *31*; α(IPF)=8.6×10^{-5} *10* B(M1)(W.u.)=0.0069 +*31*−*26* if M1, B(E2)(W.u.)=4.0 +*18*−*15* if E2.
3070.41	4^+	1660.41 *10*	100	1409.982	4^+	M1+E2		0.000254 *18*	α(K)=0.0001047 *24*; α(L)=1.061×10^{-5} *26*; α(M)=1.58×10^{-6} *4* α(N)=1.045×10^{-7} *23*; α(IPF)=0.000137 *15*

$^{76}_{32}$Ge$_{44}$-17

Adopted Levels, Gammas (continued)

$\gamma(^{76}$Ge) (continued)

E_i(level)	J^π_i	E_γ[‡]	I_γ[‡]	E_f	J^π_f	Mult.[#]	α[†]	Comments
								δ: −0.13 *8* or +1.5 *3* (2017Mu03) in (n,n′γ). B(M1)(W.u.)=0.0063 +*25*−*23* if M1, B(E2)(W.u.)=3.1 +*12*−*11* if E2.
3088.4	1	3088.3 *7*	100	0.0	0^+			
3092.10	$(3^+,5^+)$	1682.10 *9*	100	1409.982	4^+	[M1,E2]	0.000260 *18*	α(K)=0.0001022 *23*; α(L)=1.035×10^{-5} *25*; α(M)=1.54×10^{-6} *4* α(N)=1.020×10^{-7} *22*; α(IPF)=0.000146 *16* B(M1)(W.u.)=0.0173 *24* if M1, B(E2)(W.u.)=8.2 *11* if E2.
3129.86	2^+	2022.4 *9*	100 *4*	1108.416	2^+	M1+E2	0.000377 *27*	α(K)=7.26×10^{-5} *14*; α(L)=7.34×10^{-6} *15*; α(M)=1.095×10^{-6} *22* α(N)=7.24×10^{-8} *13*; α(IPF)=0.000296 *26* δ: −0.31 +*5*−*6* or +10 +*11*−*3* (2017Mu03) in (n,n′γ). B(M1)(W.u.)=0.0092 +*10*−*9* if M1, B(E2)(W.u.)=3.03 +*34*−*29* if E2.
		3129.78 *8*	17.8 *11*	0.0	0^+	E2	0.000874 *12*	α(K)=3.48×10^{-5} *5*; α(L)=3.51×10^{-6} *5*; α(M)=5.23×10^{-7} *7* α(N)=3.46×10^{-8} *5*; α(IPF)=0.000835 *12* B(E2)(W.u.)=0.061 +*8*−*7*
3141.39	1^+	1230.2[@d] *5*		1911.12	0^+			
		2578.48 *8*	58 *6*	562.917	2^+	M1+E2	0.00061 *4*	α(K)=4.74×10^{-5} *9*; α(L)=4.78×10^{-6} *9*; α(M)=7.14×10^{-7} *13* α(N)=4.72×10^{-8} *8*; α(IPF)=0.00055 *4* δ: +0.7 +*150*−*10* or +3 +*13*−*3* (2017Mu03) in (n,n′γ). B(M1)(W.u.)=0.00396 +*44*−*51* if M1, B(E2)(W.u.)=0.80 +*9*−*10* if E2.
		3141.24 *8*	100.0 *18*	0.0	0^+	M1	0.000791 *11*	B(M1)(W.u.)=0.00378 +*39*−*43* α(K)=3.38×10^{-5} *5*; α(L)=3.40×10^{-6} *5*; α(M)=5.07×10^{-7} *7* α(N)=3.36×10^{-8} *5*; α(IPF)=0.000754 *11*
3147.54	$(2)^+$	1608.29 *13*	100.0 *21*	1539.383	3^+	[M1,E2]	0.000241 *16*	α(K)=0.0001113 *27*; α(L)=1.128×10^{-5} *29*; α(M)=1.68×10^{-6} *4* α(N)=1.111×10^{-7} *26*; α(IPF)=0.000117 *13* B(M1)(W.u.)=0.0284 +*35*−*29* if M1, B(E2)(W.u.)=14.8 +*18*−*15* if E2.
		2038.2 *7*	13.3 *16*	1108.416	2^+	[M1,E2]	0.000383 *28*	α(K)=7.16×10^{-5} *14*; α(L)=7.24×10^{-6} *14*; α(M)=1.080×10^{-6} *21* α(N)=7.14×10^{-8} *13*; α(IPF)=0.000303 *26* B(M1)(W.u.)=0.00186 +*31*−*27* if M1, B(E2)(W.u.)=0.60 +*10*−*9* if E2.
		2584.41 *15*	44.7 *19*	562.917	2^+	[M1,E2]	0.00061 *4*	α(K)=4.72×10^{-5} *9*; α(L)=4.76×10^{-6} *9*; α(M)=7.11×10^{-7} *13* α(N)=4.70×10^{-8} *8*; α(IPF)=0.00056 *4* B(M1)(W.u.)=0.00306 +*39*−*33* if M1, B(E2)(W.u.)=0.62 +*8*−*7* if E2.
3162.65	$(4)^+$	1752.65 *5*	100	1409.982	4^+	E2+M1	0.000281 *21*	α(K)=9.45×10^{-5} *21*; α(L)=9.57×10^{-6} *22*; α(M)=1.428×10^{-6} *32* α(N)=9.43×10^{-8} *20*; α(IPF)=0.000175 *19* δ: −0.09 *9* or +1.4 *3* (2017Mu03) in (n,n′γ). B(M1)(W.u.)=0.280 +*47*−*35* if M1, B(E2)(W.u.)=123 +*21*−*15* if E2.
3181.95	$(2^+,3^+)$	489.73 *9*	33.5 *26*	2692.347	3^-	[E1]	0.000741 *10*	α(K)=0.000662 *9*; α(L)=6.76×10^{-5} *9*; α(M)=1.007×10^{-5} *14* α(N)=6.54×10^{-7} *9* B(E1)(W.u.)=0.0014 +*6*−*5*
		2618.93 *6*	100 *5*	562.917	2^+	[M1,E2]	0.00062 *4*	α(K)=4.62×10^{-5} *8*; α(L)=4.66×10^{-6} *9*; α(M)=6.95×10^{-7} *13* α(N)=4.60×10^{-8} *8*; α(IPF)=0.00057 *4* B(M1)(W.u.)=0.0016 +*7*−*6* if M1, B(E2)(W.u.)=0.31 +*13*−*12* if E2.

$^{76}_{32}$Ge$_{44}$-18

$\gamma(^{76}Ge)$ (continued)

E_i(level)	J^π_i	E_γ [‡]	I_γ [‡]	E_f	J^π_f	Mult. [#]	δ [#]	α [†]	Comments
3182.19	(2^+)	1642.80 *15*	22 *2*	1539.383	3^+	[M1,E2]		0.000250 *17*	α(K)=0.0001069 *25*; α(L)=1.083×10^{-5} *27*; α(M)=1.62×10^{-6} *4* α(N)=1.067×10^{-7} *24*; α(IPF)=0.000130 *15* B(M1)(W.u.)=0.0025 *+21−13* if M1, B(E2)(W.u.)=1.2 *+11−6* if E2.
		2073.75 *7*	100 *3*	1108.416	2^+	[M1,E2]		0.000397 *28*	α(K)=6.94×10^{-5} *13*; α(L)=7.01×10^{-6} *14*; α(M)=1.047×10^{-6} *20* α(N)=6.92×10^{-8} *13*; α(IPF)=0.000319 *27* B(M1)(W.u.)=0.0056 *+47−28* if M1, B(E2)(W.u.)=1.8 *+15−9* if E2.
		2619.20 *10*	53	562.917	2^+	[M1,E2]		0.00062 *4*	α(K)=4.62×10^{-5} *8*; α(L)=4.66×10^{-6} *9*; α(M)=6.95×10^{-7} *13* α(N)=4.60×10^{-8} *8*; α(IPF)=0.00057 *4* B(M1)(W.u.)=0.0015 *+12−8* if M1, B(E2)(W.u.)=0.29 *+24−15* if E2.
3191.05	2^+	2082.51 *9*	34.2 *25*	1108.416	2^+	M1+E2		0.000400 *29*	α(K)=6.89×10^{-5} *13*; α(L)=6.96×10^{-6} *14*; α(M)=1.039×10^{-6} *20* α(N)=6.87×10^{-8} *13*; α(IPF)=0.000324 *27* δ: −3 *+13−3* or −1 *+20−1* (2017Mu03) in (n,n′γ). B(M1)(W.u.)=0.0044 *+6−5* if M1, B(E2)(W.u.)=1.36 *+19−16* if E2.
		2628.08 *12*	100 *4*	562.917	2^+	M1+E2		0.00063 *4*	α(K)=4.59×10^{-5} *8*; α(L)=4.63×10^{-6} *9*; α(M)=6.91×10^{-7} *13* α(N)=4.57×10^{-8} *8*; α(IPF)=0.00058 *4* δ: +0.36 *+21−10* or +1.03 *+25−81* (2017Mu03) in (n,n′γ). B(M1)(W.u.)=0.0064 *+8−7* if M1, B(E2)(W.u.)=1.25 *+16−13* if E2.
		3190.99 *4*	13.8 *13*	0.0	0^+	E2		0.000898 *13*	α(K)=3.37×10^{-5} *5*; α(L)=3.40×10^{-6} *5*; α(M)=5.07×10^{-7} *7* α(N)=3.35×10^{-8} *5*; α(IPF)=0.000860 *12* B(E2)(W.u.)=0.065 *+10−9*
3200.01	$(3)^+$	2091.67 *14*	82 *4*	1108.416	2^+	M1+E2		0.000404 *29*	α(K)=6.83×10^{-5} *13*; α(L)=6.90×10^{-6} *13*; α(M)=1.030×10^{-6} *20* α(N)=6.81×10^{-8} *12*; α(IPF)=0.000328 *28* δ: +0.05 *+9−1* or −7 *+14−3* (2017Mu03) in (n,n′γ). B(M1)(W.u.)=0.0016 *+13−8* if M1, B(E2)(W.u.)=0.48 *+38−24* if E2.
		2636.64 *27*	100 *4*	562.917	2^+	M1+E2		0.00063 *4*	α(K)=4.57×10^{-5} *8*; α(L)=4.60×10^{-6} *8*; α(M)=6.87×10^{-7} *13* α(N)=4.55×10^{-8} *8*; α(IPF)=0.00058 *4* δ: −8 *+13−3* or +0.08 *8* in (n,n′γ). B(M1)(W.u.)=9×10^{-4} *+8−5* if M1, B(E2)(W.u.)=0.18 *+15−9* if E2.
3200.07	$(1,2^+)$	3200.0 *2*		0.0	0^+				
3231.8	4^+	2668.8 [&d] *4*	100	562.917	2^+				
3236.02	$(5)^+$	782.1 [a] *4*		2453.74	6^+				I_γ: I(782.1γ)/I(1826γ)=100/40 in (^{76}Ge,^{76}Ge′).

$^{76}_{32}Ge_{44}$-19

$\gamma(^{76}Ge)$ (continued)

E_i(level)	J^{π}_i	E_{γ} ‡	I_{γ} ‡	E_f	J^{π}_f	Mult. #	δ #	α †	Comments
3236.02	$(5)^+$	1214.23 *11*	85 *4*	2021.68	4^+	M1+E2	+2.2 *+31−18*	0.000235 *15*	α(K)=0.000201 *11*; α(L)=2.05×10^{-5} *12*; α(M)=3.05×10^{-6} *18* α(N)=2.00×10^{-7} *11*; α(IPF)=1.03×10^{-5} *20* B(M1)(W.u.)<0.13; B(E2)(W.u.)=140 *+26−96*
		1826.15 *12*	100 *4*	1409.982	4^+	M1+E2		0.000305 *23*	α(K)=8.76×10^{-5} *18*; α(L)=8.86×10^{-6} *19*; α(M)=1.322×10^{-6} *29* α(N)=8.73×10^{-8} *17*; α(IPF)=0.000207 *21* δ: +0.48 *+13−20* or +1.9 *+10−17* (2017Mu03) in (n,n′γ). B(M1)(W.u.)=0.064 *7* if M1, B(E2)(W.u.)=25.8 *28* if E2.
3243.79	1^+	2680.90 *10*	100 *5*	562.917	2^+	M1+E2		0.00065 *4*	α(K)=4.44×10^{-5} *8*; α(L)=4.48×10^{-6} *8*; α(M)=6.68×10^{-7} *12* α(N)=4.42×10^{-8} *8*; α(IPF)=0.00060 *4* δ: −4 *+60−2* or +0.04 *2* (2017Mu03) in (n,n′γ). B(M1)(W.u.)=0.0239 *+18−20* if M1, B(E2)(W.u.)=4.47 *+33−37* if E2.
		3243.66 *9*	16.8 *12*	0.0	0^+	M1		0.000830 *12*	α(K)=3.20×10^{-5} *4*; α(L)=3.22×10^{-6} *5*; α(M)=4.81×10^{-7} *7* α(N)=3.19×10^{-8} *4*; α(IPF)=0.000795 *11* B(M1)(W.u.)=0.00226 *24*
3312.29	3^-	1902.2 *2*	31 *3*	1409.982	4^+				
		2203.86 *16*	100 *8*	1108.416	2^+				
3322.80	(2^+)	1912.7 *1*	26 *2*	1409.982	4^+	[E2]		0.000359 *5*	α(K)=8.15×10^{-5} *11*; α(L)=8.25×10^{-6} *12*; α(M)=1.232×10^{-6} *17* α(N)=8.12×10^{-8} *11*; α(IPF)=0.000268 *4* B(E2)(W.u.)=1.1 *+7−5*
		2214.36 *8*	100 *3*	1108.416	2^+	[M1,E2]		0.000454 *32*	α(K)=6.18×10^{-5} *11*; α(L)=6.23×10^{-6} *12*; α(M)=9.31×10^{-7} *18* α(N)=6.15×10^{-8} *11*; α(IPF)=0.000385 *31* B(M1)(W.u.)=0.0072 *+45−31* if M1, B(E2)(W.u.)=2.0 *+12−9* if E2.
		2759.95 *14*	49 *3*	562.917	2^+	[M1,E2]		0.00068 *4*	α(K)=4.23×10^{-5} *8*; α(L)=4.26×10^{-6} *8*; α(M)=6.36×10^{-7} *12* α(N)=4.21×10^{-8} *7*; α(IPF)=0.00063 *4* B(M1)(W.u.)=0.0018 *+12−8* if M1, B(E2)(W.u.)=0.32 *+20−14* if E2.
3409.19	(1,2,3)	661.4 [d] *2*	100	2747.75	$(2)^+$				
3419.47	1^+	2310.9		1108.416	2^+				
		2856.4		562.917	2^+				
		3419.7 *6*		0.0	0^+	M1		0.000896 *13*	α(K)=2.94×10^{-5} *4*; α(L)=2.96×10^{-6} *4*; α(M)=4.42×10^{-7} *6* α(N)=2.93×10^{-8} *4*; α(IPF)=0.000863 *12*

$\gamma(^{76}Ge)$ (continued)

E_i(level)	J^π_i	E_γ[‡]	I_γ[‡]	E_f	J^π_f	Mult.[#]	α[†]	Comments
3436.9		767.8 *4*	100	2669.12	$3^+,4^+$			
3477.62	$(2^+,3)$	335.9[d] *5*	100 *25*	3141.39	1^+			
		2369.8[d] *6*	5 *2*	1108.416	2^+			
		2914.6[d] *2*	14 *2*	562.917	2^+			
3484.0	3^-	2074 *1*		1409.982	4^+			
		2921 *1*		562.917	2^+			
3532.81	(7^+)	499.1[ad] *4*	20 *20*	3033.75	(6^+)			
		1045.7[a] *4*	100	2487.07	5^+			
3536.0		547.9 *4*	100	2988.09				
3543.27	8^+	1089.6 *4*	100	2453.74	6^+			
3576.96		2037.5[d]		1539.383	3^+			
		3014.0[a] *3*		562.917	2^+			
3596.79	2^+	3033.8		562.917	2^+			
		3596.7 *4*		0.0	0^+	E2	1.05×10^{-3} *2*	α(K)=2.79×10^{-5} *4*; α(L)=2.81×10^{-6} *4*; α(M)=4.19×10^{-7} *6* α(N)=2.77×10^{-8} *4*; α(IPF)=0.001018 *14*
3632.92	(2^+)	1612.7[b] *3*	49 *7*	2021.68	4^+			E_γ: poor fit; level-energy difference=1611.6.
		1721.9 *7*	16 *5*	1911.12	0^+			
		2524.0 *2*	86 *6*	1108.416	2^+			
		3069.90 *13*	100 *6*	562.917	2^+			
3680.70	1^-	3117.7		562.917	2^+			
		3680.6 *1*		0.0	0^+	E1	1.57×10^{-3} *2*	α(K)=1.830×10^{-5} *26*; α(L)=1.835×10^{-6} *26*; α(M)=2.74×10^{-7} *4* α(N)=1.809×10^{-8} *25*; α(IPF)=0.001545 *22*
3727.83	(7^-)	769.5[a] *4*	30 *20*	2958.06	5^-			
		1274.3[a] *4*	100	2453.74	6^+	(E1+M2)	0.0001977 *34*	α(K)=9.04×10^{-5} *29*; α(L)=9.14×10^{-6} *30*; α(M)=1.36×10^{-6} *5* α(N)=8.96×10^{-8} *30*; α(IPF)=9.68×10^{-5} *17* δ: +9 *7* or +0.2 *6*.
3763.40	1^+	2655.0		1108.416	2^+			
		3200.3		562.917	2^+			
		3763.3 *2*		0.0	0^+	M1	1.02×10^{-3} *1*	α(K)=2.531×10^{-5} *35*; α(L)=2.54×10^{-6} *4*; α(M)=3.80×10^{-7} *5* α(N)=2.517×10^{-8} *35*; α(IPF)=0.000991 *14*
3783.57	$(4^+,5,6,7^-)$	750.0[a] *4*	100	3033.75	(6^+)			
		825.3[a] *4*	25 *20*	2958.06	5^-			
3886.97	(3^-)	2347.40 *25*	55 *6*	1539.383	3^+			
		2476.60 *40*	27 *6*	1409.982	4^+			
		2779.1 *4*	100 *10*	1108.416	2^+			
		3325.2 *12*	14 *7*	562.917	2^+			
3951.88	1^-	1259.9 *5*	7 *2*	2692.347	3^-	[E2]	0.0002292 *32*	B(E2)(W.u.)=10.6 *+39–33* α(K)=0.0001877 *26*; α(L)=1.914×10^{-5} *27*; α(M)=2.86×10^{-6}

$^{76}_{32}Ge_{44}$-21

$\gamma(^{76}Ge)$ (continued)

E_i(level)	J^π_i	E_γ[‡]	I_γ[‡]	E_f	J^π_f	Mult.[#]	α[†]	Comments
								4 α(N)=1.873×10^{-7} *26*; α(IPF)=1.929×10^{-5} *29*
3951.88	1$^-$	2040.70 *25*	8 *2*	1911.12	0$^+$	[E1]	0.000707 *10*	B(E1)(W.u.)=5.8×10^{-5} *+20−16* α(K)=4.11×10^{-5} *6*; α(L)=4.14×10^{-6} *6*; α(M)=6.17×10^{-7} *9* α(N)=4.07×10^{-8} *6*; α(IPF)=0.000661 *9* I_γ: preliminary result in 2014Do08 suggests ≈11.
		2843.50 *9*	38 *2*	1108.416	2$^+$	[E1]	1.18×10^{-3} *2*	B(E1)(W.u.)=1.01×10^{-4} *+23−16* α(K)=2.57×10^{-5} *4*; α(L)=2.58×10^{-6} *4*; α(M)=3.85×10^{-7} *5* α(N)=2.54×10^{-8} *4*; α(IPF)=0.001150 *16*
		3388.75 *12*	67 *4*	562.917	2$^+$	[E1]	1.45×10^{-3} *2*	B(E1)(W.u.)=1.05×10^{-4} *+24−17* α(K)=2.035×10^{-5} *28*; α(L)=2.042×10^{-6} *29*; α(M)=3.05×10^{-7} *4* α(N)=2.013×10^{-8} *28*; α(IPF)=0.001424 *20*
		3951.70 *14*	100 *8*	0.0	0$^+$	[E1]	1.68×10^{-3} *2*	B(E1)(W.u.)=9.9×10^{-5} *+22−16* α(K)=1.672×10^{-5} *23*; α(L)=1.676×10^{-6} *23*; α(M)=2.500×10^{-7} *35* α(N)=1.653×10^{-8} *23*; α(IPF)=0.001661 *23*
4024.11	1$^{(-)}$	4024.0 *2*	100	0.0	0$^+$	(E1)	1.71×10^{-3} *2*	α(K)=1.634×10^{-5} *23*; α(L)=1.638×10^{-6} *23*; α(M)=2.443×10^{-7} *34* α(N)=1.616×10^{-8} *23*; α(IPF)=0.001688 *24*
4035.12	1	4035.0 *2*	100	0.0	0$^+$			
4116.02	1	4115.9 *2*		0.0	0$^+$			
4122.28?	(1,2$^+$)	3559.5[d] *4*	100 *8*	562.917	2$^+$			
		4121.8[d] *5*	43 *6*	0.0	0$^+$			
4129.8	8$^+$	1096.0[a] *4*	100	3033.75	(6$^+$)			
4130.6		894.6[a] *4*	100	3236.02	(5)$^+$			
4192.80?	(2$^+$,3)	1273.05[d] *10*	100 *6*	2919.74	1$^+$			
		2782.70[d] *40*	84 *7*	1409.982	4$^+$			
4239.36	(1,2,3)	927.05[d] *10*	100 *6*	3312.29	3$^-$			
		3130.7[d] *6*	23 *5*	1108.416	2$^+$			
4250.93	1	4250.8 *3*		0.0	0$^+$			
4311.1		775.1[a] *4*	70 *20*	3536.0				
		1323.0[a] *4*	100	2988.09				
4326.43	(1,2,3)	1014.2[d] *2*	31 *5*	3312.29	3$^-$			
		1634.0[d] *2*	100 *5*	2692.347	3$^-$			
4331.3	1	4331.2 *12*	100	0.0	0$^+$			
4363.47	4$^+$	885.83[d] *10*	100 *8*	3477.62	(2$^+$,3)			
		1443.9[d] *5*	20 *5*	2919.74	1$^+$	[M3]	0.000548 *8*	α(K)=0.000483 *7*; α(L)=5.01×10^{-5} *7*; α(M)=7.50×10^{-6} *11* α(N)=4.94×10^{-7} *7*; α(IPF)=6.52×10^{-6} *9*

$^{76}_{32}Ge_{44}$-22

$\gamma(^{76}Ge)$ (continued)

E_i(level)	J^π_i	E_γ[‡]	I_γ[‡]	E_f	J^π_f	Mult.[#]	α[†]	Comments
								E_γ: this γ from J^π=4$^+$ to J=1 requiring high multipolarity is questionable.
4476.67?	(≤4)	843.8[d] 2	100 10	3632.92	(2$^+$)			
		3913.3[d] 5	11 3	562.917	2$^+$			
4546.8	9$^+$	1014.0 4	100	3532.81	(7$^+$)			
4613.0	10$^+$	1069.7[a] 4	100	3543.27	8$^+$			
4623.7	1$^+$	4623.5 11		0.0	0$^+$	M1	1.30×10^{-3} 2	α(K)=1.849×10^{-5} 26; α(L)=1.857×10^{-6} 26; α(M)=2.77×10^{-7} 4 α(N)=1.837×10^{-8} 26; α(IPF)=0.001275 18
4661.2	1	4661.0 4		0.0	0$^+$			
4678.26	1	4678.1 1		0.0	0$^+$			
4686.8	(9$^-$)	958.9[a] 4	100	3727.83	(7$^-$)			
		1143.6[a] 4	40 30	3543.27	8$^+$			
4719.88	(2$^+$,3,4$^+$)	1310.6[d] 3	75 13	3409.19	(1,2,3)			
		1878.3 2	98 11	2841.61	2$^+$			
		2435.6 3	100 13	2284.22	(3)$^-$			
4720.5		936.9 4	100	3783.57	(4$^+$,5,6,7$^-$)			
		992.7[d] 4	5 5	3727.83	(7$^-$)			
4722.36	(1)	4722.2 2		0.0	0$^+$			
4741.16		4741.0 2		0.0	0$^+$			
4784.04?	(1,2,3)	1461.2[d] 3	74 15	3322.80	(2$^+$)			
		3675.60[d] 45	100 11	1108.416	2$^+$			
4789.06		4788.9 3		0.0	0$^+$			
4812.47?	(2$^+$,3)	1892.7[d] 2	100 7	2919.74	1$^+$			
		3402.4[d] 3	33 5	1409.982	4$^+$			
4814.92?	(1,2,3)	1182.1[d] 3	100 15	3632.92	(2$^+$)			
		1502.3[d] 5	96 13	3312.29	3$^-$			
4837.2	(1)	4837.0 4		0.0	0$^+$			
4846.07	1	4845.9 3		0.0	0$^+$			
4874.67		4874.5 2		0.0	0$^+$			
4917.2	1	4917.0 6		0.0	0$^+$			
4936.07	1	4935.9 2		0.0	0$^+$			
5116.59	1	5116.4 2		0.0	0$^+$			
5122.47	(1,2,3)	1489.6 4	34 10	3632.92	(2$^+$)			
		1940.30 14	100 7	3182.19	(2$^+$)			
		1980.4 5	32 6	3141.39	1$^+$			
5166.89	(1)	5166.7 2		0.0	0$^+$			
5185.99	(1)	5185.8 1		0.0	0$^+$			
5202.49	1	5202.3 2		0.0	0$^+$			

$^{76}_{32}Ge_{44}$-23

Adopted Levels, Gammas (continued)

$\gamma(^{76}Ge)$ (continued)

E_i(level)	J_i^{π}	E_{γ}[‡]	I_{γ}[‡]	E_f	J_f^{π}	Mult.[#]	α[†]	Comments
5222.19		5222.0 *3*		0.0	0^+			
5267.00	1	5266.8 *3*		0.0	0^+			
5273.8	(1)	5273.6 *6*		0.0	0^+			
5285.10	1	5284.9 *2*		0.0	0^+			
5304.30	1	5304.1 *3*		0.0	0^+			
5365.80	1	5365.6 *3*		0.0	0^+			
5379.7	1	5379.5 *4*		0.0	0^+			
5390.8	(1)	5390.6 *5*		0.0	0^+			
5418.8	(1)	5418.6 *4*		0.0	0^+			
5434.51	1	5434.3 *3*		0.0	0^+			
5450.0?	(12^+)	837.0[ad] *4*	100	4613.0	10^+			
5522.58	(1,2,3)	1282.9[cd] *4*	<81[c]	4239.36	(1,2,3)			
		2680.9 *3*	92 *10*	2841.61	2^+			
		2868.1 *2*	100 *14*	2654.51	$(0^+,1^+)$			
5540.42	1	5540.2 *2*	100	0.0	0^+			
5567.62	(1)	5567.4 *2*		0.0	0^+			
5579.0	1	5578.8 *5*		0.0	0^+			
5626.7	1	5626.5 *8*	100	0.0	0^+			
5663.32	(2^+)	2481.1 *4*	50 *10*	3182.19	(2^+)			
		2970.90 *15*	100 *12*	2692.347	3^-			
		3752.10 *50*	42 *9*	1911.12	0^+			
		4253.3 *5*	57 *9*	1409.982	4^+			
5665.43	1	5665.2 *3*		0.0	0^+			
5677.83	1	5677.6 *3*		0.0	0^+			
5699.03	1^-	5698.8 *2*	100	0.0	0^+	E1	2.23×10^{-3} *3*	α(K)=1.069×10^{-5} *15*; α(L)=1.070×10^{-6} *15*; α(M)=1.597×10^{-7} *22* α(N)=1.057×10^{-8} *15*; α(IPF)=0.002215 *31*
5708.6	(1)	5708.4 *6*		0.0	0^+			
5748.53	1^-	5748.3 *1*	100	0.0	0^+	E1	2.24×10^{-3} *3*	α(K)=1.058×10^{-5} *15*; α(L)=1.059×10^{-6} *15*; α(M)=1.580×10^{-7} *22* α(N)=1.046×10^{-8} *15*; α(IPF)=0.002227 *31*
5749.90?	(1,2,3)	2981.2[d] *4*	100 *20*	2768.73	2^+			
		3465.5[d] *4*	68 *13*	2284.22	$(3)^-$			
5785.24	1	5785.0 *2*		0.0	0^+			
5794.34	1	5794.1 *2*		0.0	0^+			
5821.0		5820.8 *6*		0.0	0^+			
5825.5	1	5825.3 *8*		0.0	0^+			
5843.2	(11^-)	1156.4[a] *4*	100	4686.8	(9^-)			
5846.7		5846.5 *7*		0.0	0^+			
5865.0		5864.8 *6*		0.0	0^+			
5882.92?	(1,2,3)	2700.5[d] *4*	94 *16*	3182.19	(2^+)			

From ENSDF

$^{76}_{32}Ge_{44}$-24

$\gamma(^{76}Ge)$ (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	α[†]	Comments
5882.92?	(1,2,3)	3190.6[d] *3*	100 *13*	2692.347	3^-			
5909.05		5908.8 *3*		0.0	0^+			
5955.9	1	5955.6 *8*	100	0.0	0^+			
5983.25	1^-	5983.0 *2*	100	0.0	0^+	E1	2.30×10^{-3} *3*	α(K)=1.009×10^{-5} *14*; α(L)=1.010×10^{-6} *14*; α(M)=1.507×10^{-7} *21* α(N)=9.98×10^{-9} *14*; α(IPF)=0.002285 *32*
6021.13?	(1,2,3)	3328.7[d] *8*	100 *30*	2692.347	3^-			
		3366.5[d] *3*	73 *14*	2654.51	$(0^+,1^+)$			
		3736.90[d] *45*	80 *20*	2284.22	$(3)^-$			
6048.7	1	6048.4 *4*		0.0	0^+			
6065.1?	(1,2,3)	2882.9[d] *9*	47 *16*	3182.19	(2^+)			
		3145.3[d] *4*	100 *20*	2919.74	1^+			
6081.7	(1)	6081.4 *4*		0.0	0^+			
6102.3		6102.0 *9*		0.0	0^+			
6113.86	1	6113.6 *3*		0.0	0^+			
6130.57	1	6130.3 *2*		0.0	0^+			
6145.87	1	6145.6 *2*		0.0	0^+			
6162.7		6162.4 *9*		0.0	0^+			
6191.57	1	6191.3 *2*		0.0	0^+			
6223.7		6223.4 *7*		0.0	0^+			
6228.5	1	6228.2 *4*		0.0	0^+			
6235.1		6234.8 *9*		0.0	0^+			
6240.98	1	6240.7 *3*		0.0	0^+			
6272.98	1	6272.7 *3*		0.0	0^+			
6285.58	1	6285.3 *2*		0.0	0^+			
6315.7	1	6315.4 *4*		0.0	0^+			
6330.48	1	6330.2 *2*		0.0	0^+			
6366.5		6366.2 *11*		0.0	0^+			
6393.5	1	6393.2 *5*		0.0	0^+			
6408.4	1	6408.1 *5*		0.0	0^+			
6436.4		6436.1 *9*		0.0	0^+			
6448.6		6448.3 *11*		0.0	0^+			
6472.50	1	6472.2 *3*		0.0	0^+			
6498.20	1	6497.9 *3*		0.0	0^+			
6513.6	1	6513.3 *4*		0.0	0^+			
6572.3		6572.0 *6*		0.0	0^+			
6601.51	1	6601.2 *2*		0.0	0^+			
6611.4		6611.1 *6*		0.0	0^+			
6629.31	1	6629.0 *3*		0.0	0^+			
6642.2		6641.9 *5*		0.0	0^+			
6661.7		6661.4 *9*		0.0	0^+			

$\gamma(^{76}Ge)$ (continued)

E_i(level)	J^π_i	E_γ[‡]	I_γ[‡]	E_f	J^π_f	Mult.[#]
6670.91	1	6670.6 *3*		0.0	0^+	
6741.9	(1)	6741.6 *6*		0.0	0^+	
6765.1	1	6764.8 *4*		0.0	0^+	
6787.03	1	6786.7 *2*		0.0	0^+	
6816.83	1	6816.5 *3*		0.0	0^+	
6835.83	1	6835.5 *2*		0.0	0^+	
6846.53	1	6846.2 *3*		0.0	0^+	
6880.6	1	6880.3 *4*		0.0	0^+	
6884.5		6884.2 *10*		0.0	0^+	
6899.2	1	6898.9 *5*		0.0	0^+	
6908.3		6908.0 *18*		0.0	0^+	
6938.9	1	6938.6 *7*		0.0	0^+	
6960.24	1	6959.9 *3*		0.0	0^+	
6985.4	1	6985.1 *5*		0.0	0^+	
6999.05	1^-	6998.7 *3*	100	0.0	0^+	E1
7011.4	1	7011.0 *9*		0.0	0^+	
7026.35	$1^{(-)}$	7026.0 *3*		0.0	0^+	(E1)
7048.3	1	7047.9 *9*		0.0	0^+	
7081.6	1	7081.2 *9*		0.0	0^+	
7091.8	1	7091.4 *4*		0.0	0^+	
7102.8	1	7102.4 *6*		0.0	0^+	
7121.66	1	7121.3 *3*		0.0	0^+	
7130.46	1	7130.1 *3*		0.0	0^+	
7147.7	1	7147.3 *4*		0.0	0^+	
7172.0		7171.6 *9*		0.0	0^+	
7250.9	1^-	7250.5 *7*		0.0	0^+	E1
7290.1		7289.7 *4*		0.0	0^+	
7301.08	1^-	7300.7 *3*		0.0	0^+	E1
7407.09	1	7406.7 *3*		0.0	0^+	
7416.0		7415.6 *4*		0.0	0^+	
7452.6		7452.2 *5*		0.0	0^+	
7479.0		7478.6 *5*		0.0	0^+	
7485.40	1	7485.0 *3*		0.0	0^+	
7521.6	1	7521.2 *5*		0.0	0^+	
7537.0	(1)	7536.6 *4*		0.0	0^+	
7549.2	(1)	7548.8 *7*		0.0	0^+	
7585.0	1	7584.6 *4*		0.0	0^+	
7643.0	1	7642.6 *4*		0.0	0^+	
7651.2	1	7650.8 *4*		0.0	0^+	
7678.1	1	7677.7 *4*		0.0	0^+	
7694.6	1	7694.2 *11*	100	0.0	0^+	
7723.1	(1)	7722.7 *4*		0.0	0^+	
7777.3	(1)	7776.9 *7*		0.0	0^+	
7784.2		7783.8 *9*		0.0	0^+	
7797.0	1	7796.6 *4*		0.0	0^+	
7804.1	1	7803.7 *6*		0.0	0^+	
7814.7	1	7814.3 *7*		0.0	0^+	
7817.63		7817.2 *2*		0.0	0^+	
7836.7		7836.3 *6*		0.0	0^+	
7849.7	(1)	7849.3 *5*		0.0	0^+	
7861.6	1	7861.2 *4*		0.0	0^+	
7883.7	1	7883.3 *10*		0.0	0^+	
7894.0		7893.6 *12*		0.0	0^+	
7916.2	1^-	7915.8 *24*	100	0.0	0^+	E1
7950.35	1	7949.9 *2*		0.0	0^+	
7976.1	(1)	7975.6 *7*		0.0	0^+	
7996.3	(1)	7995.8 *4*		0.0	0^+	
8018.0	(1)	8017.5 *14*		0.0	0^+	
8027.0	(1)	8026.5 *8*		0.0	0^+	
8049.8	(1)	8049.3 *6*		0.0	0^+	
8063.9	1	8063.4 *8*		0.0	0^+	
8094.7		8094.2 *8*		0.0	0^+	
8103.3		8102.8 *5*		0.0	0^+	
8110.0		8109.5 *8*		0.0	0^+	
8135.0		8134.5 *11*		0.0	0^+	
8152.3	$1^{(-)}$	8151.8 *5*	100	0.0	0^+	(E1)
8160.7		8160.2 *9*		0.0	0^+	
8178.3	1	8177.8 *4*		0.0	0^+	
8188.3	1	8187.8 *5*		0.0	0^+	
8236.9	(1)	8236.4 *4*		0.0	0^+	
8253.4		8252.9 *9*		0.0	0^+	
8260.1	(1)	8259.6 *6*		0.0	0^+	
8284.99	(1)	8284.5 *3*		0.0	0^+	
8294.8		8294.3 *12*		0.0	0^+	
8304.0	1	8303.5 *5*		0.0	0^+	
8318.29	1	8317.8 *3*		0.0	0^+	
8329.4	1	8328.9 *7*		0.0	0^+	
8348.2		8347.7 *9*		0.0	0^+	
8357.9	(1)	8357.4 *7*		0.0	0^+	
8397.8		8397.3 *5*		0.0	0^+	
8418.5		8418.0 *15*		0.0	0^+	
8425.70	1	8425.2 *3*	100	0.0	0^+	

$^{76}_{32}Ge_{44}$-26

Adopted Levels, Gammas (continued)

$\gamma(^{76}Ge)$ (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]
8446.6	(1)	8446.1 7		0.0	0^+	
8462.4		8461.9 9		0.0	0^+	
8500.51	1	8500.0 3		0.0	0^+	
8521.2		8520.7 6		0.0	0^+	
8535.6	1	8535.1 5		0.0	0^+	
8546.6	1^-	8546.1 5		0.0	0^+	E1
8552.8	1	8552.3 8		0.0	0^+	
8567.42	1	8566.9 3		0.0	0^+	
8602.8		8602.3 5		0.0	0^+	
8626.2	1	8625.7 7		0.0	0^+	
8649.6		8649.1 8		0.0	0^+	
8662.5	(1)	8662.0 4		0.0	0^+	
8696.7		8696.2 7		0.0	0^+	
8741.2	(1)	8740.7 4		0.0	0^+	
8753.2	1^-	8752.7 6		0.0	0^+	E1
8768.9	1	8768.4 9		0.0	0^+	
8806.8		8806.2 5		0.0	0^+	
8844.3	1	8843.7 4		0.0	0^+	
8889.1		8888.5 9		0.0	0^+	
9014.2	1^-	9013.6 14	100	0.0	0^+	E1

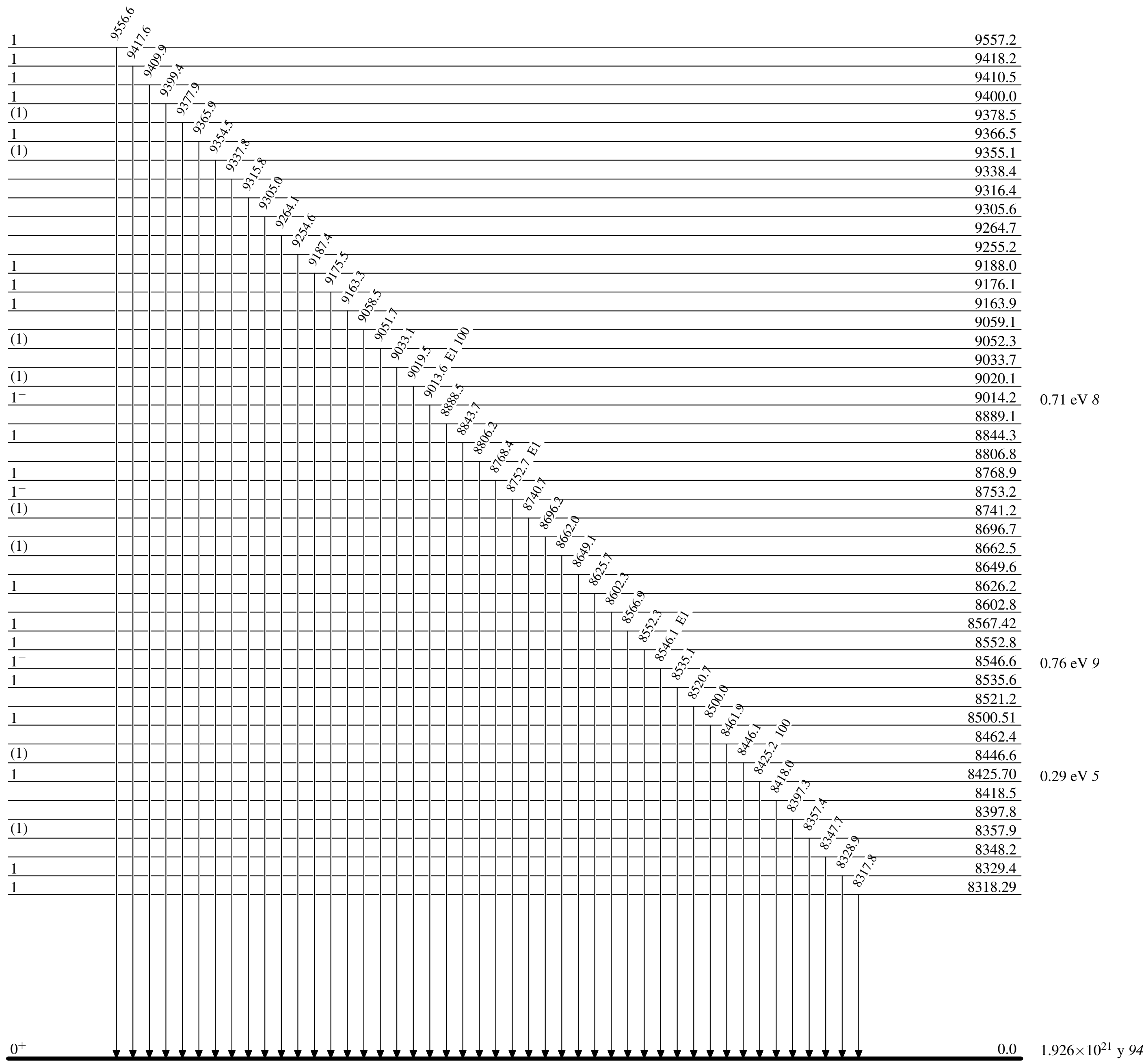
E_i(level)	J_i^π	E_γ[‡]	E_f	J_f^π
9020.1	(1)	9019.5 10	0.0	0^+
9033.7		9033.1 9	0.0	0^+
9052.3	(1)	9051.7 12	0.0	0^+
9059.1		9058.5 11	0.0	0^+
9163.9	1	9163.3 9	0.0	0^+
9176.1	1	9175.5 8	0.0	0^+
9188.0	1	9187.4 4	0.0	0^+
9255.2		9254.6 7	0.0	0^+
9264.7		9264.1 6	0.0	0^+
9305.6		9305.0 4	0.0	0^+
9316.4		9315.8 4	0.0	0^+
9338.4		9337.8 6	0.0	0^+
9355.1	(1)	9354.5 8	0.0	0^+
9366.5	1	9365.9 5	0.0	0^+
9378.5	(1)	9377.9 4	0.0	0^+
9400.0	1	9399.4 6	0.0	0^+
9410.5	1	9409.9 4	0.0	0^+
9418.2	1	9417.6 5	0.0	0^+
9557.2	1	9556.6 5	0.0	0^+

[†] Additional information 4.
[‡] When a level is populated in more than one gamma-ray datasets, averages of all available data of comparable precision are taken. Exceptions are noted.
[#] From $\gamma(\theta)$ in (n,n′γ). RUL for E2 and M2 restricts to E2 and M1+E2 for mult=Q and D+Q, respectively. Exceptions are noted.
[@] From (n,n′γ) only.
[&] Placement suggested by the evaluators.
[a] γ from $^{238}U(^{76}Ge,^{76}Ge'\gamma)$ only.
[b] Poor fit, level-energy difference=1611.6.
[c] Multiply placed with undivided intensity.
[d] Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

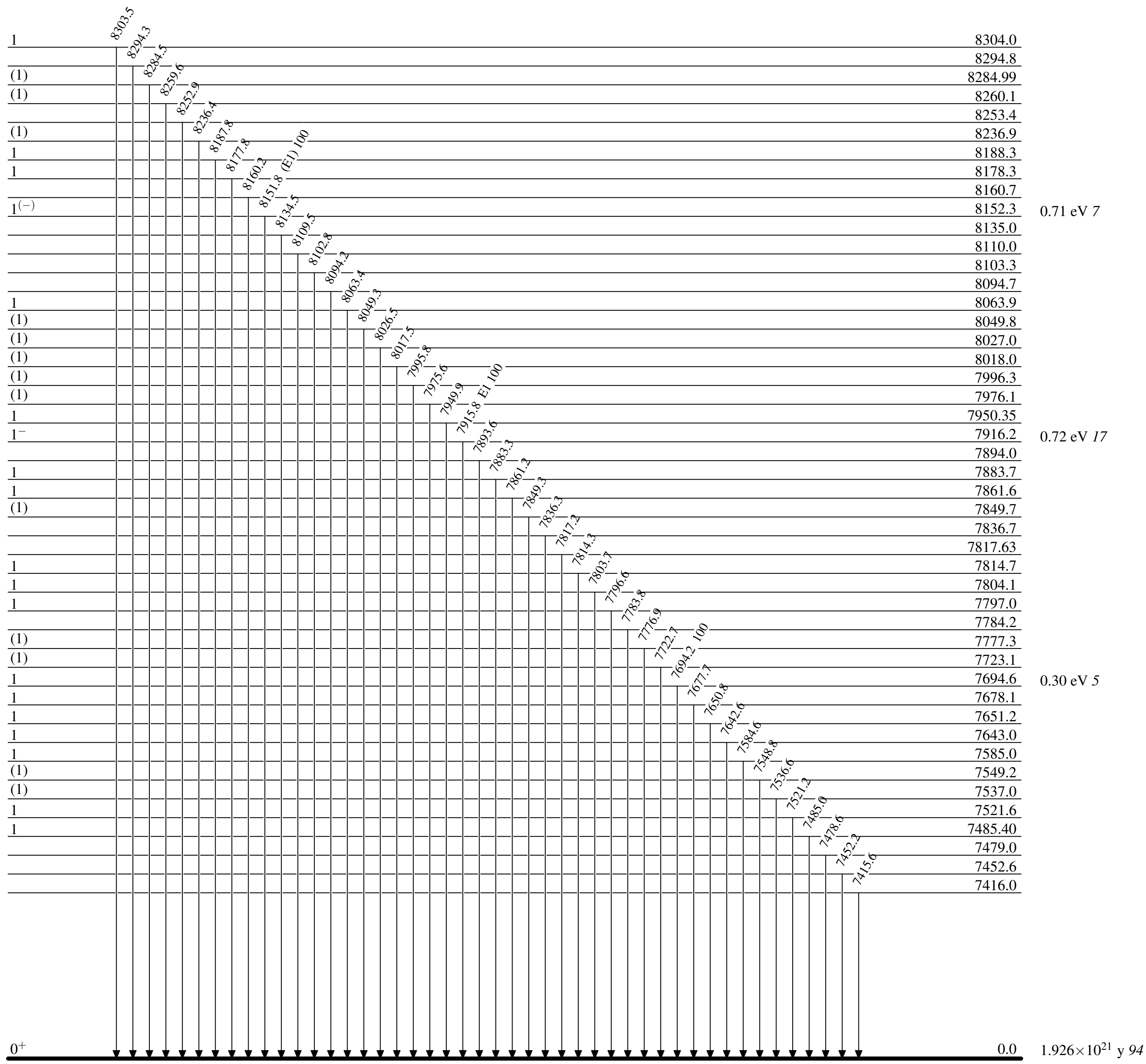


$^{76}_{32}Ge_{44}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

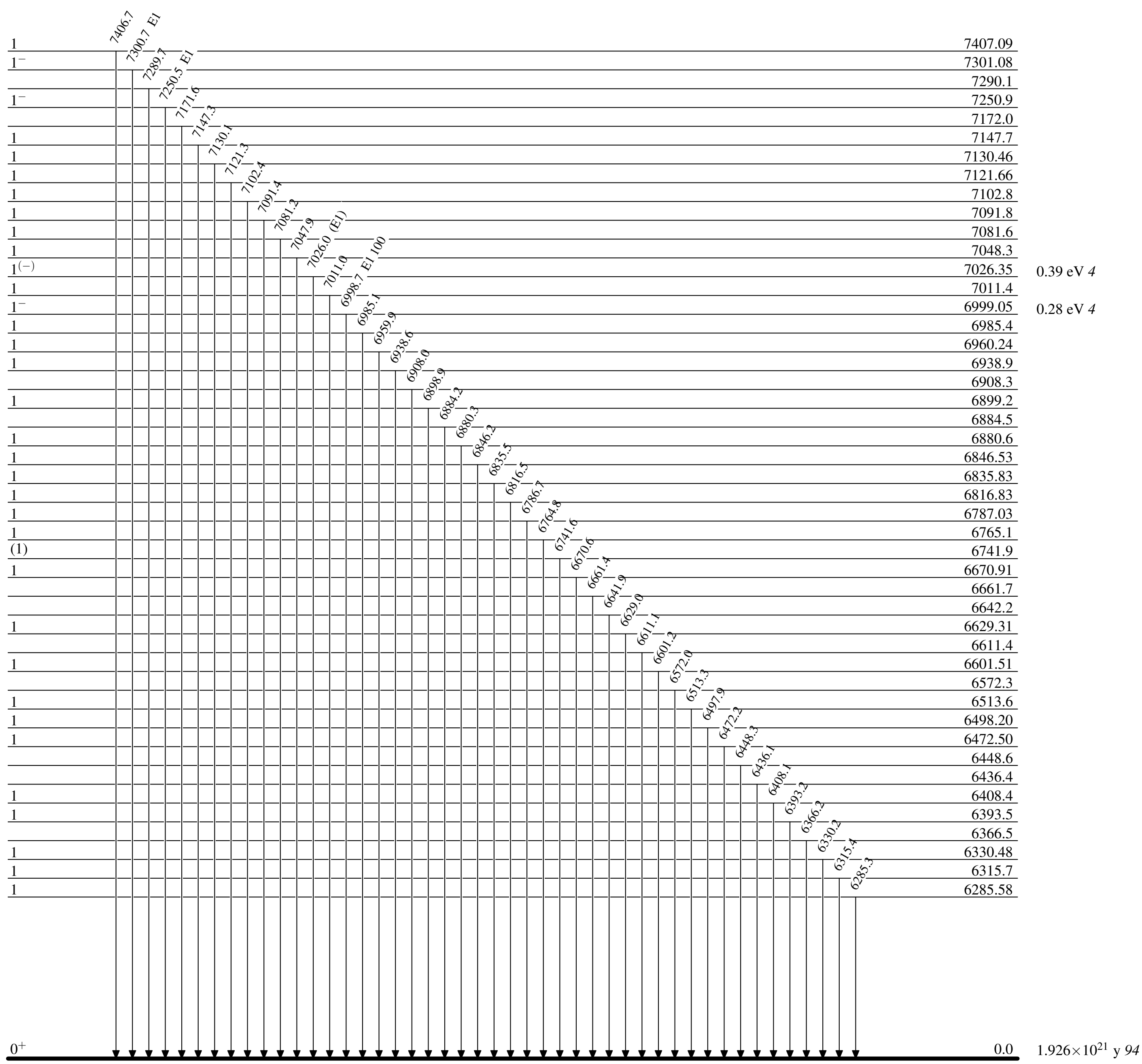


$^{76}_{32}Ge_{44}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

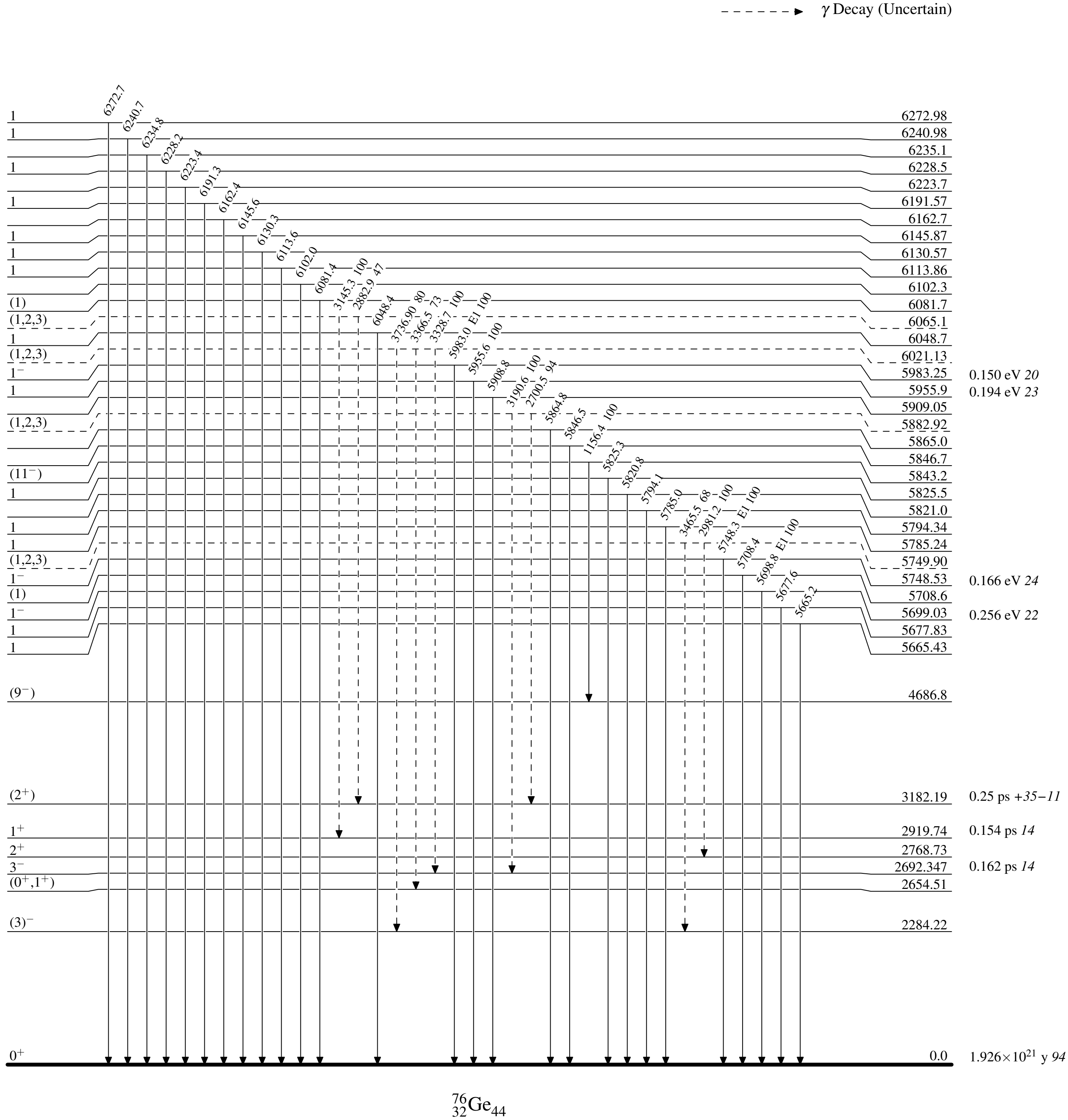


$^{76}_{32}Ge_{44}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



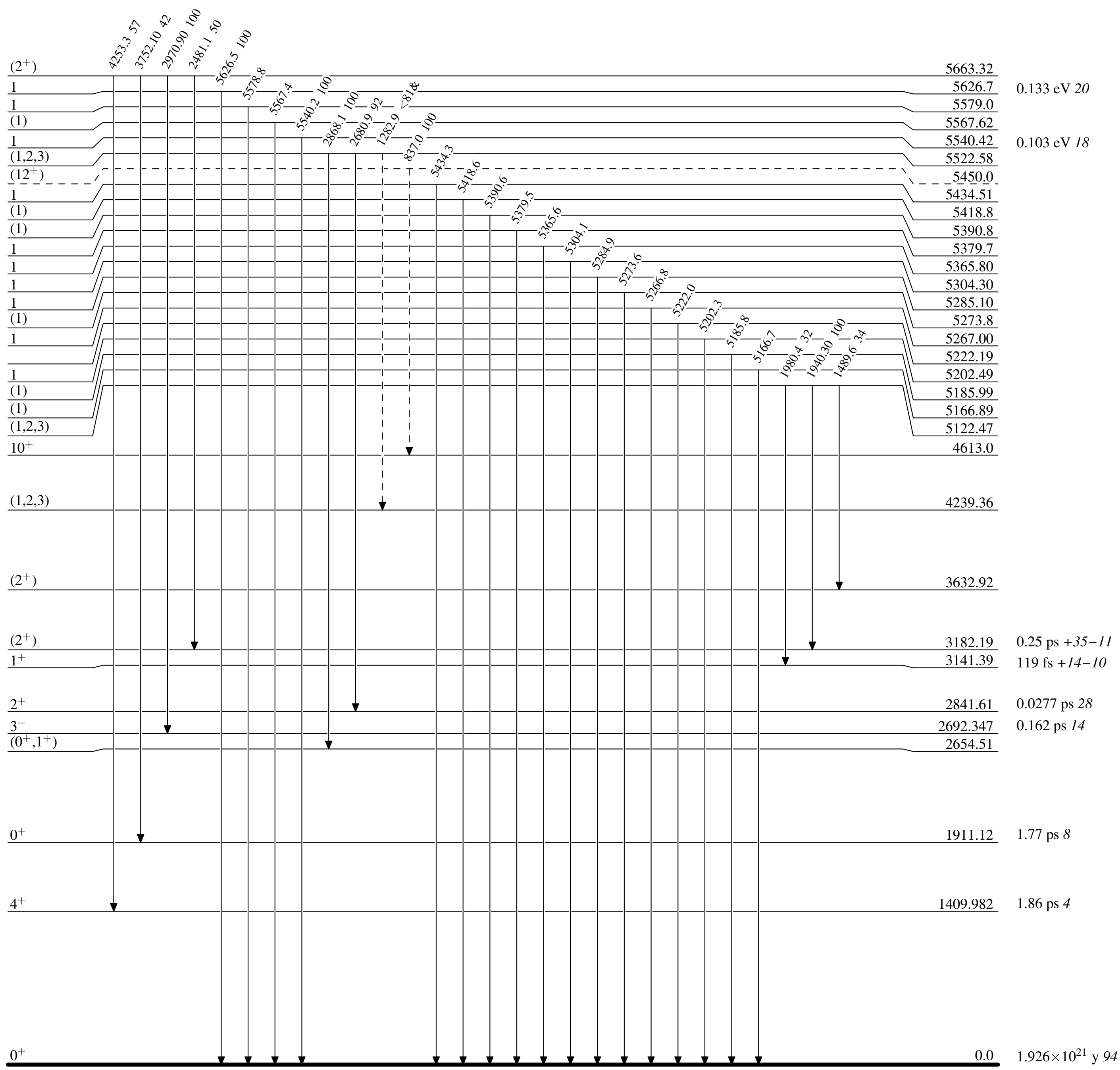
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

- - - - - ► γ Decay (Uncertain)



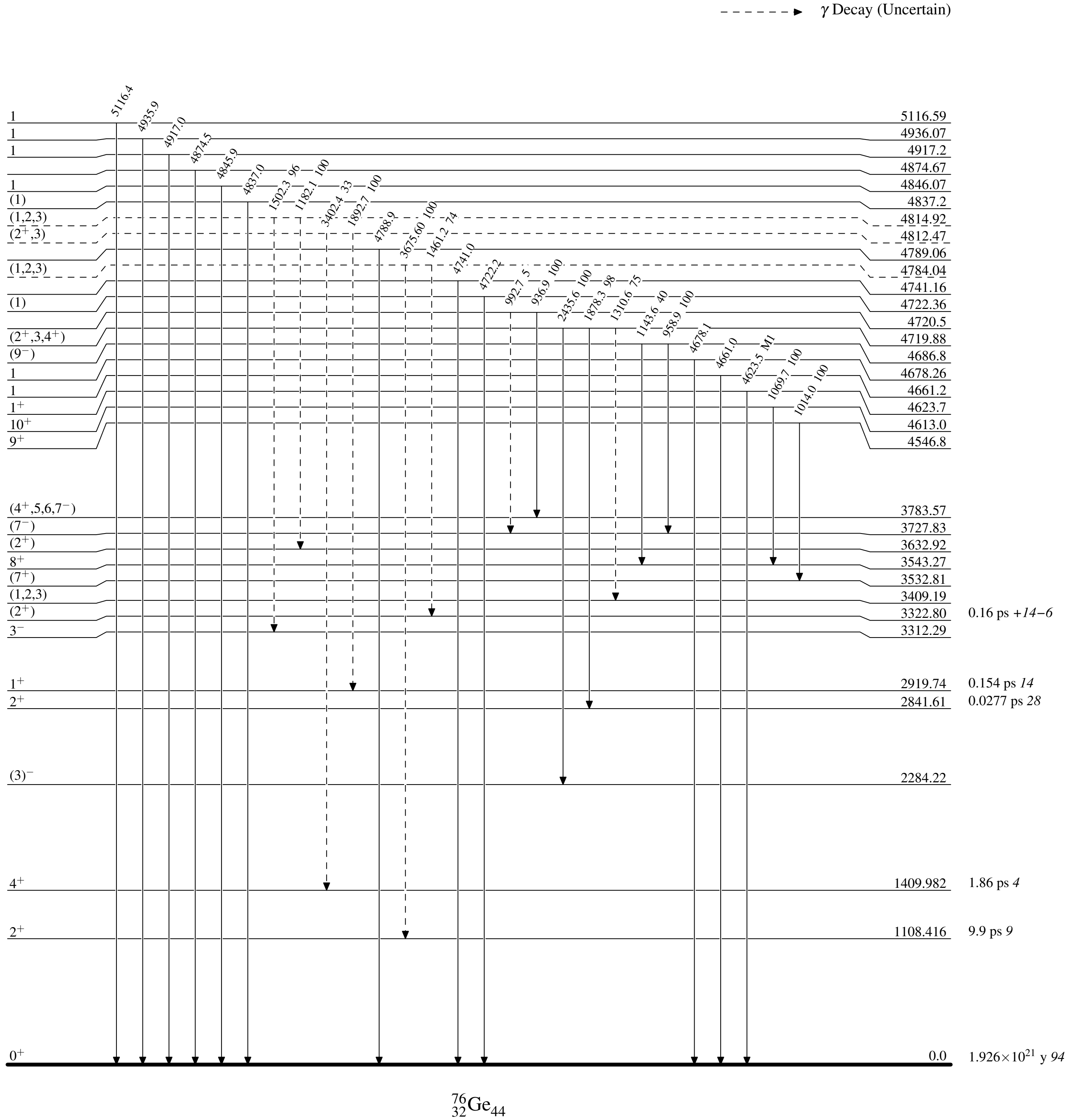
$^{76}_{32}Ge_{44}$

Adopted Levels, Gammas

Legend

Level Scheme (continued)

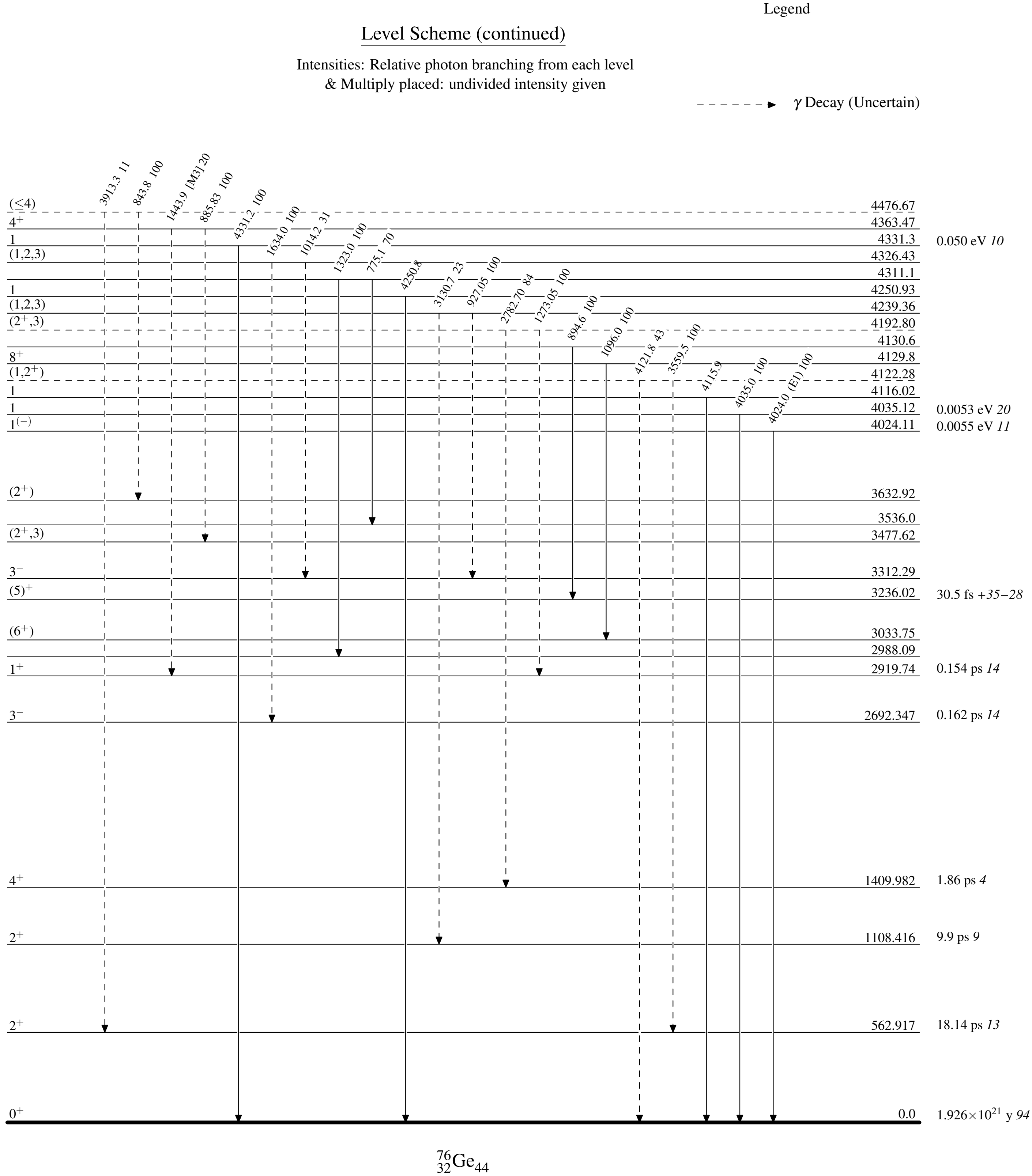
Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



Adopted Levels, Gammas

Level Scheme (continued)

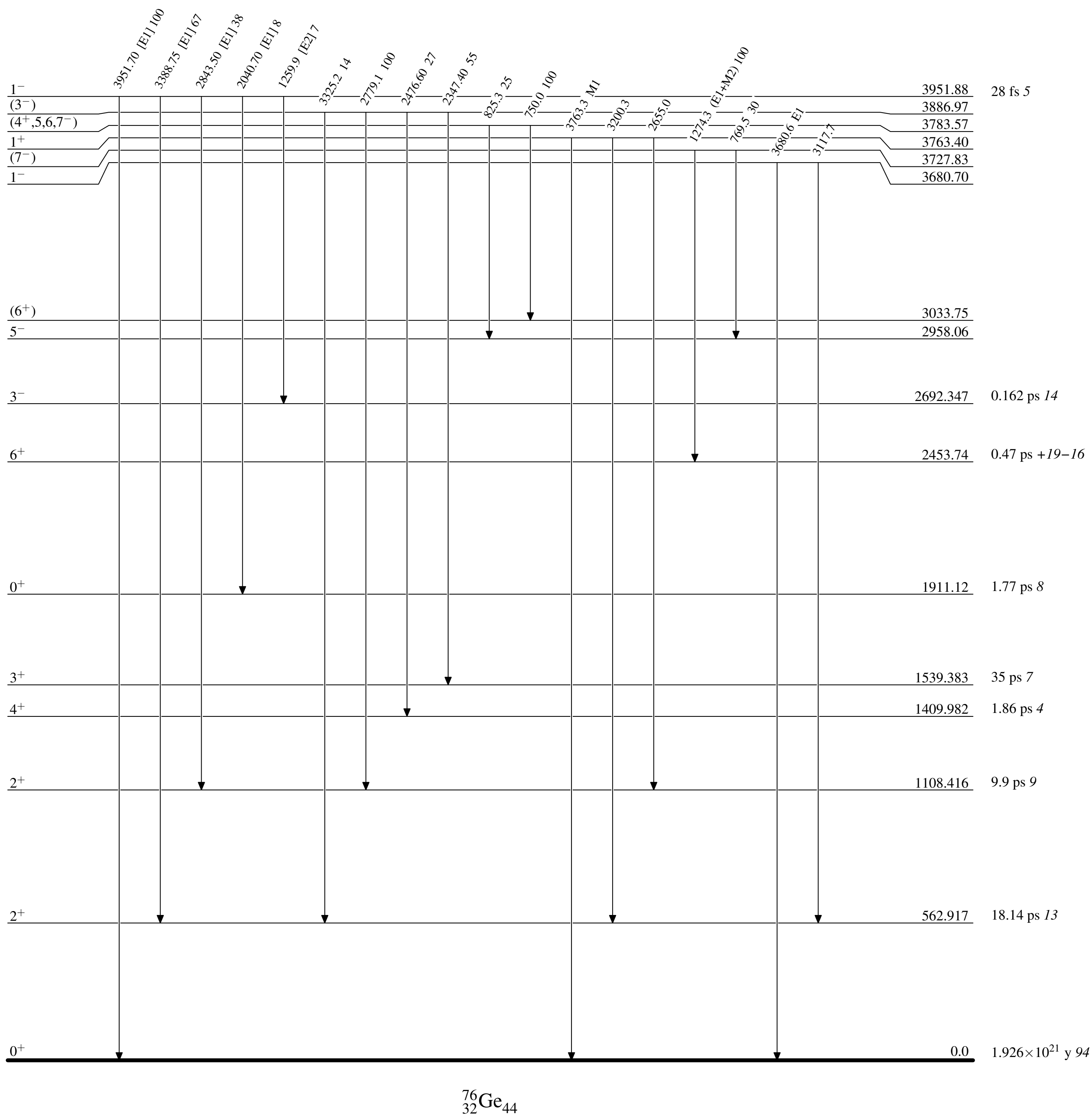
Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



Adopted Levels, Gammas

Level Scheme (continued)

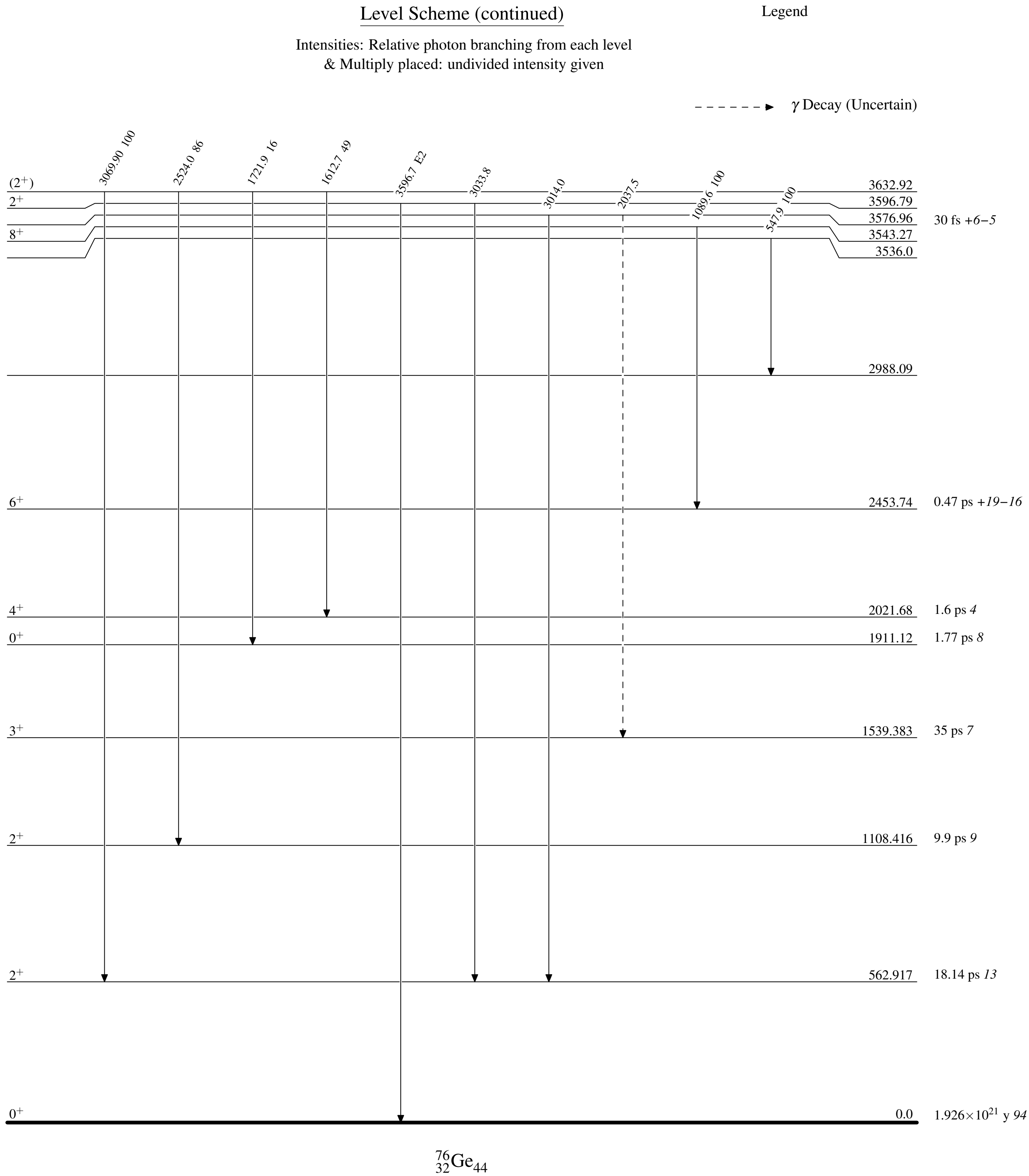
Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



Adopted Levels, Gammas

Level Scheme (continued)

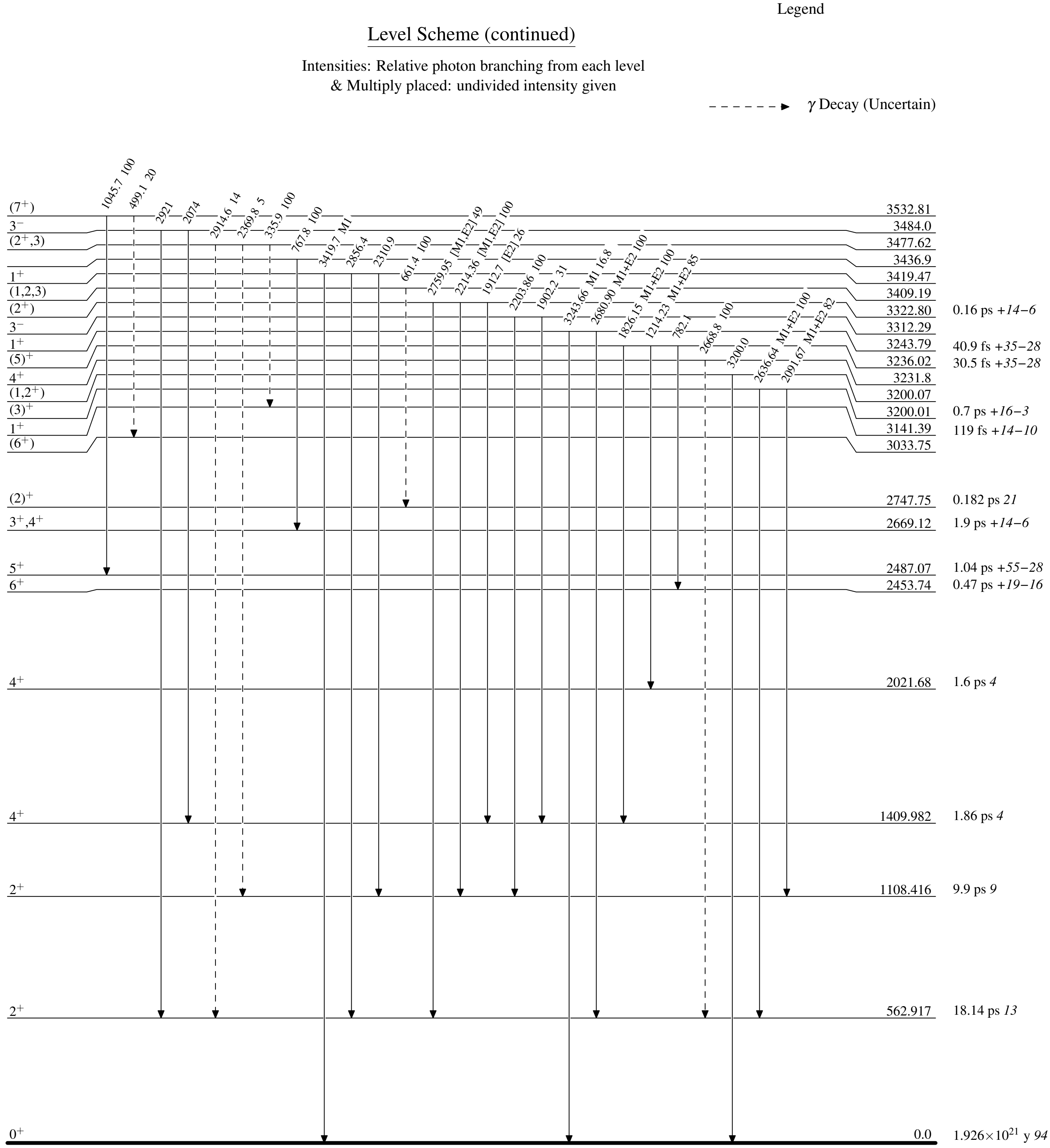
Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

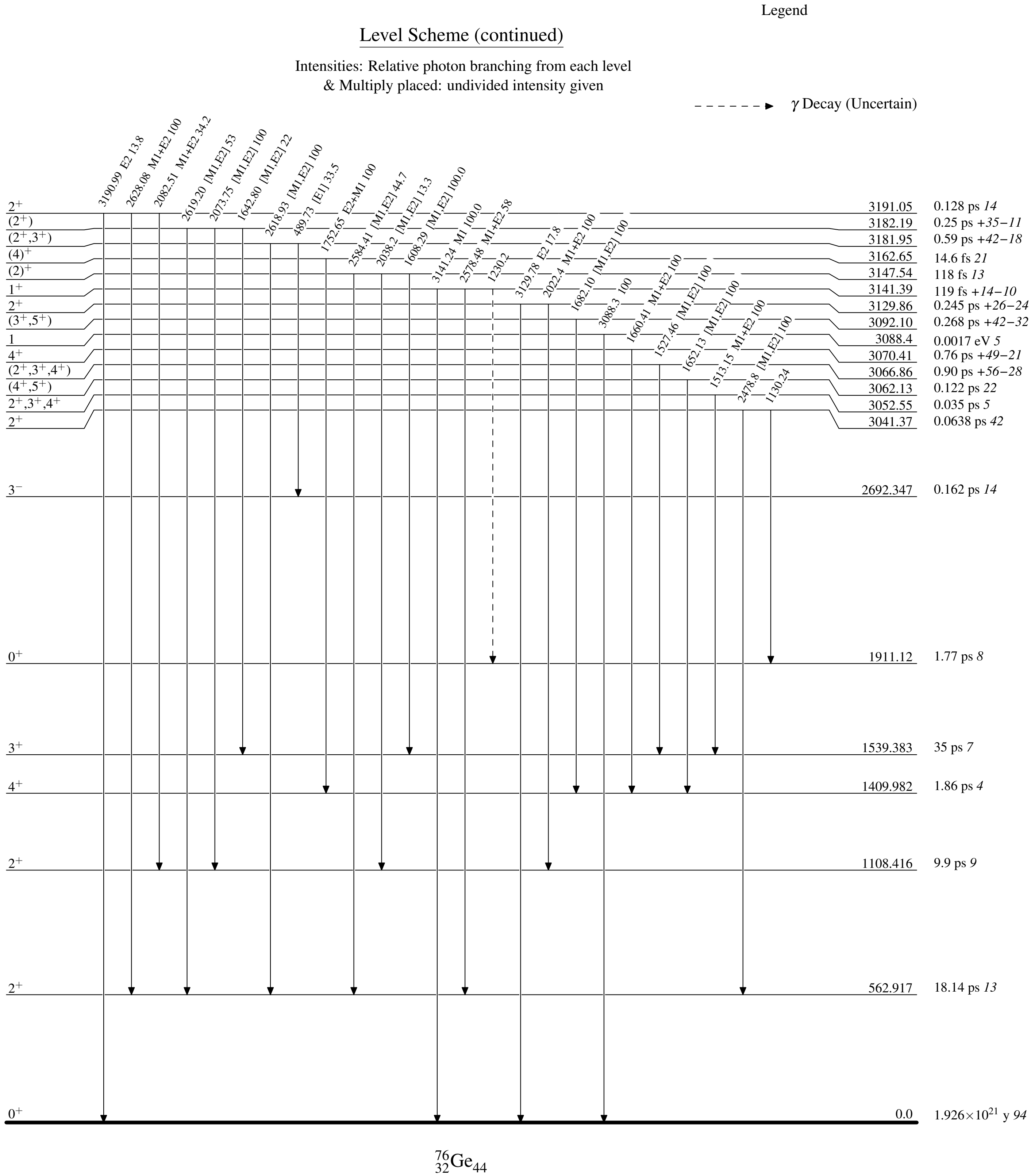


$^{76}_{32}Ge_{44}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



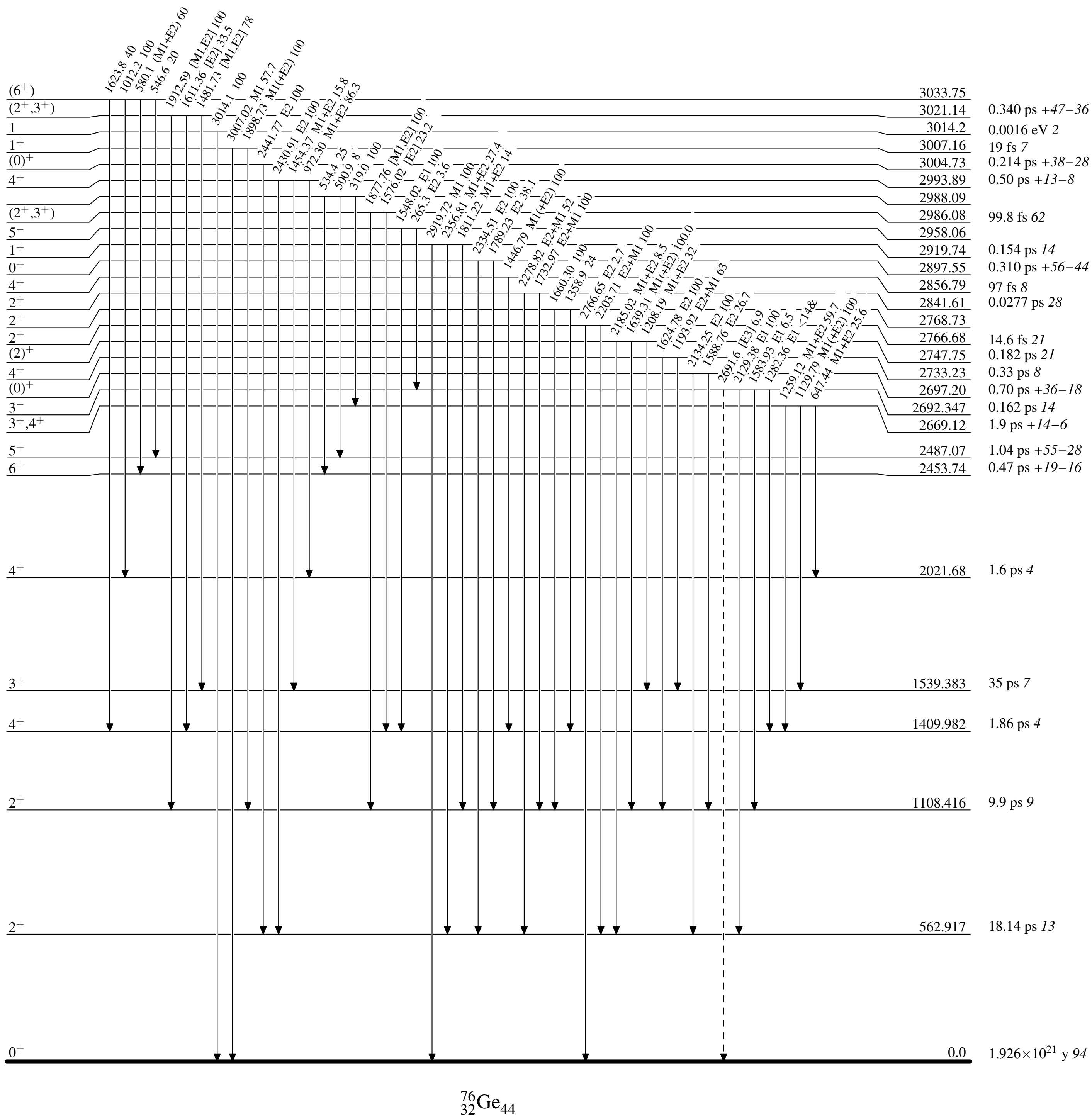
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

γ Decay (Uncertain)

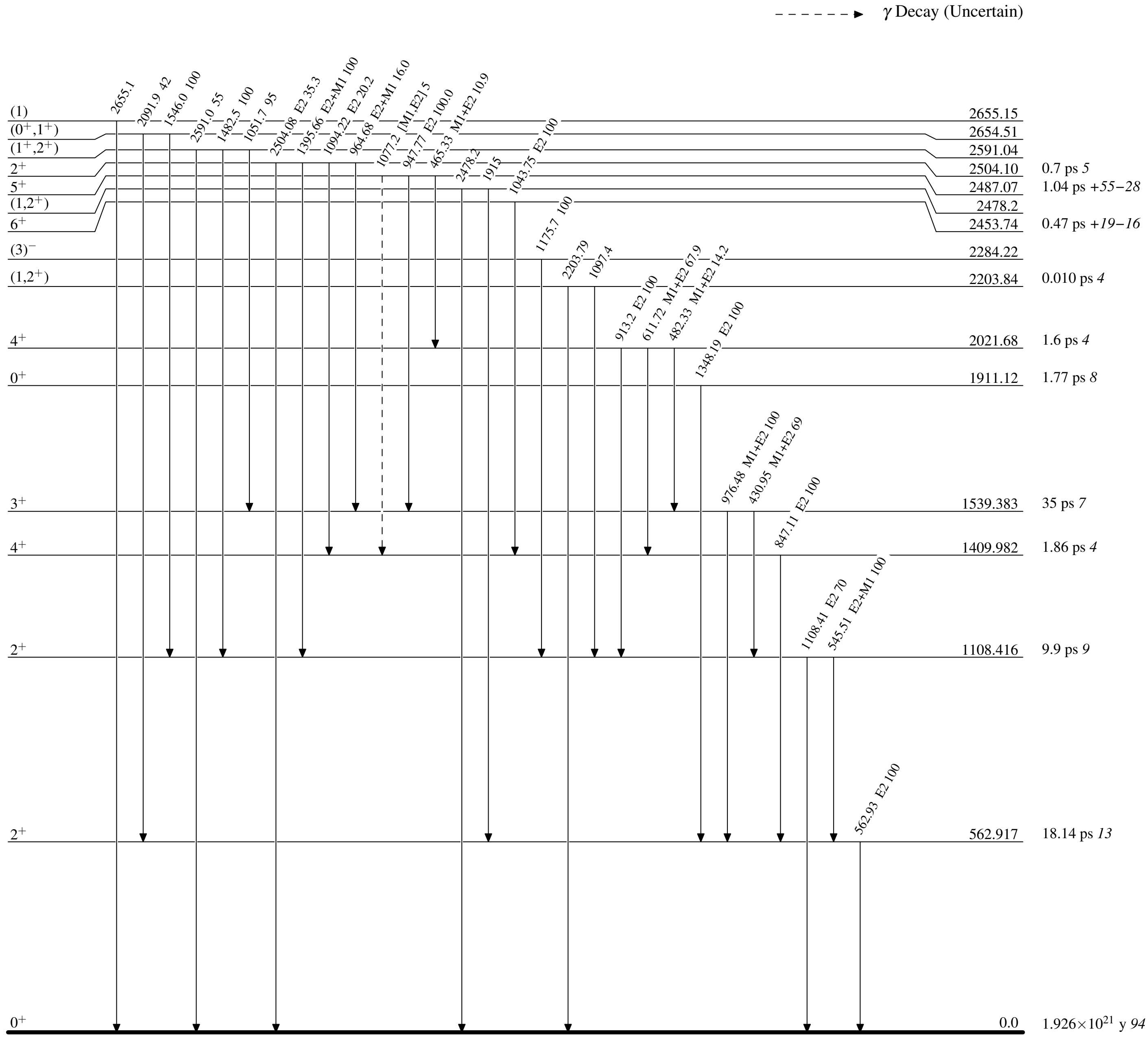


Adopted Levels, Gammas

Level Scheme (continued)

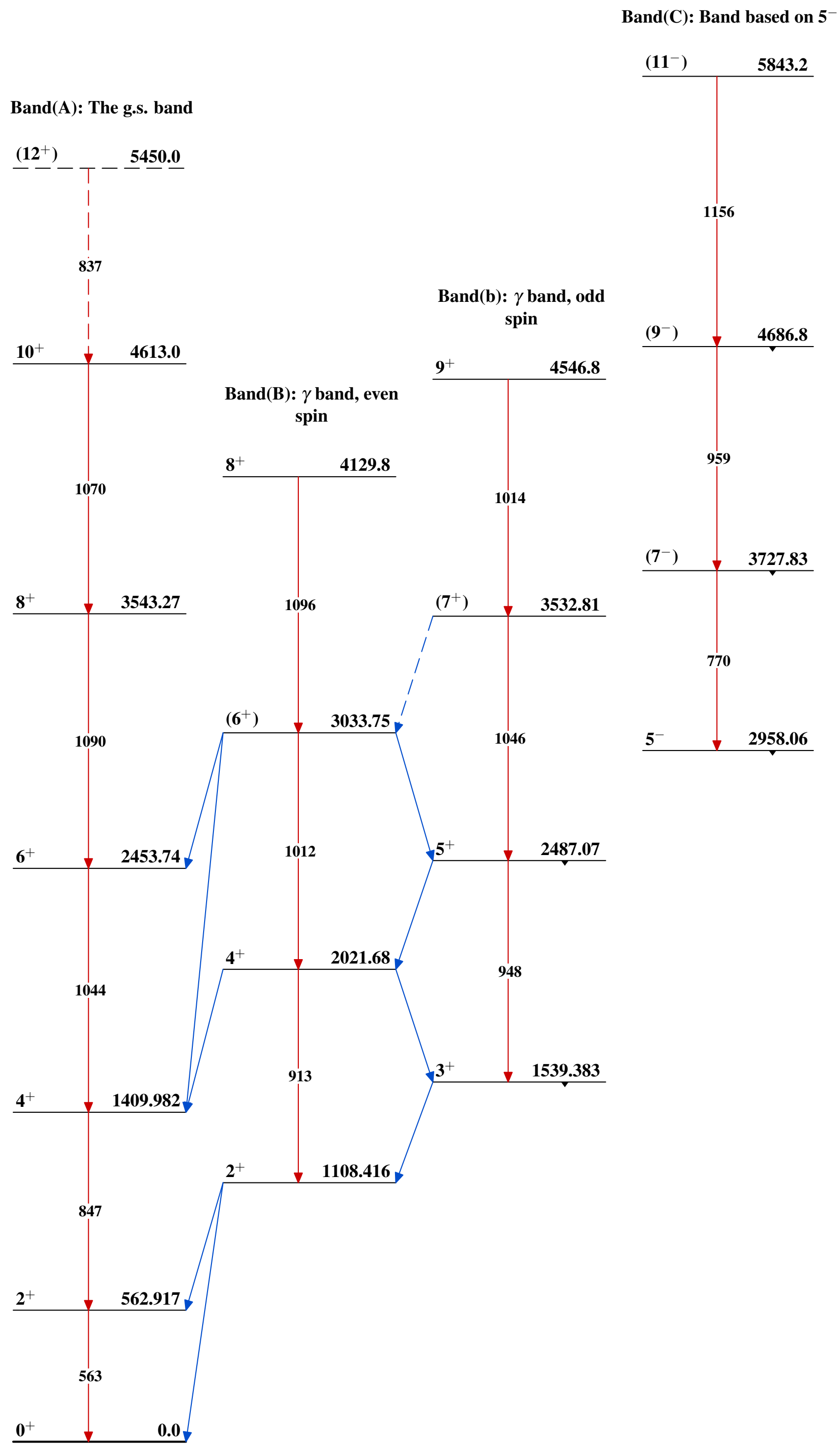
Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

Legend



$^{76}_{32}Ge_{44}$

Adopted Levels, Gammas



$^{76}_{32}Ge_{44}$

Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Ameenah R. Farhan, Balraj Singh	NDS 110,1917 (2009)	30-Jun-2009

Q(β^-)=955 *11*; S(n)=8721 *4*; S(p)=13159 *5*; Q(α)=−8530 *5* 2012Wa38
Note: Current evaluation has used the following Q record $ 955 10 *8719* 4 *13159* 5 −8530 *4* 2009AuZZ,2003Au03.
S(2n)=14792 *4*, s(2p)=24137 *4* (2009AuZZ).
Values in 2003Au03: Q(α)=−8580 *50*, s(2p)=24300 *80* (2003Au03); others same as in 2009AuZZ.
Other reaction: ^{238}U(p,F), E=25 MeV, measured fission fragment mass distribution (1997Hu09).
Additional information 1.
Nuclear structure calculations: 2008Yo07 (high-spin levels, B(E2), shell model), 1992Er02, 1992Hs02.
Double β decay calculation: 2001Ka15.

^{78}Ge Levels

Cross Reference (XREF) Flags

A	^{78}Ga β^- decay (5.09 s)	D	Coulomb excitation
B	^{79}Ga β^-n decay (2.847 s)	E	^{82}Se(d,^{6}Li)
C	^{76}Ge(t,p)	F	^{192}Os(^{82}Se,Xγ)

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$[#]	XREF	Comments
0.0[@]	0$^+$	88.0 min *10*	ABCDEF	%β^-=100 T$_{1/2}$: from 1965Kv01. Others: 88 min 2 (1965Fr04), 86 min 1 (1953Su04).
619.36[@] *12*	2$^+$	13.5 ps *24*	A CDEF	J$^\pi$: level is Coulomb excited from 0$^+$; L(t,p)=2. T$_{1/2}$: weighted average of 15.9 ps *28* from $\beta\gamma\gamma$(t) in β^- decay (1993Ch05) and 11.1 ps *7* from B(E2)↑=0.222 *14* (2005Pa23).
1186.51 *12*	2$^+$	12 ps *6*	A C E	J$^\pi$: L(t,p)=2.
1546.6 *4*	0$^+$	25 ps *11*	A C E	J$^\pi$: L(t,p)=0.
1570.20[@] *19*	4$^+$	<3.5 ps	A C EF	J$^\pi$: L(t,p)=4.
1644.58 *14*	(2,3,4$^+$)	15 ps *6*	A	J$^\pi$: log *ft*=6.64 from (3$^+$); γ to 2$^+$.
1842.73 *22*	2$^+$		A C	J$^\pi$: L(t,p)=2.
2292 *3*	(4$^+$)		C	J$^\pi$: L(t,p)=(4).
2319.57 *20*	(2,3,4)	43 ps *5*	A	J$^\pi$: log *ft*=6.26 from (3$^+$).
2330 *3*			C	J$^\pi$: L(t,p)=(4,5) suggests (4$^+$,5$^-$), another L(t,p)=(0,4) suggests (0$^+$,4$^+$). The 2330 peak in (t,p) may contain contribution from 2319 level as well.
2404? *5*			C	
2438.71 *19*	(2$^+$)	<7 ps	A C	J$^\pi$: L(t,p)=2.
2652 *3*	(5$^-$)		C	J$^\pi$: L(t,p)=5.
2665.63 *17*	(2,3,4$^+$)	4.2 ps *25*	A	J$^\pi$: log *ft*=5.81 from (3$^+$); γ to 2$^+$.
2706.01 *19*	(2$^+$)		A	J$^\pi$: log *ft*=6.29 from (3$^+$); γ to 0$^+$.
2748.2[@] *11*	(6$^+$)		F	J$^\pi$: yrast population in (^{82}Se,X).
2759 *10*	(3$^-$,4$^+$)		C	J$^\pi$: L(t,p)=(3,4).
2850 *10*	(5$^-$)		C	J$^\pi$: L(t,p)=5.
2857.14 *19*	(2,3,4$^+$)		A	J$^\pi$: log *ft*=6.20 from (3$^+$); γ to 2$^+$.
2952.9 *3*	(4$^+$)	9 ps *4*	A C	J$^\pi$: L(t,p)=4.
3120.60 *20*	(2,3,4$^+$)	<2.8 ps	A	J$^\pi$: log *ft*=5.65 from (3$^+$); γ to 2$^+$.
3183 *10*	(2$^+$)		C	J$^\pi$: L(t,p)=2.
3236 *10*	(1$^-$&3$^-$)		C	J$^\pi$: L(t,p)=1+3.
3287 *10*	(6$^+$)		C	J$^\pi$: L(t,p)=6.
3350 *10*	(0$^+$)		C	J$^\pi$: L(t,p)=0.
3389.91 *22*	(2$^+$,3,4$^+$)		A C	J$^\pi$: log *ft*=6.18 from (3$^+$); γ's to 2$^+$ and (4$^+$).
3615 *10*	(3$^-$)		C	J$^\pi$: L(t,p)=3.
3638 *10*	(2$^+$)		C	J$^\pi$: L(t,p)=2.
3667 *10*	0$^+$		C	J$^\pi$: L(t,p)=0.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{78}Ge Levels (continued)

E(level)†	Jπ‡	XREF	Comments
3687.73 *17*	(4⁺)	A C	XREF: C(3707). Jπ: L(t,p)=4.
3714.2@ *15*	(8⁺)	F	Jπ: yrast population in (^{82}Se,X).
3797 *10*	(3⁻)	C	Jπ: L(t,p)=3.
3816 *10*	(2⁺)	C	Jπ: L(t,p)=2.
3898 *10*	0⁺	C	Jπ: L(t,p)=0.
3965 *10*	(2⁺)	C	Jπ: L(t,p)=2.
4015 *10*	(0⁺)	C	Jπ: L(t,p)=0.
4036 *10*	(5⁻)	C	Jπ: L(t,p)=5.
4070 *10*	(2⁺)	C	Jπ: L(t,p)=2.
4083.7 *5*	(2,3,4⁺)	A	Jπ: log *ft*=5.64 from (3⁺); γ to 2⁺.
4115 *10*	(1⁻)	C	Jπ: L(t,p)=1.
4134 *10*	(2⁺)	C	Jπ: L(t,p)=2.
4270.08 *23*	(2,3,4⁺)	A C	XREF: C(4259). Jπ: log *ft*=5.76 from (3⁺); γ to 2⁺.
4279.4 *4*	(2,3,4⁺)	A	Jπ: log *ft*=5.81 from (3⁺); γ to 2⁺.
4305 *10*		C	
4335 *10*		C	
4378 *10*		C	
4745 *10*		C	
4816 *10*		C	
5078.2 *10*	(2,3,4⁺)	A	Jπ: log *ft*=5.68 from (3⁺); γ to 2⁺.
5191 *10*		C	
5324 *10*		C	

† From least squares fit to Eγ′s.

‡ From L transfer in (t,p) except as noted. The evaluators consider all assignments as tentative for levels above 1843 since there seem disagreements between the (t,p) data of 1978Ar12 and 1987Ma21. Moreover, L(t,p)>2 distribution patterns are generally not characteristic of a unique L value.

From $\beta\gamma\gamma$(t) fast timing technique in β^- decay (1993Ch05), except as noted.

@ Band(A): yrast structure.

γ(^{78}Ge)

E_i(level)	J_i^π	Eγ†	Iγ†	E_f	J_f^π	Mult.	Comments
619.36	2⁺	619.40 *16*	100	0.0	0⁺	[E2]	B(E2)(W.u.)=23 *4*
1186.51	2⁺	567.06 *16*	91 *5*	619.36	2⁺	[E2]	B(E2)(W.u.)=19 *11*
		1186.42 *16*	100 *5*	0.0	0⁺	[E2]	B(E2)(W.u.)=0.53 *24*
1546.6	0⁺	927.2 *3*	100	619.36	2⁺		
1570.20	4⁺	950.77 *17*	100	619.36	2⁺	[E2]	B(E2)(W.u.)>11
1644.58	(2,3,4⁺)	458.00 *15*	47 *3*	1186.51	2⁺		
		1025.11 *17*	100 *6*	619.36	2⁺		
1842.73	2⁺	1223.36 *18*	100	619.36	2⁺		
2319.57	(2,3,4)	674.86 *17*	100	1644.58	(2,3,4⁺)		
2438.71	(2⁺)	891.3 *16*	12 *7*	1546.6	0⁺		
		1251.96 *20*	65 *8*	1186.51	2⁺		
		1819.59 *21*	100 *16*	619.36	2⁺		
2665.63	(2,3,4⁺)	345.76 *26*	63 *9*	2319.57	(2,3,4)		
		1021.2 *4*	15 *4*	1644.58	(2,3,4⁺)		
		1479.13 *18*	100 *7*	1186.51	2⁺		
		2046.32 *25*	67 *7*	619.36	2⁺		
2706.01	(2⁺)	862.8 *15*	25 *11*	1842.73	2⁺		
		1061.9 *4*	20 *6*	1644.58	(2,3,4⁺)		

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

$\gamma(^{78}Ge)$ (continued)

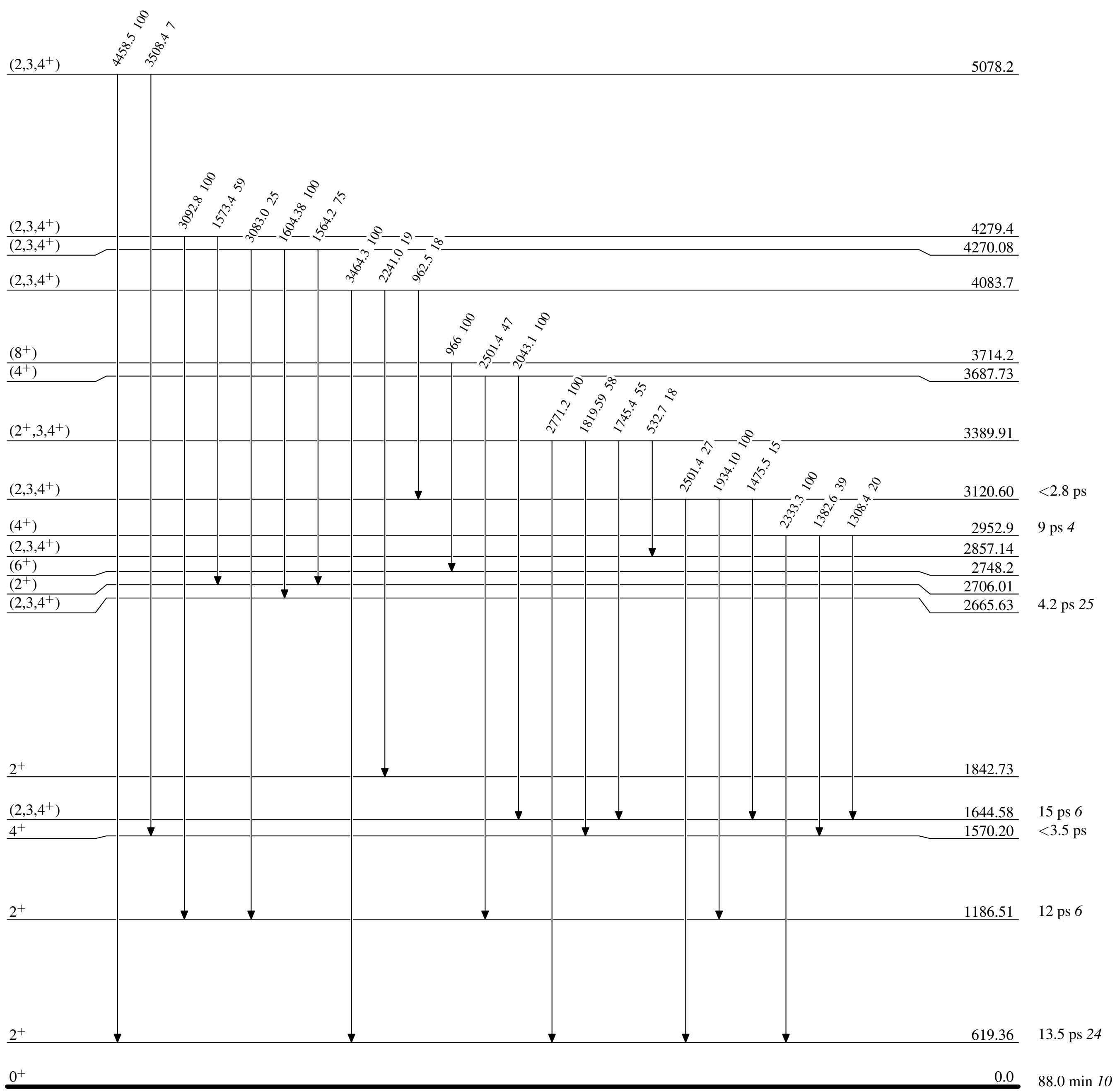
E_i(level)	J_i^π	E_γ†	I_γ†	E_f	J_f^π
2706.01	(2+)	1519.32 *24*	47 *7*	1186.51	2+
		2706.2 *4*	100 *11*	0.0	0+
2748.2	(6+)	1178‡	100‡	1570.20	4+
2857.14	(2,3,4+)	1212.41 *24*	100 *13*	1644.58	(2,3,4+)
		1670.67 *23*	83 *10*	1186.51	2+
		2237.9 *4*	63 *13*	619.36	2+
2952.9	(4+)	1308.4 *3*	20 *10*	1644.58	(2,3,4+)
		1382.6 *9*	39 *35*	1570.20	4+
		2333.3 *4*	100 *17*	619.36	2+
3120.60	(2,3,4+)	1475.5 *4*	15 *6*	1644.58	(2,3,4+)
		1934.10 *21*	100 *7*	1186.51	2+
		2501.4 *3*	27 *5*	619.36	2+
3389.91	(2+,3,4+)	532.7 *4*	18 *5*	2857.14	(2,3,4+)
		1745.4 *4*	55 *13*	1644.58	(2,3,4+)
		1819.59 *21*	58 *24*	1570.20	4+
		2771.2 *6*	100 *24*	619.36	2+
3687.73	(4+)	2043.1 *1*	100 *18*	1644.58	(2,3,4+)
		2501.4 *3*	47 *24*	1186.51	2+
3714.2	(8+)	966‡	100‡	2748.2	(6+)
4083.7	(2,3,4+)	962.5 *15*	18 *9*	3120.60	(2,3,4+)
		2241.0 *6*	19 *5*	1842.73	2+
		3464.3 *8*	100 *12*	619.36	2+
4270.08	(2,3,4+)	1564.2 *3*	75 *12*	2706.01	(2+)
		1604.38 *23*	100 *14*	2665.63	(2,3,4+)
		3083.0 *15*	25 *15*	1186.51	2+
4279.4	(2,3,4+)	1573.4 *3*	59 *11*	2706.01	(2+)
		3092.8 *7*	100 *17*	1186.51	2+
5078.2	(2,3,4+)	3508.4 *16*	7 *5*	1570.20	4+
		4458.5 *12*	100 *18*	619.36	2+

† From ^{78}Ga β^- decay unless otherwise stated.
‡ From $^{192}Os(^{82}Se,X\gamma)$ only.

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

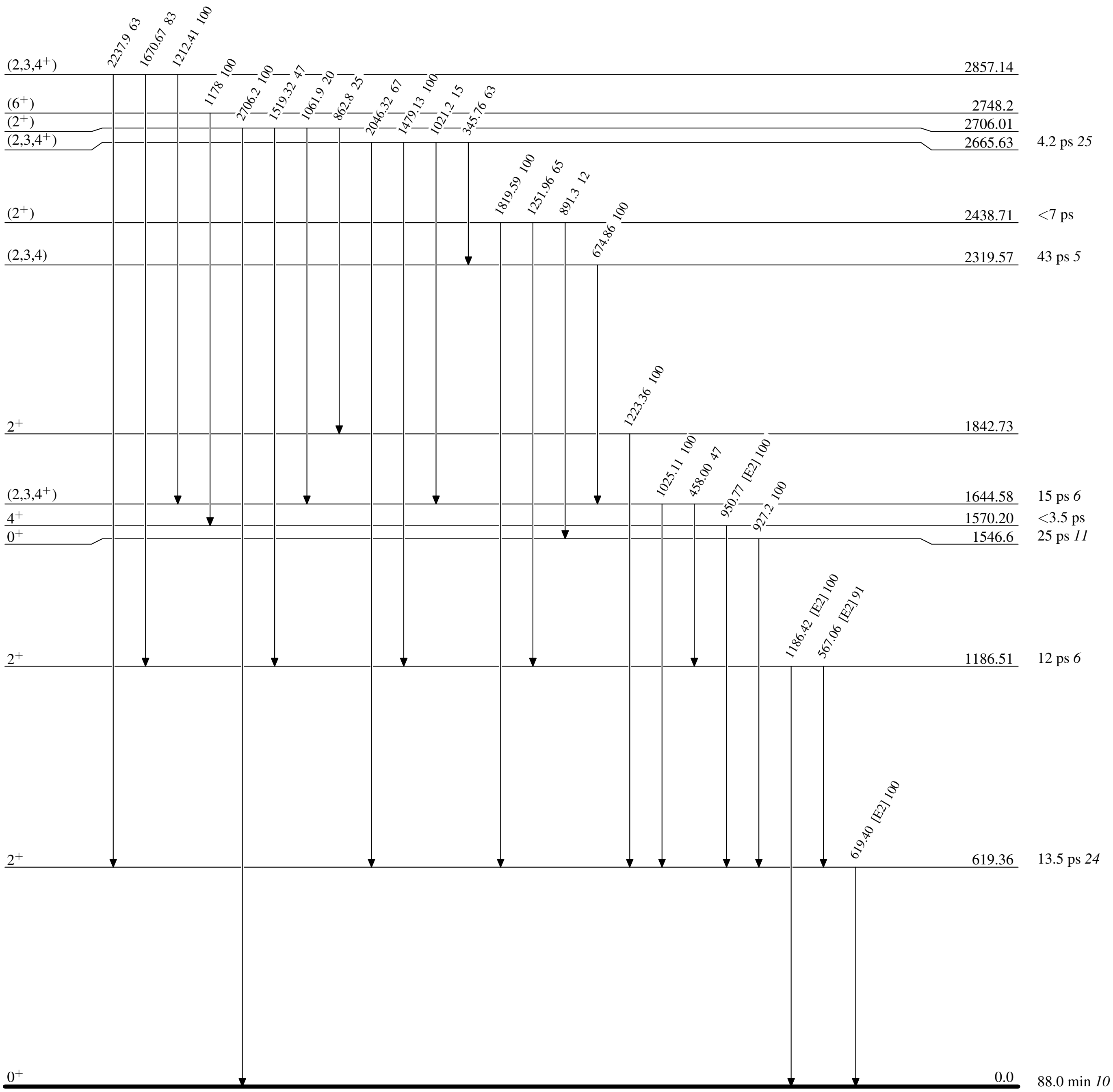


$^{78}_{32}Ge_{46}$

Adopted Levels, Gammas

Level Scheme (continued)

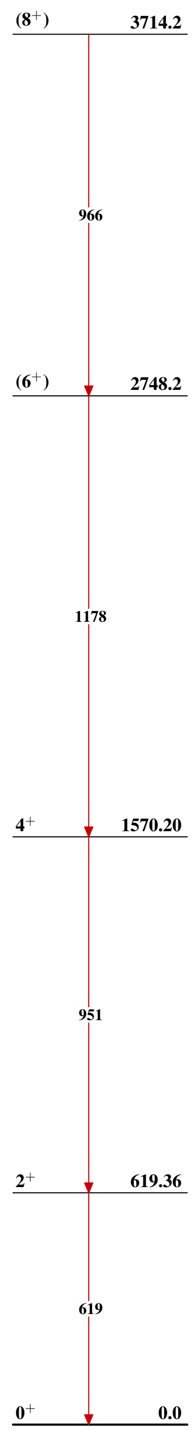
Intensities: Relative photon branching from each level



$^{78}_{32}Ge_{46}$

Adopted Levels, Gammas

Band(A): Yrast structure



$^{78}_{32}Ge_{46}$