Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Kazimierz Zuber, Balraj Singh	NDS 125, 1 (2015)	25-Jan-2015

Q(β^-)=−9210 *40*; S(n)=10246 *16*; S(p)=5293 *16*; Q(α)=−2690 *16* 2012Wa38
Q(εp)=835 *16*, S(2n)=25276 *16*, S(2p)=9771 *16* (2012Wa38).
^{61}Zn produced and identified by 1955Li39 in the bombardment of ^{58}Ni by 15-22 MeV α particles followed by chemical separation. An earlier abstract by Cumming (Phys. Rev. 99, 1645A (1955)) and a later full paper 1959Cu86 confirmed this isotope.
Theory, calculations:
Additional information 1.
2002Ca48: large-scale shell model calculations.
2004Ho08: the effective interaction GXPF1 for shell model in the pf shell.

^{61}Zn Levels

Note that in 1999-NDS (1999Bh04), 88.2, 418.3, and 756.0 levels were erroneously assigned half-lives of <430 ms, 0.14 s *7* and <130 ms, respectively. These half-lives in 1999Oi01 simply refer to the half-life of the decaying ^{61}Ga isotope.
For band configurations in terms of quasiparticle notation, see ^{28}Si(^{36}Ar,2pnγ) datasets.

Cross Reference (XREF) Flags

A	^{61}Ga ε decay (167 ms)	E	^{58}Ni(^{16}O,^{13}C)
B	^{28}Si(^{36}Ar,2pnγ)	F	^{58}Ni(^{6}Li,t),(^{12}C,^{9}Be)
C	^{40}Ca(^{24}Mg,2pnγ)	G	^{64}Zn(^{3}He,^{6}He)
D	^{58}Ni(α,nγ)		

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$	XREF	Comments
0.0[e]	3/2$^-$	89.1 s *2*	ABCDEFG	%ε+%β^+=100 J$^\pi$: allowed β transitions to 1/2$^-$ (log *ft*=5.96) and 5/2$^-$ (log *ft*=5.20) levels in ^{61}Cu from ^{61}Zn ε. T$_{1/2}$: from 1972Du09. Others: 88.8 s *18* (1955Li39), 88.5 s *10* (1959Cu86), 85.9 s *6* (1969Ho02).
88.55[f] *19*	1/2$^-$		ABCD	J$^\pi$: ΔJ=1, (M1+E2) γ to 3/2$^-$; isotropic $\gamma(\theta)$.
123.84[d] *9*	5/2$^-$	≈5.5 ns	ABCDEFG	J$^\pi$: ΔJ=1, M1+E2 γ to 3/2$^-$. T$_{1/2}$: γ(t) in (^{24}Mg,2pnγ) (2006An31).
418.80[g] *14*	3/2$^-$		ABCDE G	J$^\pi$: ΔJ=0, M1+E2 γ to 3/2$^-$.
755.42[f] *10*	5/2$^-$		ABCD	J$^\pi$: ΔJ=1, M1+E2 γ to 3/2$^-$.
938.5 *3*	(1/2$^-$)		A DEFG	J$^\pi$: γs to 1/2$^-$ and 3/2$^-$.
996.66[e] *10*	7/2$^-$		BCD	J$^\pi$: stretched E2 996γ to 3/2$^-$.
1239 *9*			FG	
1264.99[d] *13*	9/2$^-$		BCDE	
1361.8 *5*	3/2$^-$,5/2$^-$		A D	J$^\pi$: M1+E2 γ to 3/2$^-$.
1387 *9*			FG	
1402.64[g] *18*	7/2$^-$		BCD	J$^\pi$: ΔJ=1, M1 γ to 5/2$^-$.
1636 *20*			G	
1657.8 *6*	5/2$^-$,7/2$^-$		D	J$^\pi$: M1+E2 γ to 5/2$^-$.
1730			E	
2002.60[f] *19*	9/2$^-$		BCD	J$^\pi$: M1(+E2) γ to 7/2$^-$; ΔJ=2 γ to 5/2$^-$.
2030 *10*			EF	
2098.9 *10*			D	
2198 *20*			G	
2250 *10*			F	

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Adopted Levels, Gammas (continued)

^{61}Zn Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	XREF	Comments
2269.8[e] *4*	11/2$^-$	BCD	
2399.0[i] *5*	9/2$^+$	BCDEFG	XREF: G(2417).
2520 *10*		F	
2646 *20*		G	
2698.7[g] *4*	11/2$^-$	BC	
2715 *10*		FG	
2798.7[d] *4*	(13/2$^-$)	BCDE	J$^{\pi}$: 1532$\gamma(\theta)$.
2804 *9*		FG	
3090 *10*		F	
3243.8[h] *8*	(11/2$^+$)	BC	
3300 *10*		F	
3335.7[i] *6*	13/2$^+$	BCD	
3345 *20*		G	
3380	(3/2$^-$)	E	J$^{\pi}$: T=3/2 analog of ^{61}Cu 3/2$^-$ g.s.
3460.8[f] *7*	(13/2$^-$)	BC	
3494.0 *10*		BC	
3645 *20*		G	
3843.8[e] *7*	(15/2$^-$)	BC	
3880 *80*		EF	
4263.7[h] *7*	15/2$^+$	BC	
4308.8 *11*	(13/2)	BC	
4380 *80*		EF	
4414.6[i] *8*	17/2$^+$	BCD	
4644.2[d] *7*	17/2$^-$	BC	
4670 *30*		G	
4914.7 *11*		BC	
5100 *30*		EFG	
5194.6[f] *9*	(17/2$^-$)	BC	
5254.1 *8*		BC	
5320 *30*		G	
5467.8 *13*		BC	
5542.9[e] *8*	(19/2$^-$)	BC	
5552.2[h] *8*	19/2$^+$	BC	
5590 *90*		EF	
6090.3[i] *12*	21/2$^+$	BC	
6211.7 *10*		BC	
7283.7[j] *9*	(21/2$^-$)	BC	
7295.9[h] *10*	(23/2$^+$)	BC	
7486.3 *15*	25/2$^+$	BC	
7628.5[k] *9*	23/2$^-$	BC	
8335.2[b] *11*	(21/2$^-$)	BC	
8496.4 *12*	(25/2$^+$)	BC	
8775.1[c] *11*	(23/2$^-$)	BC	
8879.1[j] *12*	(25/2$^-$)	BC	
9036.5? *21*		B	
9160.5[k] *12*	27/2$^-$	BC	
9303.1[b] *11*	(25/2$^-$)	B	
9367.2 *11*	(25/2$^-$)	B	
9950.8[c] *11*	(27/2$^-$)	B	
9990 *70*	(3/2$^-$)	E	T=5/2 Isobaric analog state.
10057.6[j] *12*	29/2$^-$	B	

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Adopted Levels, Gammas (continued)

^{61}Zn Levels (continued)

E(level)†	Jπ‡	XREF	E(level)†	Jπ‡	XREF	E(level)†	Jπ‡	XREF
10154.6[k] 13	31/2⁻	BC	14299.5[b] 17	(37/2⁻)	B	19270[p] 5	(41/2⁻)	B
10664.6[b] 12	(29/2⁻)	B	14325[&] 3	(35/2⁻)	B	19653[o] 6	(45/2⁻)	B
10871 6	(25/2⁺)	B	14431[l] 4	(33/2⁺)	B	19690[m] 6	(45/2⁻)	B
11183 5	(27/2⁺)	B	14433 7	(31/2⁻)	B	19773[@] 6	(43/2⁻)	B
11261? 5	(25/2⁺)	B	14449 5	(35/2⁻)	B	20060[#] 6	(45/2⁺)	B
11368[l] 3	(25/2⁺)	B	14769 6		B	20531[q] 5	(43/2⁻)	B
11505.4[c] 12	(31/2⁻)	B	14817[@] 4	(35/2⁻)	B	20642[a] 6	(45/2⁻)	B
11527?[m] 5	(29/2⁻)	B	15020 6	(33/2⁻)	B	20674[l] 5	(45/2⁺)	B
11770 5	(29/2⁺)	B	15206[m] 5	(37/2⁻)	B	20999[n] 6	(47/2⁻)	B
12042[o] 6	(29/2⁻)	B	15224[p] 4	(33/2⁻)	B	21745[p] 6	(45/2⁻)	B
12232 4	(29/2⁺)	B	15261.3[c] 25	(39/2⁻)	B	22239[o] 7	(49/2⁻)	B
12337[a] 4	(29/2⁻)	B	15293 6		B	22397[m] 7	(49/2⁻)	B
12469.1[b] 13	(33/2⁻)	B	15475[o] 5	(37/2⁻)	B	22584[&] 6	(47/2⁻)	B
12537[#] 4	(29/2⁺)	B	15565[#] 5	(37/2⁺)	B	22901[@] 7	(47/2⁻)	B
12665[&] 3	(31/2⁻)	B	15739[a] 4	(37/2⁻)	B	22965[#] 7	(49/2⁺)	B
12725.7 24	(33/2⁻)	B	16099[q] 4	(35/2⁻)	B	23180[q] 6	(47/2⁻)	B
12761 5	(31/2⁻)	B	16230[n] 5	(39/2⁻)	B	23222[l] 6	(49/2⁺)	B
12802[l] 3	(29/2⁺)	B	16280[l] 4	(37/2⁺)	B	23856[n] 7	(51/2⁻)	B
12865[@] 4	(31/2⁻)	B	16438[&] 4	(39/2⁻)	B	23900[a] 6	(49/2⁻)	B
13210 4	(33/2)	B	17119[p] 5	(37/2⁻)	B	24604[p] 7	(49/2⁻)	B
13264[m] 5	(33/2⁻)	B	17126[@] 5	(39/2⁻)	B	25280?[o] 8	(53/2⁻)	B
13319.3[c] 15	(35/2⁻)	B	17310[m] 5	(41/2⁻)	B	25449?[m] 8	(53/2⁻)	B
13664[o] 6	(33/2⁻)	B	17455[o] 6	(41/2⁻)	B	26042[l] 7	(53/2⁺)	B
13882[#] 4	(33/2⁺)	B	17610[#] 5	(41/2⁺)	B	26220[q] 7	(51/2⁻)	B
13886[a] 4	(33/2⁻)	B	17987[a] 5	(41/2⁻)	B	26696[#] 8	(53/2⁺)	B
14061 6	(35/2⁻)	B	18196[q] 5	(39/2⁻)	B	27084?[n] 8	(55/2⁻)	B
14072 5	(35/2⁻)	B	18363[l] 5	(41/2⁺)	B	29171[l] 7	(57/2⁺)	B
14114 5	(33/2)	B	18471[n] 6	(43/2⁻)	B			
14144[n] 6	(35/2⁻)	B	19149[&] 5	(43/2⁻)	B			

† Level energies with ΔE<8 keV are deduced from least-squares fit to the Adopted Gammas (by evaluators). The others are weighted averages of all available data from (^{16}O,^{13}C),(^{6}Li,t) and (^{3}He,^{6}He).

‡ For states with J≥9/2, assignments are essentially as proposed in the high-spin studies by 2009An01 and 2006An31, which are based on γγ(θ) and γ(lin pol) data for selected transitions, band assignments, decay pattern of levels, and yrast nature of population of levels in heavy-ion γ-ray studies, except as noted. The parentheses in many cases have been added by the evaluators.

[#] Band(A): Band based on (29/2⁺).

[@] Band(B): Band based on (31/2⁻).

[&] Band(C): Band based on (31/2⁻).

[a] Band(D): Band based on (29/2⁻).

[b] Band(E): Band based on (21/2⁻),α=+1/2.

[c] Band(e): Band based on (23/2⁻),α=−1/2.

[d] Band(F): Band based on 3/2⁻,α=+1/2.

[e] Band(f): Band based on 3/2⁻,α=−1/2.

[f] Band(G): Band based on 1/2⁻,α=+1/2.

[g] Band(g): Band based on 1/2⁻,α=−1/2.

[h] Band(H): Band based on 11/2⁺.

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Adopted Levels, Gammas (continued)

^{61}Zn Levels (continued)

[i] Band(I): Band based on $9/2^+$.
[j] Band(J): Band based on $21/2^-$,α=+1/2.
[k] Band(j): Band based on $23/2^-$,α=−1/2.
[l] Band(K): SD-1 band,α=+1/2.
[m] Band(L): SD-2 band,α=+1/2.
[n] Band(l): SD-3 band,α=−1/2.
[o] Band(M): SD-4 band,α=+1/2.
[p] Band(N): SD-5 band,α=+1/2.
[q] Band(n): SD-6 band,α=−1/2.

Adopted Levels, Gammas (continued)

γ(^{61}Zn)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ	α[@]	Comments
88.55	1/2$^-$	88.4 *3*	100	0.0	3/2$^-$	(M1+E2)	≈0.2	0.12 *2*	E_γ: unweighted average of 88.0 *1* (1982Sm01), 88.4 *1* (1984Th07) and 88.9 *1* (2009An01,2006An31). Weighted average is the same but with a large χ^2 value. α: assuming 25% uncertainty in δ.
123.84	5/2$^-$	123.8 *1*	100	0.0	3/2$^-$	M1+E2	−0.05 *2*	0.0352 *8*	B(M1)(W.u.)≈0.0021; B(E2)(W.u.)≈0.62
418.80	3/2$^-$	295.4 *2*	5.7 *7*	123.84	5/2$^-$	(M1+E2)	−0.44 *37*	0.0051 *19*	
		330.5 *4*	14.3 *4*	88.55	1/2$^-$	(M1+E2)	+0.27 *13*	0.0032 *4*	E_γ: unweighted average of 330.4 *3* (1982Sm01), 329.8 *5* (1984Th07), 331.3 *2* (2009An01,2006An31). Weighted average is 330.9 *4* with a large χ^2 value.
		419.0 *3*	100.0 *20*	0.0	3/2$^-$	M1+E2	−0.10 *5*		E_γ: unweighted average of 418.4 *1* (1982Sm01), 418.5 *2* (1984Th07), 419.1 *2* (2009An01,2006An31). Weighted average is 419.2 *2* with a large χ^2 value.
755.42	5/2$^-$	338.2 *6*	5.0 *6*	418.80	3/2$^-$				E_γ: unweighted average of 337.0 *7* (1982Sm01), 338.6 *2* (1984Th07), 339.0 *2* (2009An01,2006An31). Weighted average is 338.7 *3* with a large χ^2 value.
		631.7 *3*	6.1 *6*	123.84	5/2$^-$	D			
		666.6 *3*	10.0 *6*	88.55	1/2$^-$				
		755.55 *13*	100.0 *19*	0.0	3/2$^-$	M1+E2	−0.07 *4*		
938.5	(1/2$^-$)	520.0 *4*	30 *13*	418.80	3/2$^-$				I_γ: unweighted average of 16 *4* in (α,nγ) (1982Sm01) and 43 *10* in ε decay. Value of 232 *43* from 1984Th07 in (α,nγ) seems discrepant thus not used.
		849.8 *7*	26.8 *24*	88.55	1/2$^-$				
		938.2 *4*	100.0 *16*	0.0	3/2$^-$				
996.66	7/2$^-$	241.4 *1*	0.68 *14*	755.42	5/2$^-$				
		578.0 *3*	6.0 *3*	418.80	3/2$^-$	Q			
		872.7 *1*	100.0 *16*	123.84	5/2$^-$	M1+E2	−1.9 *1*		Mult.: from (α,nγ).
		996.7 *5*	37 *4*	0.0	3/2$^-$	E2			I_γ: unweighted average of values from (α,nγ) (1982Sm01,1984Th07) and ^{40}Ca(^{24}Mg,2pnγ) (2006An31).
1264.99	9/2$^-$	1141.1 *1*	100	123.84	5/2$^-$	E2			E_γ: from (α,nγ) (1982Sm01).
1361.8	3/2$^-$,5/2$^-$	606.0 *5*	13.9 *14*	755.42	5/2$^-$				
		944.0 *10*	33 *6*	418.80	3/2$^-$				
		1240[&]	50	123.84	5/2$^-$				Questionable placement suggested in 1982Sm01, 50% relative branching from 1989Sc28 in (α,nγ). Note that there is a 1239γ from 1658 level proposed by 1984Th07. Evaluators consider the 1240γ from 1362 level as suspect.
		1362.0 *10*	100 *6*	0.0	3/2$^-$	M1+E2			δ: −0.29 *17* or +0.18 *11* In (α,nγ).
1402.64	7/2$^-$	647.1 *2*	100 *3*	755.42	5/2$^-$	M1			γ branching ratios are from (^{24}Mg,2pnγ) (2006An31). Corresponding values from (α,nγ) (1982Sm01) are in reasonable agreement, but in sharp disagreements with those from 1984Th07 and 1989Sc28 in (α,ng). I_γ: 100 in (α,nγ) (1984Th07).
		984.4 *3*	103 *15*	418.80	3/2$^-$				I_γ: 30 *8* in (α,nγ) (1984Th07) seems discrepant.

$^{61}_{30}Zn_{31}$-5

Adopted Levels, Gammas (continued)

γ(^{61}Zn) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ	Comments
1402.64	7/2$^-$	1278.6 *7*	59 *12*	123.84	5/2$^-$	D		I_γ: 16 *4* in (α,nγ) (1984Th07) seems discrepant.
		1401.9 *5*	156 *91*	0.0	3/2$^-$			I_γ: 32 *7* in (α,nγ) (1984Th07) seems discrepant.
1657.8	5/2$^-$,7/2$^-$	1239.0 *7*	100	418.80	3/2$^-$			
		1534.0 *10*	38 *7*	123.84	5/2$^-$	M1+E2	−1.4 *9*	
2002.60	9/2$^-$	737.6 *4*	11.8 *12*	1264.99	9/2$^-$			
		1006.0 *2*	100 *8*	996.66	7/2$^-$	M1(+E2)	−0.4 *4*	
		1247.0 *4*	86 *8*	755.42	5/2$^-$	Q		
2098.9		1975	100	123.84	5/2$^-$			
2269.8	11/2$^-$	1005 *1*	37 *4*	1264.99	9/2$^-$	D		
		1273.6 *4*	100 *4*	996.66	7/2$^-$	E2		
2399.0	9/2$^+$	997.0[&] *5*	12 *7*	1402.64	7/2$^-$			
		1403.4 *7*	100 *12*	996.66	7/2$^-$	E1		
		2273 *1*	5.6 *2*	123.84	5/2$^-$	(M2)		
2698.7	11/2$^-$	696.2 *3*	25.4 *15*	2002.60	9/2$^-$	D		
		1433 *1*	100 *3*	1264.99	9/2$^-$	D		
2798.7	(13/2$^-$)	529.4 *3*	1.7 *2*	2269.8	11/2$^-$			
		1532 *1*	100 *7*	1264.99	9/2$^-$	Q		
3243.8	(11/2$^+$)	1978 *1*	100	1264.99	9/2$^-$	D		
3335.7	13/2$^+$	936.7 *5*	100 *5*	2399.0	9/2$^+$	E2		
		1066 *1*	18 *1*	2269.8	11/2$^-$	E1		
3460.8	(13/2$^-$)	1458 *1*	100 *4*	2002.60	9/2$^-$	Q		
		2195 *1*	83 *5*	1264.99	9/2$^-$	Q		
3494.0		2229 *1*	100	1264.99	9/2$^-$	Q		
3843.8	(15/2$^-$)	1046 *1*	26 *1*	2798.7	(13/2$^-$)			
		1572 *1*	100 *6*	2269.8	11/2$^-$	Q		E_γ: level-energy difference=1574.
4263.7	15/2$^+$	1019 *1*	19 *1*	3243.8	(11/2$^+$)	Q		
		1466 *1*	100 *5*	2798.7	(13/2$^-$)	E1		
4308.8	(13/2)	2039 *1*	100	2269.8	11/2$^-$	D		
4414.6	17/2$^+$	1079 *1*	100	3335.7	13/2$^+$	E2		
4644.2	17/2$^-$	1847 *1*	100	2798.7	(13/2$^-$)	E2		
4914.7		2116 *1*	100	2798.7	(13/2$^-$)	D		
5194.6	(17/2$^-$)	1733 *1*	100	3460.8	(13/2$^-$)	(Q)		
5254.1		839.2 *4*	100 *3*	4414.6	17/2$^+$			
		990.9 *5*	45 *10*	4263.7	15/2$^+$			
5467.8		1624 *1*	100	3843.8	(15/2$^-$)			
5542.9	(19/2$^-$)	898.9 *4*	36 *12*	4644.2	17/2$^-$			
		1698 *1*	100 *5*	3843.8	(15/2$^-$)	Q		
5552.2	19/2$^+$	908.3 *5*	24 *1*	4644.2	17/2$^-$	D		
		1289 *1*	100 *9*	4263.7	15/2$^+$	E2		
6090.3	21/2$^+$	1675 *3*	100	4414.6	17/2$^+$	E2		
6211.7		1799 *1*	100 *26*	4414.6	17/2$^+$			
		1946 *1*	61 *4*	4263.7	15/2$^+$			
7283.7	(21/2$^-$)	1733 *1*	57 *14*	5552.2	19/2$^+$			

$^{61}_{30}Zn_{31}$-6

Adopted Levels, Gammas (continued)

γ(^{61}Zn) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]
7283.7	(21/2$^-$)	2088 *1*	81 *5*	5194.6	(17/2$^-$)	Q
		2639 *1*	100 *43*	4644.2	17/2$^-$	
7295.9	(23/2$^+$)	1743 *1*	100	5552.2	19/2$^+$	Q
7486.3	25/2$^+$	1396 *1*	100	6090.3	21/2$^+$	E2
7628.5	23/2$^-$	344.8 *2*	4.0 *13*	7283.7	(21/2$^-$)	
		1538 *1*	100 *9*	6090.3	21/2$^+$	E1
8335.2	(21/2$^-$)	1039 *1*	86 *19*	7295.9	(23/2$^+$)	
		2246[&] *1*	38 *19*	6090.3	21/2$^+$	
		2785 *2*	29 *15*	5552.2	19/2$^+$	
		3142 *3*	38 *14*	5194.6	(17/2$^-$)	
		3691 *3*	100 *24*	4644.2	17/2$^-$	Q
8496.4	(25/2$^+$)	868 *1*	53 *13*	7628.5	23/2$^-$	
		1200.4 *12*	100 *27*	7295.9	(23/2$^+$)	
8775.1	(23/2$^-$)	439.9 *4*	100	8335.2	(21/2$^-$)	D
8879.1	(25/2$^-$)	1595 *1*	100	7283.7	(21/2$^-$)	Q
9036.5?		1408 *2*	100	7628.5	23/2$^-$	
9160.5	27/2$^-$	1532 *1*	100 *11*	7628.5	23/2$^-$	E2
		1675 *4*	63 *32*	7486.3	25/2$^+$	
9303.1	(25/2$^-$)	528.0 *6*	85 *12*	8775.1	(23/2$^-$)	
		968 *1*	29 *6*	8335.2	(21/2$^-$)	
		1676 *2*	82 *21*	7628.5	23/2$^-$	D+Q
		2006 *2*	100 *18*	7295.9	(23/2$^+$)	D
9367.2	(25/2$^-$)	592.0 *4*	100 *16*	8775.1	(23/2$^-$)	
		2071 *2*	89 *32*	7295.9	(23/2$^+$)	D
9950.8	(27/2$^-$)	583.3 *6*	99 *8*	9367.2	(25/2$^-$)	D+Q
		647.6 *5*	80 *9*	9303.1	(25/2$^-$)	D+Q
		1175.9 *4*	100 *10*	8775.1	(23/2$^-$)	Q
10057.6	29/2$^-$	897		9160.5	27/2$^-$	
		1178		8879.1	(25/2$^-$)	
10154.6	31/2$^-$	994.1 *5*	100	9160.5	27/2$^-$	E2
10664.6	(29/2$^-$)	713.6 *5*	100 *9*	9950.8	(27/2$^-$)	D+Q
		1362 *1*	35 *6*	9303.1	(25/2$^-$)	
10871	(25/2$^+$)	4780 *5*	100	6090.3	21/2$^+$	Q
11183	(27/2$^+$)	3697 *4*	100	7486.3	25/2$^+$	D+Q
11261?	(25/2$^+$)	5170[&] *4*	100	6090.3	21/2$^+$	
11368	(25/2$^+$)	5278[#] *5*	100	6090.3	21/2$^+$	Q
11505.4	(31/2$^-$)	840.7[#] *6*	92 *7*	10664.6	(29/2$^-$)	D+Q
		1446 *2*	19 *7*	10057.6	29/2$^-$	
		1555 *1*	100 *11*	9950.8	(27/2$^-$)	Q
11770	(29/2$^+$)	4284 *4*	100	7486.3	25/2$^+$	Q
12232	(29/2$^+$)	4745 *5*	100	7486.3	25/2$^+$	
12469.1	(33/2$^-$)	963.6 *6*	100 *7*	11505.4	(31/2$^-$)	
12469.1	(33/2$^-$)	1805 *2*	87 *9*	10664.6	(29/2$^-$)	Q
12537	(29/2$^+$)	3500 *4*	100 *29*	9036.5?		
		5050 *5*	71 *29*	7486.3	25/2$^+$	Q
12665	(31/2$^-$)	3505[#] *3*	100	9160.5	27/2$^-$	Q
12725.7	(33/2$^-$)	2571 *2*	100	10154.6	31/2$^-$	D+Q
12761	(31/2$^-$)	3600 *4*	100	9160.5	27/2$^-$	Q
12802	(29/2$^+$)	1434 *1*	100 *19*	11368	(25/2$^+$)	Q
		1542[#&] *2*	29 *18*	11261?	(25/2$^+$)	(Q)
		4305 *5*	53 *12*	8496.4	(25/2$^+$)	Q
		5314 *5*	23 *12*	7486.3	25/2$^+$	Q
12865	(31/2$^-$)	3704[&] *4*	100	9160.5	27/2$^-$	
13210	(33/2)	3055 *3*	100	10154.6	31/2$^-$	D
13264	(33/2$^-$)	1736[&] *2*		11527?	(29/2$^-$)	
		3109[&] *4*	100	10154.6	31/2$^-$	(D)
13319.3	(35/2$^-$)	850[#] *1*	56 *11*	12469.1	(33/2$^-$)	D+Q
		1814 *2*	100 *13*	11505.4	(31/2$^-$)	Q
		3165 *3*	24 *6*	10154.6	31/2$^-$	
13664	(33/2$^-$)	1622 *2*	100	12042	(29/2$^-$)	
13882	(33/2$^+$)	1345 *1*	100	12537	(29/2$^+$)	Q
13886	(33/2$^-$)	1549 *2*	100 *10*	12337	(29/2$^-$)	Q
		3731 *3*	18 *5*	10154.6	31/2$^-$	D+Q
14072	(35/2$^-$)	3917 *4*	100	10154.6	31/2$^-$	Q
14114	(33/2)	3959 *4*	100	10154.6	31/2$^-$	D
14299.5	(37/2$^-$)	980 *1*	53 *13*	13319.3	(35/2$^-$)	
		1831 *2*	100 *13*	12469.1	(33/2$^-$)	Q
14325	(35/2$^-$)	1660 *2*	100 *26*	12665	(31/2$^-$)	
		4170 *4*	63 *16*	10154.6	31/2$^-$	Q
14431	(33/2$^+$)	1629 *2*	100 *17*	12802	(29/2$^+$)	Q
		1702[&] *2*	11 *6*	12725.7	(33/2$^-$)	
		2199 *2*	8 *4*	12232	(29/2$^+$)	
14433	(31/2$^-$)	5272 *6*	100	9160.5	27/2$^-$	Q
14449	(35/2$^-$)	4294 *4*	100	10154.6	31/2$^-$	Q
14769		4614 *5*	100	10154.6	31/2$^-$	
14817	(35/2$^-$)	1952 *2*	100 *37*	12865	(31/2$^-$)	
		4662 *5*	100 *37*	10154.6	31/2$^-$	
15020	(33/2$^-$)	4865 *5*	100	10154.6	31/2$^-$	D+Q
15206	(37/2$^-$)	1942 *2*	100	13264	(33/2$^-$)	Q
15224	(33/2$^-$)	4559[&] *5*	100	10664.6	(29/2$^-$)	
15261.3	(39/2$^-$)	1942 *2*	100	13319.3	(35/2$^-$)	
15293		5138 *5*	100	10154.6	31/2$^-$	
15475	(37/2$^-$)	1811 *2*	100	13664	(33/2$^-$)	
15565	(37/2$^+$)	1683 *2*	100	13882	(33/2$^+$)	Q

Adopted Levels, Gammas (continued)

γ(^{61}Zn) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]
15739	(37/2$^-$)	1853 *2*	100	13886	(33/2$^-$)	Q
16099	(35/2$^-$)	875 *1*	100 *40*	15224	(33/2$^-$)	
		4593 *5*	70 *30*	11505.4	(31/2$^-$)	
16230	(39/2$^-$)	755 *1*	50 *17*	15475	(37/2$^-$)	
		1024 *1*	67 *11*	15206	(37/2$^-$)	
		2086 *2*	100 *17*	14144	(35/2$^-$)	(Q)
		2169 *3*	44 *11*	14061	(35/2$^-$)	(Q)
16280	(37/2$^+$)	1849 *2*	100	14431	(33/2$^+$)	Q
16438	(39/2$^-$)	2113 *2*	100	14325	(35/2$^-$)	Q
17119	(37/2$^-$)	1020[&] *1*	50 *25*	16099	(35/2$^-$)	
		1895 *2*	100 *20*	15224	(33/2$^-$)	
17126	(39/2$^-$)	2309 *3*	100	14817	(35/2$^-$)	
17310	(41/2$^-$)	1080[&] *1*	14 *10*	16230	(39/2$^-$)	
		2104 *2*	100 *12*	15206	(37/2$^-$)	Q
17455	(41/2$^-$)	1980 *2*	100	15475	(37/2$^-$)	Q
17610	(41/2$^+$)	2045 *2*	100	15565	(37/2$^+$)	Q
17987	(41/2$^-$)	2248 *2*	100	15739	(37/2$^-$)	Q
18196	(39/2$^-$)	2097 *2*	100	16099	(35/2$^-$)	Q
18363	(41/2$^+$)	2083 *2*	100	16280	(37/2$^+$)	Q
18471	(43/2$^-$)	2241 *2*	100	16230	(39/2$^-$)	
19149	(43/2$^-$)	2711 *3*	100	16438	(39/2$^-$)	Q
19270	(41/2$^-$)	2151 *2*	100	17119	(37/2$^-$)	
19653	(45/2$^-$)	2198 *2*	100	17455	(41/2$^-$)	Q
19690	(45/2$^-$)	2380 *2*	100	17310	(41/2$^-$)	
19773	(43/2$^-$)	2647 *3*	100	17126	(39/2$^-$)	
20060	(45/2$^+$)	2450 *3*	100	17610	(41/2$^+$)	Q
20531	(43/2$^-$)	2335 *2*	100	18196	(39/2$^-$)	Q
20642	(45/2$^-$)	2655 *3*	100	17987	(41/2$^-$)	Q
20674	(45/2$^+$)	2311 *2*	100	18363	(41/2$^+$)	Q
20999	(47/2$^-$)	2528 *3*	100	18471	(43/2$^-$)	
21745	(45/2$^-$)	2475 *3*	100	19270	(41/2$^-$)	
22239	(49/2$^-$)	2586 *3*	100	19653	(45/2$^-$)	
22397	(49/2$^-$)	2707 *3*	100	19690	(45/2$^-$)	
22584	(47/2$^-$)	3435 *3*	100	19149	(43/2$^-$)	
22901	(47/2$^-$)	3128 *4*	100	19773	(43/2$^-$)	
22965	(49/2$^+$)	2905 *3*	100	20060	(45/2$^+$)	Q
23180	(47/2$^-$)	2649 *3*	100	20531	(43/2$^-$)	Q
23222	(49/2$^+$)	2548 *3*	100	20674	(45/2$^+$)	Q
23856	(51/2$^-$)	2857 *3*	100	20999	(47/2$^-$)	
23900	(49/2$^-$)	3258 *3*	100	20642	(45/2$^-$)	Q
24604	(49/2$^-$)	2859 *3*	100	21745	(45/2$^-$)	
25280?	(53/2$^-$)	3041[&] *4*	100	22239	(49/2$^-$)	
25449?	(53/2$^-$)	3052[&] *4*	100	22397	(49/2$^-$)	
26042	(53/2$^+$)	2820 *3*	100	23222	(49/2$^+$)	Q
26220	(51/2$^-$)	3040 *3*	100	23180	(47/2$^-$)	Q
26696	(53/2$^+$)	3731 *4*	100	22965	(49/2$^+$)	
27084?	(55/2$^-$)	3228[&] *4*	100	23856	(51/2$^-$)	
29171	(57/2$^+$)	3129 *3*	100	26042	(53/2$^+$)	Q

[†] Primarily From ^{28}Si(^{36}Ar,2pnγ) (2009An01) and/or ^{40}Ca(^{24}Mg,2pnγ) (2006An31), where in-beam γ-ray data are most comprehensive. For low-lying levels (below 2.5 MeV), energy and intensity data from (α,nγ) (1984Th07,1982Sm01) are also considered in the averaging procedure. Exceptions are noted.

[‡] From γγ(θ) and γ(lin pol) data in high-spin studies.

[#] Doublet structure.

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

[&] Placement of transition in the level scheme is uncertain.

$^{61}_{30}Zn_{31}$-8

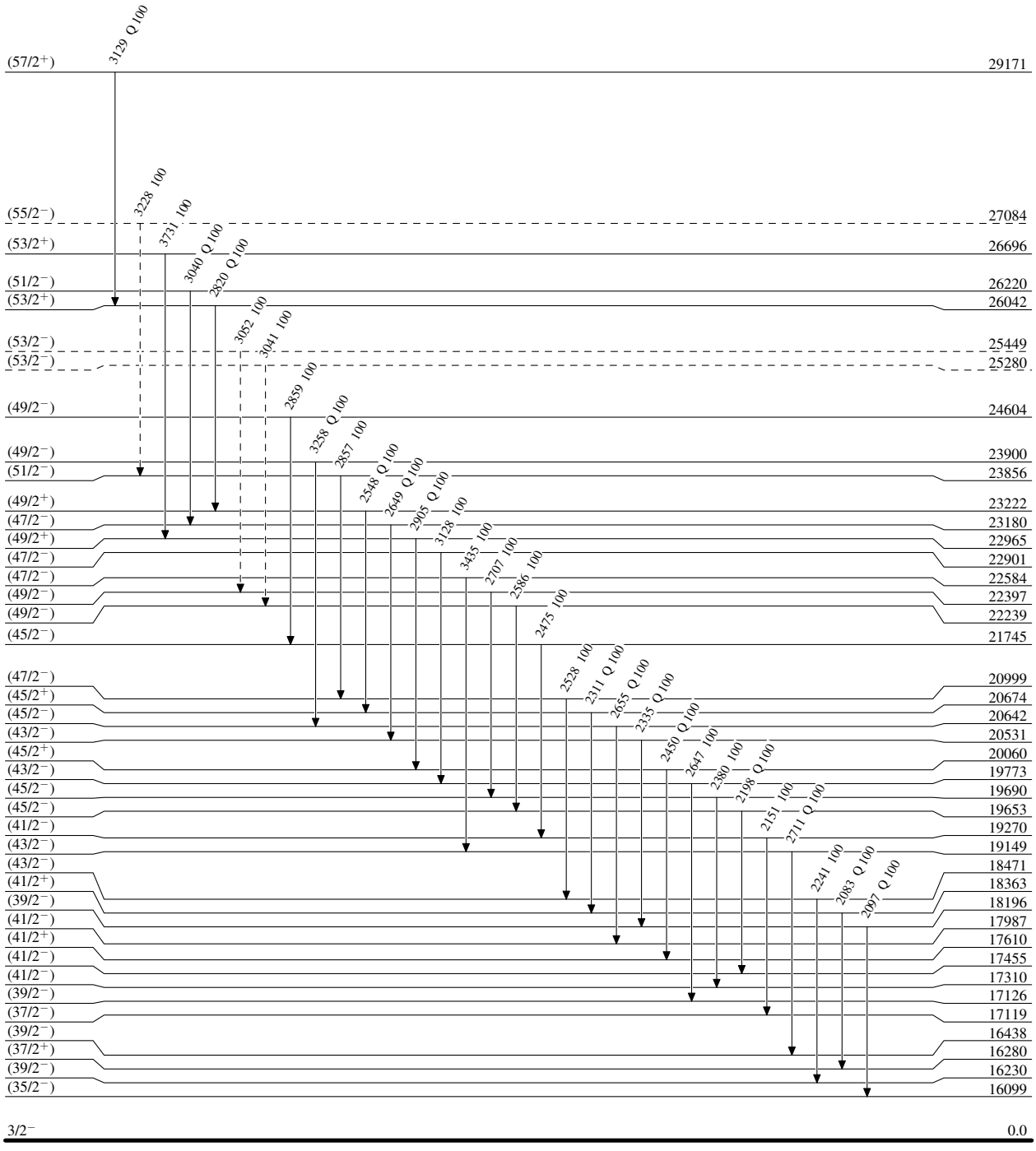
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{61}_{30}Zn_{31}$

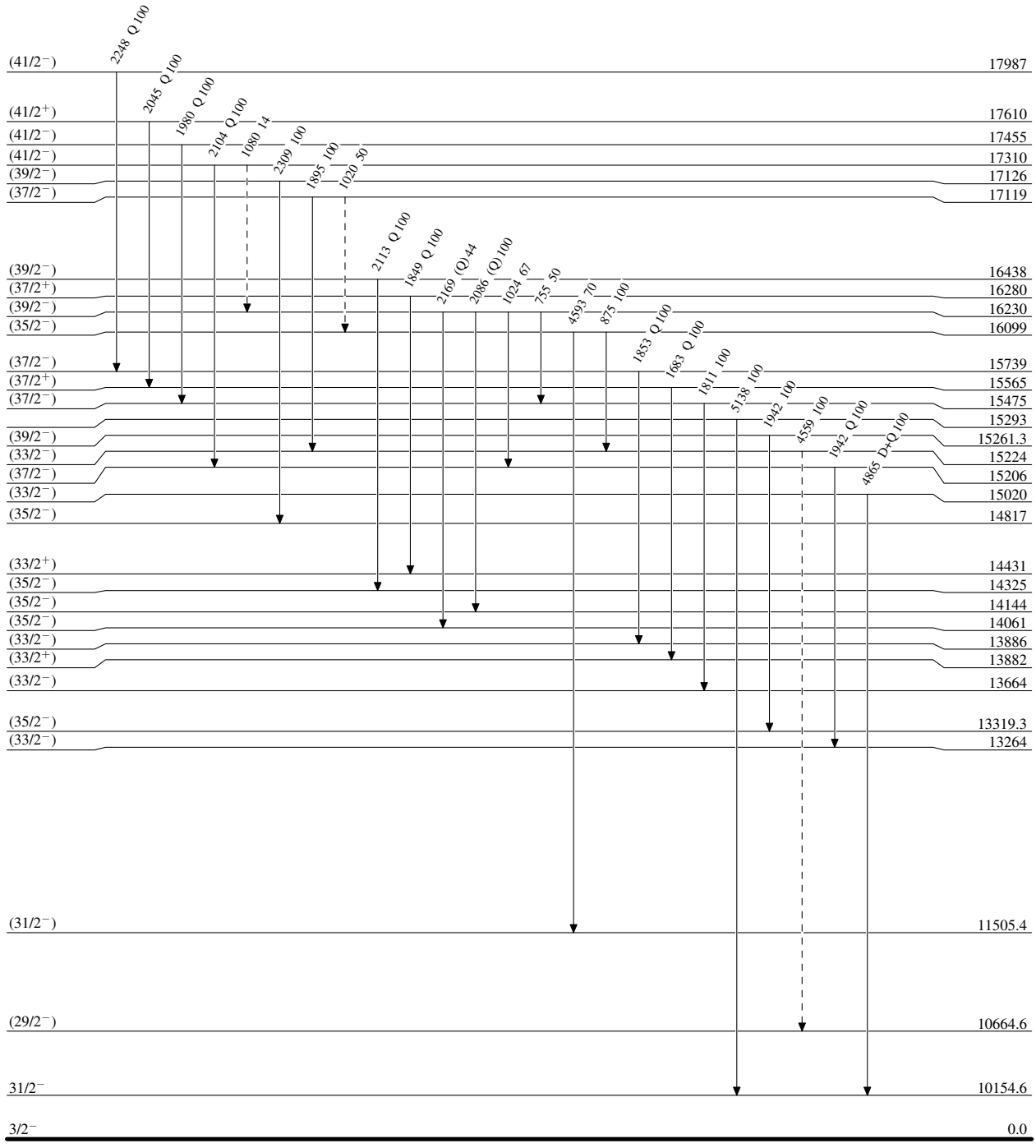
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

- - - - - - ► γ Decay (Uncertain)



$^{61}_{30}Zn_{31}$

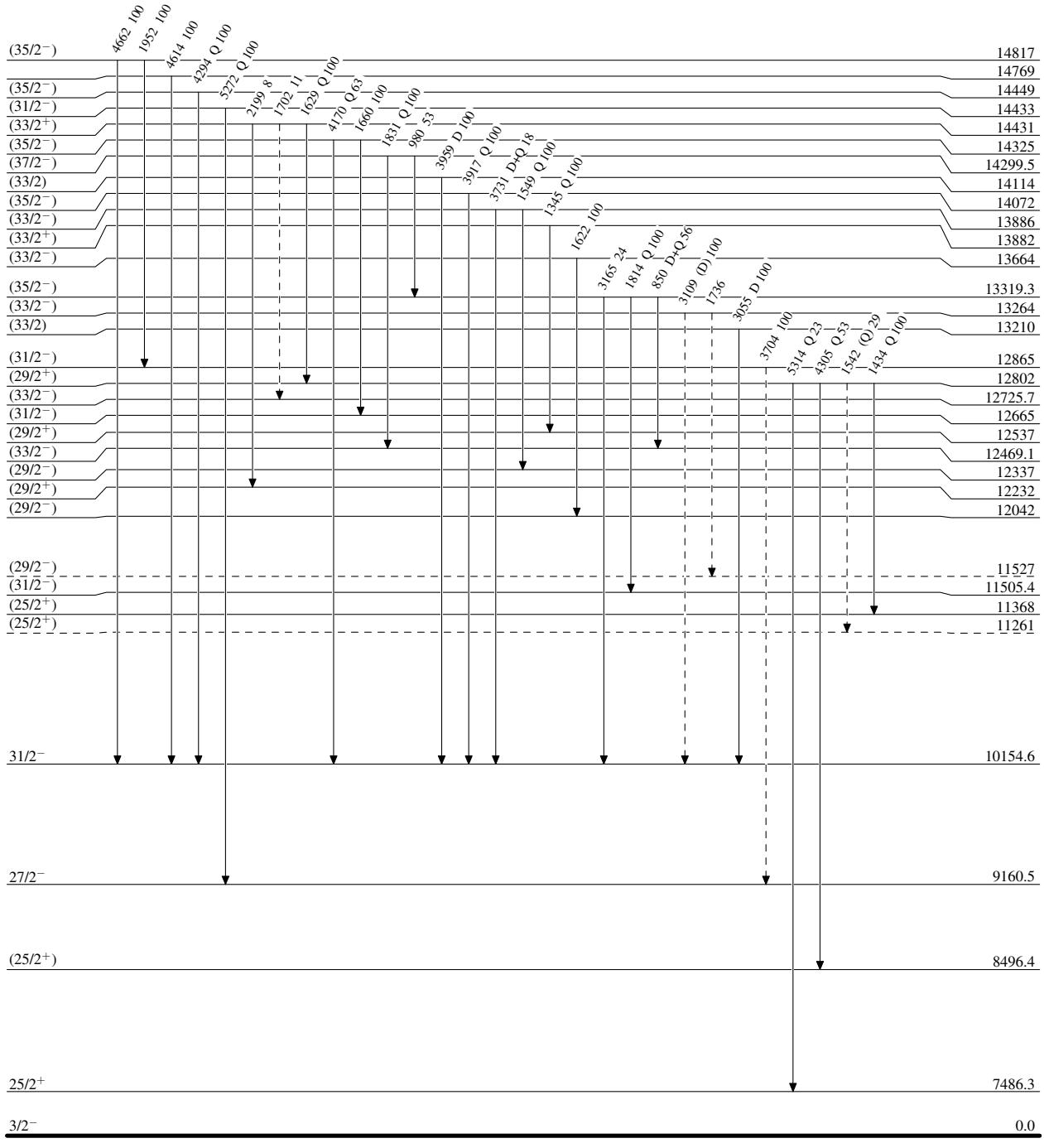
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{61}_{30}Zn_{31}$

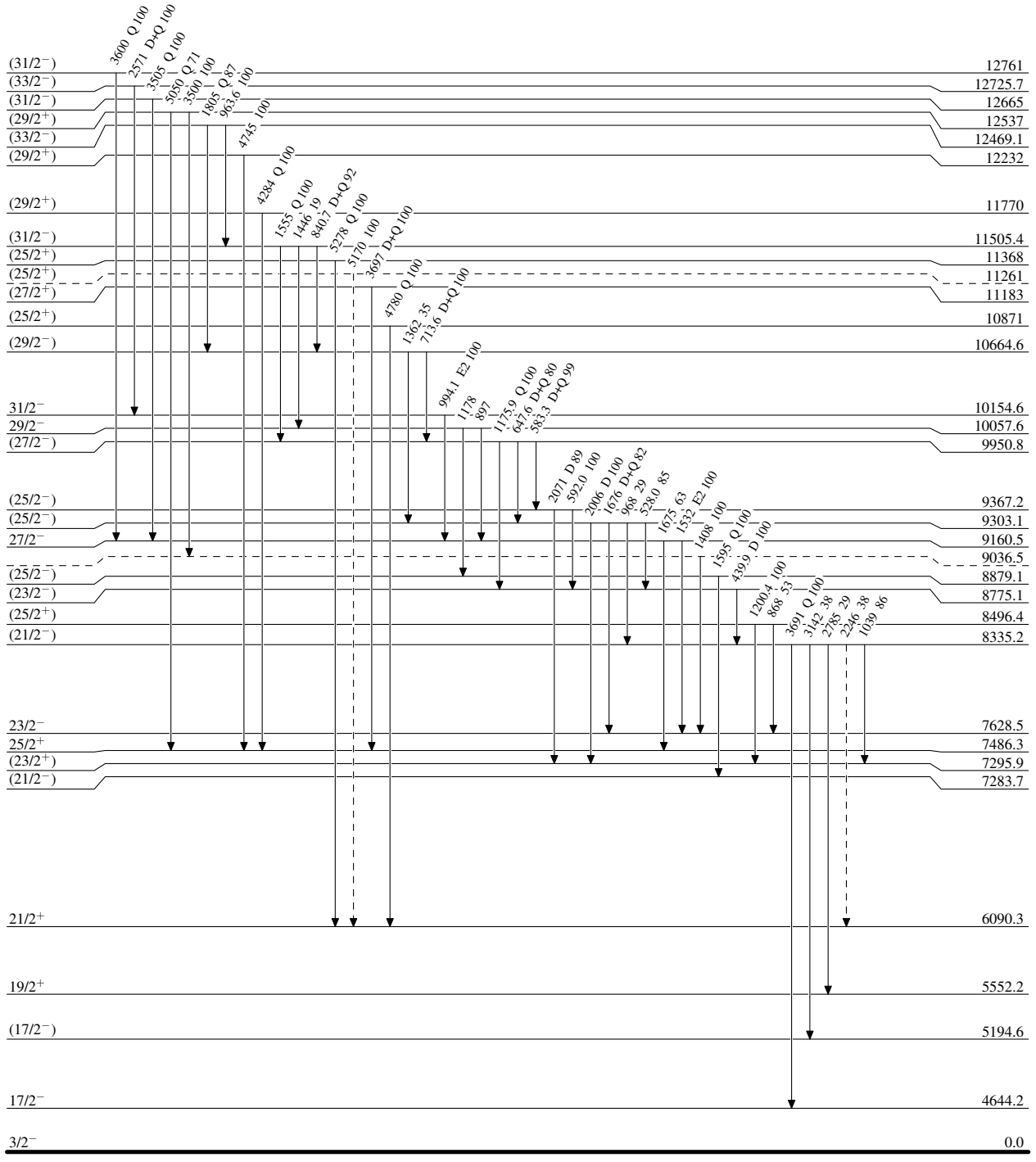
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{61}_{30}Zn_{31}$

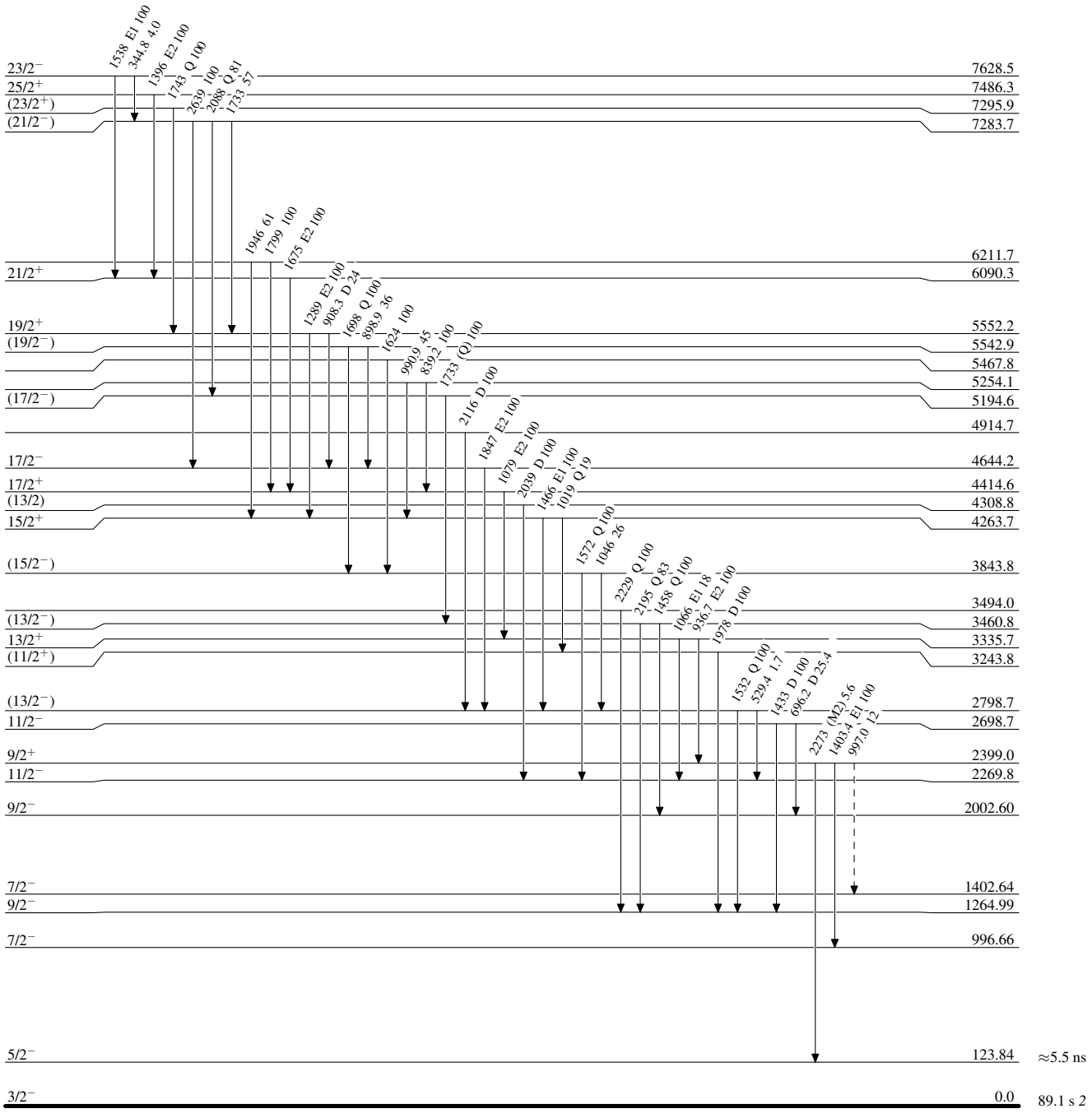
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{61}_{30}Zn_{31}$

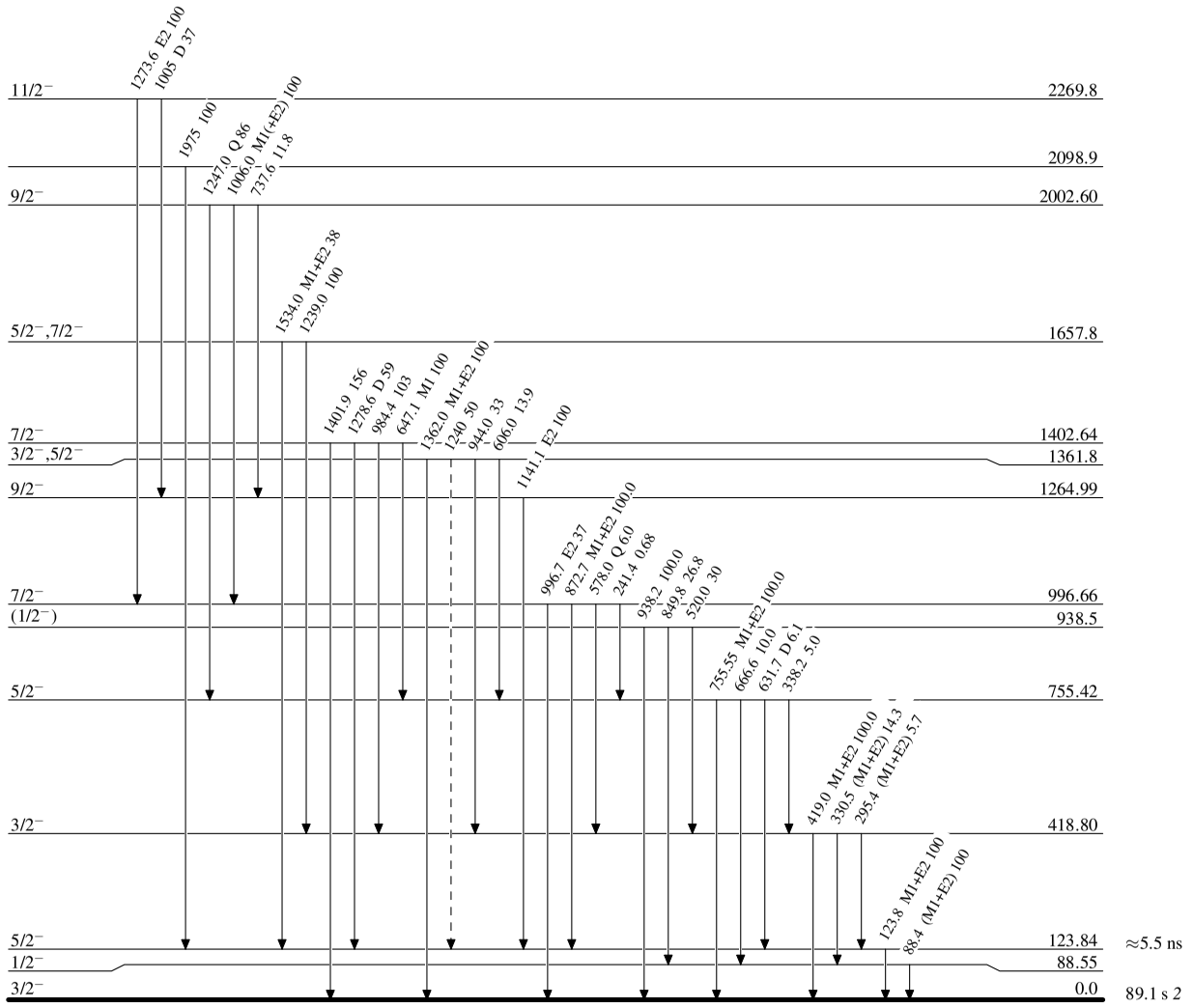
Adopted Levels, Gammas

Legend

Level Scheme (continued)

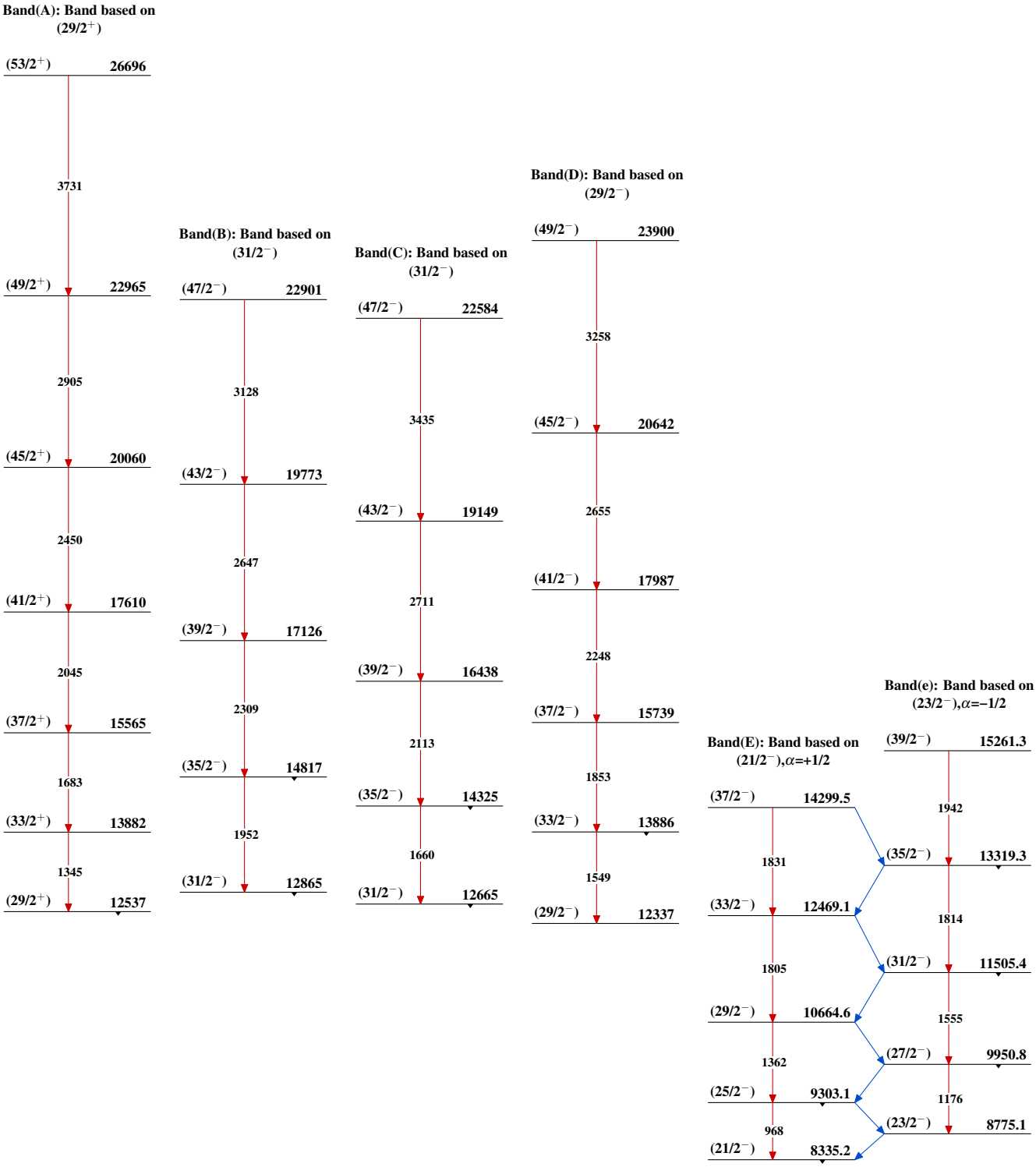
Intensities: Relative photon branching from each level

– – – – – – ► γ Decay (Uncertain)

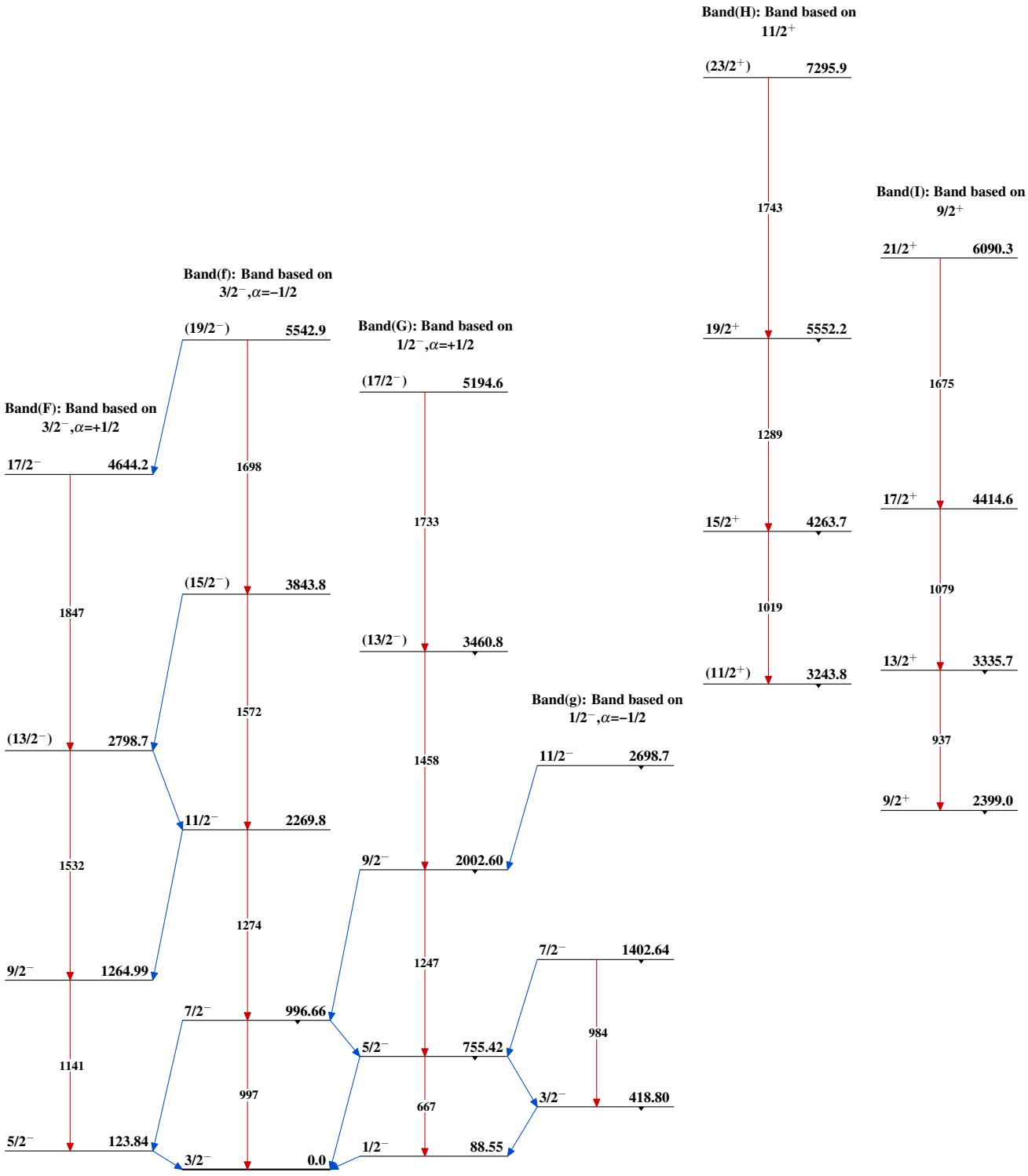


$^{61}_{30}Zn_{31}$

Adopted Levels, Gammas

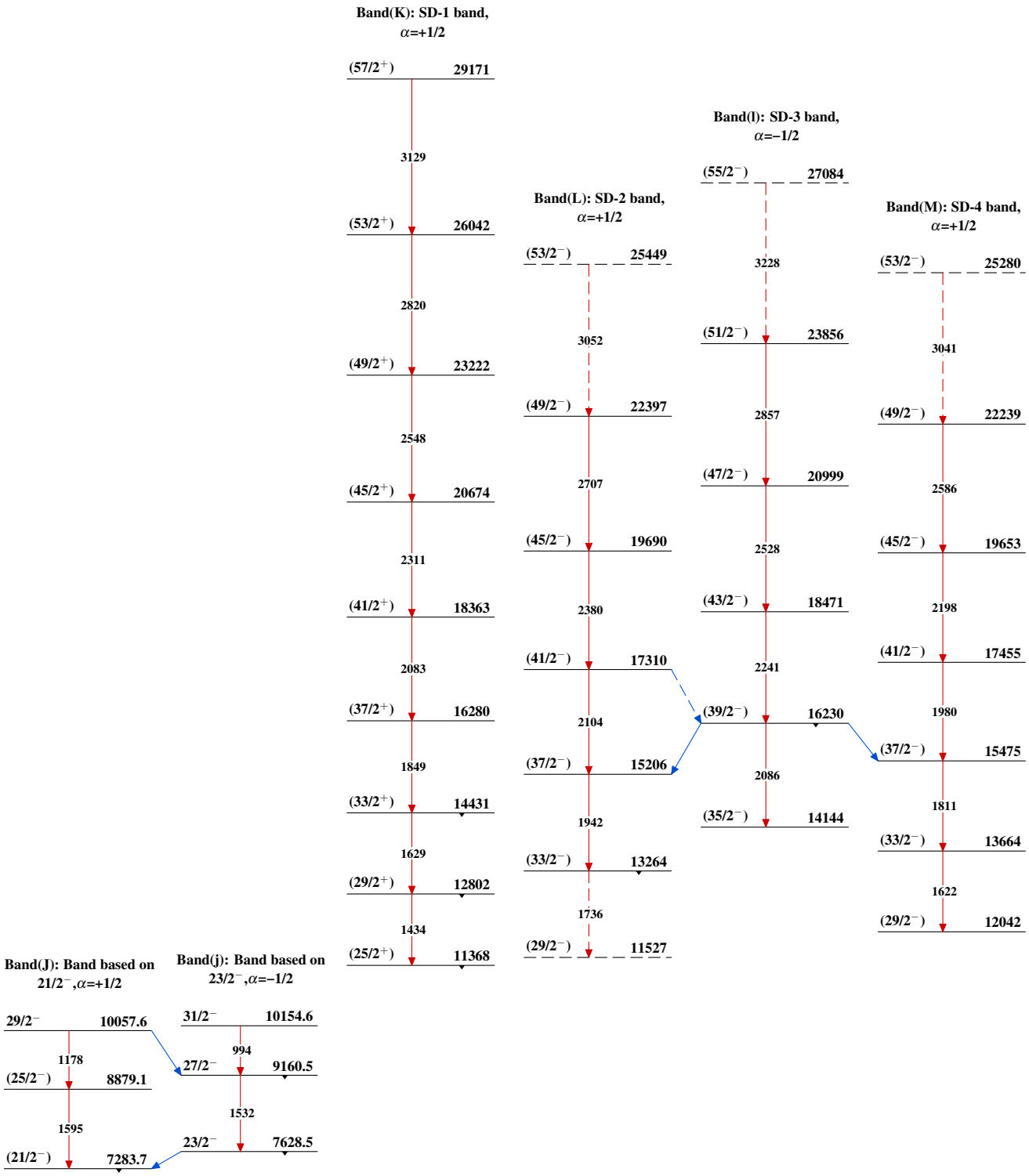


Adopted Levels, Gammas (continued)



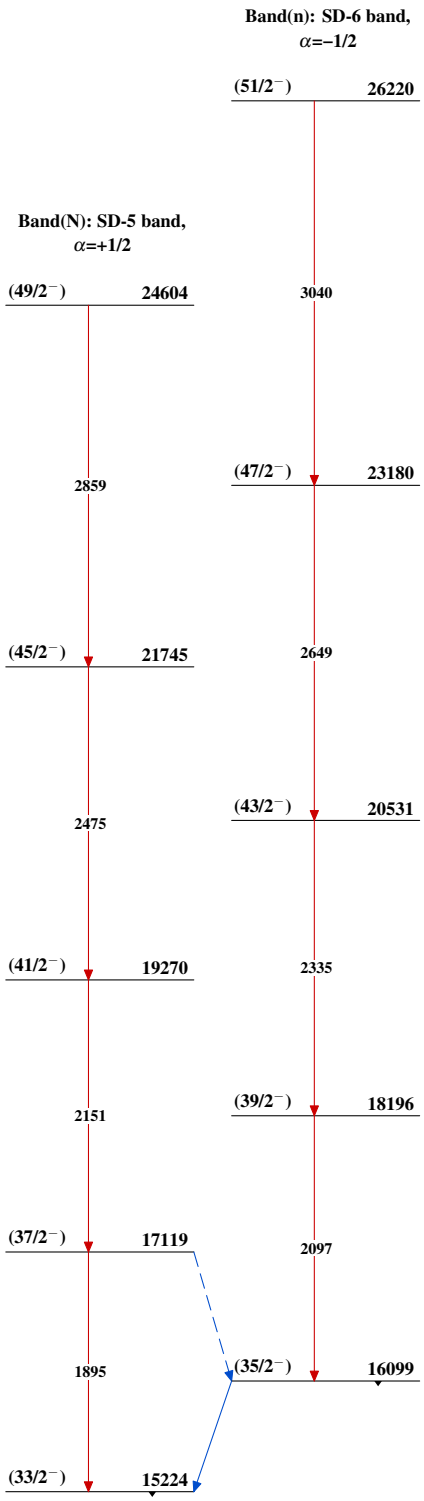
$^{61}_{30}Zn_{31}$

Adopted Levels, Gammas (continued)



$^{61}_{30}Zn_{31}$

Adopted Levels, Gammas (continued)



$^{61}_{30}Zn_{31}$