(HI,xnγ) 2009Pa40,1989Ny03

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	A. Hashizume	NDS 112, 1647 (2011)	1-Oct-2009

2009Pa40: ^{100}Mo(^{32}S,5nγ) E=155 MeV; Euroball which contain 27 coaxial, 25 four-element clover and 13 seven-element cluster HPGe detectors; high-fold γ (γ^4) coin.
1989Ny03: ^{93}Nb(^{37}Cl,3nγ) E=155 MeV, ^{94}Mo(^{37}Cl,p3nγ) E=160 MeV; γ, K x ray, γγ coin, γ(K x ray) coin, γ(θ).
1986JaZP: ^{54}Fe(^{74}Se,2np), ^{58}Ni(^{74}Se,4p3n) and/or ^{58}Ni(^{76}Se,4pn) E=300 MeV, mass separated, Z-sensitive ion chamber; γ, γγ coin.
Level scheme is that proposed by 2009Pa40. Levels belonging to bands are given by the authors based on γγ coin spectra.

^{127}Ce Levels

E(level)[@&]	Jπ	$T_{1/2}$[a]	Comments
0.0[†]	(1/2+)	34 s 2	%ε+%β+=100
7.2[‡] 12	(5/2+)	28.6 s 7	%ε+%β+=100
28.9[†] 4	(3/2+)		
36.7[#] 12	(7/2−)	>10 μs	
162.4[#] 12	(9/2−)		
167.1[‡] 12	(7/2+)		
205.1[†] 4	(5/2+)		
271.7[†] 5	(7/2+)		
324.9[#] 12	(11/2−)		
365.9[‡] 12	(9/2+)		
552.6[#] 13	(13/2−)		
570.7[†] 5	(9/2+)		
600.8[‡] 12	(11/2+)		
674.3[†] 6	(11/2+)		
773.6[#] 13	(15/2−)		
866.4[‡] 11	(13/2+)		
1072.9[†] 6	(13/2+)		
1094.0[#] 13	(17/2−)		
1160.8[‡] 11	(15/2+)		
1215.2[†] 7	(15/2+)		
1351.0[#] 13	(19/2−)		
1477.9[‡] 11	(17/2+)		
1682.3[†] 7	(17/2+)		
1752.1[#] 13	(21/2−)		
1810.9[‡] 11	(19/2+)		
1865.1[†] 8	(19/2+)		
2027.6[#] 13	(23/2−)		
2145.8[‡] 11	(21/2+)		
2329.2[†] 8	(21/2+)		
2458.8[#] 13	(25/2−)		
2492.3[‡] 10	(23/2+)		
2540.1[†] 9	(23/2+)		
2714.1[#] 14	(27/2−)		
2746.8 11			

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(HI,xnγ) 2009Pa40,1989Ny03 (continued)

^{127}Ce Levels (continued)

E(level)[@&]	Jπ	E(level)[@&]	Jπ	E(level)[@&]	Jπ	E(level)[@&]	Jπ
2826.4[‡] *11*	(25/2+)	3953.2[#] *14*	(35/2−)	5251.0[‡] *13*	(39/2+)	7622.5[‡] *14*	(49/2+)
2864.1[†] *9*	(25/2+)	4049.5[‡] *12*	(33/2+)	5640.7[#] *14*	(43/2−)	7810.2[#] *15*	(51/2−)
3044.0[#] *14*	(29/2−)	4108.6[†] *11*	(33/2+)	5701.7[‡] *13*	(41/2+)	8142.7[‡] *14*	(51/2+)
3058.1[†] *10*	(27/2+)	4331.6[†] *11*	(35/2+)	5881.0[†] *12*	(41/2+)	8481.5[#] *16*	(53/2−)
3101.7[‡] *11*	(27/2+)	4340.4[#] *14*	(37/2−)	6131.1[†] *13*	(43/2+)	8712.4[‡] *15*	(53/2+)
3300.3[#] *14*	(31/2−)	4430.3[‡] *12*	(35/2+)	6147.7[‡] *13*	(43/2+)	9052.6[#] *16*	(55/2−)
3401.9[‡] *11*	(29/2+)	4732.7[#] *14*	(39/2−)	6157.2[#] *15*	(45/2−)	9818.5[#] *16*	(57/2−)
3426.0[†] *10*	(29/2+)	4833.1[‡] *12*	(37/2+)	6624.7[‡] *13*	(45/2+)	10389.6?[#] *16*	(59/2−)
3630.7[†] *11*	(31/2+)	4922.8[†] *11*	(37/2+)	6670.3[#] *15*	(47/2−)		
3632.6[#] *14*	(33/2−)	5166.9[†] *12*	(39/2+)	7098.9[‡] *14*	(47/2+)		
3713.4[‡] *11*	(31/2+)	5183.1[#] *14*	(41/2−)	7258.8[#] *15*	(49/2−)		

[†] Band(A): π =+ band built on the ground (1/2+) state. Possible configuration is (ν $d_{3/2}$)[411]1/2+ orbital. After bandcrossing, the possible configuration is (ν $h_{11/2}$)⊗(π $h_{11/2}g_{7/2}$) (2009Pa40,1989Ny03).

[‡] Band(B): π =+ band built on the (5/2+) state. Possible configuration is (ν $d_{5/2}$)[402]5/2+ orbital.

[#] Band(C): π =− band built on the (7/2−) state. Possible configuration is (ν $h_{11/2}$)[523]7/2− orbital. After bandcrossing, possible configuration is (ν $h_{11/2}$)⊗(π $h_{11/2}$)^2 (2009Pa40,1989Ny03).

[@] The band head energy of band(C) is from Adopted Levels.

[&] From least-squares fit to E_γ's. assuming Δ(E_γ)=0.4 keV for the strong transitions (I_γ>510) and Δ(E_γ)=0.6 keV for the weak transitions (I_γ>410) for the γ's reported by 2009Pa40 (evaluator). 2009Pa40 estimate ΔE_γ as follows: the γ-ray energies are estimated to be accurate to ±0.3 keV to the strong transitions (I_γ>510), rising to ±0.6 keV for the weaker transitions. However, the least-squares fit with these uncertainties cause seven γ rays that fit poorly, just outside 2σ's.

[a] From Adopted Levels.

γ(^{127}Ce)

E_γ[†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[#]	Comments
28.8 *5*		28.9	(3/2+)	0.0	(1/2+)			
29.56 *5*	67.6 *4*	36.7	(7/2−)	7.2	(5/2+)	[E1]	1.158	α(L)=0.918 *14*; α(M)=0.192 *3*; α(N+..)=0.0472 *7* α(N)=0.0410 *6*; α(O)=0.00591 *9*; α(P)=0.000256 *4* E_γ: from adopted gammas. I_γ: From intensity balance: in the calculation, 125.5 keV γ is assumed as (M1,E2) and 288.3 keV γ is assumed as E2.
125.5 *4*	55 *5*	162.4	(9/2−)	36.7	(7/2−)	D		
159.5 *4*	55 *5*	167.1	(7/2+)	7.2	(5/2+)	D		
162.3 *4*	152 *5*	324.9	(11/2−)	162.4	(9/2−)	D		
176.1 *4*	55 *16*	205.1	(5/2+)	28.9	(3/2+)	D		
198.5 *4*	39.3 *16*	365.9	(9/2+)	167.1	(7/2+)	D		
205.1 *4*	37 *4*	205.1	(5/2+)	0.0	(1/2+)	Q		
220.8 *4*	77 *3*	773.6	(15/2−)	552.6	(13/2−)	D		
227.7 *4*	84 *3*	552.6	(13/2−)	324.9	(11/2−)	D		
234.8 *4*	25.1 *16*	600.8	(11/2+)	365.9	(9/2+)	D		
242.9 *4*	82 *4*	271.7	(7/2+)	28.9	(3/2+)	Q		
254.8 *6*	4.2 *4*	2746.8		2492.3	(23/2+)	D		
254.9 *4*	68 *2*	2714.1	(27/2−)	2458.8	(25/2−)	D		
255.9 *4*	13.7 *16*	3300.3	(31/2−)	3044.0	(29/2−)	D		
257.0 *4*	35 *16*	1351.0	(19/2−)	1094.0	(17/2−)	D		

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(HI,xnγ) 2009Pa40,1989Ny03 (continued)

γ(^{127}Ce) (continued)

E_γ [†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	Comments
265.4 *4*	22.3 *10*	866.4	(13/2$^+$)	600.8	(11/2$^+$)	D	
274.3 *6*	6.7 *5*	3101.7	(27/2$^+$)	2826.4	(25/2$^+$)	D	
275.3 *4*	24.8 *10*	2027.6	(23/2$^-$)	1752.1	(21/2$^-$)	D	
288.3 *4*	46 *2*	324.9	(11/2$^-$)	36.7	(7/2$^-$)	Q	
294.5 *6*	9.6 *9*	1160.8	(15/2$^+$)	866.4	(13/2$^+$)	D	
298.5 *6*	4.5 *12*	570.7	(9/2$^+$)	271.7	(7/2$^+$)	D	
300.2 *4*	13.3 *8*	3401.9	(29/2$^+$)	3101.7	(27/2$^+$)	D	
311.6 *6*	2.8 *3*	3058.1	(27/2$^+$)	2746.8		D	
311.6 *4*	22.8 *13*	3713.4	(31/2$^+$)	3401.9	(29/2$^+$)	D	
316.6 *4*	13.9 *10*	1477.9	(17/2$^+$)	1160.8	(15/2$^+$)	D	
320.2 *4*	36.1 *22*	1094.0	(17/2$^-$)	773.6	(15/2$^-$)	D	
321.0 *4*	32.2 *16*	3953.2	(35/2$^-$)	3632.6	(33/2$^-$)	D	
330.1 *4*	51.4 *22*	3044.0	(29/2$^-$)	2714.1	(27/2$^-$)	D	
332.0 *4*	41 *22*	3632.6	(33/2$^-$)	3300.3	(31/2$^-$)	D	
333.9 *4*	15 *3*	2826.4	(25/2$^+$)	2492.3	(23/2$^+$)	D	
334[‡] *1*	11.7 *12*	1810.9	(19/2$^+$)	1477.9	(17/2$^+$)	D	E_γ: Other: 328.4 *0.3* (2009Pa40).
334.9 *4*	15 *3*	2145.8	(21/2$^+$)	1810.9	(19/2$^+$)	D	
336.6 *6*	8.6 *13*	4049.5	(33/2$^+$)	3713.4	(31/2$^+$)	D	
345.8 *6*	9.9 *10*	2492.3	(23/2$^+$)	2145.8	(21/2$^+$)	D	
359.2 *4*	30.1 *22*	365.9	(9/2$^+$)	7.2	(5/2$^+$)	Q	
365.6 *4*	20.8 *16*	570.7	(9/2$^+$)	205.1	(5/2$^+$)	Q	
386.6 *4*	29.8 *11*	4340.4	(37/2$^-$)	3953.2	(35/2$^-$)	D	
390.1 *4*	45.4 *16*	552.6	(13/2$^-$)	162.4	(9/2$^-$)	Q	
392.8 *4*	14.1 *12*	4732.7	(39/2$^-$)	4340.4	(37/2$^-$)	D	
399.3 *4*	28 *5*	1072.9	(13/2$^+$)	674.3	(11/2$^+$)	D	
400.9 *4*	33.3 *22*	1752.1	(21/2$^-$)	1351.0	(19/2$^-$)	D	
402.9 *4*	37 *11*	674.3	(11/2$^+$)	271.7	(7/2$^+$)	Q	
430.9 *4*	30.1 *16*	2458.8	(25/2$^-$)	2027.6	(23/2$^-$)	D	
433.5 *4*	13.6 *10*	600.8	(11/2$^+$)	167.1	(7/2$^+$)	Q	
448.8 *4*	100	773.6	(15/2$^-$)	324.9	(11/2$^-$)	Q	
451.0 *4*	24.6 *22*	5183.1	(41/2$^-$)	4732.7	(39/2$^-$)	D	
458.3 *4*	16 *3*	5640.7	(43/2$^-$)	5183.1	(41/2$^-$)	D	
466.2 *6*	1.6 *22*	1682.3	(17/2$^+$)	1215.2	(15/2$^+$)	D	
500.7 *4*	35.5 *22*	866.4	(13/2$^+$)	365.9	(9/2$^+$)	Q	
501.8 *4*	36 *3*	1072.9	(13/2$^+$)	570.7	(9/2$^+$)	Q	
512.4 *4*	10.9 *16*	6670.3	(47/2$^-$)	6157.2	(45/2$^-$)	D	
516.5 *6*	8.2 *16*	6157.2	(45/2$^-$)	5640.7	(43/2$^-$)	D	
518.0 *4*	19.1 *22*	3058.1	(27/2$^+$)	2540.1	(23/2$^+$)	Q	
534.9 *4*	19.7 *16*	2864.1	(25/2$^+$)	2329.2	(21/2$^+$)	Q	
540.6 *4*	42 *3*	1215.2	(15/2$^+$)	674.3	(11/2$^+$)	Q	
541.7 *4*	74 *3*	1094.0	(17/2$^-$)	552.6	(13/2$^-$)	Q	
559.8 *4*	47 *3*	1160.8	(15/2$^+$)	600.8	(11/2$^+$)	Q	
561.9 *4*	29 *3*	3426.0	(29/2$^+$)	2864.1	(25/2$^+$)	Q	
565.7 *4*	21.3 *3*	3058.1	(27/2$^+$)	2492.3	(23/2$^+$)	Q	
572.6 *4*	38 *4*	3630.7	(31/2$^+$)	3058.1	(27/2$^+$)	Q	
575.5 *4*	25 *3*	3401.9	(29/2$^+$)	2826.4	(25/2$^+$)	Q	
577.3 *4*	181 *7*	1351.0	(19/2$^-$)	773.6	(15/2$^-$)	Q	
585.3 *4*	56 *3*	3044.0	(29/2$^-$)	2458.8	(25/2$^-$)	Q	
585.9 *4*	135 *8*	3300.3	(31/2$^-$)	2714.1	(27/2$^-$)	Q	
589.3 *4*	42.1 *22*	3632.6	(33/2$^-$)	3044.0	(29/2$^-$)	Q	
609.8 *4*	35 *5*	1682.3	(17/2$^+$)	1072.9	(13/2$^+$)	Q	
609.9 *4*	46 *4*	3101.7	(27/2$^+$)	2492.3	(23/2$^+$)	Q	
611.6 *4*	16 *3*	1477.9	(17/2$^+$)	866.4	(13/2$^+$)	Q	
611.7 *4*	50 *4*	3713.4	(31/2$^+$)	3101.7	(27/2$^+$)	Q	
646.9 *4*	27 *5*	2329.2	(21/2$^+$)	1682.3	(17/2$^+$)	Q	

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(HI,xnγ) 2009Pa40,1989Ny03 (continued)

$\gamma(^{127}Ce)$ (continued)

E_γ[†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.
647.3 *4*	26 *4*	4049.5	$(33/2^+)$	3401.9	$(29/2^+)$	Q
649.9 *4*	44 *6*	1865.1	$(19/2^+)$	1215.2	$(15/2^+)$	Q
650.5 *4*	55 *5*	1810.9	$(19/2^+)$	1160.8	$(15/2^+)$	Q
652.4 *4*	67 *4*	3953.2	$(35/2^-)$	3300.3	$(31/2^-)$	Q
658.1 *4*	72 *4*	1752.1	$(21/2^-)$	1094.0	$(17/2^-)$	Q
667.4 *4*	21 *3*	2145.8	$(21/2^+)$	1477.9	$(17/2^+)$	Q
675.0 *4*	24 *5*	2540.1	$(23/2^+)$	1865.1	$(19/2^+)$	Q
676.7 *4*	191 *7*	2027.6	$(23/2^-)$	1351.0	$(19/2^-)$	Q
680.2 *4*	33 *7*	2826.4	$(25/2^+)$	2145.8	$(21/2^+)$	Q
682.1 *4*	43 *7*	2492.3	$(23/2^+)$	1810.9	$(19/2^+)$	Q
682.6 *4*	27 *4*	4108.6	$(33/2^+)$	3426.0	$(29/2^+)$	Q
686.7 *4*	140 *6*	2714.1	$(27/2^-)$	2027.6	$(23/2^-)$	Q
700.9 *4*	29 *7*	4331.6	$(35/2^+)$	3630.7	$(31/2^+)$	Q
706.9 *4*	71 *6*	2458.8	$(25/2^-)$	1752.1	$(21/2^-)$	Q
708.0 *4*	53 *5*	4340.4	$(37/2^-)$	3632.6	$(33/2^-)$	Q
716.9 *4*	27 *4*	4430.3	$(35/2^+)$	3713.4	$(31/2^+)$	Q
779.8 *4*	78 *7*	4732.7	$(39/2^-)$	3953.2	$(35/2^-)$	Q
783.6 *4*	26 *4*	4833.1	$(37/2^+)$	4049.5	$(33/2^+)$	Q
814.2 *4*	27 *5*	4922.8	$(37/2^+)$	4108.6	$(33/2^+)$	Q
820.7 *4*	22 *5*	5251.0	$(39/2^+)$	4430.3	$(35/2^+)$	Q
835.3 *4*	27 *6*	5166.9	$(39/2^+)$	4331.6	$(35/2^+)$	Q
842.0 *4*	56 *4*	5183.1	$(41/2^-)$	4340.4	$(37/2^-)$	Q
868.6 *4*	25 *7*	5701.7	$(41/2^+)$	4833.1	$(37/2^+)$	Q
896.7 *4*	19 *7*	6147.7	$(43/2^+)$	5251.0	$(39/2^+)$	Q
908.0 *4*	74 *8*	5640.7	$(43/2^-)$	4732.7	$(39/2^-)$	Q
923.0 *4*	34 *7*	6624.7	$(45/2^+)$	5701.7	$(41/2^+)$	Q
951.2 *4*	14 *7*	7098.9	$(47/2^+)$	6147.7	$(43/2^+)$	Q
958.2 *4*	23 *10*	5881.0	$(41/2^+)$	4922.8	$(37/2^+)$	Q
964.1 *4*	26 *13*	6131.1	$(43/2^+)$	5166.9	$(39/2^+)$	Q
973.5 *4*	60 *8*	6157.2	$(45/2^-)$	5183.1	$(41/2^-)$	Q
997.8 *4*	24 *8*	7622.5	$(49/2^+)$	6624.7	$(45/2^+)$	Q
1030.2 *4*	82 *9*	6670.3	$(47/2^-)$	5640.7	$(43/2^-)$	Q
1043.8 *4*	14 *8*	8142.7	$(51/2^+)$	7098.9	$(47/2^+)$	Q
1089.9 *4*	10 *5*	8712.4	$(53/2^+)$	7622.5	$(49/2^+)$	Q
1101.6 *4*	63 *10*	7258.8	$(49/2^-)$	6157.2	$(45/2^-)$	Q
1139.9 *4*	41 *11*	7810.2	$(51/2^-)$	6670.3	$(47/2^-)$	Q
1222.7 *4*	60 *11*	8481.5	$(53/2^-)$	7258.8	$(49/2^-)$	Q
1242.4 *4*	39 *11*	9052.6	$(55/2^-)$	7810.2	$(51/2^-)$	Q
1337.0[@] *4*	11[@] *10*	9818.5	$(57/2^-)$	8481.5	$(53/2^-)$	Q
1337.0[@&] *4*	[@]	10389.6?	$(59/2^-)$	9052.6	$(55/2^-)$	Q

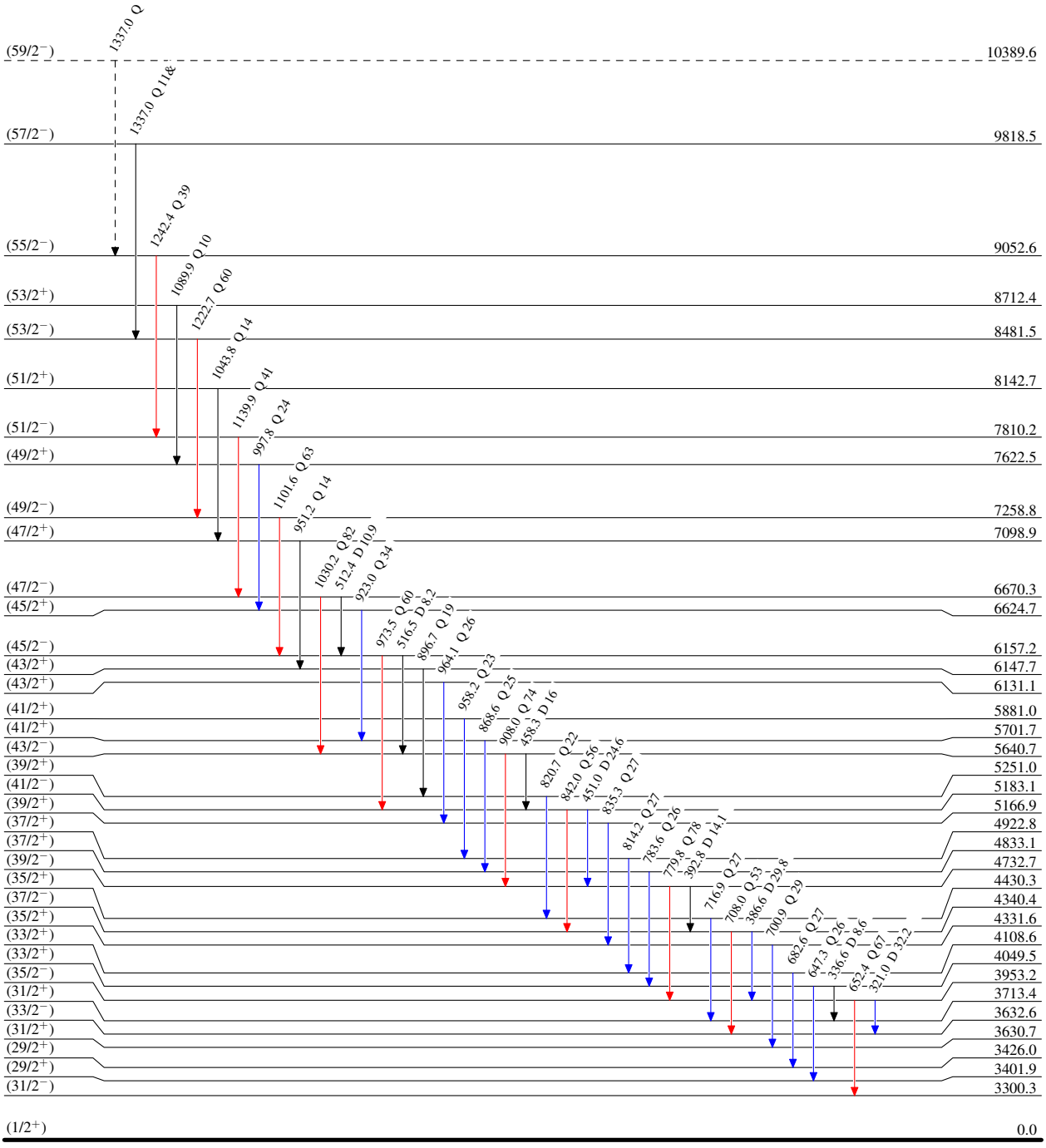
[†] From 2009Pa40, unless otherwise noted.
[‡] E_γ from 1989Ny03, I_γ from 2009Pa40.
[#] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
[@] Multiply placed with undivided intensity.
[&] Placement of transition in the level scheme is uncertain.

(HI,xnγ) 2009Pa40,1989Ny03

Level Scheme

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)



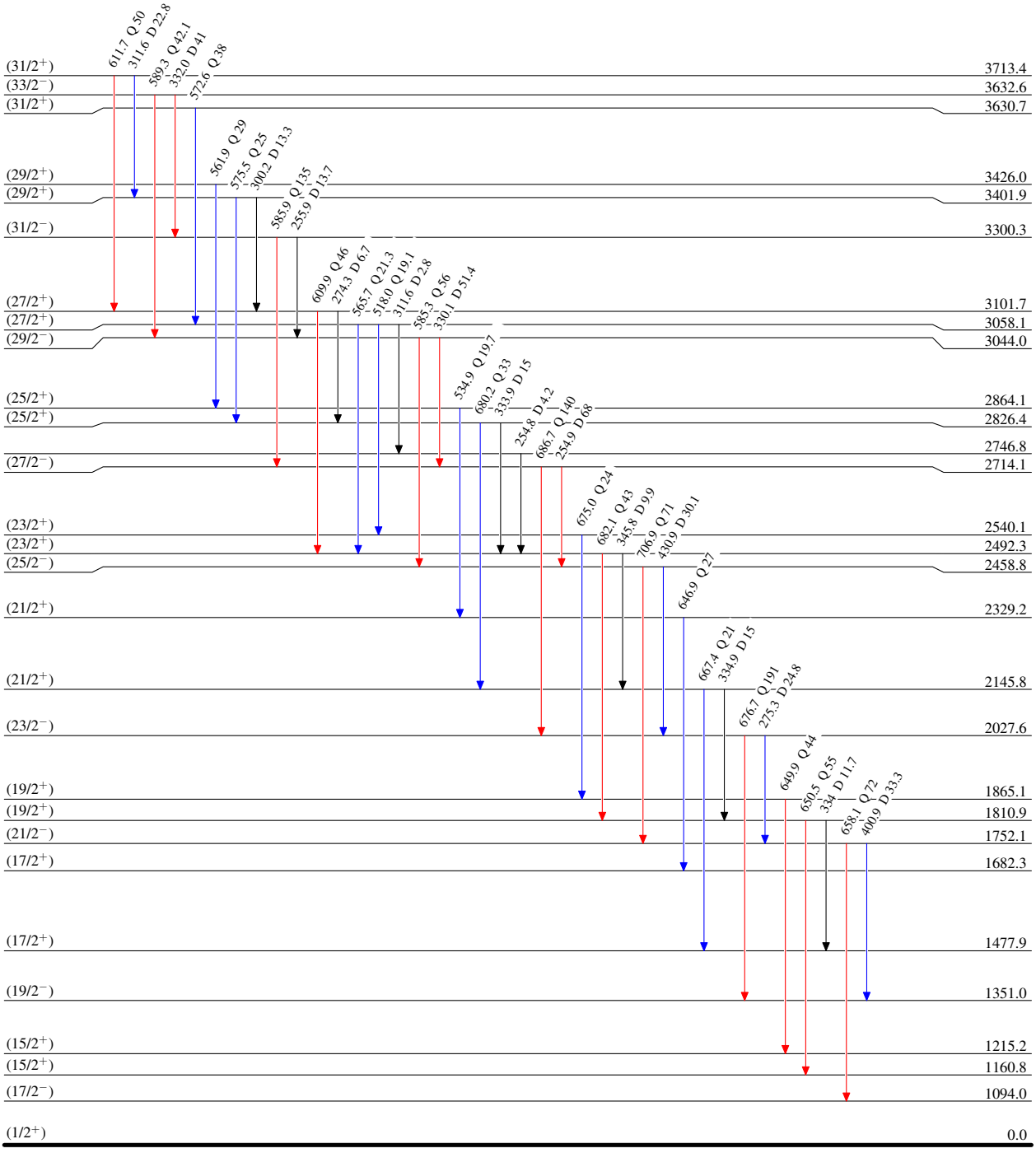
$^{127}_{58}Ce_{69}$

(HI,xnγ) 2009Pa40,1989Ny03

Level Scheme (continued)

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$



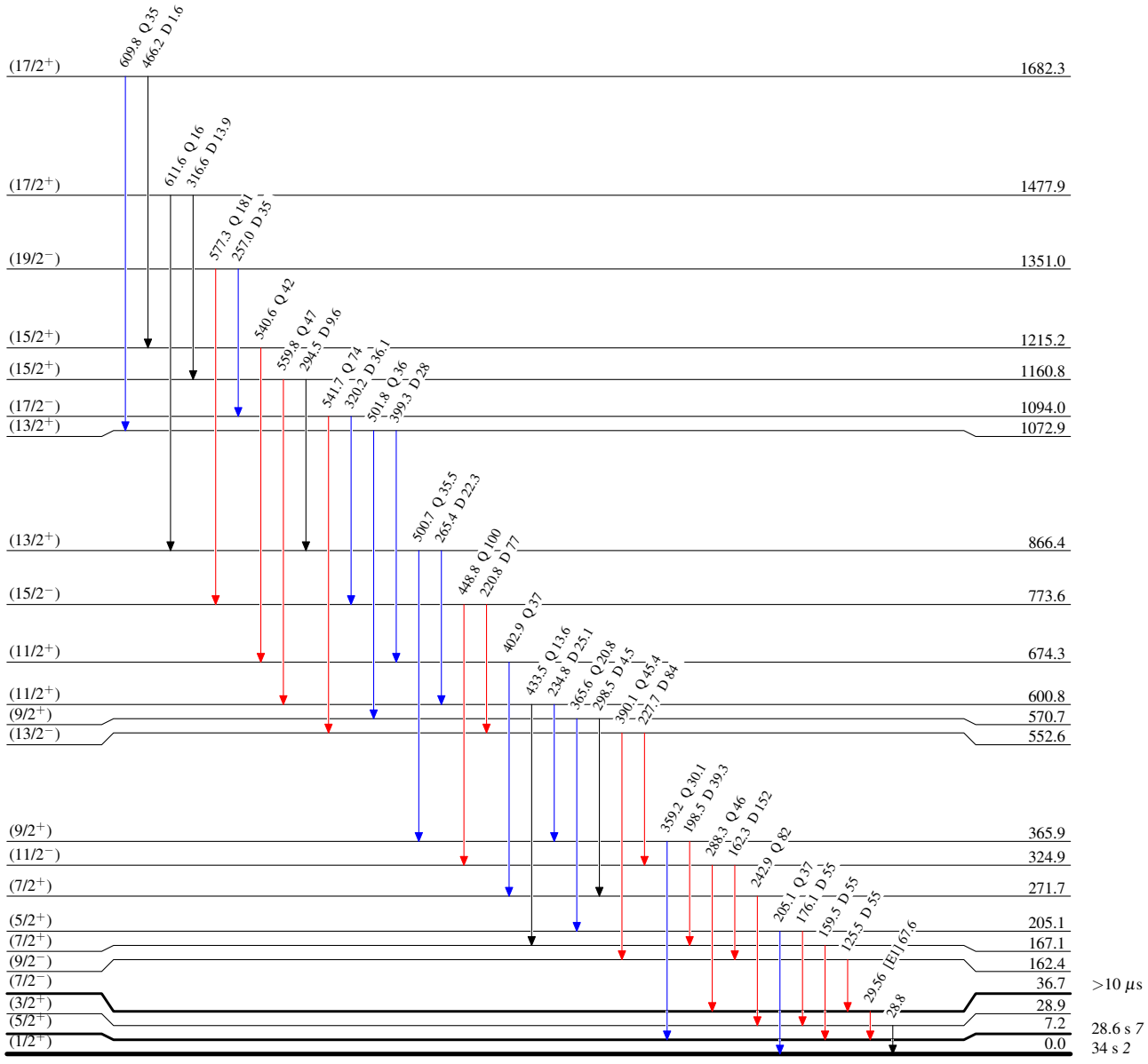
$^{127}_{58}Ce_{69}$

(HI,xnγ) 2009Pa40,1989Ny03

Level Scheme (continued)

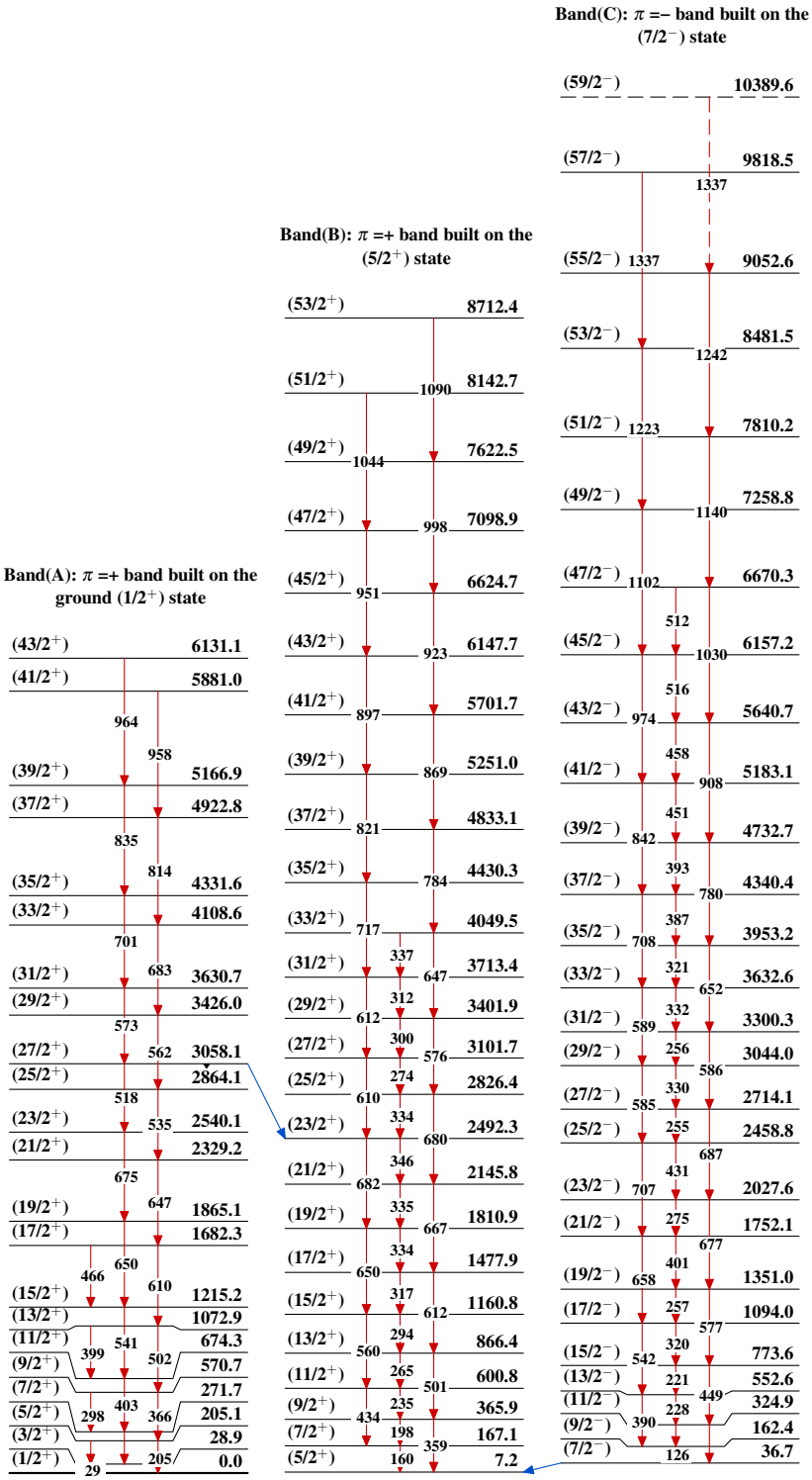
Intensities: Relative I_γ
& Multiply placed: undivided intensity given

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$



$^{127}_{58}Ce_{69}$

(HI,xnγ) 2009Pa40,1989Ny03



$^{127}_{58}Ce_{69}$