(HI,xnγ) 2002Ch38

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. Katakura, Z. D. Wu	NDS 109, 1655 (2008)	1-Apr-2008

2002Ch38: ^{64}Zn(^{64}Zn,3pnγ) E=260 MeV; recoiling evaporation residues were dispersed by the Argonne Fragment Mass Analyzer (FMA); GAMMASPHERE comprised of 78 HPGe detectors in conjunction with the Microball charged-particle detector and the Neutron Shell; Measured Eγ, Iγ, γγ, γ(θ), γγ(θ).

1993Ko25: ^{92}Mo(^{35}Cl,2pnγ) E=135, 150 MeV; NORDBALL array of Compton suppressed Ge with multiplicity filter; measured Eγ, γγ coin, nγ coin; proposed five bands.

1997As05: ^{92}Mo(^{36}Ar,3pnγ) E=195 MeV; enriched ^{92}Mo, HPGe detectors; measured Eγ, γγ-coin,γγ directional correlation; deduced $T_{1/2}$ of isomers.

^{124}La Levels

Quasiparticle labels:
C=π9/2[404], α=+1/2 ($g_{9/2}$ orbit).
D=π9/2[404], α=−1/2 ($g_{9/2}$ orbit).
E=π1/2[550], α=−1/2 ($h_{11/2}$ orbit).
F=π1/2[550], α=+1/2 ($h_{11/2}$ orbit).
b=ν1/2[411], α=−1/2 ($d_{3/2}$ orbit).
e=ν7/2[523], α=−1/2 ($h_{11/2}$ orbit).
f=ν7/2[523], α=+1/2 ($h_{11/2}$ orbit).
i=ν5/2[402], α=+1/2 ($d_{5/2}$ orbit).
j=ν5/2[402], α=−1/2 ($d_{5/2}$ orbit).

E(level)[†]	Jπ[‡]	$T_{1/2}$	Comments
0.0+x[a]	(7+)		Additional information 1. Jπ: The bandhead J^π value was based on the the comparison of the experimental levels energies to the those calculated using CQOCM(Core-quasiparticle coupling model). The assignment is consistent with that assigned using excitation energy systematics by 1996Li13.
0.0+y[e]	(8−)	29.21 s *17*	Additional information 2. $T_{1/2}$: From 1997As05. 1992Id01 suggested this level is a high-spin isomer. Jπ: The bandhead J^π value was assigned based on the deduced configuration. It was consistent with the value suggested by 1992Id01.
54.9+x[@] *8*	(6−)		Jπ: γ from (8−).
68.9+x[b] *7*	(8+)		Jπ: Q γ from (10+) and D+Q γ from (9+).
140.4+x[#] *8*	(7−)		Jπ: Q γ from (9−).
180.7+x[&] *8*	(7−)		Jπ: D+Q γ from (8−) and γ from (9−).
191.4+x[a] *6*	(9+)		Jπ: Q γ to (7+).
267.8+x[@] *8*	(8−)		Jπ: Q γ from (10−).
286.43+y[f] *24*	(9−)		Jπ: D+Q γ to (8−).
324.4+x[b] *7*	(10+)		Jπ: D+Q γ to (9+).
438.6+x[#] *8*	(9−)		Jπ: Q γ from (11−).
460.2+x[&] *7*	(9−)		Jπ: Q γ from (11−).
549.4+x[a] *7*	(11+)		Jπ: Q γ to (9+).
601.68+y[e] *24*	(10−)		Jπ: Q γ to (8−).
654.5+x[@] *7*	(10−)		Jπ: Q γ from (12−).
750.2+x[b] *7*	(12+)		Jπ: Q γ to (10+).
861.8+x[#] *8*	(11−)		Jπ: Q 402γ to (9−) and D+Q γ to (10−) and assumed negative parity band structure.
916.3+x[&] *7*	(11−)		Jπ: D γ to (10+) and assumed negative parity band structure.

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(HI,xnγ) 2002Ch38 (continued)

^{124}La Levels (continued)

E(level)†	Jπ‡	Comments
941.6+y[f] *3*	(11⁻)	Jπ: Q γ to (9⁻).
1070.1+x[a] *7*	(13⁺)	Jπ: Q γ to (11⁺).
1185.6+x[@] *7*	(12⁻)	Jπ: D+Q γ to (11⁻) and D γ to (11⁺).
1233.4+x[d] *8*	(11⁺)	Jπ: Q γ from (13⁺).
1302.1+y[e] *4*	(12⁻)	Jπ: Q γ to (10⁻).
1344.1+x[b] *7*	(14⁺)	Jπ: Q γ to (12⁺).
1390.5+x[c] *7*	(12⁺)	Jπ: Q γ form (14⁺).
1403.3+x[#] *8*	(13⁻)	Jπ: Q γ to (11⁻).
1510.3+x[&] *7*	(13⁻)	Jπ: Q γ to (11⁻).
1677.8+y[f] *4*	(13⁻)	Jπ: Q γ to (11⁻).
1724.1+x[d] *7*	(13⁺)	Jπ: D+Q γ to (12⁺) and assumed positive parity band structure.
1740.3+x[a] *7*	(15⁺)	Jπ: Q γ to (13⁺).
1837.4+x[@] *7*	(14⁻)	Jπ: Q γ to (12⁻).
1967.2+x[c] *7*	(14⁺)	Jπ: D+Q γ to (13⁺).
2054.4+x[#] *9*	(15⁻)	Jπ: Q γ to (13⁻).
2059.6+y[e] *4*	(14⁻)	Jπ: Q γ to (12⁻).
2094.2+x[b] *7*	(16⁺)	Jπ: Q γ to (14⁺).
2210.9+x[&] *7*	(15⁻)	Jπ: Q γ to (13⁻).
2252.1+y *11*		
2329.2+x[d] *7*	(15⁺)	Jπ: Q γ to (13⁺).
2429.1+y[f] *5*	(15⁻)	Jπ: Q γ to (13⁻).
2544.1+x[a] *7*	(17⁺)	Jπ: Q γ to (15⁺).
2585.6+x[@] *8*	(16⁻)	Jπ: Q γ to (14⁻).
2647.2+x[c] *7*	(16⁺)	Jπ: Q γ to (14⁺).
2769.8+y[e] *5*	(16⁻)	Jπ: Q γ to (14⁻).
2800.1+y *15*		
2803.6+x[#] *9*	(17⁻)	Jπ: Q γ to (15⁻).
2986.6+x[b] *8*	(18⁺)	Jπ: Q γ to (16⁺).
2992.1+x[&] *8*	(17⁻)	Jπ: Q γ to (15⁻).
3045.6+x[d] *8*	(17⁺)	Jπ: γ from (18⁺) and γ to (15⁺) and (16⁺).
3099.7+y[f] *5*	(17⁻)	Jπ: Q γ to (15⁻).
3128.6+y *11*		
3387.1+x *13*		
3431.2+y[e] *6*	(18⁻)	Jπ: Q γ to (16⁻).
3436.9+x[@] *8*	(18⁻)	Jπ: Q γ to (16⁻).
3441.7+x[c] *8*	(18⁺)	Jπ: Q γ to (16⁺).
3463.1+x[a] *8*	(19⁺)	Jπ: Q γ to (17⁺).
3641.4+x[#] *10*	(19⁻)	Jπ: Q γ to (17⁻).
3802.2+y[f] *6*	(19⁻)	Jπ: Q γ to (17⁻).
3869.0+x[&] *10*	(19⁻)	Jπ: Q γ to (17⁻).
3870.1+x[d] *8*	(19⁺)	Jπ: γ to (17⁺) and (18⁺).
3987.6+y *15*		
4000.4+x[b] *8*	(20⁺)	Jπ: Q γ to (18⁺).
4176.1+x *16*		
4203.3+y[e] *8*	(20⁻)	
4350.9+x[c] *8*	(20⁺)	Jπ: Q γ to (18⁺).
4354.6+x[@] *9*	(20⁻)	Jπ: Q γ to (18⁻).
4473.3+x[a] *8*	(21⁺)	Jπ: Q γ to (19⁺).

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(HI,xnγ) 2002Ch38 (continued)

^{124}La Levels (continued)

E(level)†	Jπ‡	Comments
4555.5+x[#] *10*	(21⁻)	Jπ: Q γ to (19⁻).
4638.9+y[f] *9*	(21⁻)	
4796.9+x[d] *10*	(21⁺)	
4844.7+x[&] *12*	(21⁻)	Jπ: Q γ to (19⁻).
4929.6+y *18*		
5096.5+x[b] *8*	(22⁺)	Jπ: Q γ to (20⁺).
5107.7+y[e] *10*	(22⁻)	
5345.0+x[@] *11*	(22⁻)	Jπ: Q γ to (20⁻).
5357.8+x[c] *9*	(22⁺)	Jπ: Q γ to (20⁺).
5531.1+x[#] *11*	(23⁻)	Jπ: Q γ to (21⁻).
5550.6+x[a] *8*	(23⁺)	Jπ: D+Q γ to (21⁺).
5615.1+y[f] *11*	(23⁻)	
5826.0+x[d] *11*	(23⁺)	
5917.8+x[&] *13*	(23⁻)	
6149.2+y[e] *12*	(24⁻)	
6236.5+x[b] *10*	(24⁺)	
6340.0+x[c] *11*	(24⁺)	
6409.8+x[@] *12*	(24⁻)	
6592.8+x[#] *12*	(25⁻)	
6686.2+x[a] *10*	(25⁺)	
6724.5+y[f] *12*	(25⁻)	
6900.5+x[d] *12*	(25⁺)	
7317.9+y[e] *14*	(26⁻)	
7389.2+x[c] *12*	(26⁺)	
7436.4+x[b] *12*	(26⁺)	
7538.3+x[@] *14*	(26⁻)	
7734.4+x[#] *14*	(27⁻)	
7900.1+x[a] *12*	(27⁺)	
8044.4+x[d] *14*	(27⁺)	
8529.3+x[c] *14*	(28⁺)	
8584.7+y[e] *15*	(28⁻)	
8687.5+x[b] *13*	(28⁺)	
8732.7+x[@] *15*	(28⁻)	
8925.0+x[#] *15*	(29⁻)	
9193.5+x[a] *14*	(29⁺)	
9751.0+x[c] *15*	(30⁺)	
10130.0+x[#] *16*	(31⁻)	
10556.7+x[a] *15*	(31⁺)	
11058.2+x[c] *16*	(32⁺)	
11377.0+x[#] *17*	(33⁻)	
11986.0+x[a] *16*	(33⁺)	
12455.3+x[c] *17*	(34⁺)	
12722.2+x[#] *18*	(35⁻)	
14184.6+x[#] *19*	(37⁻)	

† From least-squares fit to Eγ′s (by compilers).

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(HI,xnγ) 2002Ch38 (continued)

^{124}La Levels (continued)

‡ From Adopted Levels.
# Band(A): Eb band.
@ Band(B): Ei band, α=0.
& Band(b): Ej band, α=1.
a Band(C): Ee band, α=1.
b Band(c): Ef band, α=0.
c Band(D): Fe band, α=0.
d Band(d): Ff band, α=1.
e Band(E): Ce band, α=0. Possible $K^\pi=8^-$ isomer band.
f Band(e): De band, α=1. Possible $K^\pi=8^-$ isomer band.

γ(^{124}La)

R: γγ angular correlation asymmetry; 1.0 for ΔJ=2, Q and 0.63 for ΔJ=1, D.

E_γ †	I_γ ‡	E_i(level)	J_i^π	E_f	J_f^π	Mult. @	δ	Comments
85.4 *6*	10.0 *10*	140.4+x	(7$^-$)	54.9+x	(6$^-$)			
87.6 *6*	4.4 *4*	267.8+x	(8$^-$)	180.7+x	(7$^-$)	D+Q		R=0.46 *8*.
122.6 *3*	64 *3*	191.4+x	(9$^+$)	68.9+x	(8$^+$)	D+Q		R=0.61 *2*.
126.3 *6*	10.0 *10*	180.7+x	(7$^-$)	54.9+x	(6$^-$)	D+Q		R=0.55 *4*.
127.6 *3*	34.1 *17*	267.8+x	(8$^-$)	140.4+x	(7$^-$)	D+Q		R=0.60 *3*.
133.2 *3*	152 *8*	324.4+x	(10$^+$)	191.4+x	(9$^+$)	D+Q		R=0.54 *1*.
157.1 *6*	1.2 *1*	1390.5+x	(12$^+$)	1233.4+x	(11$^+$)			
171.0 *3*	54 *3*	438.6+x	(9$^-$)	267.8+x	(8$^-$)	D+Q		R=0.54 *2*.
191.4 *6*	4.2 *4*	191.4+x	(9$^+$)	0.0+x	(7$^+$)	Q		R=0.88 *6*.
192.5 *3*	35.0 *18*	460.2+x	(9$^-$)	267.8+x	(8$^-$)	D+Q		R=0.49 *2*.
194.5 *3*	17.9 *9*	654.5+x	(10$^-$)	460.2+x	(9$^-$)	D+Q		R=0.47 *2*.
200.9 *3*	148 *7*	750.2+x	(12$^+$)	549.4+x	(11$^+$)	D+Q	−0.050 *12*	A_2=−0.31 *6*; A_4=+0.05 *8* R=0.51 *1*.
207.5 *6*	5.3 *5*	861.8+x	(11$^-$)	654.5+x	(10$^-$)	D+Q		R=0.60 *3*.
212.5 *6*	5.2 *5*	267.8+x	(8$^-$)	54.9+x	(6$^-$)			
215.9 *3*	26.0 *13*	654.5+x	(10$^-$)	438.6+x	(9$^-$)	D+Q		R=0.56 *3*.
225.0 *3*	199 *10*	549.4+x	(11$^+$)	324.4+x	(10$^+$)	D+Q	−0.035 *13*	A_2=−0.29 *6*; A_4=+0.08 *8* R=0.55 *1*.
242.6 *6*	5.9 *6*	1967.2+x	(14$^+$)	1724.1+x	(13$^+$)	D+Q		R=0.54 *2*.
255.4 *3*	34.0 *17*	324.4+x	(10$^+$)	68.9+x	(8$^+$)	Q		A_2=+0.24 *8*; A_4=−0.05 *10* R=1.01 *3*.
262.0 *3*	34.5 *17*	916.3+x	(11$^-$)	654.5+x	(10$^-$)	D+Q	+0.057 *4*	A_2=−0.14 *7*; A_4=+0.11 *8* R=0.47 *2*.
269.3 *3*	23.6 *12*	1185.6+x	(12$^-$)	916.3+x	(11$^-$)	D+Q		A_2=−0.57 *9*; A_4=0 R=0.50 *2*.
274.1 *3*	61 *3*	1344.1+x	(14$^+$)	1070.1+x	(13$^+$)	D+Q	−0.079 *15*	A_2=−0.35 *6*; A_4=+0.08 *8* R=0.51 *2*.
279.6 *6*	5.9 *6*	460.2+x	(9$^-$)	180.7+x	(7$^-$)			
286.5 *3*	60 *3*	286.43+y	(9$^-$)	0.0+y	(8$^-$)	(M1+E2)	+0.37 *1*	A_2=+0.31 *10*; A_4=+0.14 *12* R=1.07 *2*.
298.0 *3*	14.3 *7*	438.6+x	(9$^-$)	140.4+x	(7$^-$)	Q		R=0.96 *3*.
315.3 *3*	31.7 *16*	601.68+y	(10$^-$)	286.43+y	(9$^-$)	(M1+E2)	+0.22 *5*	A_2=+0.12 *9*; A_4=−0.04 *8* R=1.23 *3*.
318.2 *6*	7.0 *7*	2647.2+x	(16$^+$)	2329.2+x	(15$^+$)			
320.0 *3*	120 *6*	1070.1+x	(13$^+$)	750.2+x	(12$^+$)	D+Q	−0.113 *20*	A_2=−0.40 *6*; A_4=+0.07 *8* R=0.45 *1*.

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(HI,xnγ) 2002Ch38 (continued)

γ(^{124}La) (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[@]	δ	Comments
324.7 *3*	20.6 *10*	1510.3+x	(13$^-$)	1185.6+x	(12$^-$)	D+Q		R=0.41 *2*.
326.9 *3*	13.2 *7*	1837.4+x	(14$^-$)	1510.3+x	(13$^-$)	D+Q		R=0.60 *2*.
329.8 *6*	1.5 *2*	3099.7+y	(17$^-$)	2769.8+y	(16$^-$)			
334.0 *6*	3.9 *4*	1724.1+x	(13$^+$)	1390.5+x	(12$^+$)			
340.0 *3*	16.6 *8*	941.6+y	(11$^-$)	601.68+y	(10$^-$)	D+Q		R=1.20 *4*.
341.2 *6*	1.5 *2*	2769.8+y	(16$^-$)	2429.1+y	(15$^-$)			
354.1 *3*	19.2 *10*	2094.2+x	(16$^+$)	1740.3+x	(15$^+$)	D+Q		A_2=−0.79 *7*; A_4=+0.09 *9* R=0.48 *4*.
357.9 *3*	42.5 *21*	549.4+x	(11$^+$)	191.4+x	(9$^+$)	Q		A_2=+0.23 *8*; A_4=−0.02 *9* R=1.04 *3*.
360.5 *3*	11.5 *6*	1302.1+y	(12$^-$)	941.6+y	(11$^-$)	D+Q		R=0.94 *5*.
362.4 *6*	7.0 *7*	2329.2+x	(15$^+$)	1967.2+x	(14$^+$)	D+Q		R=0.59 *3*.
369.3 *6*	2.6 *3*	2429.1+y	(15$^-$)	2059.6+y	(14$^-$)			
373.7 *3*	15.2 *8*	2210.9+x	(15$^-$)	1837.4+x	(14$^-$)	D+Q		R=0.51 *2*.
375.2 *6*	8.6 *9*	2585.6+x	(16$^-$)	2210.9+x	(15$^-$)	D+Q		R=0.51 *2*.
375.9 *6*	5.5 *6*	1677.8+y	(13$^-$)	1302.1+y	(12$^-$)			
381.6 *6*	3.5 *4*	2059.6+y	(14$^-$)	1677.8+y	(13$^-$)			
386.7 *3*	20.1 *10*	654.5+x	(10$^-$)	267.8+x	(8$^-$)	Q		R=0.88 *3*.
394.8 *6*	4.7 *5*	3441.7+x	(18$^+$)	3045.6+x	(17$^+$)			
396.3 *3*	57 *3*	1740.3+x	(15$^+$)	1344.1+x	(14$^+$)	D+Q	−0.091 *13*	A_2=−0.36 *6*; A_4=+0.08 *8* R=0.42 *2*.
398.6 *6*	6.8 *7*	3045.6+x	(17$^+$)	2647.2+x	(16$^+$)			
401.6 *3*	22.9 *11*	861.8+x	(11$^-$)	460.2+x	(9$^-$)	Q		R=0.71 *3*.
406.1 *6*	5.7 *6*	2992.1+x	(17$^-$)	2585.6+x	(16$^-$)			
423.1 *3*	48.3 *24*	861.8+x	(11$^-$)	438.6+x	(9$^-$)	Q		R=0.96 *2*.
425.6 *3*	109 *5*	750.2+x	(12$^+$)	324.4+x	(10$^+$)	Q		A_2=+0.23 *8*; A_4=−0.13 *9* R=1.06 *2*.
427.9 *6*	8.0 *8*	3870.1+x	(19$^+$)	3441.7+x	(18$^+$)			
442.8 *6*	4.2 *4*	2986.6+x	(18$^+$)	2544.1+x	(17$^+$)	D+Q		R=0.48 *5*.
449.9 *3*	23.2 *12*	2544.1+x	(17$^+$)	2094.2+x	(16$^+$)	D+Q		A_2=−0.34 *6*; A_4=0.0 R=0.40 *4*.
453.4 *6*	0.7 *1*	5550.6+x	(23$^+$)	5096.5+x	(22$^+$)	D+Q		E_γ: 452 keV in Fig 2 in 2002Ch38 maybe a misprint. R=0.34 *6*.
456.0 *3*	12.3 *6*	916.3+x	(11$^-$)	460.2+x	(9$^-$)	Q		R=0.78 *4*.
473.4 *6*	2.7 *3*	4473.3+x	(21$^+$)	4000.4+x	(20$^+$)			
476.6 *6*	8.3 *8*	3463.1+x	(19$^+$)	2986.6+x	(18$^+$)			
478[&]		916.3+x	(11$^-$)	438.6+x	(9$^-$)			Not observed in 2002Ch38. Calculated from the level scheme in 1993Ko25.
490.7 *6*	8.6 *9*	1724.1+x	(13$^+$)	1233.4+x	(11$^+$)	Q		R=1.04 *6*.
520.6 *3*	65 *3*	1070.1+x	(13$^+$)	549.4+x	(11$^+$)	Q		A_2=+0.52 *5*; A_4=0.0 R=1.00 *3*.
531.0 *3*	35.2 *18*	1185.6+x	(12$^-$)	654.5+x	(10$^-$)	Q		R=1.06 *2*.
538.0 *6*	1.4 *1*	4000.4+x	(20$^+$)	3463.1+x	(19$^+$)			
541.5 *3*	76 *4*	1403.3+x	(13$^-$)	861.8+x	(11$^-$)	Q		A_2=+0.30 *9*; A_4=−0.15 *9* Positive sign of A_4 in Table I in 2002Ch38 is a type error. It was corrected by the author of ^{64}Zn(^{64}Zn,3pnγ):XUNDL-1 via per e-mail from one of the authors (E. Paul) of 2002Ch38 see also ^{64}Zn(^{64}Zn,3pnγ):XUNDL-1. R=1.10 *2*.
548[#] *1*		2800.1+y		2252.1+y				
576.9 *3*	18.3 *9*	1967.2+x	(14$^+$)	1390.5+x	(12$^+$)	Q		A_2=+0.30 *8*; A_4=−0.03 *9* R=0.98 *2*.

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(HI,xnγ) 2002Ch38 (continued)

γ(^{124}La) (continued)

E_γ †	I_γ ‡	E_i(level)	J_i^π	E_f	J_f^π	Mult. @	δ	Comments
591.3 *6*	5.6 *6*	916.3+x	(11$^-$)	324.4+x	(10$^+$)	D		R=0.69 *6*.
593.8 *3*	134 *7*	1344.1+x	(14$^+$)	750.2+x	(12$^+$)	Q		A_2=+0.30 *8*; A_4=−0.03 *8* R=1.02 *4*.
593.9 *3*	25.2 *13*	1510.3+x	(13$^-$)	916.3+x	(11$^-$)	Q		A_2=+0.32 *8*; A_4=−0.02 *9* R=0.99 *2*.
601.6 *3*	20.7 *10*	601.68+y	(10$^-$)	0.0+y	(8$^-$)	Q		R=1.09 *4*.
605.1 *3*	12.1 *6*	2329.2+x	(15$^+$)	1724.1+x	(13$^+$)	Q		R=1.09 *4*.
622.2 *6*	1.1 *1*	5096.5+x	(22$^+$)	4473.3+x	(21$^+$)			
636.4 *3*	10.4 *5*	1185.6+x	(12$^-$)	549.4+x	(11$^+$)	D		R=0.50 *9*.
651.1 *3*	73 *4*	2054.4+x	(15$^-$)	1403.3+x	(13$^-$)	Q		R=1.01 *2*.
651.8 *3*	39.8 *20*	1837.4+x	(14$^-$)	1185.6+x	(12$^-$)	Q		A_2=+0.54 *7*; A_4=0 R=0.97 *3*.
655.2 *3*	30.0 *15*	941.6+y	(11$^-$)	286.43+y	(9$^-$)	Q		R=0.80 *3*.
661.4 *3*	16.4 *8*	3431.2+y	(18$^-$)	2769.8+y	(16$^-$)	Q		R=1.02 *4*.
670.2 *3*	63 *3*	1740.3+x	(15$^+$)	1070.1+x	(13$^+$)	Q		A_2=+0.34 *8*; A_4=−0.07 *9* R=1.08 *3*.
670.7 *3*	16.2 *8*	3099.7+y	(17$^-$)	2429.1+y	(15$^-$)	Q		R=1.07 *3*.
680.3 *3*	23.6 *12*	2647.2+x	(16$^+$)	1967.2+x	(14$^+$)	Q		A_2=+0.43 *7*; A_4=0 R=0.90 *2*.
700.3 *3*	34.8 *17*	1302.1+y	(12$^-$)	601.68+y	(10$^-$)	Q		R=1.00 *4*.
700.6 *3*	31.0 *16*	2210.9+x	(15$^-$)	1510.3+x	(13$^-$)	Q		R=0.91 *3*.
702.5 *3*	10.3 *5*	3802.2+y	(19$^-$)	3099.7+y	(17$^-$)	Q		R=1.15 *9*.
710.1 *3*	26.2 *13*	2769.8+y	(16$^-$)	2059.6+y	(14$^-$)	Q		R=1.07 *3*.
716.1 *3*	13.0 *7*	3045.6+x	(17$^+$)	2329.2+x	(15$^+$)			
736.3 *3*	31.2 *16*	1677.8+y	(13$^-$)	941.6+y	(11$^-$)	Q		R=1.07 *4*.
748.0 *3*	33.1 *17*	2585.6+x	(16$^-$)	1837.4+x	(14$^-$)	Q		R=1.16 *4*.
749.2 *3*	59 *3*	2803.6+x	(17$^-$)	2054.4+x	(15$^-$)	Q		R=1.07 *2*.
750.3 *3*	91 *5*	2094.2+x	(16$^+$)	1344.1+x	(14$^+$)	Q		A_2=+0.42 *8*; A_4=+0.08 *9* R=1.08 *2*.
751.4 *3*	22.2 *11*	2429.1+y	(15$^-$)	1677.8+y	(13$^-$)	Q		R=1.08 *3*.
757.4 *3*	33.4 *17*	2059.6+y	(14$^-$)	1302.1+y	(12$^-$)	Q		R=1.08 *5*.
759.6 *6*	9.6 *10*	1510.3+x	(13$^-$)	750.2+x	(12$^+$)	D		R=0.64 *8*.
767.1 *6*	9.4 *9*	1837.4+x	(14$^-$)	1070.1+x	(13$^+$)	D		R=0.69 *6*.
772.1 *6*	8.7 *9*	4203.3+y	(20$^-$)	3431.2+y	(18$^-$)			
781.2 *3*	26.4 *13*	2992.1+x	(17$^-$)	2210.9+x	(15$^-$)	Q		R=1.13 *5*.
789# *1*		4176.1+x		3387.1+x				
794.2 *3*	24.6 *12*	3441.7+x	(18$^+$)	2647.2+x	(16$^+$)	Q		R=0.97 *2*.
803.8 *3*	56 *3*	2544.1+x	(17$^+$)	1740.3+x	(15$^+$)	Q		A_2=+0.40 *9*; A_4=−0.16 *10* R=1.12 *3*.
824.7 *3*	11.5 *6*	3870.1+x	(19$^+$)	3045.6+x	(17$^+$)			
836.7 *6*	9.0 *9*	4638.9+y	(21$^-$)	3802.2+y	(19$^-$)			
837.8 *3*	38.2 *19*	3641.4+x	(19$^-$)	2803.6+x	(17$^-$)	Q		R=0.93 *2*.
840.9 *3*	26.9 *13*	1390.5+x	(12$^+$)	549.4+x	(11$^+$)	(M1+E2)	+0.28 *10*	A_2=+0.19 *10*; A_4=+0.11 *11* R=0.52 *1*.
843# *1*		3387.1+x		2544.1+x	(17$^+$)			
845.4 *6*	7.5 *8*	2585.6+x	(16$^-$)	1740.3+x	(15$^+$)	D+Q		R=0.51 *3*.
851.3 *3*	14.5 *7*	3436.9+x	(18$^-$)	2585.6+x	(16$^-$)	Q		R=0.98 *5*.
859# *1*		3987.6+y		3128.6+y				
867.3 *6*	8.0 *8*	2210.9+x	(15$^-$)	1344.1+x	(14$^+$)			
877.0 *6*	7.0 *7*	3869.0+x	(19$^-$)	2992.1+x	(17$^-$)	(Q)		R=1.63 *10*. Value of R exceeds expected value of 1.0 for ΔJ=2, Q.
892.3 *3*	54 *3*	2986.6+x	(18$^+$)	2094.2+x	(16$^+$)	Q		A_2=+0.36 *10*; A_4=−0.202 *10* R=1.05 *4*.
897.3 *3*	11.8 *6*	1967.2+x	(14$^+$)	1070.1+x	(13$^+$)			
904.4 *6*	9.3 *9*	5107.7+y	(22$^-$)	4203.3+y	(20$^-$)			

Continued on next page (footnotes at end of table)

(HI,xnγ) 2002Ch38 (continued)

γ(^{124}La) (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[@]	Comments
905.3 *6*	7.0 *7*	2647.2+x	(16$^+$)	1740.3+x	(15$^+$)		
909.2 *3*	22.7 *11*	4350.9+x	(20$^+$)	3441.7+x	(18$^+$)	Q	R=1.20 *14*.
914.1 *3*	19.6 *10*	4555.5+x	(21$^-$)	3641.4+x	(19$^-$)	Q	R=0.97 *4*.
917.7 *3*	10.7 *5*	4354.6+x	(20$^-$)	3436.9+x	(18$^-$)	Q	R=1.00 *5*.
919.0 *3*	32.5 *16*	3463.1+x	(19$^+$)	2544.1+x	(17$^+$)	Q	A_2=+0.41 *9*; A_4=0.00 *9* R=1.27 *9*.
926.8 *6*	8.4 *8*	4796.9+x	(21$^+$)	3870.1+x	(19$^+$)		
942[#] *1*		4929.6+y		3987.6+y			
950[#] *1*		2252.1+y		1302.1+y	(12$^-$)		
974 *1*	21.5 *11*	1724.1+x	(13$^+$)	750.2+x	(12$^+$)	D+Q	A_2=−0.09 *5*; A_4=0 E_γ: Eγ=966.6 quoted in the Table VI of 2002Ch38 is incorrect. It was corrected by the author of ^{64}Zn(^{64}Zn,3pnγ):XUNDL-1 via per e-mail from one of the authors (E. Paul) of 2002Ch38 see also ^{64}Zn(^{64}Zn,3pnγ):XUNDL-1.
975.6 *6*	2.6 *3*	4844.7+x	(21$^-$)	3869.0+x	(19$^-$)	Q	R=1.06 *6*.
975.6 *3*	10.8 *5*	5531.1+x	(23$^-$)	4555.5+x	(21$^-$)	Q	R=1.06 *6*.
976.2 *6*	5.3 *5*	5615.1+y	(23$^-$)	4638.9+y	(21$^-$)		
982.2 *6*	2.9 *3*	6340.0+x	(24$^+$)	5357.8+x	(22$^+$)		
985 *1*	9.1 *9*	2329.2+x	(15$^+$)	1344.1+x	(14$^+$)		E_γ: Eγ=978.0 quoted in Table VI of 2002Ch38 is incorrect. It was corrected by the author of ^{64}Zn(^{64}Zn,3pnγ):XUNDL-1 via per e-mail from one of the authors (E. Paul) of 2002Ch38 see also ^{64}Zn(^{64}Zn,3pnγ):XUNDL-1.
990.4 *6*	4.1 *4*	5345.0+x	(22$^-$)	4354.6+x	(20$^-$)	Q	R=1.14 *7*.
1006.9 *3*	11.2 *6*	5357.8+x	(22$^+$)	4350.9+x	(20$^+$)	Q	R=1.18 *18*.
1010.0 *3*	27.2 *14*	4473.3+x	(21$^+$)	3463.1+x	(19$^+$)	Q	R=1.02 *7*.
1013.9 *3*	24.9 *12*	4000.4+x	(20$^+$)	2986.6+x	(18$^+$)	Q	R=0.86 *6*.
1029.1 *3*	10.6 *5*	5826.0+x	(23$^+$)	4796.9+x	(21$^+$)		
1041.5 *6*	4.8 *5*	6149.2+y	(24$^-$)	5107.7+y	(22$^-$)		
1049.2 *6*	2.5 *3*	7389.2+x	(26$^+$)	6340.0+x	(24$^+$)		
1061.7 *6*	6.4 *6*	6592.8+x	(25$^-$)	5531.1+x	(23$^-$)		
1064.8 *6*	3.4 *3*	6409.8+x	(24$^-$)	5345.0+x	(22$^-$)		
1068.4 *6*	4.7 *5*	1390.5+x	(12$^+$)	324.4+x	(10$^+$)		E_γ: poor fit; level-energy difference=1066.2.
1069[#] *1*		3128.6+y		2059.6+y	(14$^-$)		
1073.1 *6*	1.2 *1*	5917.8+x	(23$^-$)	4844.7+x	(21$^-$)		E_γ: 1072 keV in Fig 2 in 2002Ch38 maybe a misprint.
1074.5 *6*	3.4 *3*	6900.5+x	(25$^+$)	5826.0+x	(23$^+$)		
1077.5 *3*	17.2 *9*	5550.6+x	(23$^+$)	4473.3+x	(21$^+$)		
1096.1 *3*	10.9 *5*	5096.5+x	(22$^+$)	4000.4+x	(20$^+$)	Q	R=1.01 *11*.
1109.3 *6*	3.5 *4*	6724.5+y	(25$^-$)	5615.1+y	(23$^-$)		
1128.5 *6*	1.4 *1*	7538.3+x	(26$^-$)	6409.8+x	(24$^-$)		
1135.6 *6*	6.5 *7*	6686.2+x	(25$^+$)	5550.6+x	(23$^+$)		
1140.0 *6*	6.5 *7*	6236.5+x	(24$^+$)	5096.5+x	(22$^+$)		
1140.1 *6*	2.3 *2*	8529.3+x	(28$^+$)	7389.2+x	(26$^+$)		
1141.6 *6*	3.9 *4*	7734.4+x	(27$^-$)	6592.8+x	(25$^-$)		
1143.8 *6*	1.7 *2*	8044.4+x	(27$^+$)	6900.5+x	(25$^+$)		
1168.6 *6*	2.6 *3*	7317.9+y	(26$^-$)	6149.2+y	(24$^-$)		
1174.0 *6*	5.4 *5*	1724.1+x	(13$^+$)	549.4+x	(11$^+$)		
1190.6 *6*	2.9 *3*	8925.0+x	(29$^-$)	7734.4+x	(27$^-$)		
1194.4 *6*	0.6 *1*	8732.7+x	(28$^-$)	7538.3+x	(26$^-$)		
1199.9 *6*	1.4 *1*	7436.4+x	(26$^+$)	6236.5+x	(24$^+$)		E_γ: 1204 quoted in figure 2 of 2002Ch38 is a misprint. It was corrected by the author of ^{64}Zn(^{64}Zn,3pnγ):XUNDL-1 via per e-mail from one of the authors (E. Paul) of 2002Ch38 see also ^{64}Zn(^{64}Zn,3pnγ):XUNDL-1.

Continued on next page (footnotes at end of table)

(HI,xnγ) 2002Ch38 (continued)

γ(^{124}La) (continued)

E_γ †	I_γ ‡	E_i(level)	J_i^π	E_f	J_f^π	Comments
1205.0 *6*	1.6 *2*	10130.0+x	(31^-)	8925.0+x	(29^-)	
1213.9 *6*	3.3 *3*	7900.1+x	(27^+)	6686.2+x	(25^+)	
1217.4 *6*	6.8 *7*	1967.2+x	(14^+)	750.2+x	(12^+)	
1221.7 *6*	2.2 *2*	9751.0+x	(30^+)	8529.3+x	(28^+)	
1247.0 *6*	1.3 *1*	11377.0+x	(33^-)	10130.0+x	(31^-)	
1251.1 *6*	1.6 *2*	8687.5+x	(28^+)	7436.4+x	(26^+)	
1257.5 *6*	3.1 *3*	2329.2+x	(15^+)	1070.1+x	(13^+)	
1266.8 *6*	0.9 *1*	8584.7+y	(28^-)	7317.9+y	(26^-)	
1293.3 *6*	1.1 *1*	9193.5+x	(29^+)	7900.1+x	(27^+)	
1302.5 *6*	4.0 *4*	2647.2+x	(16^+)	1344.1+x	(14^+)	
1307.1 *6*	1.3 *1*	11058.2+x	(32^+)	9751.0+x	(30^+)	
1345.1 *6*	0.7 *1*	12722.2+x	(35^-)	11377.0+x	(33^-)	
1349.5 *6*	2.5 *3*	3441.7+x	(18^+)	2094.2+x	(16^+)	E_γ: poor fit; level-energy difference=1347.5.
1363.2 *6*	0.9 *1*	10556.7+x	(31^+)	9193.5+x	(29^+)	
1397.1 *6*	0.9 *1*	12455.3+x	(34^+)	11058.2+x	(32^+)	
1429.3 *6*	0.2 *1*	11986.0+x	(33^+)	10556.7+x	(31^+)	
1462.4 *6*	0.1 *1*	14184.6+x	(37^-)	12722.2+x	(35^-)	

† Δ(Eγ)=0.3 keV for Iγ>10, 0.6 keV for Iγ<10, and 1 keV for when Eγ is quoted to nearest keV. 2002Ch38 state that Δ(Eγ)=0.3 keV for Iγ>10, rising to 0.6 keV for the weaker transitions.

‡ Δ(Iγ)=5% for Iγ>10 and 10% for Iγ<10. 2002Ch38 state that Δ(Eγ)<5% for Iγ>10, and <10% for the weaker transitions.

From level schemes in 2002Ch38, assuming Δ(Eγ)=1 keV.

@ From γ(θ) and/or angular-correlation value R.

& Placement of transition in the level scheme is uncertain.

(HI,xnγ) 2002Ch38

Level Scheme

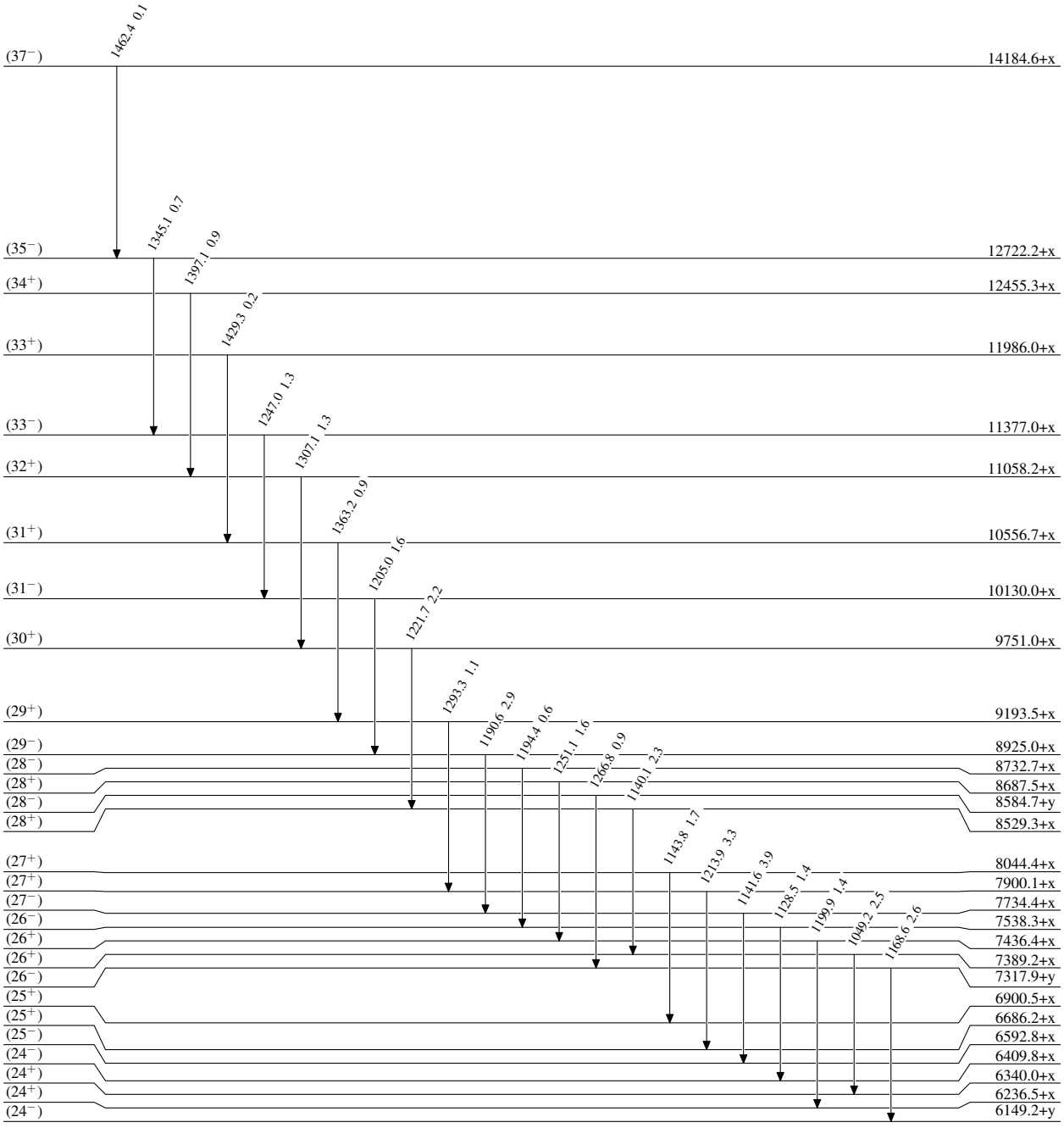
Intensities: Relative I_γ

Legend

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

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

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



$^{124}_{57}La_{67}$

(HI,xnγ) 2002Ch38

Level Scheme (continued)

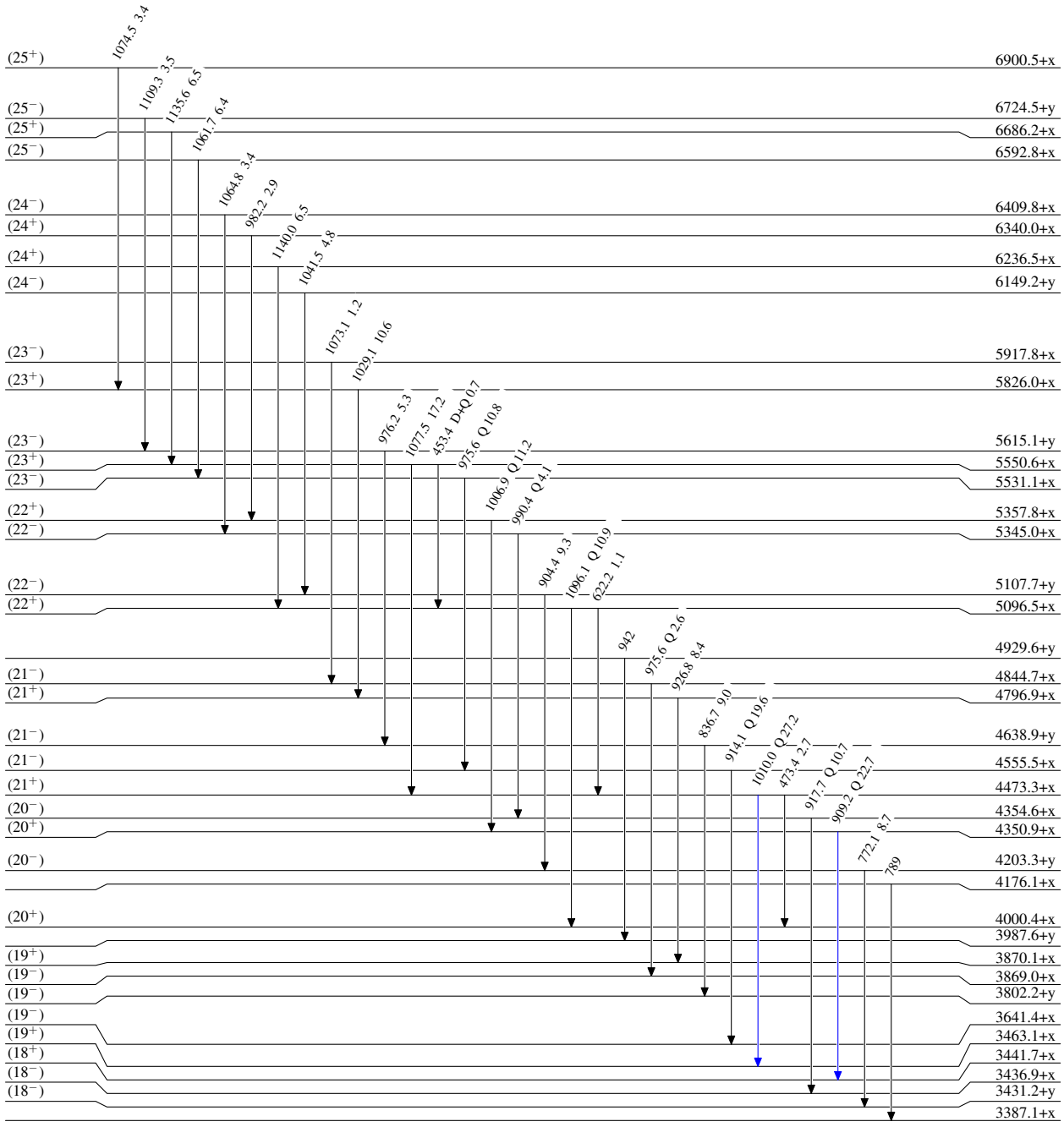
Intensities: Relative I_γ

Legend

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

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

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

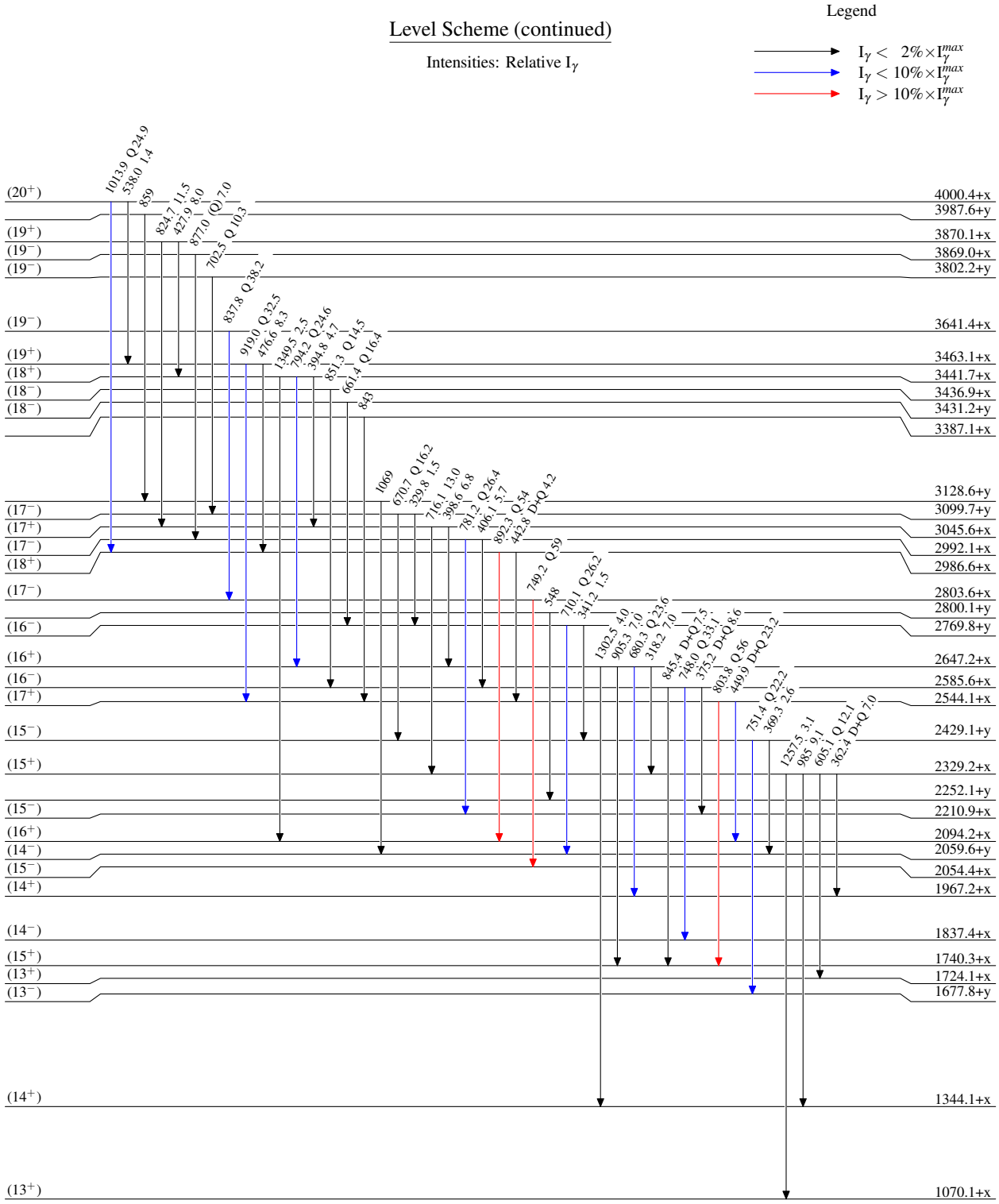


$^{124}_{57}La_{67}$

(HI,xnγ) 2002Ch38

Level Scheme (continued)

Intensities: Relative I_γ



$^{124}_{57}La_{67}$

(HI,xnγ) 2002Ch38

Level Scheme (continued)

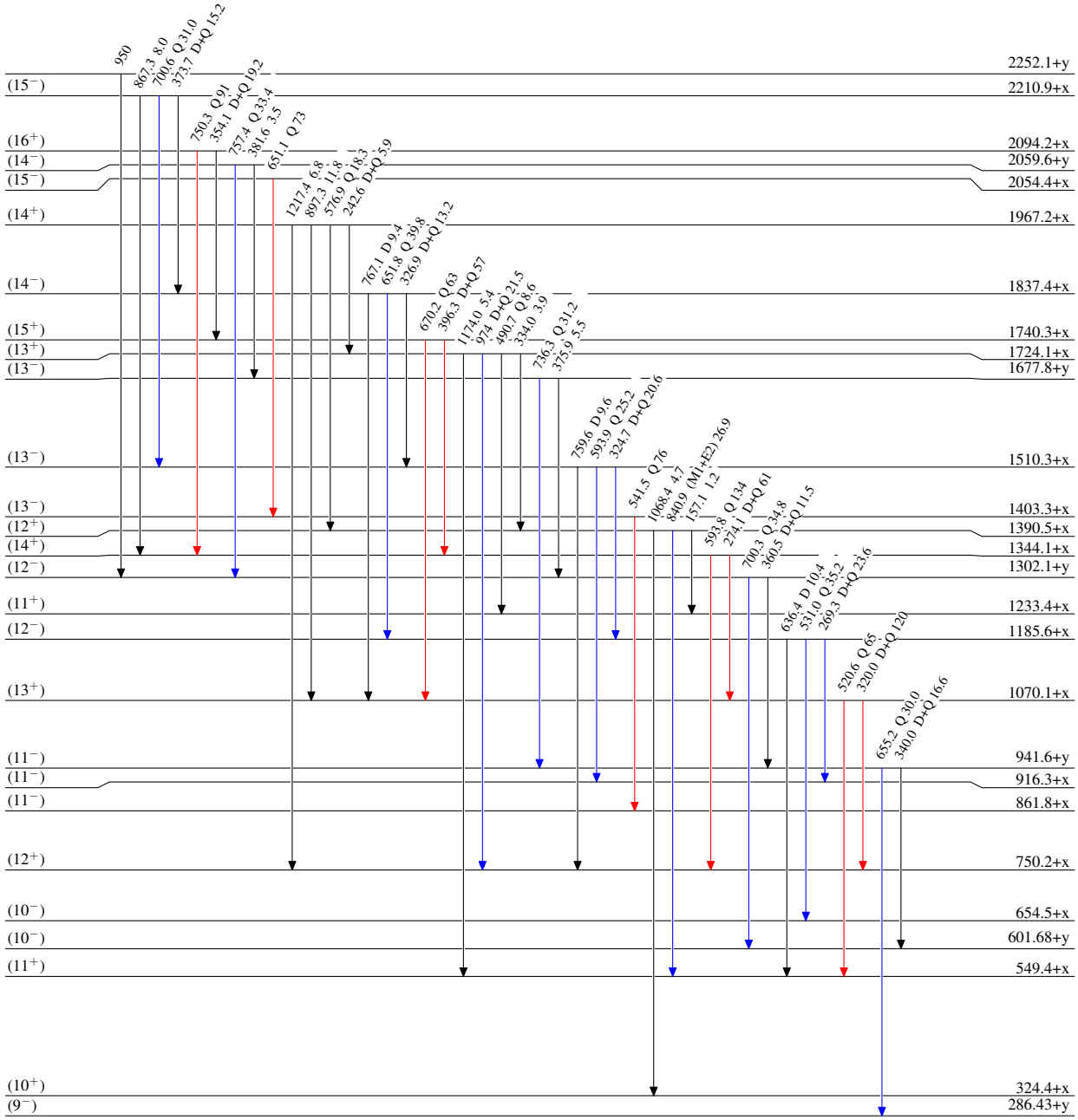
Intensities: Relative I_γ

Legend

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

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

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



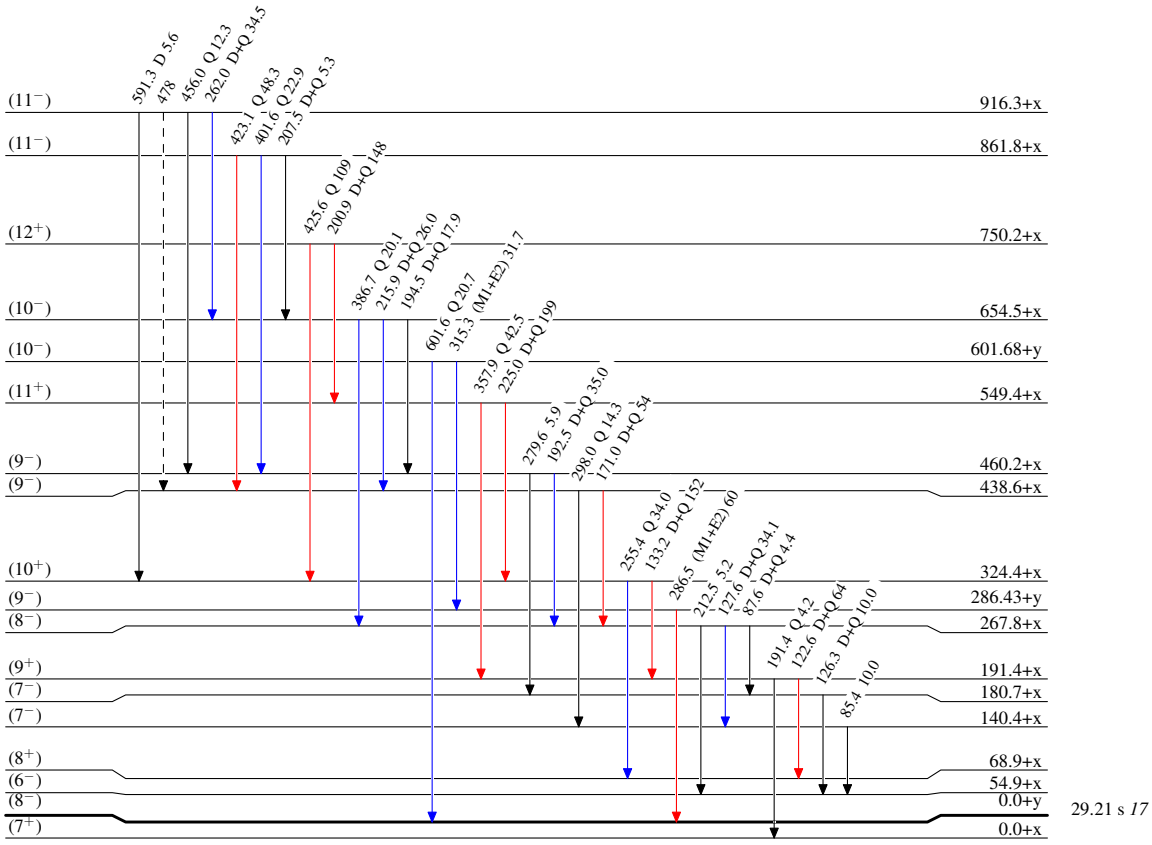
$^{124}_{57}La_{67}$

(HI,xnγ) 2002Ch38

Level Scheme (continued)

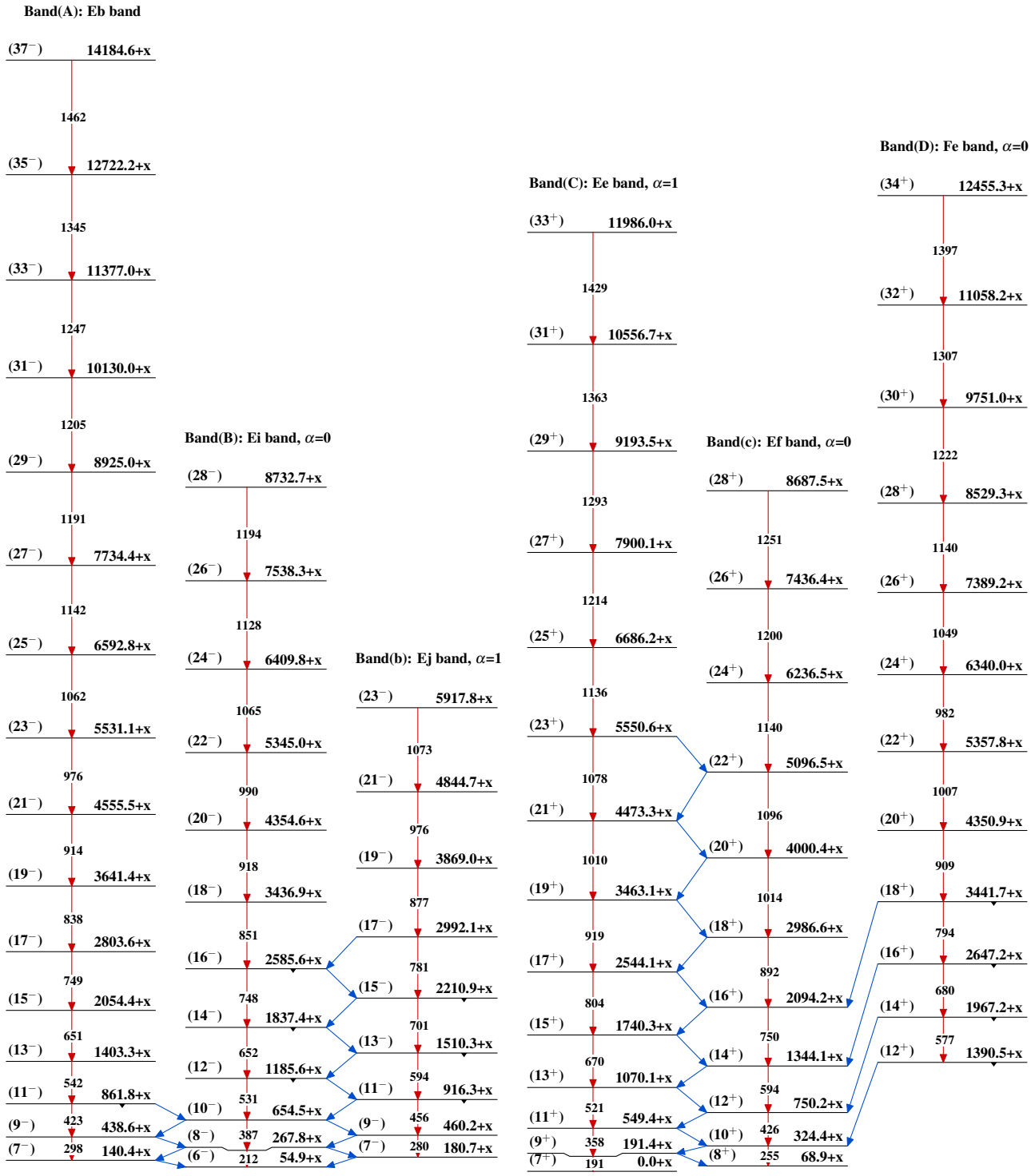
Intensities: Relative I_γ

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)



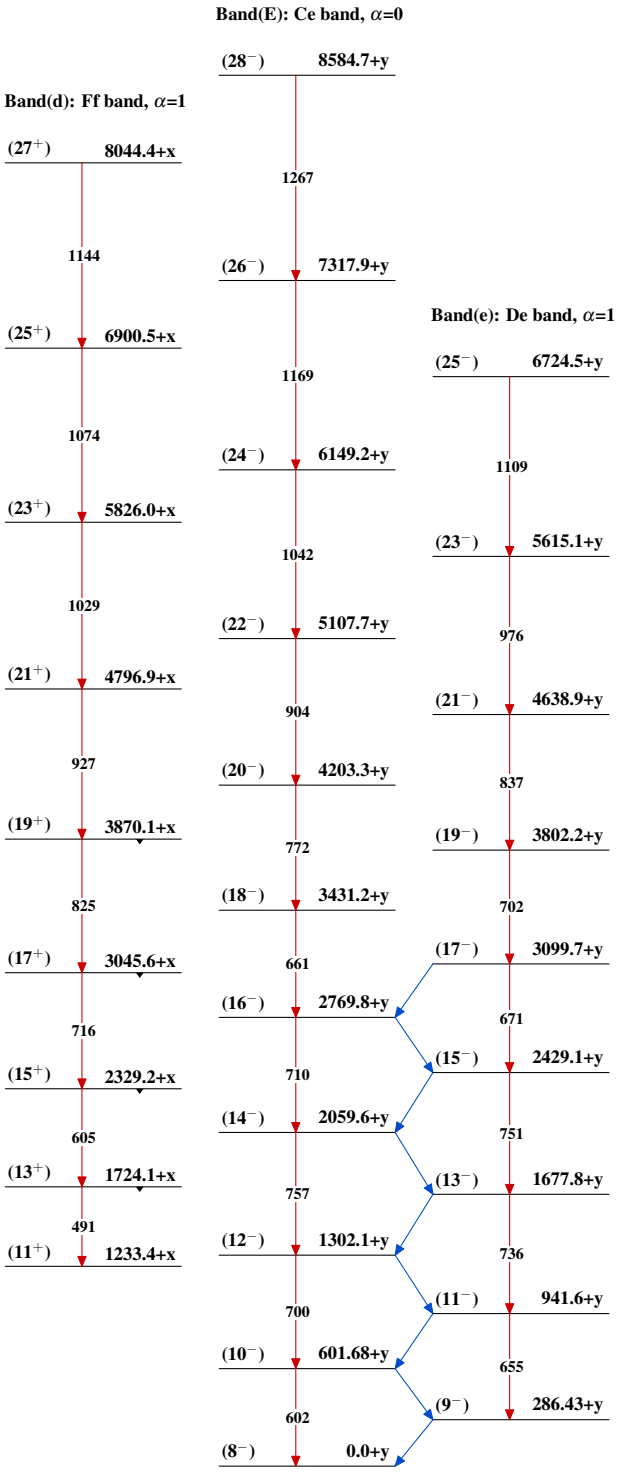
$^{124}_{57}La_{67}$

(HI,xnγ) 2002Ch38



$^{124}_{57}La_{67}$

(HI,xnγ) 2002Ch38 (continued)



$^{124}_{57}La_{67}$