(HI,xnγ) 1991Pa07,1996Gi08

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Yu. Khazov, I. Mitropolsky, A. Rodionov	NDS 107, 2715 (2006)	17-Jul-2006

1977Gi17: ^{118}Sn(^{16}O,3nγ), E=55-85 MeV. Measured Eγ, γγ, γ(θ), γγ(t), Xγ(t), ceγ(t), $T_{1/2}$.
1991Pa07: ^{117}Sn(^{18}O,4nγ), E=85 MeV. Measured Eγ, γγ. NORDBALL array.
1996Gi08: ^{100}Mo(^{35}S,5nγ), E not given. Measured Eγ, γγ deduced the location of $\nu(s_{1/2}+d_{3/2})$ bandhead (61.8 keV, $J^\pi=1/2^+$). EUROGAM array.
2004Li27: ^{116}Sn(^{19}F,p3n), E=95 MeV. Measured Eγ, γγ, lifetimes. A combined detector array of 11 BGO Compton-suppressed HPGe detectors; DSA method.
Evaluators used corresponding XUNDL file.
199Kl11: ^{110}Pd(^{28}Si,α3n), E=125 MeV; measured $T_{1/2}$ by DSAM. GASP array.

^{131}Ce Levels

The level scheme is mainly as given by 1991Pa07, 1996Gi08, 2004Li27, based on γγ coincidence data, assumed band structure and calculations.

E(level)†	Jπe	$T_{1/2}$	Comments
0.0#	(7/2+)	10.2 min *3*	$T_{1/2}$: from Adopted Levels.
62.1@ *9*	1/2+	5.4 min *5*	$T_{1/2}$: from Adopted Levels E.
134.9@ *9*	3/2+		
161.980‡ *10*	9/2−	88 ns *2*	$T_{1/2}$: from γ(t) (1998Io01). Others: 70 ns *6* (1983AkZZ), 80 ns (1977Gi17).
257.07# *11*	(9/2+)		
300.28‡ *9*	(11/2−)	120 ps *8*	$T_{1/2}$: from 1999Kl11.
347.5@ *9*	5/2+		
473.8@ *9*	7/2+		
543.19# *24*	(11/2+)		
637.04‡ *19*	(13/2−)		
809.8‡ *3*	(15/2−)	5.21 ps *26*	$T_{1/2}$: from 1999Kl11.
866.51# *25*	(13/2+)	1.0 ps *4*	$T_{1/2}$: from 2004Li27.
983.8@ *8*	11/2+		
1176.7 *4*	(15/2−)		
1212.4# *3*	(15/2+)		
1295.3‡ *3*	(17/2−)		
1409.2d *6*			
1452.0‡ *4*	(19/2−)	>2.8 ps	$T_{1/2}$: from 2004Li27.
1591.5# *4*	(17/2+)	0.91 ps *7*	$T_{1/2}$: from 2004Li27.
1608.6@ *6*	15/2+		
1696.0 *6*	(17/2−)		
1805.5 *4*	(19/2−)		
1976.9 *4*	(19/2+)		
2067.6‡ *5*	(21/2−)		
2202.3‡ *5*	(23/2−)	1.0 ps *4*	$T_{1/2}$: from 2004Li27.
2286.9 *5*			
2313.1? *10*	(19/2−)		
2352.4a *4*	(19/2+)		
2387.4#c *4*	(21/2+)	0.42 ps *18*	$T_{1/2}$: from 2004Li27.
2505.7a *4*	(21/2+)		

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(HI,xnγ) 1991Pa07,1996Gi08 (continued)

^{131}Ce Levels (continued)

E(level)[†]	Jπ[e]	$T_{1/2}$	Comments
2564.0 *5*	(23/2$^-$)		
2685.6[a] *4*	(23/2$^+$)		
2762.0[&] *5*	(23/2$^+$)		
2910.0[a] *5*	(25/2$^+$)		
2912.6[‡] *5*	(25/2$^-$)		
3029.2[‡] *6*	(27/2$^-$)	0.85 ps *16*	$T_{1/2}$: from 2004Li27.
3036.3[&c] *5*	(25/2$^+$)	<1.52 ps	$T_{1/2}$: from 2004Li27. Effective half-life; not corrected for side feeding. Band: Assignment to ν $g_{7/2}$ band by 2004Li27 contradicts band assignment by 1991Pa07 and 1998Io01.
3069.7[bc] *6*	(25/2$^-$)		
3198.8[a] *6*	(27/2$^+$)		
3272.8[&] *6*	(27/2$^+$)		
3287.7[bc] *5*	(27/2$^-$)		
3522.9[a] *6*	(29/2$^+$)		
3540.0[&c] *6*	(29/2$^+$)		
3544.3[b] *6*	(29/2$^-$)		
3818.1[b] *6*	(31/2$^-$)		
3840.9[&] *7*	(31/2$^+$)		
3893.9[a] *6*	(31/2$^+$)		
3921.2[‡] *8*	(31/2$^-$)	<0.72 ps	$T_{1/2}$: from 2004Li27. Effective half-life; not corrected for side feeding.
4153.2[b] *7*	(33/2$^-$)		
4178.1[&] *7*	(33/2$^+$)		
4313.9[a] *7*	(33/2$^+$)		
4511.1[b] *7*	(35/2$^-$)		
4549.7[&] *7*	(35/2$^+$)		
4745.9[a] *7*	(35/2$^+$)		
4843.2[‡] *9*	(35/2$^-$)		
4909.3[b] *7*	(37/2$^-$)		
4955.6[&] *8*	(37/2$^+$)		
5244.9[a] *9*	(37/2$^+$)		
5341.9[b] *8*	(39/2$^-$)		
5390.3[&] *8*	(39/2$^+$)		
5714.9[a] *9*	(39/2$^+$)		
5797.1[b] *8*	(41/2$^-$)		
5805.2[‡] *11*	(39/2$^-$)		
5860.4[&] *9*	(41/2$^+$)		
6293.0[b] *9*	(43/2$^-$)		
6352.3[&] *10*	(43/2$^+$)		
6742.9[a] *10*	(43/2$^+$)		
6809.1[b] *10*	(45/2$^-$)		
6880.4[&] *10*	(45/2$^+$)		
7355.0[b] *10*	(47/2$^-$)		
7422.3[&] *11*	(47/2$^+$)		
7801.9[a] *12*	(47/2$^+$)		
7932.1[b] *11*	(49/2$^-$)		
8009.5[&] *11*	(49/2$^+$)		
8577.2?[&] *12*	(51/2$^+$)		

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(HI,xnγ) 1991Pa07,1996Gi08 (continued)

^{131}Ce Levels (continued)

† From least-square fit to Eγ's, if ΔEγ not given, ±0.50 keV assumed for least-squares fitting.
‡ Band(A): Band based on Configuration=(ν $h_{11/2}$) (1991πa07). Q_t=3.1 eb *6* (2004Li27).
# Band(B): Band based on Configuration=(ν $g_{7/2}$) (1991πa07). Q_t=4.6 eb *15* (2004Li27).
@ Band(C): Band based on configuration=(ν($s_{1/2}$+$d_{3/2}$)) (1996Gi08, 1998Io01).
& Band(D): band based on Configuration=(N,G7/2)(π$h_{11/2}$)^2 (1991Pa07).
a Band(E): Band based on Configuration=(N,H11/2)(π$h_{11/2}$)(π$g_{7/2}$) (1991Pa07).
b Band(F): band based on Configuration=(N,H11/2)(π$h_{11/2}$)^2 (1991Pa07).
c The level also decays to unspecified states.
d The level decays to unspecified states.
e From mult. and regular sequence of transitions in the band cascade.

γ(^{131}Ce)

A_2 values from 1977Gi17.

E_γ †	I_γ @	E_i(level)	J_i^π	E_f	J_f^π	Mult.&	Comments
72.84‡ *5*		134.9	3/2$^+$	62.1	1/2$^+$		
126.1‡ *2*		473.8	7/2$^+$	347.5	5/2$^+$		
135.0		2202.3	(23/2$^-$)	2067.6	(21/2$^-$)		
138.29‡ *9*	48 *4*	300.28	(11/2$^-$)	161.980	9/2$^-$	(M1,E2)	γ(θ): A_2=−0.52 *6*.
153.1 *4*		2505.7	(21/2$^+$)	2352.4	(19/2$^+$)		
156.0		1452.0	(19/2$^-$)	1295.3	(17/2$^-$)		
157.0		3069.7	(25/2$^-$)	2912.6	(25/2$^-$)		
161.98‡ *1*	100 *7*	161.980	9/2$^-$	0.0	(7/2$^+$)	(E1)	γ(θ): A_2=−0.01 *5*. Other: A_2=−0.20 *2* (1998Io01).
172.7 *4*	4.3 *8*	809.8	(15/2$^-$)	637.04	(13/2$^-$)	(M1,E2)	γ(θ): A_2=−0.53 *12*.
180.2 *4*		2685.6	(23/2$^+$)	2505.7	(21/2$^+$)		
212.56‡ *7*		347.5	5/2$^+$	134.9	3/2$^+$		
218.0		3287.7	(27/2$^-$)	3069.7	(25/2$^-$)		
218.9 *4*		2505.7	(21/2$^+$)	2286.9			
224.3 *4*		2910.0	(25/2$^+$)	2685.6	(23/2$^+$)		
236.0		3272.8	(27/2$^+$)	3036.3	(25/2$^+$)		
257.0		3544.3	(29/2$^-$)	3287.7	(27/2$^-$)		
257.07‡ *11*	23.5 *18*	257.07	(9/2$^+$)	0.0	(7/2$^+$)	(M1,E2)	γ(θ): A_2=−0.32 *7*.
258.0[a]		3287.7	(27/2$^-$)	3029.2	(27/2$^-$)		
267.0		3540.0	(29/2$^+$)	3272.8	(27/2$^+$)		
274.0		3036.3	(25/2$^+$)	2762.0	(23/2$^+$)		
274.0		3818.1	(31/2$^-$)	3544.3	(29/2$^-$)		
285.39‡ *7*		347.5	5/2$^+$	62.1	1/2$^+$		
286.0‡ *4*	10.2 *20*	543.19	(11/2$^+$)	257.07	(9/2$^+$)		
289.0		3198.8	(27/2$^+$)	2910.0	(25/2$^+$)		
298.0		2685.6	(23/2$^+$)	2387.4	(21/2$^+$)		
301.0		3840.9	(31/2$^+$)	3540.0	(29/2$^+$)		
323.29 *26*	2.0 *4*	866.51	(13/2$^+$)	543.19	(11/2$^+$)	(M1,E2)	γ(θ): A_2=−0.46 *10*.
324.0		3522.9	(29/2$^+$)	3198.8	(27/2$^+$)		
333.0		2685.6	(23/2$^+$)	2352.4	(19/2$^+$)		
335.0		4153.2	(33/2$^-$)	3818.1	(31/2$^-$)		
336.56 *26*	29 *2*	637.04	(13/2$^-$)	300.28	(11/2$^-$)	(M1,E2)	γ(θ): A_2=−0.23 *7*.
337.0		4178.1	(33/2$^+$)	3840.9	(31/2$^+$)		
339.05‡ *21*		473.8	7/2$^+$	134.9	3/2$^+$		

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(HI,xnγ) 1991Pa07,1996Gi08 (continued)

γ(^{131}Ce) (continued)

E_γ †	I_γ @	E_i(level)	J_i^π	E_f	J_f^π	Mult. &	Comments
345.9 *3*	0.6 *2*	1212.4	(15/2$^+$)	866.51	(13/2$^+$)		
358.0		4511.1	(35/2$^-$)	4153.2	(33/2$^-$)		
367.0		1176.7	(15/2$^-$)	809.8	(15/2$^-$)		
371.0		3893.9	(31/2$^+$)	3522.9	(29/2$^+$)		
371.0		4549.7	(35/2$^+$)	4178.1	(33/2$^+$)		
375.0		2762.0	(23/2$^+$)	2387.4	(21/2$^+$)		
375.0		3287.7	(27/2$^-$)	2912.6	(25/2$^-$)		
379.0		1591.5	(17/2$^+$)	1212.4	(15/2$^+$)		
385.0[a]		1976.9	(19/2$^+$)	1591.5	(17/2$^+$)		
398.0		4909.3	(37/2$^-$)	4511.1	(35/2$^-$)		
404.4 *4*		2910.0	(25/2$^+$)	2505.7	(21/2$^+$)		
405.0		4955.6	(37/2$^+$)	4549.7	(35/2$^+$)		
411.0		2387.4	(21/2$^+$)	1976.9	(19/2$^+$)		
420.0		4313.9	(33/2$^+$)	3893.9	(31/2$^+$)		
432.0		4745.9	(35/2$^+$)	4313.9	(33/2$^+$)		
432.0		5341.9	(39/2$^-$)	4909.3	(37/2$^-$)		
434.0		5390.3	(39/2$^+$)	4955.6	(37/2$^+$)		
455.0		5797.1	(41/2$^-$)	5341.9	(39/2$^-$)		
470.0		5860.4	(41/2$^+$)	5390.3	(39/2$^+$)		
475.0[a]		3544.3	(29/2$^-$)	3069.7	(25/2$^-$)		
475.2 *3*	7.7 *10*	637.04	(13/2$^-$)	161.980	9/2$^-$	(E2)	γ(θ): A_2=0.36 *8*.
485.7 *3*	4.1 *5*	1295.3	(17/2$^-$)	809.8	(15/2$^-$)	(M1,E2)	γ(θ): A_2=−0.65 *10*.
491.0[a]		6352.3	(43/2$^+$)	5860.4	(41/2$^+$)		
496.0		2564.0	(23/2$^-$)	2067.6	(21/2$^-$)		
496.0		6293.0	(43/2$^-$)	5797.1	(41/2$^-$)		
504.0		3540.0	(29/2$^+$)	3036.3	(25/2$^+$)		
509.7[#] *4*	31 *5*	809.8	(15/2$^-$)	300.28	(11/2$^-$)		
510.0[#]		983.8	11/2$^+$	473.8	7/2$^+$		
510.0[a]		1805.5	(19/2$^-$)	1295.3	(17/2$^-$)		
511.0[#]		3272.8	(27/2$^+$)	2762.0	(23/2$^+$)		
513.0		3198.8	(27/2$^+$)	2685.6	(23/2$^+$)		
515.0		3544.3	(29/2$^-$)	3029.2	(27/2$^-$)		
515.0[a]		6809.1	(45/2$^-$)	6293.0	(43/2$^-$)		
519.3 *5*	2.4 *5*	1696.0	(17/2$^-$)	1176.7	(15/2$^-$)	(M1,E2)	γ(θ): A_2=−0.57 *11*.
529.0		2505.7	(21/2$^+$)	1976.9	(19/2$^+$)		
529.0[a]		6880.4	(45/2$^+$)	6352.3	(43/2$^+$)		
530.0		3818.1	(31/2$^-$)	3287.7	(27/2$^-$)		
539.8 *4*	5.7 *7*	1176.7	(15/2$^-$)	637.04	(13/2$^-$)	(M1,E2)	γ(θ): A_2=−0.77 *11*.
543.2[‡] *4*	9.3 *9*	543.19	(11/2$^+$)	0.0	(7/2$^+$)	(E2)	γ(θ): A_2=0.23 *8*.
547.0[a]		7355.0	(47/2$^-$)	6809.1	(45/2$^-$)		
568.0		3840.9	(31/2$^+$)	3272.8	(27/2$^+$)		
609.0		4153.2	(33/2$^-$)	3544.3	(29/2$^-$)		
609.5 *3*	11.3 *20*	866.51	(13/2$^+$)	257.07	(9/2$^+$)	(E2)	γ(θ): A_2=0.27 *9*.
613.0		3522.9	(29/2$^+$)	2910.0	(25/2$^+$)		
615.0		2067.6	(21/2$^-$)	1452.0	(19/2$^-$)		
617.5[a] *6*	2.2 *4*	2313.1?	(19/2$^-$)	1696.0	(17/2$^-$)	(M1,E2)	γ(θ): A_2=−0.38 *14*.
624.8		1608.6	15/2$^+$	983.8	11/2$^+$		
629.0		1805.5	(19/2$^-$)	1176.7	(15/2$^-$)		
638.0		4178.1	(33/2$^+$)	3540.0	(29/2$^+$)		
641.9 *4*	12.6 *15*	1452.0	(19/2$^-$)	809.8	(15/2$^-$)	(E2)	γ(θ): A_2=0.29 *9*.
649.0		3036.3	(25/2$^+$)	2387.4	(21/2$^+$)		
657.9 *4*	4.9 *8*	1295.3	(17/2$^-$)	637.04	(13/2$^-$)	(E2)	γ(θ): A_2=0.31 *11*.
669.2 *3*	7.7 *12*	1212.4	(15/2$^+$)	543.19	(11/2$^+$)	(E2)	γ(θ): A_2=0.30 *9*.
678.4[‡]		2286.9		1608.6	15/2$^+$		

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(HI,xnγ) 1991Pa07,1996Gi08 (continued)

γ(^{131}Ce) (continued)

E_γ [†]	I_γ [@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[&]	Comments
693.0		4511.1	(35/2$^-$)	3818.1	(31/2$^-$)		
695.0		3893.9	(31/2$^+$)	3198.8	(27/2$^+$)		
708.7 *4*		2685.6	(23/2$^+$)	1976.9	(19/2$^+$)		
709.0		4549.7	(35/2$^+$)	3840.9	(31/2$^+$)		
710.0		2912.6	(25/2$^-$)	2202.3	(23/2$^-$)		
724.0		3287.7	(27/2$^-$)	2564.0	(23/2$^-$)		
725.0 *3*	8.5 *15*	1591.5	(17/2$^+$)	866.51	(13/2$^+$)	(E2)	γ(θ): A_2=0.34 *9*.
743.8[‡]		2352.4	(19/2$^+$)	1608.6	15/2$^+$		
750.0 *4*	6.3 *13*	2202.3	(23/2$^-$)	1452.0	(19/2$^-$)	(E2)	γ(θ): A_2=0.29 *8*.
756.0		4909.3	(37/2$^-$)	4153.2	(33/2$^-$)		
759.0		2564.0	(23/2$^-$)	1805.5	(19/2$^-$)		
764.5 *3*	4.0 *8*	1976.9	(19/2$^+$)	1212.4	(15/2$^+$)	(E2)	γ(θ): A_2=0.10 *12*.
773.0		2067.6	(21/2$^-$)	1295.3	(17/2$^-$)		
778.0		4955.6	(37/2$^+$)	4178.1	(33/2$^+$)		
784.9 *4*	3.0 *6*	2762.0	(23/2$^+$)	1976.9	(19/2$^+$)	(E2)	γ(θ): A_2=0.26 *11*.
789.0		3818.1	(31/2$^-$)	3029.2	(27/2$^-$)		
791.0		4313.9	(33/2$^+$)	3522.9	(29/2$^+$)		
795.8 *3*	2.6 *5*	2387.4	(21/2$^+$)	1591.5	(17/2$^+$)	(E2)	γ(θ): A_2=0.15 *11*.
826.9 *4*	3.5 *7*	3029.2	(27/2$^-$)	2202.3	(23/2$^-$)	(E2)	γ(θ): A_2=0.15 *13*.
[x]830.1 *8*	2.4 *5*					(E2)	γ(θ): A_2=0.32 *13*. E_γ: from 1977Gi17.
831.0		5341.9	(39/2$^-$)	4511.1	(35/2$^-$)		
841.0		5390.3	(39/2$^+$)	4549.7	(35/2$^+$)		
845.0		2912.6	(25/2$^-$)	2067.6	(21/2$^-$)		
852.0		4745.9	(35/2$^+$)	3893.9	(31/2$^+$)		
878.0		2286.9		1409.2			
888.0		5797.1	(41/2$^-$)	4909.3	(37/2$^-$)		
892.0		3921.2	(31/2$^-$)	3029.2	(27/2$^-$)		
905.0		5860.4	(41/2$^+$)	4955.6	(37/2$^+$)		
914.5 *4*		2505.7	(21/2$^+$)	1591.5	(17/2$^+$)		
922.0		4843.2	(35/2$^-$)	3921.2	(31/2$^-$)		
931.0		5244.9	(37/2$^+$)	4313.9	(33/2$^+$)		
943.0		2352.4	(19/2$^+$)	1409.2			
951.0		6293.0	(43/2$^-$)	5341.9	(39/2$^-$)		
962.0		5805.2	(39/2$^-$)	4843.2	(35/2$^-$)		
962.0		6352.3	(43/2$^+$)	5390.3	(39/2$^+$)		
969.0		5714.9	(39/2$^+$)	4745.9	(35/2$^+$)		
996.0		1805.5	(19/2$^-$)	809.8	(15/2$^-$)		
1012.0		6809.1	(45/2$^-$)	5797.1	(41/2$^-$)		
1020.0		6880.4	(45/2$^+$)	5860.4	(41/2$^+$)		
1028.0		6742.9	(43/2$^+$)	5714.9	(39/2$^+$)		
1059.0		7801.9	(47/2$^+$)	6742.9	(43/2$^+$)		
1062.0		7355.0	(47/2$^-$)	6293.0	(43/2$^-$)		
1070.0		7422.3	(47/2$^+$)	6352.3	(43/2$^+$)		
1086.0[a]		3287.7	(27/2$^-$)	2202.3	(23/2$^-$)		
1112.0		2564.0	(23/2$^-$)	1452.0	(19/2$^-$)		
1123.0		7932.1	(49/2$^-$)	6809.1	(45/2$^-$)		
1129.0		8009.5	(49/2$^+$)	6880.4	(45/2$^+$)		
1139.8 *4*		2352.4	(19/2$^+$)	1212.4	(15/2$^+$)		
1155.0[a]		8577.2?	(51/2$^+$)	7422.3	(47/2$^+$)		

[†] Weighted average from 1977Gi17, 1991Pa07 and 1996Gi08, when values are available, assuming ΔEγ=0.5 keV for Eγ if it is not noted.

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(HI,xnγ) 1991Pa07,1996Gi08 (continued)

$\gamma(^{131}Ce)$ (continued)

‡ Eγ is taken from ^{131}Pr ε decay (1.51 min) and ^{131}Pr ε decay (1.71 s) since it is more accurate.
# Mixed with the 511 γ-ray apparently.
@ From 1977Gi17 at E(^{16}O)=66 MeV.
& From $\gamma(\theta)$, RUL for E2 and M2 used when level lifetimes are available and band structure.
a Placement of transition in the level scheme is uncertain.
x γ ray not placed in level scheme.

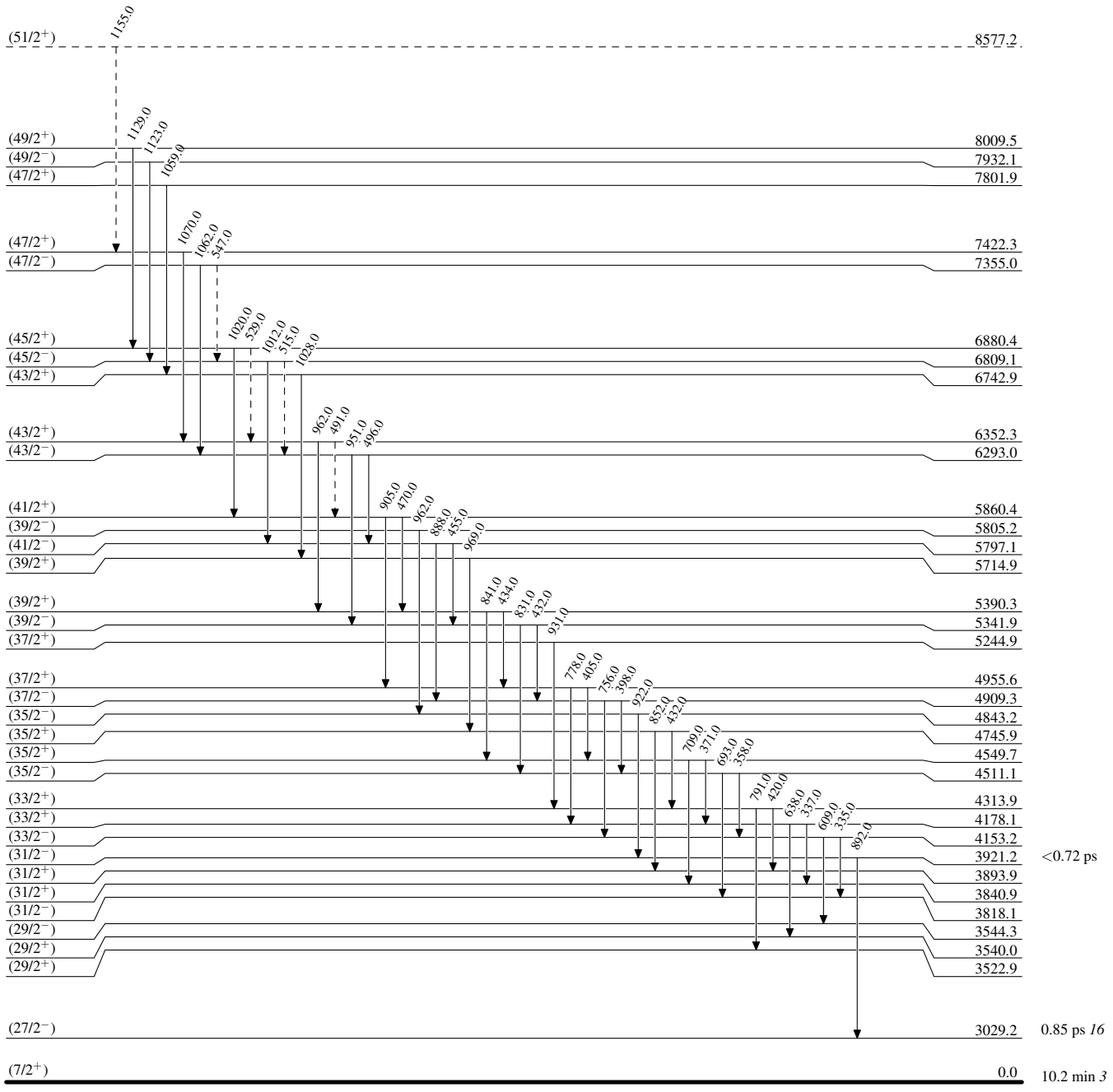
(HI,xnγ) 1991Pa07,1996Gi08

Legend

Level Scheme

Intensities: Relative I_γ

γ Decay (Uncertain)



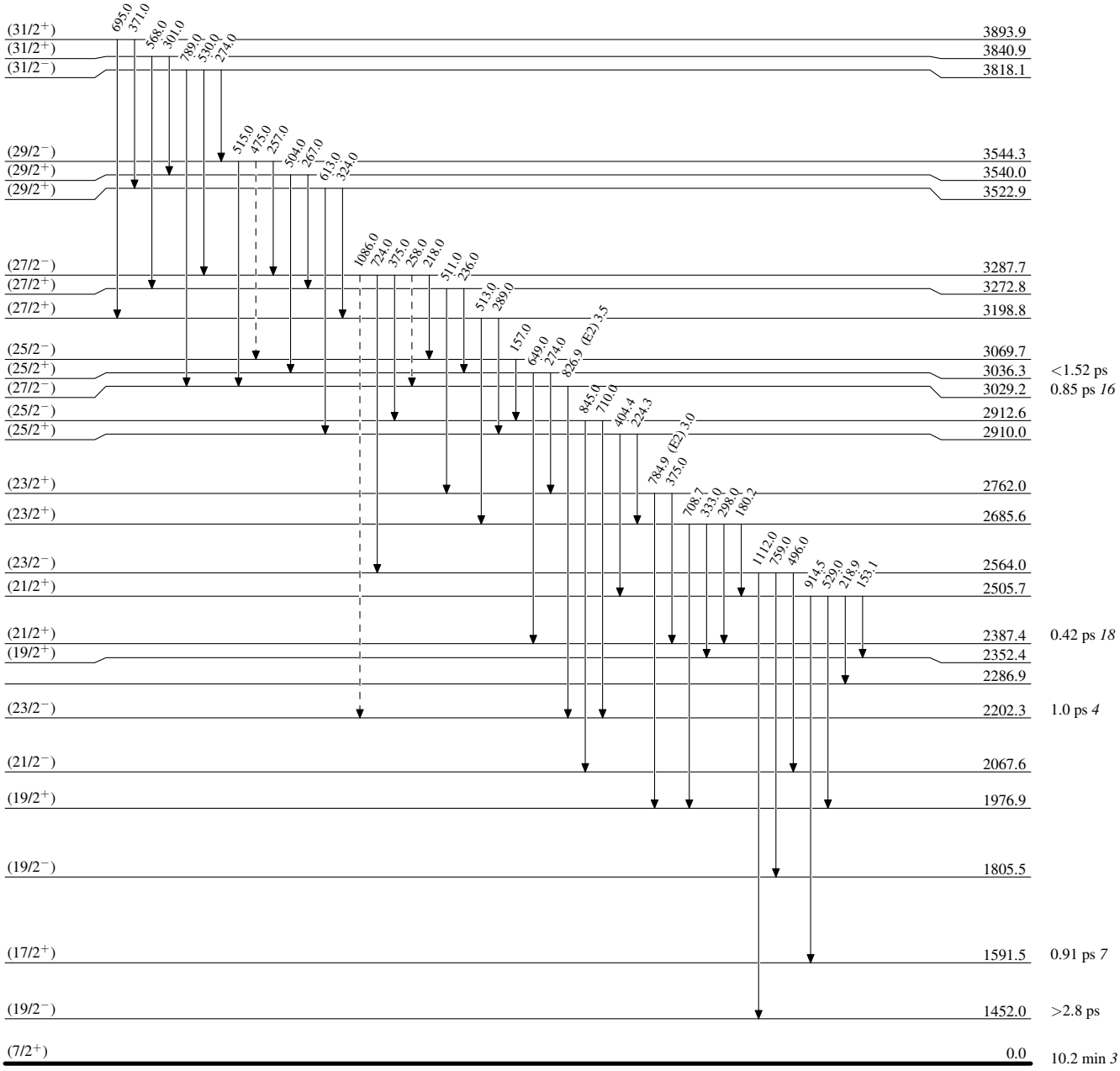
$^{131}_{58}Ce_{73}$

(HI,xnγ) 1991Pa07,1996Gi08

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)



$^{131}_{58}Ce_{73}$

(HI,xnγ) 1991Pa07,1996Gi08

Level Scheme (continued)

Intensities: Relative I_γ

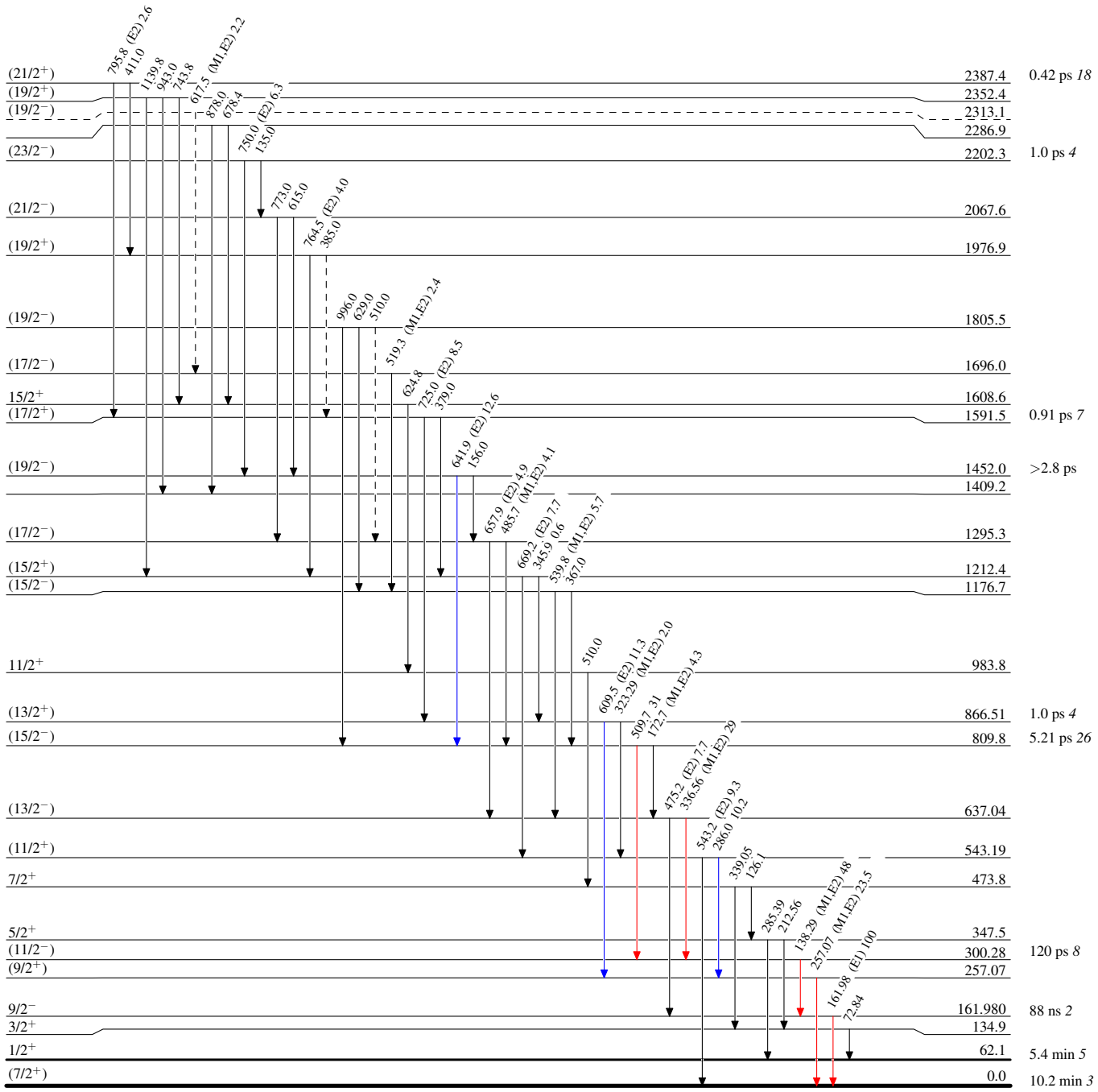
Legend

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

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

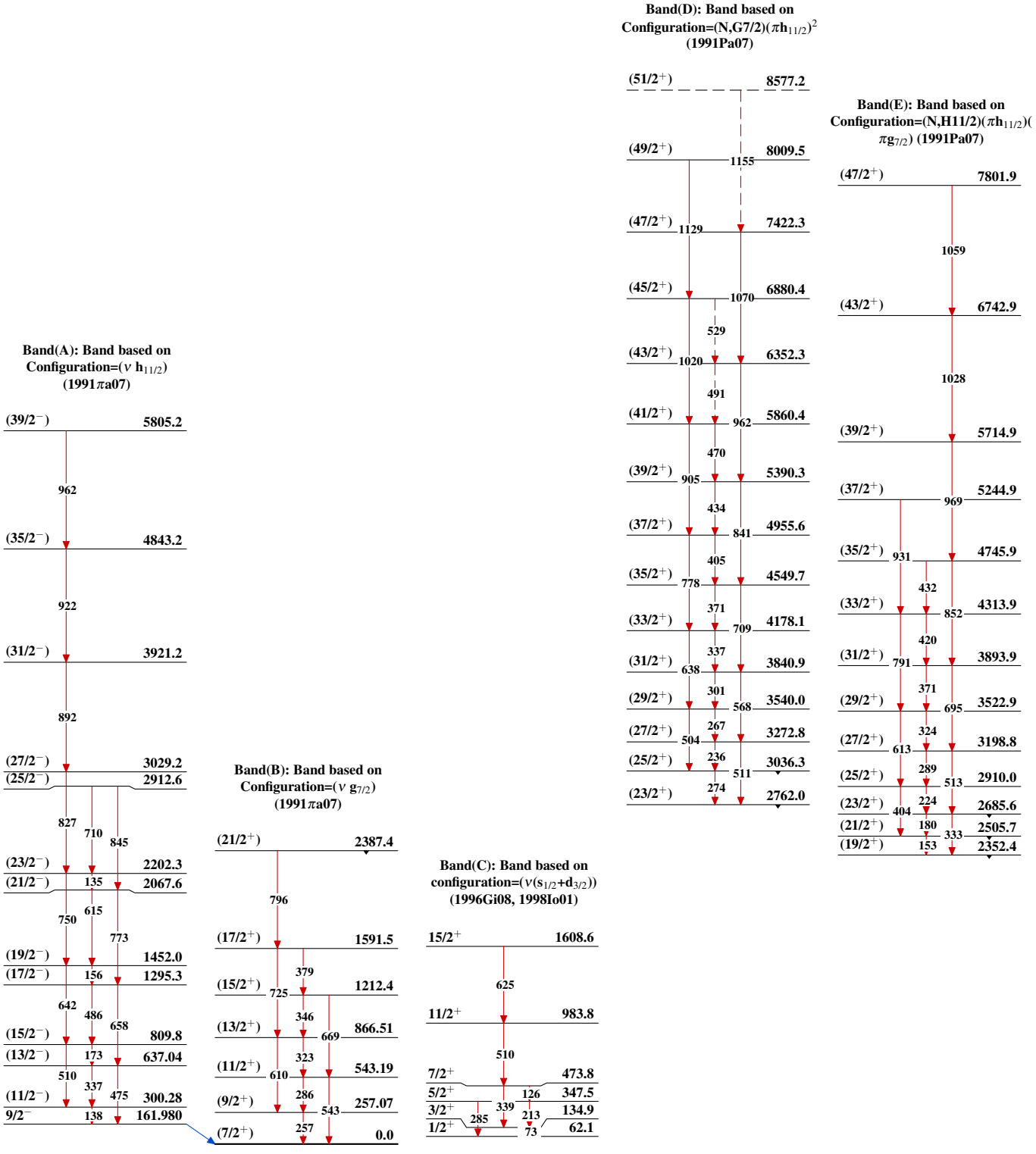
$I_\gamma > 10\% \times I_\gamma^{max}$

γ Decay (Uncertain)



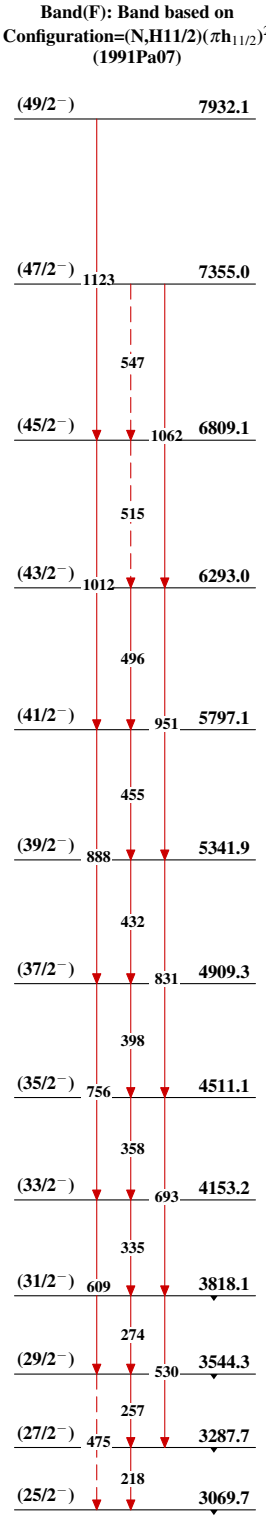
$^{131}_{58}Ce_{73}$

(HI,xnγ) 1991Pa07,1996Gi08



$^{131}_{58}Ce_{73}$

(HI,xnγ) 1991Pa07,1996Gi08 (continued)



$^{131}_{58}Ce_{73}$