^{116}Cd(^{18}O,4npγ) 1991Hi12

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Janos Timar and Zoltan Elekes, Balraj Singh	NDS 121, 143 (2014)	31-May-2014

1991Hi12: ^{116}Cd(^{18}O,4np) E=85 MeV, ^{122}Sn(^{11}B,4n) E=50 MeV; γγ-coin, γ(θ).

^{129}Cs Levels

E(level)†	Jπ@	$T_{1/2}$&	E(level)†	Jπ@
0.0	1/2+		2396.0[a] 6	23/2−
6.55[c] 5	5/2+		2631.8[c] 6	21/2+
188.85[d] 24	7/2+	2.26 ns 6	2667.0[f] 7	19/2+
208.8[e] 3	5/2+		2676.3[g] 8	(19/2+)
426.52[c] 24	9/2+		2812.3[g] 7	(21/2+)
575.5[a] 3	11/2−	0.718 μs 21	2908.0[d] 7	23/2+
603.3?[f] 8	(7/2+)		2951.3[e] 7	21/2+
648.2[d] 4	11/2+		3042.4[g] 8	(23/2+)
690.4[e] 4	9/2+		3095.7[b] 6	25/2−
1023.9[a] 5	15/2−		3235.9[a] 10	27/2−
1032.2[c] 4	13/2+		3295.8[c] 12	
1150.1[b] 5	13/2−		3406.3[g] 8	(25/2+)
1231.0[f] 7	(11/2+)		3728.8[d] 7	27/2+
1279.4[d] 5	15/2+		3801.9?[#g] 9	(27/2+)
1339.3[e] 5	13/2+		3923.8?[b] 10	
1627.5[a] 5	19/2−		3948.8?[c] 16	
1692.3[b] 5	17/2−		4114.8[a] 11	31/2−
1792.0[‡c] 5	17/2+		4129.6?[g] 9	(29/2+)
1890.1[f] 7	15/2+		4435.8[d] 13	
2047.8[d] 6	19/2+		5032.5[a] 11	35/2−
2122.4[e] 6	17/2+		5989.5[a] 15	(39/2−)
2319.6[b] 6	21/2−		7000.5[a] 18	(43/2−)

† From least-squares fit to Eγ data, assuming 0.3 keV uncertainty when Eγ stated to nearest keV, 1 keV otherwise.
‡ Large negative intensity balance at this level.
# This level is at 3734 keV in Adopted Levels due to reversed ordering of 327.7-395.6 γ cascade.
@ As assigned in 1991Hi12.
& From Adopted Levels.
[a] Band(A): Band based on 11/2−,α=−1/2.
[b] Band(a): Band based on 11/2−,α=+1/2.
[c] Band(B): Band based on 5/2+, 6 keV, α=+1/2.
[d] Band(b): Band based on 7/2+, 189,α=−1/2.
[e] Band(C): Band based on 5/2+, 209, α=+1/2.
[f] Band(c): Band based on 7/2+, 603, α=+1/2.
[g] Band(D): Band based on (19/2+).

^{116}Cd(^{18}O,4npγ) 1991Hi12 (continued)

γ(^{129}Cs)

When only A_2 is given, A_4 is set to zero.

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α[‡]	Comments
6.55 *5*		6.55	5/2$^+$	0.0	1/2$^+$			E_γ: from Adopted Gammas.
136.1	2.4 *3*	2812.3	(21/2$^+$)	2676.3	(19/2$^+$)	(M1+E2)	0.50 *13*	α(K)=0.39 *7*; α(L)=0.09 *5*; α(M)=0.019 *11* α(N)=0.0039 *21*; α(O)=0.00049 *23*; α(P)=1.30×10^{-5} *5* A_2=−0.08 *8*
145.2	5.1 *5*	2812.3	(21/2$^+$)	2667.0	19/2$^+$	(M1+E2)	0.41 *10*	α(K)=0.32 *5*; α(L)=0.07 *4*; α(M)=0.015 *8* α(N)=0.0030 *15*; α(O)=0.00038 *17*; α(P)=1.08×10^{-5} *4* A_2=−0.24 *6*
149.0	73 *7*	575.5	11/2$^-$	426.52	9/2$^+$			A_2=+0.04 *4*
182.3	104 *11*	188.85	7/2$^+$	6.55	5/2$^+$			
202.2	7.2 *7*	208.8	5/2$^+$	6.55	5/2$^+$	(M1+E2)		α(K)=0.116 *9*; α(L)=0.021 *7*; α(M)=0.0043 *15* α(N)=0.0009 *3*; α(O)=0.00012 *4*; α(P)=4.10×10^{-6} *15* A_2=+0.41 *11*; A_4=+0.11 *10*
230.1	15.3 *15*	3042.4	(23/2$^+$)	2812.3	(21/2$^+$)	(M1+E2)	0.096 *8*	α(K)=0.080 *4*; α(L)=0.013 *4*; α(M)=0.0028 *8* α(N)=0.00058 *15*; α(O)=7.6×10^{-5} *16*; α(P)=2.85×10^{-6} *17* A_2=−0.22 *10*; A_4=+0.17 *9*
237.6	11.7 *12*	426.52	9/2$^+$	188.85	7/2$^+$	D		A_2=−0.18 *5*
327.7	1.3 *1*	4129.6?	(29/2$^+$)	3801.9?	(27/2$^+$)	(M1+E2)		A_2=−0.63 *16* Additional information 3.
363.9	11.5 *12*	3406.3	(25/2$^+$)	3042.4	(23/2$^+$)	(M1+E2)	0.0254 *17*	A_2=−0.59 *5*
385 *1*		1032.2	13/2$^+$	648.2	11/2$^+$			
386.6	42 *4*	575.5	11/2$^-$	188.85	7/2$^+$	[M2]	0.0864	α(K)=0.0729 *11*; α(L)=0.01076 *16*; α(M)=0.00223 *4* α(N)=0.000472 *7*; α(O)=6.53×10^{-5} *10*; α(P)=3.12×10^{-6} *5* A_2=+0.11 *9*; A_4=+0.12 *8* sign of A_4 is inconsistent with ΔJ=2, quadrupole transition.
395.6	3.7 *4*	3801.9?	(27/2$^+$)	3406.3	(25/2$^+$)	(M1+E2)		A_2=−0.50 *8* Additional information 2.
420.0	91 *9*	426.52	9/2$^+$	6.55	5/2$^+$			A_2=+0.11 *10*; A_4=+0.02 *8* Additional information 1.
448.4	100	1023.9	15/2$^-$	575.5	11/2$^-$	(E2)		A_2=+0.32 *10*; A_4=−0.05 *8*
459.4	50 *5*	648.2	11/2$^+$	188.85	7/2$^+$	(E2)		A_2=+0.27 *10*; A_4=−0.04 *8*
481 *1*		690.4	9/2$^+$	208.8	5/2$^+$			
501.6	5.8 *6*	690.4	9/2$^+$	188.85	7/2$^+$	(M1+E2)		A_2=−0.41 *14*; A_4=+0.04 *13*
574.6	10.6 *11*	1150.1	13/2$^-$	575.5	11/2$^-$	D+Q		A_2=−0.76 *12*; A_4=+0.05 *11*
597 *1*		603.3?	(7/2$^+$)	6.55	5/2$^+$			
604.1	76 *8*	1627.5	19/2$^-$	1023.9	15/2$^-$	(Q)		A_2=+0.26 *10*; A_4=−0.06 *8*
605.6	27 *3*	1032.2	13/2$^+$	426.52	9/2$^+$	(Q)		A_2=+0.27 *10*; A_4=+0.01 *8*
626.8	4.0 *4*	2319.6	21/2$^-$	1692.3	17/2$^-$			
628 *1*		1231.0	(11/2$^+$)	603.3?	(7/2$^+$)			

Continued on next page (footnotes at end of table)

^{116}Cd(^{18}O,4npγ) 1991Hi12 (continued)

γ(^{129}Cs) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	Comments
631.1	40 *4*	1279.4	15/2$^+$	648.2	11/2$^+$	(Q)	A_2=+0.29 *10*; A_4=−0.05 *8*
648.9	7.4 *7*	1339.3	13/2$^+$	690.4	9/2$^+$	(Q)	A_2=+0.23 *6*
653 *1*		3948.8?		3295.8			
660 *1*		1890.1	15/2$^+$	1231.0	(11/2$^+$)		
664 *1*		3295.8		2631.8	21/2$^+$		
668.0	13.9 *14*	1692.3	17/2$^-$	1023.9	15/2$^-$	D+Q	A_2=−0.66 *11*; A_4=+0.08 *10*
688 *1*		3923.8?		3235.9	27/2$^-$		
692.5	25.2 *25*	2319.6	21/2$^-$	1627.5	19/2$^-$	D+Q	A_2=−0.39 *10*; A_4=+0.23 *10*
699.7	5.6 *6*	3095.7	25/2$^-$	2396.0	23/2$^-$	D+Q	A_2=−0.65 *18*; A_4=+0.27 *17*
707 *1*		4435.8		3728.8	27/2$^+$		
759.7	15.2 *15*	1792.0	17/2$^+$	1032.2	13/2$^+$	(Q)	A_2=+0.34 *11*; A_4=−0.05 *9*
768.4[#]	69[#] *7*	2047.8	19/2$^+$	1279.4	15/2$^+$	(Q)	A_2=+0.35 *10*; A_4=−0.03 *8*
768.4[#]	69[#] *7*	2396.0	23/2$^-$	1627.5	19/2$^-$	(Q)	
776.1	12.6 *13*	3095.7	25/2$^-$	2319.6	21/2$^-$	(Q)	A_2=+0.35 *11*; A_4=+0.03 *10*
777 *1*		2667.0	19/2$^+$	1890.1	15/2$^+$		
783.1	5.2 *5*	2122.4	17/2$^+$	1339.3	13/2$^+$	(Q)	A_2=+0.30 *15*; A_4=−0.04 *13*
787 *1*		2676.3	(19/2$^+$)	1890.1	15/2$^+$		
805 *1*		1231.0	(11/2$^+$)	426.52	9/2$^+$		
820.8	4.2 *4*	3728.8	27/2$^+$	2908.0	23/2$^+$	(Q)	A_2=+0.27 *18*; A_4=−0.06 *16*
828 *1*		3923.8?		3095.7	25/2$^-$		
828.9	4.9 *5*	2951.3	21/2$^+$	2122.4	17/2$^+$	(Q)	A_2=+0.37 *14*; A_4=−0.03 *13*
839.8	32 *3*	2631.8	21/2$^+$	1792.0	17/2$^+$	(Q)	A_2=+0.30 *10*; A_4=−0.08 *9*
840 *1*	32 *3*	3235.9	27/2$^-$	2396.0	23/2$^-$	(Q)	A_2=+0.30 *10*; A_4=−0.08 *9*
860.2	12.8 *13*	2908.0	23/2$^+$	2047.8	19/2$^+$	(Q)	A_2=+0.37 *12*; A_4=−0.05 *10*
878.9	11.1 *11*	4114.8	31/2$^-$	3235.9	27/2$^-$	(Q)	A_2=+0.32 *12*; A_4=0.00 *10*
917.7	4.0 *4*	5032.5	35/2$^-$	4114.8	31/2$^-$	(Q)	A_2=+0.19 *7*
957 *1*	<2	5989.5	(39/2$^-$)	5032.5	35/2$^-$		
1011 *1*	>2	7000.5	(43/2$^-$)	5989.5	(39/2$^-$)		
1020 *1*		2812.3	(21/2$^+$)	1792.0	17/2$^+$		
1242 *1*		1890.1	15/2$^+$	648.2	11/2$^+$		
1387 *1*	1.3 *1*	2667.0	19/2$^+$	1279.4	15/2$^+$	(Q)	A_2=+0.45 *38*; A_4=+0.03 *34*

[†] Above 500 keV, evaluators assign (Q) for positive A_2 and (M1+E2) for large negative A_2 values; below 500 keV, (E2) are assigned based on RUL, assuming level half-life is <10 ns or so. 1991Hi12 assign E2 for positive A_2 value. See also Adopted Gammas.

[‡] 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.

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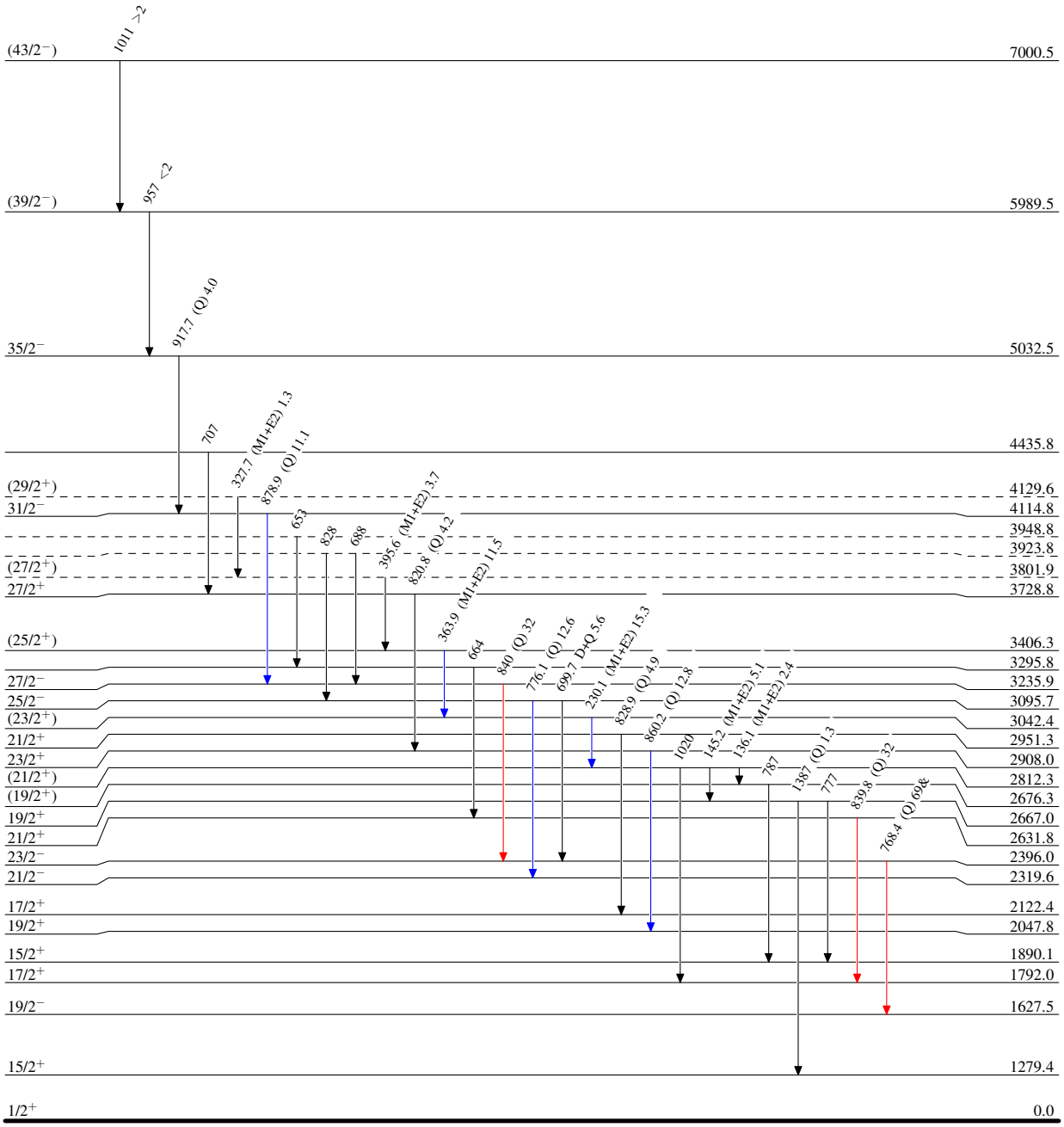
Level Scheme

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

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



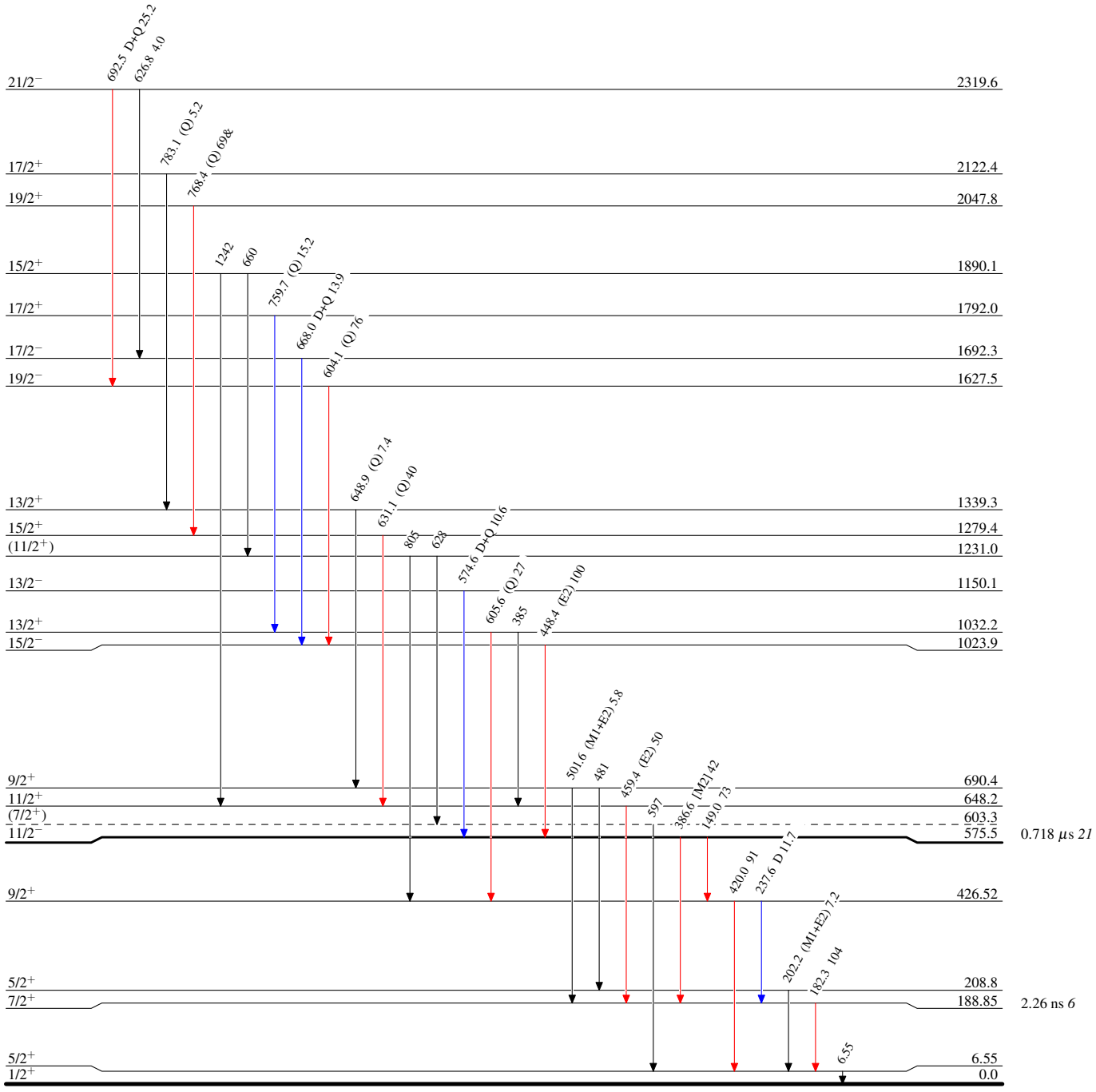
$^{129}_{55}Cs_{74}$

^{116}Cd(^{18}O,4npγ) 1991Hi12

Level Scheme (continued)

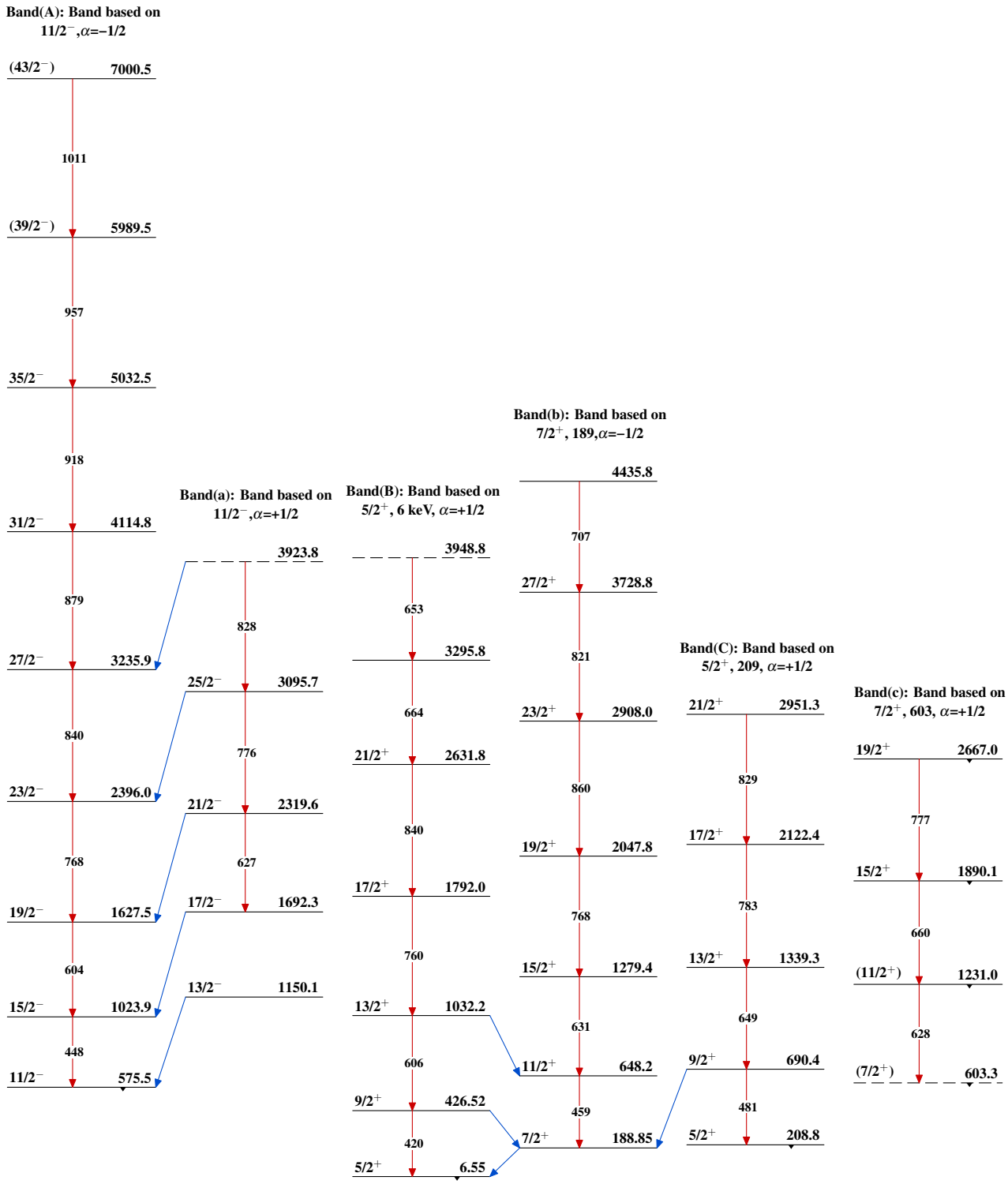
Intensities: Relative I_γ
& Multiply placed: undivided intensity given

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



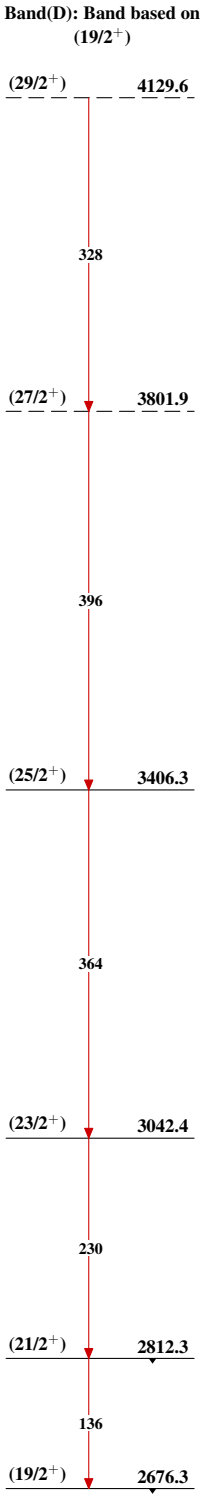
$^{129}_{55}Cs_{74}$

^{116}Cd(^{18}O,4npγ) 1991Hi12



$^{129}_{55}Cs_{74}$

^{116}Cd(^{18}O,4npγ) 1991Hi12 (continued)



$^{129}_{55}Cs_{74}$