^{116}Cd(^{9}Be,3nγ) 1996Pa11

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	T. Tamura	NDS 108, 455 (2007)	30-Sep-2006

The level scheme is that proposed by 1996Pa11 on the basis of $\gamma\gamma$-coin, excitation functions and transition intensity balance.
1996Pa11: ^{116}Cd(^{9}Be,3nγ), E(^{9}Be)=37.8 MeV; 14 Compton-suppressed HP Ge; measured $\gamma\gamma$-coincident γ's, DCO ratios In 100 ns prompt timing system; deduced γ multipole orders, levels, decay scheme.

^{122}Te Levels

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$	Comments
0.0[#]	0$^+$		
563.94[#] *17*	2$^+$		
1181.44[#] *23*	4$^+$		
1257.07 *17*	2$^+$		
1357.5[@] *3*	0$^+$		
1751.6[#] *3*	6$^+$		
1752.62[@] *3*	2$^+$	0.38 ps *+5–4*	level from Adopted Levels As expected 2$^+$ member of band 2.
1910.24[@] *23*	4$^+$		
2284.8[@] *3*	6$^+$		
2408.7[b] *3*	5$^-$		
2670.7[@] *3*	8$^+$		
2759.9[b] *4*	(6)$^-$		
2801.9[c] *3*	7$^-$		
2891.6[a] *3*	(7$^-$)		
2914.6[&] *4*	(8$^+$)		
2973.0[b] *3*	(7$^-$)		
3075.3[a] *3*	(8$^-$)		
3212.2[&] *4*	(9$^+$)		
3292.9[@] *4*	(10$^+$)		
3335.1[a] *3*	(9$^-$)		
3356.7[b] *4*	(8$^-$)		
3462.3[c] *3*	(9$^-$)		
3575.3[&] *5*	(10$^+$)		
3746.9[a] *3*	(10$^-$)		
3807.2 *4*			
3976.2[&] *5*	(11$^+$)		
3996.3[b] *4*	(10$^-$)		
3998.5[@] *4*	(12$^+$)		
3999.9 *4*			
4039.6[a] *4*	(11$^-$)		
4174.4[c] *4*	(11$^-$)		
4389.3[&] *6*	(12$^+$)		
4442.8[a] *4*	(12$^-$)		
4477.7 *4*	(12)		
4519.6 *4*			
4547.2 *5*			
4683.4 *5*	(14$^+$)		
4783.4[a] *4*	(13$^-$)		
4805.6[c] *4*	(13$^-$)		
4909.1[@] *5*	(14$^+$)		

Continued on next page (footnotes at end of table)

^{116}Cd(^{9}Be,3nγ) 1996Pa11 (continued)

^{122}Te Levels (continued)

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
4944.3 *5*		5706.6 *5*		6026.1 *5*	(15)	6635.5 *5*	
5241.0[a] *4*	(14$^-$)	5718.0[a] *4*	(15$^-$)	6041.4 *5*		6648.8 *6*	
5249.4 *5*	(15$^+$)	5753.2[@] *5*	(16$^+$)	6287.1 *6*		6710.7 *6*	
5268.8 *4*		5870.1 *5*	(15)	6379.8[@] *6*		6915.2[a] *5*	(18$^-$)
5409.7 *5*	(16$^+$)	5970.2[a] *4*	(16$^-$)	6393.3 *5*			
5645.1 *5*		5973.7 *5*	(15)	6614.2[a] *5*	(17$^-$)		

† E(levels) are based on a least-squares fit to the E(γ's) of 1996Pa11 (evaluator).
‡ From Adopted Levels.
# Band(A): band 1, g.s. band.
@ Band(B): band 2, positive parity band built on the two-proton hole 0$^+$ state at 1357 keV.
& Band(C): Band 3, positive parity band built on the possible configuration $(\pi g_{9/2}^{-1})(\pi g_{7/2})_{8+}\otimes(\pi d_{5/2}^{2})_{0+}$.
[a] Band(D): band 4, negative parity band based on possible non-collective state (7$^-$) at 2890 keV. Possible configuration=$(\nu h_{11/2}g_{7/2})$.
[b] Band(E): band 5, negative parity Band based on 5$^-$ at 2408 keV.
[c] Band(F): band 6, negative parity Band based on 7$^-$ at 2802 keV.

γ(^{122}Te)

DCO=I(35°−90°)/I(90°−35°) from sum spectra gated by 564.1γ, 570.0γ, 919.0γ and 622.1γ (Q) transitions. For this measurement conditions, DCO ratio≈1.0 suggests stretched E2 transition, while DCO ratio≈0.55 stretched dipole transition (1996Pa11).

E_γ†	I_γ‡	E_i(level)	J_i^π	E_f	J_f^π	Mult.#	Comments
102.5 *2*	1.26 *13*	3075.3	(8$^-$)	2973.0	(7$^-$)	D+Q	Mult.: DCO ratio=0.43 *1*.
160.5 *2*	2.34 *23*	5409.7	(16$^+$)	5249.4	(15$^+$)	D+Q	Mult.: DCO ratio=0.42 *1*.
183.8 *2*	0.32 *3*	3075.3	(8$^-$)	2891.6	(7$^-$)		
225.8 *2*	0.65 *7*	4909.1	(14$^+$)	4683.4	(14$^+$)	D+Q	Mult.: DCO ratio=0.62 *2*.
260.1 *2*	0.63 *6*	3335.1	(9$^-$)	3075.3	(8$^-$)	(D+Q)	Mult.: DCO ratio=0.95 *3*.
268.3 *2*	0.34 *3*	4442.8	(12$^-$)	4174.4	(11$^-$)		
273.4 *2*	3.3 *3*	3075.3	(8$^-$)	2801.9	7$^-$		DCO ratio=1.00 *2*; decay scheme requires d(+Q).
292.8 *2*	0.47 *5*	4039.6	(11$^-$)	3746.9	(10$^-$)		
297.6 *2*	0.73 *7*	3212.2	(9$^+$)	2914.6	(8$^+$)	(D+Q)	Mult.: DCO ratio=0.66 *2*.
303.3 *2*	0.66 *7*	4477.7	(12)	4174.4	(11$^-$)	D	Mult.: DCO ratio=0.47 *2*.
340.5 *2*	0.76 *8*	5249.4	(15$^+$)	4909.1	(14$^+$)	D+Q	Mult.: DCO ratio=0.38 *1*.
340.6 *2*	1.90 *19*	4783.4	(13$^-$)	4442.8	(12$^-$)		
351.5 *2*	1.26 *13*	2759.9	(6)$^-$	2408.7	5$^-$	D+Q	Mult.: DCO ratio=0.55 *2*.
361.7 *2*	0.58	6648.8		6287.1			
362.5 *2*	2.19 *22*	4805.6	(13$^-$)	4442.8	(12$^-$)		
363.1 *2*	0.52 *5*	3575.3	(10$^+$)	3212.2	(9$^+$)		
383.4 *2*	0.40 *4*	3356.7	(8$^-$)	2973.0	(7$^-$)		
386.0 *2*	1.3 *1*	2670.7	8$^+$	2284.8	6$^+$		
393.2 *2*	0.80 *8*	2801.9	7$^-$	2408.7	5$^-$		
395.16 *8*	7.3 *5*	1752.62	2$^+$	1357.5	0$^+$	E2	from Adopted Gammas.
397.1 *2*	0.76	4944.3		4547.2			
400.9 *2*	0.26 *3*	3976.2	(11$^+$)	3575.3	(10$^+$)		
403.1 *2*	1.89 *20*	4442.8	(12$^-$)	4039.6	(11$^-$)		
411.7 *2*	1.95 *20*	3746.9	(10$^-$)	3335.1	(9$^-$)		
413.1 *2*	0.12 *2*	4389.3	(12$^+$)	3976.2	(11$^+$)		
417.0 *2*	1.01 *10*	6287.1		5870.1	(15)		

Continued on next page (footnotes at end of table)

^{116}Cd(^{9}Be,3nγ) 1996Pa11 (continued)

$\gamma(^{122}Te)$ (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	Comments
437.8 *2*	0.60 *6*	5706.6		5268.8			
457.2 *2*	1.58 *16*	5241.0	(14$^-$)	4783.4	(13$^-$)	D+Q	Mult.: DCO ratio=0.25 *2*.
476.6 *2*	0.60 *6*	5718.0	(15$^-$)	5241.0	(14$^-$)		
532.9 *2*	6.2 *6*	3335.1	(9$^-$)	2801.9	7$^-$	(Q)	Mult.: DCO ratio=0.78 *2* (value for 532.9γ+533.0γ).
533.0 *2*	5.5 *6*	2284.8	6$^+$	1751.6	6$^+$	(D+Q)	Mult.: DCO ratio=0.78 *2* (value for 532.9γ+533.0γ).
548.7 *2*	2.16 *22*	4547.2		3998.5	(12$^+$)		
564.1 *2*	115 *12*	563.94	2$^+$	0.0	0$^+$	E2	Mult.: DCO ratio=0.97 *1*; RUL.
564.2 *2*	3.4 *3*	2973.0	(7$^-$)	2408.7	5$^-$		
566.1 *2*	3.6 *4*	5249.4	(15$^+$)	4683.4	(14$^+$)		
570.0 *2*	95 *10*	1751.6	6$^+$	1181.44	4$^+$	Q	Mult.: DCO ratio=1.03 *1*.
597.0 *2*	1.39 *14*	3356.7	(8$^-$)	2759.9	(6)$^-$		
617.3 *2*	109 *11*	1181.44	4$^+$	563.94	2$^+$	Q	Mult.: DCO ratio=1.05 *1*.
622.1 *2*	35 *4*	3292.9	(10$^+$)	2670.7	8$^+$	Q	Mult.: DCO ratio=1.08 *1*.
626.6 *2*	2.16 *22*	6379.8		5753.2	(16$^+$)		
631.6 *2*	2.83 *28*	4805.6	(13$^-$)	4174.4	(11$^-$)		
631.7 *2*	1.15 *11*	6041.4		5409.7	(16$^+$)		
639.6 *2*	0.69 *7*	3996.3	(10$^-$)	3356.7	(8$^-$)		
660.5 *2*	4.4 *4*	3462.3	(9$^-$)	2801.9	7$^-$	Q	Mult.: DCO ratio=0.92 *2*.
664.1 *2*	5.3 *5*	3335.1	(9$^-$)	2670.7	8$^+$	D	Mult.: DCO ratio=0.48 *1*.
669.3 *2*	1.04 *12*	6710.7		6041.4			
671.6 *2*	5.2 *5*	3746.9	(10$^-$)	3075.3	(8$^-$)	Q	Mult.: DCO ratio=1.10 *3*.
685.0 *2*	17.7 *18*	4683.4	(14$^+$)	3998.5	(12$^+$)	Q	Mult.: DCO ratio=1.08 *2*.
688.1 *2*	2.27 *23*	2973.0	(7$^-$)	2284.8	6$^+$		
693.3 *2*	1.73 *17*	1257.07	2$^+$	563.94	2$^+$		
695.8 *2*	3.5 *4*	4442.8	(12$^-$)	3746.9	(10$^-$)	Q	Mult.: DCO ratio=0.97 *2*.
704.4 *2*	6.7 *7*	4039.6	(11$^-$)	3335.1	(9$^-$)	(Q)	Mult.: DCO ratio=1.04 *2* (value for 704.4γ+705.6γ).
705.6 *2*	29.7 *30*	3998.5	(12$^+$)	3292.9	(10$^+$)	Q	Mult.: DCO ratio=1.04 *2* (value for 704.4γ+705.6γ).
712.2 *2*	4.5 *5*	4174.4	(11$^-$)	3462.3	(9$^-$)	Q	Mult.: DCO ratio=0.92 *2* (value for 712.2γ+712.4γ).
712.4 *2*	0.75 *7*	4519.6		3807.2			
726.0 *2*	3.2 *3*	5409.7	(16$^+$)	4683.4	(14$^+$)		
728.6 *2*	1.36 *14*	1910.24	4$^+$	1181.44	4$^+$		
729.2 *2*	1.93 *19*	5970.2	(16$^-$)	5241.0	(14$^-$)	Q	Mult.: DCO ratio=1.12 *3*.
743.8 *2*	2.9 *3*	4783.4	(13$^-$)	4039.6	(11$^-$)	Q	Mult.: DCO ratio=1.07 *3*.
791.7 *2*	2.04 *20*	3462.3	(9$^-$)	2670.7	8$^+$	D	Mult.: DCO ratio=0.52 *2*.
793.6 *2*	0.88 *9*	1357.5	0$^+$	563.94	2$^+$		
798.1 *2*	1.08 *11*	5241.0	(14$^-$)	4442.8	(12$^-$)	Q	Mult.: DCO ratio=0.93 *5*.
844.1 *2*	2.21 *22*	5753.2	(16$^+$)	4909.1	(14$^+$)	Q	Mult.: DCO ratio=1.14 *4*.
896.2 *2*	1.00 *10*	6614.2	(17$^-$)	5718.0	(15$^-$)		
910.6 *2*	5.9 *6*	4909.1	(14$^+$)	3998.5	(12$^+$)	Q	Mult.: DCO ratio=0.98 *2*.
919.0 *2*	61 *6*	2670.7	8$^+$	1751.6	6$^+$	Q	Mult.: DCO ratio=1.06 *1*.
935.1 *2*	1.34 *13*	5718.0	(15$^-$)	4783.4	(13$^-$)	Q	Mult.: DCO ratio=1.20 *6*.
945.0 *2*	0.75 *8*	6915.2	(18$^-$)	5970.2	(16$^-$)		
961.7 *2*	0.81 *8*	5645.1		4683.4	(14$^+$)		
983.6 *2*	0.39 *4*	6393.3		5409.7	(16$^+$)		
1050.2 *2*	15.2 *15*	2801.9	7$^-$	1751.6	6$^+$	D	Mult.: DCO ratio=0.58 *1*.
1103.4 *2*	3.5 *4*	2284.8	6$^+$	1181.44	4$^+$	Q	Mult.: DCO ratio=1.15 *5*.
1117.0 *2*	0.91 *11*	6026.1	(15)	4909.1	(14$^+$)	D	Mult.: DCO ratio=0.71 *2*.
1136.4 *2*	0.73	3807.2		2670.7	8$^+$		
1140.1 *2*	2.12 *20*	2891.6	(7$^-$)	1751.6	6$^+$	(D)	Mult.: DCO ratio=0.43 *2*.
1163.0 *2*	1.54 *15*	2914.6	(8$^+$)	1751.6	6$^+$	Q	Mult.: DCO ratio=1.02 *3*.
1186.7 *2*	1.16 *12*	5870.1	(15)	4683.4	(14$^+$)	D	Mult.: DCO ratio=0.57 *2*.
1221.6 *2*	4.4 *4*	2973.0	(7$^-$)	1751.6	6$^+$	(D)	Mult.: DCO ratio=0.59 *2*.
1225.8 *2*	0.78 *8*	6635.5		5409.7	(16$^+$)		
1227.3 *2*	3.5 *4*	2408.7	5$^-$	1181.44	4$^+$	D	Mult.: DCO ratio=0.65 *3*.
1229.2 *2*	0.55 *6*	5268.8		4039.6	(11$^-$)		
1256.9 *2*	0.90 *10*	1257.07	2$^+$	0.0	0$^+$		

Continued on next page (footnotes at end of table)

^{116}Cd(^{9}Be,3nγ) 1996Pa11 (continued)

$\gamma(^{122}Te)$ (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	Comments
1290.3 *2*	0.56 *6*	5973.7	(15)	4683.4	(14^+)	D	Mult.: DCO ratio=0.74 *3*.
1329.1 *2*	1.15 *11*	3999.9		2670.7	8^+		
1346.5 *2*	1.52 *15*	1910.24	4^+	563.94	2^+		

† From 1996Pa11.
‡ From 1996Pa11; relative to I(564.1γ)=100 At E(^{9}Be)=37.8 MeV. Detailed conditions are given. Uncertainties are statistical from peak fitting only.
# Multipolarities were deduced from DCO ratios listed in comments, except noted otherwise.

^{116}Cd(^{9}Be,3nγ) 1996Pa11

Level Scheme

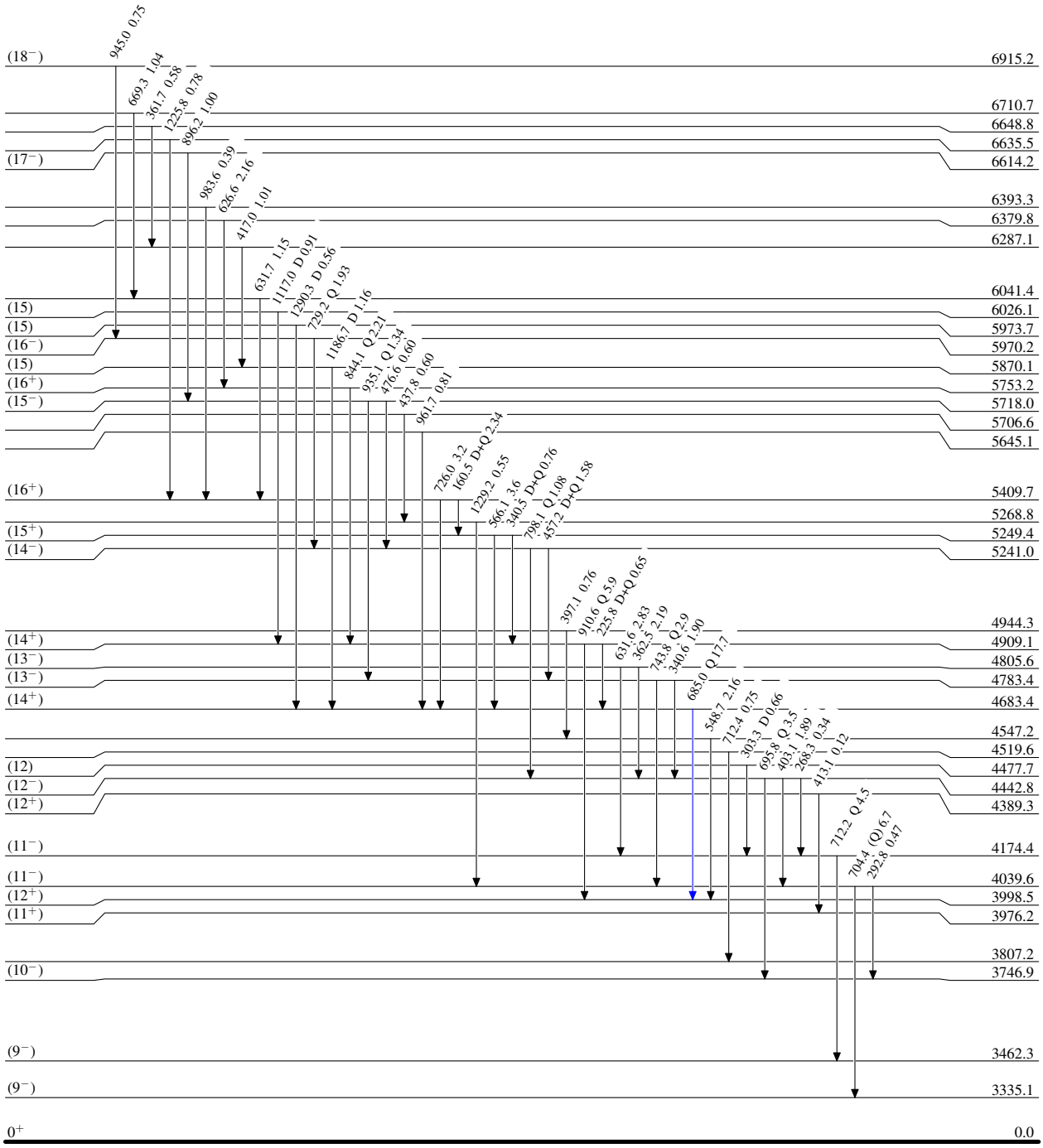
Intensities: Relative I_γ

Legend

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

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

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

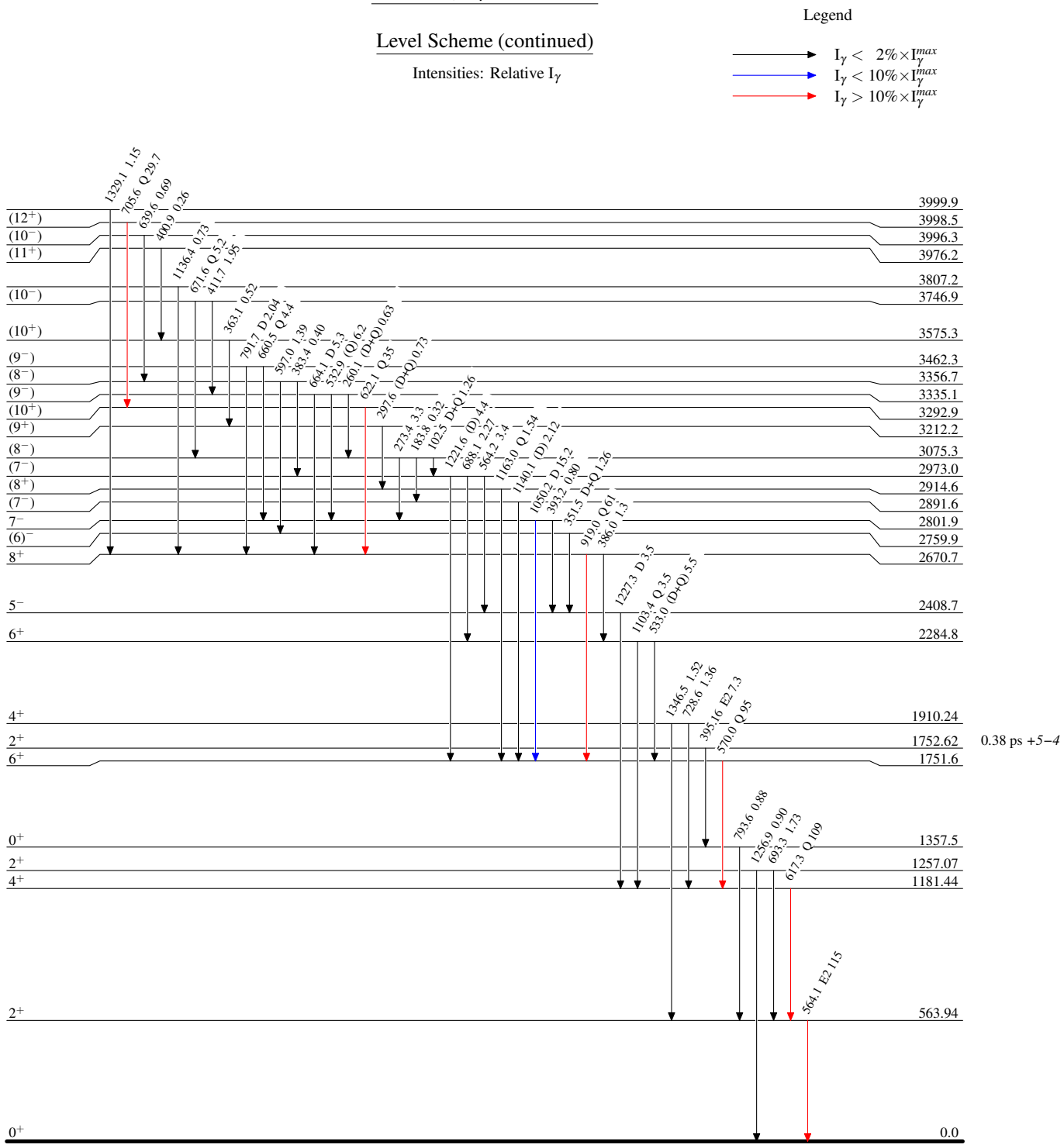


$^{122}_{52}Te_{70}$

^{116}Cd(^{9}Be,3nγ) 1996Pa11

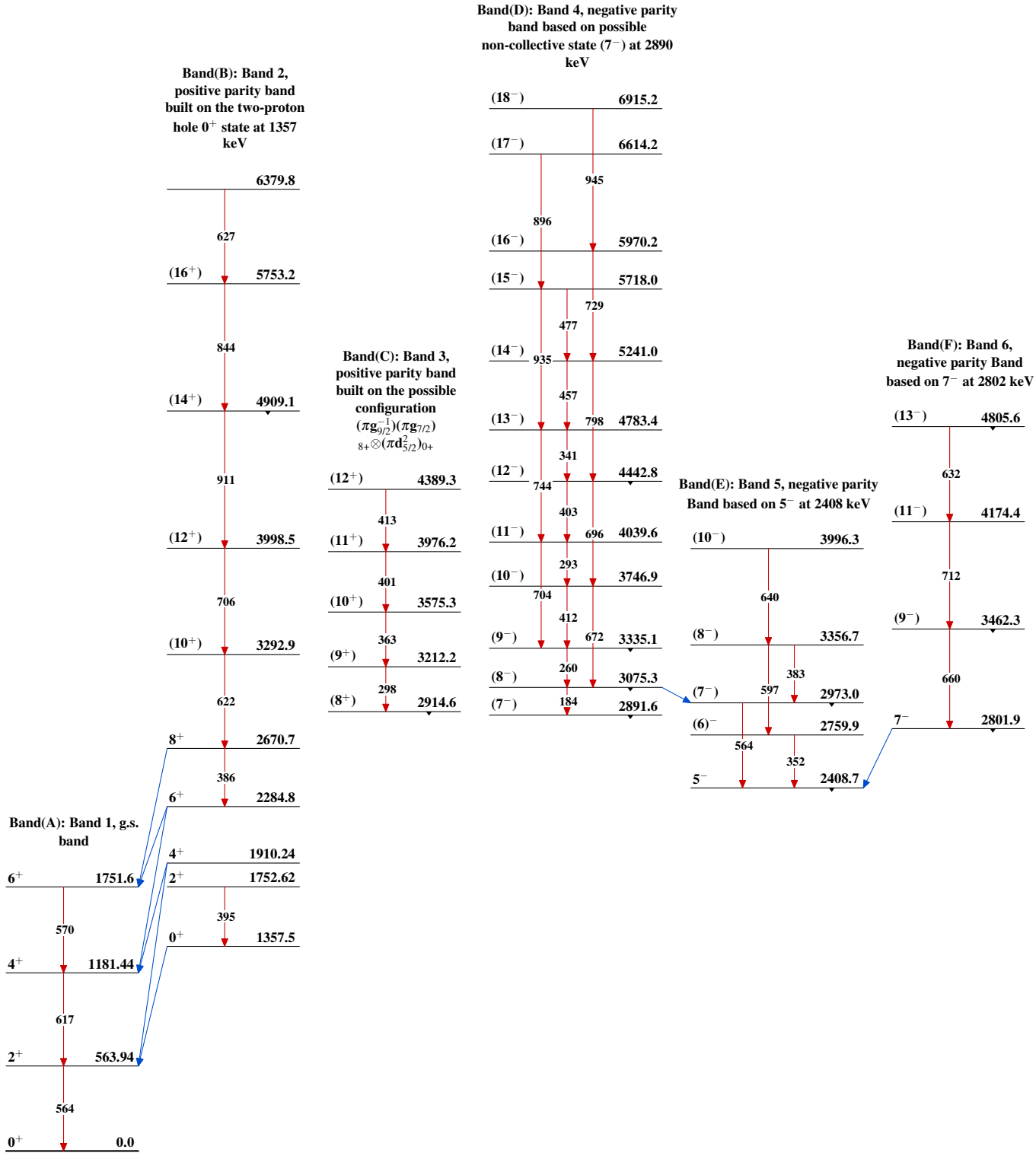
Level Scheme (continued)

Intensities: Relative I_γ



$^{122}_{52}Te_{70}$

^{116}Cd(^{9}Be,3nγ) 1996Pa11



$^{122}_{52}Te_{70}$