(HI,xnγ) 1992Je02,1978St01,1989Kl02

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	NDS 109, 1383 (2008)	1-Mar-2008

2007As07: ^{98}Mo(^{12}C,3nγ). E=60 MeV beam provided by Yale Tandem accelerator. Measured Eγ, Iγ,γγ-coin using SPEEDY array of seven HPGe detectors, four at 41.5° and three at 138.5°. Measured half-lives uing Recoil Distance Doppler Shift and Differential Decay Curve methods.
1978St01: ^{94}Zr(^{16}O,3nγ) E(^{16}O)=59 MeV.
1989Kl02: ^{82}Se(^{30}Si,5n) E(^{30}Si)=150 MeV.
1992Je02: ^{94}Zr(^{17}O,4n) E(^{17}O)=80 MeV, "NORDBALL" multidetector array. Measured γ between 0.05 and 2.0 MeV. FWHM=5 keV at 1 MeV.
Measured evaporated protons and α with special system (Hystrix).
Others: E(^{16}O)=56 MeV (1974Ha48,1978Sp09).
The level scheme is from 1992Je02.

^{107}Cd Levels

E(level)†	Jπ‡	$T_{1/2}$	Comments
0.0	5/2+	6.50 h *2*	
205.2[c] *8*	7/2+		
504.80 *20*	7/2+		
808.8 *7*	9/2+		
845.0[&] *9*	11/2−		γ(θ,H,t): Q=0.94 *1* (1978Sp09).
933.7[c] *9*	11/2+	4.8 ps *14*	$T_{1/2}$: from 1974Ha48, recoil-distance Doppler-shift method.
1359.8[&] *9*	15/2−	21.8 ps *12*	$T_{1/2}$: From 2007As05, 2007As07, 16.3 ps *10* from 1974Ha48, recoil-distance Doppler-shift method.
1924.1[c] *9*	15/2+		
2157.9[&] *9*	19/2−		
2546.1 *10*	17/2−		
2645.4 *10*			
2678.4 *13*	21/2+	55 ns *4*	Q= 1.21 *6* (1978Sp09) $T_{1/2}$: from Adopted Levels.
3048.6? *13*	21/2−		
3114.1[&] *9*	23/2−		
3117.6[c] *9*	19/2+		
3216.7[c] *9*	(17/2)		
3579.5 *9*	(21/2)		
4009.0[c] *9*	23/2+		
4165.3[@] *9*	27/2−		
4181.9[&] *9*	27/2−		
4189.7[a] *9*	25/2+		
4363.5[#] *10*	27/2−		
4502.2[c] *9*	27/2+		
4876.0[b] *9*	29/2+		
5017.3[a] *9*	29/2+		
5230.8[c] *9*	31/2+		
5314.4[@] *10*	31/2−		
5333.7[&] *10*	(31/2−)		
5564.1[#] *12*	(29/2)		
5815.0[b] *9*	33/2+		
6034.5[a] *10*	33/2+		
6183.3[c] *9*	35/2+		

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(HI,xnγ) 1992Je02,1978St01,1989Kl02 (continued)

^{107}Cd Levels (continued)

E(level)[†]	Jπ[‡]	Comments
6615.7[&] *11*	(35/2⁻)	
6921.6[b] *9*	37/2⁺	
7220.8[a] *11*	37/2⁺	
7316.5[c] *10*	39/2⁺	
7831.5[&] *13*	(39/2⁻)	
8048.2 *13*	(37/2)	
8186.7[b] *10*	41/2⁺	
8669.3[c] *10*	43/2⁺	
9621.1[b] *11*	45/2⁺	
9855.9 *12*	(45/2)	
10220.4[c] *12*	47/2⁺	
11116.5 *14*	(47/2)	
11227.1[b] *16*	(49/2⁺)	
11851.4[c] *16*	(51/2⁺)	
0.0+x		
3115+x[d]		Additional information 1.
3803.3+x[d] *3*		
4440+x		
4527+x[d]		
4608+x		
5229+x[d]		
5614+x[d]		
5900+x		
6390+x[d] *5*		
6546.5+x[d] *5*		
6680+x		
6852+x		

† Level energy from least-squares adjustment.
‡ From previous known Jπ and as derived by 1992Je02 from γ decay.
# Band(A): the ordering of transitions In the band is uncertain.
@ Band(B): negative parity band.
& Band(C): negative parity band, N($h_{11/2}$) configuration, up to (39/2⁻).
a Band(D): positive parity band, up to 37/2⁺.
b Band(E): positive parity band, up to (49/2⁺).
c Band(F): positive parity band, up to (51/2⁺).
d Band(G): bandhead unknown.

γ(^{107}Cd)

A_2, A_4 coef are extracted from γ(θ) spectra (1978St01).

E_γ[†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	Comments
(36.5)	7.8 *CA*	845.0	11/2⁻	808.8	9/2⁺	E1	I_γ: from branching: Iγ(37γ)/Iγ(640γ)=0.11 *1* via (α,2nγ). Mult.: based on α(exp)=2.7 *10* from I(γ+ce) balance about E(level)=809 via (α,2nγ)(t) (1974Ha41).

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(HI,xnγ) 1992Je02,1978St01,1989Kl02 (continued)

γ(^{107}Cd) (continued)

E_γ [†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ	Comments
[x]136.8 *1*	5.3 *2*							
156.0 *1*	5.3 *2*	6546.5+x		6390+x				Mult.: ΔJ=0,1.
171.3 *4*	1.6 *2*	6852+x		6680+x				Mult.: ΔJ=−1.
205.2	100	205.2	$7/2^+$	0.0	$5/2^+$	M1+E2	+0.25 *1*	Mult.: from adopted gammas.
[x]242.8 *1*	5.1 *3*							
[x]246.4 *1*	10.3 *3*							
286.0 *1*	9.7 *2*	5900+x		5614+x				Mult.: ΔJ=0,1.
290.1 *2*	3.6 *2*	6680+x		6390+x				Mult.: ΔJ=−1.
[x]302.2 *4*	0.8 *2*							
304	3.9 *CA*	808.8	$9/2^+$	504.80	$7/2^+$	M1(+E2)		I_γ: from branching: Iγ(303γ)/Iγ(809γ)=0.20 *2* via ^{107}In decay.
[x]306.1 *4*	2.6 *4*							
312.6 *2*	3.8 *2*	4502.2	$27/2^+$	4189.7	$25/2^+$	M1		
362.8 *1*	6.9 *3*	3579.5	(21/2)	3216.7	(17/2)	E2		
384.8 *2*	16.7 *3*	5614+x		5229+x				E_γ: in the figure 3b of 1992Je02, this transition is given As 385. The energy in their table 1 given as 394.8, may be a misprint? Mult.: ΔJ=1.
429.4 *1*	8.2 *3*	4009.0	$23/2^+$	3579.5	(21/2)			Mult.: ΔJ=0,−1.
461.8 *2*	3.8 *2*	3579.5	(21/2)	3117.6	$19/2^+$			Mult.: ΔJ=0,−1.
[x]473.6 *3*	2.0 *2*							
[x]482.8 *3*	2.5 *3*							
490.7 *2*	6.5 *4*	6390+x		5900+x				Mult.: ΔJ=0,1.
493.2 *1*	17.3 *6*	4502.2	$27/2^+$	4009.0	$23/2^+$	E2		
[x]504.8 *2*	4.8 *2*							
504.8 *2*	4.8 *2*	504.80	$7/2^+$	0.0	$5/2^+$	M1+E2	−0.28 *8*	A_2=−0.430 *26*, A_4=0.003 *36*. δ: from 506γ(θ). Other: −0.6 *3* from γ-ray linear pol.
[x]509.0 *2*	6.2 *3*							
514.8 *1*	84.7 *6*	1359.8	$15/2^-$	845.0	$11/2^-$	E2		A_2=0.294 *8*, A_4=−0.083 *3*.
520.5	13.2 *3*	2678.4	$21/2^+$	2157.9	$19/2^-$	E1		A_2=−0.144 *12*, A_4=0.00 *2*. E_γ: from 1978St01. Not seen by 1992Je02. Mult.: E1 inferred from change in sign of 521γ pol via γ(θ) versus γ-ray linear pol (1978St01). −0.008≤δ≤+0.04 from 521γ linear pol.
[x]557.5 *3*	4.0 *3*							
571.3 *3*	3.2 *3*	3216.7	(17/2)	2645.4				
603.9	21.5 *20*	808.8	$9/2^+$	205.2	$7/2^+$	M1+E2	−2.3 *3*	A_2=−0.324 *19*, A_4=0.11 *2*. δ: from 604γ(θ). Other: −27≤δ≤−1.6 from γ-ray linear pol.
620.6 *2*	3.6 *2*	5229+x		4608+x				Mult.: ΔJ=−1.
640.5	81.3 *25*	845.0	$11/2^-$	205.2	$7/2^+$	M2		A_2=0.154 *7*, A_4=−0.041 *7*. Mult.: from α(K)exp=0.0112 *12* via (p,nγ); consistent with change in sign of 641γ pol via γ(θ) versus γ-ray linear pol. −0.016≤δ≤+0.08 from 641γ linear pol.
686.3 *1*	12.0 *11*	4876.0	$29/2^+$	4189.7	$25/2^+$	E2		A_2=0.29 *4*, A_4=−0.12 *6*.
688.3 *3*	4.8 *10*	3803.3+x		3115+x				
701.7 *2*	2.1 *3*	5229+x		4527+x				Mult.: ΔJ=−1.

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(HI,xnγ) 1992Je02,1978St01,1989Kl02 (continued)

γ(^{107}Cd) (continued)

E_γ [†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ	Comments
724.3 *2*	4.9 *4*	4527+x		3803.3+x				Mult.: ΔJ=−1.
728.3 *5*	14.5 *20*	933.7	$11/2^+$	205.2	$7/2^+$	E2		I_γ: determined by γγ-coin. A_2=0.272 *16*, A_4=−0.09 *2* (doublet).
728.7 *1*	10.6 *2*	5230.8	$31/2^+$	4502.2	$27/2^+$	E2		
777.6 *4*	0.7 *3*	6390+x		5614+x				
789.2 *3*	4.5 *3*	5229+x		4440+x				Mult.: ΔJ=1.
798.1 *1*	69.0 *7*	2157.9	$19/2^-$	1359.8	$15/2^-$	E2		A_2=0.291 *9*, A_4=−0.082 *10*.
808.9	19.4 *4*	808.8	$9/2^+$	0.0	$5/2^+$	E2		A_2=0.196 *13*, A_4=−0.04 *2*.
827.6 *3*	1.8 *3*	5017.3	$29/2^+$	4189.7	$25/2^+$	E2		
890.7	6.6 *4*	3048.6?	$21/2^-$	2157.9	$19/2^-$	M1+E2	+0.9 *3*	A_2=0.445 *34*, A_4=0.07 *5*. δ: from 891γ(θ). Other: +0.6≤δ≤+5 from γ-ray linear pol. E_γ: from 1978St01. 1992Je02 gives a pure E2 from DCO ratio and an other placement (4009 level).
891.4 *2*	10.8 *4*	4009.0	$23/2^+$	3117.6	$19/2^+$	E2		
939.0 *2*	11.6 *4*	5815.0	$33/2^+$	4876.0	$29/2^+$	E2		
952.4 *3*	8.6 *8*	6183.3	$35/2^+$	5230.8	$31/2^+$	E2		
956.3 *2*	45.6 *12*	3114.1	$23/2^-$	2157.9	$19/2^-$	E2		A_2=0.291 *15*, A_4=−0.09 *2*.
959.5 *3*	10.1 *16*	3117.6	$19/2^+$	2157.9	$19/2^-$	E1		
990.4 *2*	6.3 *5*	1924.1	$15/2^+$	933.7	$11/2^+$	E2		A_2=0.21 *4*, A_4=−0.08 *6*.
1017.2 *3*	2.2 *3*	6034.5	$33/2^+$	5017.3	$29/2^+$	E2		
1051.2 *2*	11.8 *4*	4165.3	$27/2^-$	3114.1	$23/2^-$	E2		A_2=0.28 *5*, A_4=−0.09 *7*.
1067.8 *2*	7.5 *4*	4181.9	$27/2^-$	3114.1	$23/2^-$	E2		
1075.7 *2*	20 *4*	4189.7	$25/2^+$	3114.1	$23/2^-$	E1		A_2=−0.208 *32*, A_4=0.02 *4*. Mult.: E1 inferred from change in sign of 1076γ pol and from DCO. −0.022≤δ≤+0.03 from 1076γ(θ).
[x]1093.2 *5*	3.7 *3*							
1106.6 *2*	10.1 *4*	6921.6	$37/2^+$	5815.0	$33/2^+$			
1133.2 *2*	11.2 *5*	7316.5	$39/2^+$	6183.3	$35/2^+$	E2		
1149.1 *4*	6.0 *6*	5314.4	$31/2^-$	4165.3	$27/2^-$	E2		
1151.8 *3*	2.5 *6*	5333.7	$(31/2^-)$	4181.9	$27/2^-$	(E2)		
[x]1176.8 *14*	2.2 *15*							
1186.3 *4*	7.5 *5*	2546.1	$17/2^-$	1359.8	$15/2^-$	M1		
1186.3 *4*	<2.2	7220.8	$37/2^+$	6034.5	$33/2^+$	E2		
1186.6 *7*	1.2	9855.9	(45/2)	8669.3	$43/2^+$			Mult.: ΔJ=0,−1.
1193.2 *5*	3.7 *15*	3117.6	$19/2^+$	1924.1	$15/2^+$			
1200.6 *7*	8.5 *4*	5564.1	(29/2)	4363.5	$27/2^-$			Mult.: ΔJ=0,1.
1215.8 *7*	9.5 *4*	7831.5	$(39/2^-)$	6615.7	$(35/2^-)$	E2		
1249.4 *5*	5.7 *4*	4363.5	$27/2^-$	3114.1	$23/2^-$	E2		
1260.6 *7*	1.3	11116.5	(47/2)	9855.9	(45/2)			Mult.: ΔJ=0,−1.
1265.1 *4*	5.6 *10*	8186.7	$41/2^+$	6921.6	$37/2^+$	E2		
1282.0 *6*	5.3 *9*	6615.7	$(35/2^-)$	5333.7	$(31/2^-)$	E2		
[x]1312.0 *13*	1.5 *4*							
[x]1330.1 *11*	1.8 *3*							
[x]1345.4 *12*	1.7 *7*							
1352.8 *3*	5.0 *3*	8669.3	$43/2^+$	7316.5	$39/2^+$	E2		
[x]1357.0 *11*	4.3 *10*							
[x]1368.3 *12*	1.3 *4*							
1432.5 *7*	7.6 *4*	8048.2	(37/2)	6615.7	$(35/2^-)$			Mult.: ΔJ=0,−1.
1434.4 *3*	3.0	9621.1	$45/2^+$	8186.7	$41/2^+$	E2		
1551.1 *7*	1.7 *3*	10220.4	$47/2^+$	8669.3	$43/2^+$	E2		
[x]1595 *1*	2.6 *4*							
1606.0 *12*	1.8 *4*	11227.1	$(49/2^+)$	9621.1	$45/2^+$			
[x]1623 *1*	2.2 *3*							

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(HI,xnγ) 1992Je02,1978St01,1989Kl02 (continued)

γ(^{107}Cd) (continued)

E_γ [†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π
1631 *1*	1.0 *4*	11851.4	(51/2$^+$)	10220.4	47/2$^+$
[x]1640 *1*	2.4 *4*				

[†] From 1992Je02, unless otherwise noted.
[‡] From DCO ratio in (1992Je02). E2 assignments are from A_2=+0.2 to +0.3, and γ-ray linear pol=+0.3 to +0.6. γ pol deduced from γ(θ) (1978St01).
[x] γ ray not placed in level scheme.

(HI,xnγ) 1992Je02,1978St01,1989Kl02

Level Scheme

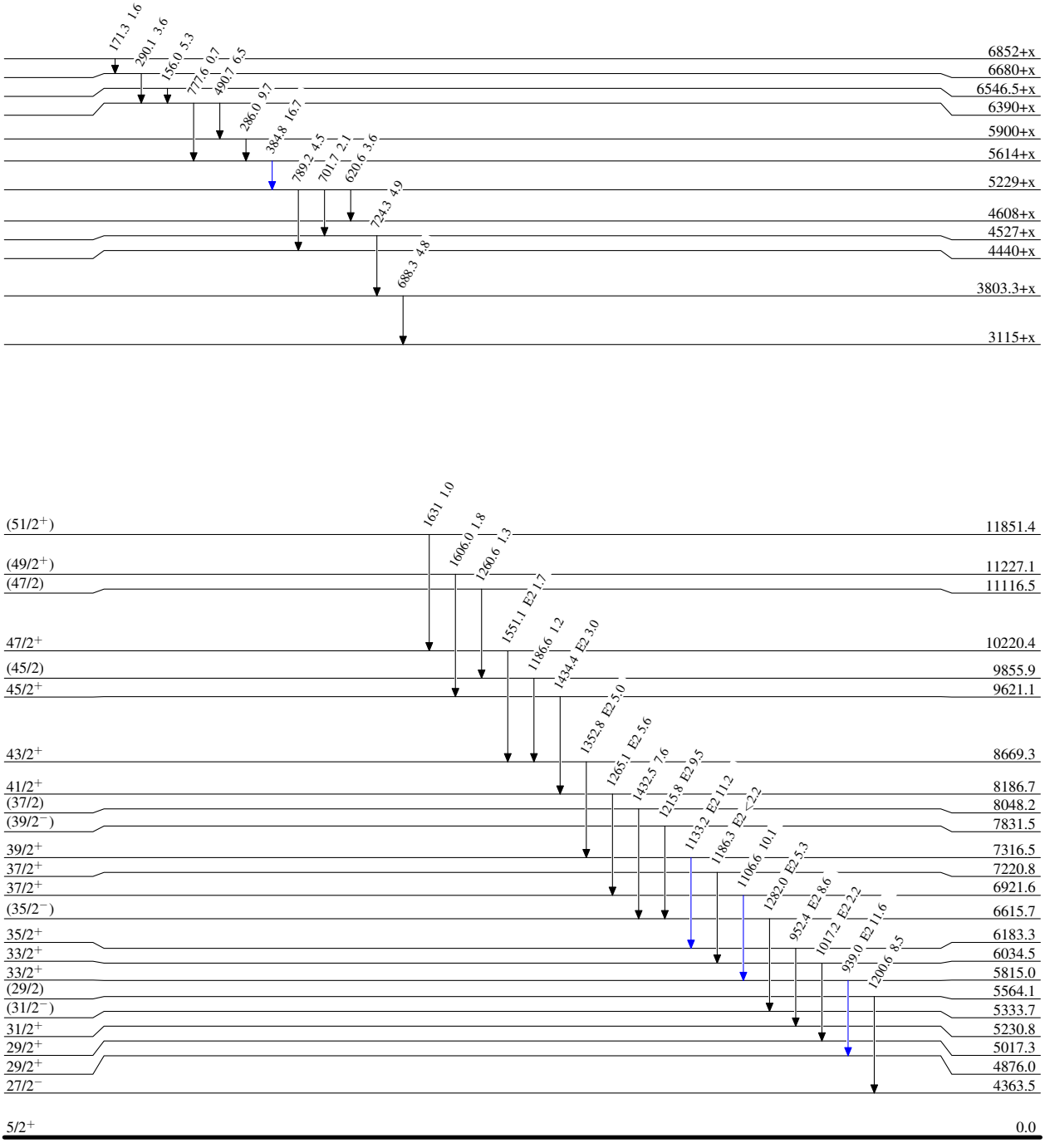
Intensities: Relative I_γ

Legend

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

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

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

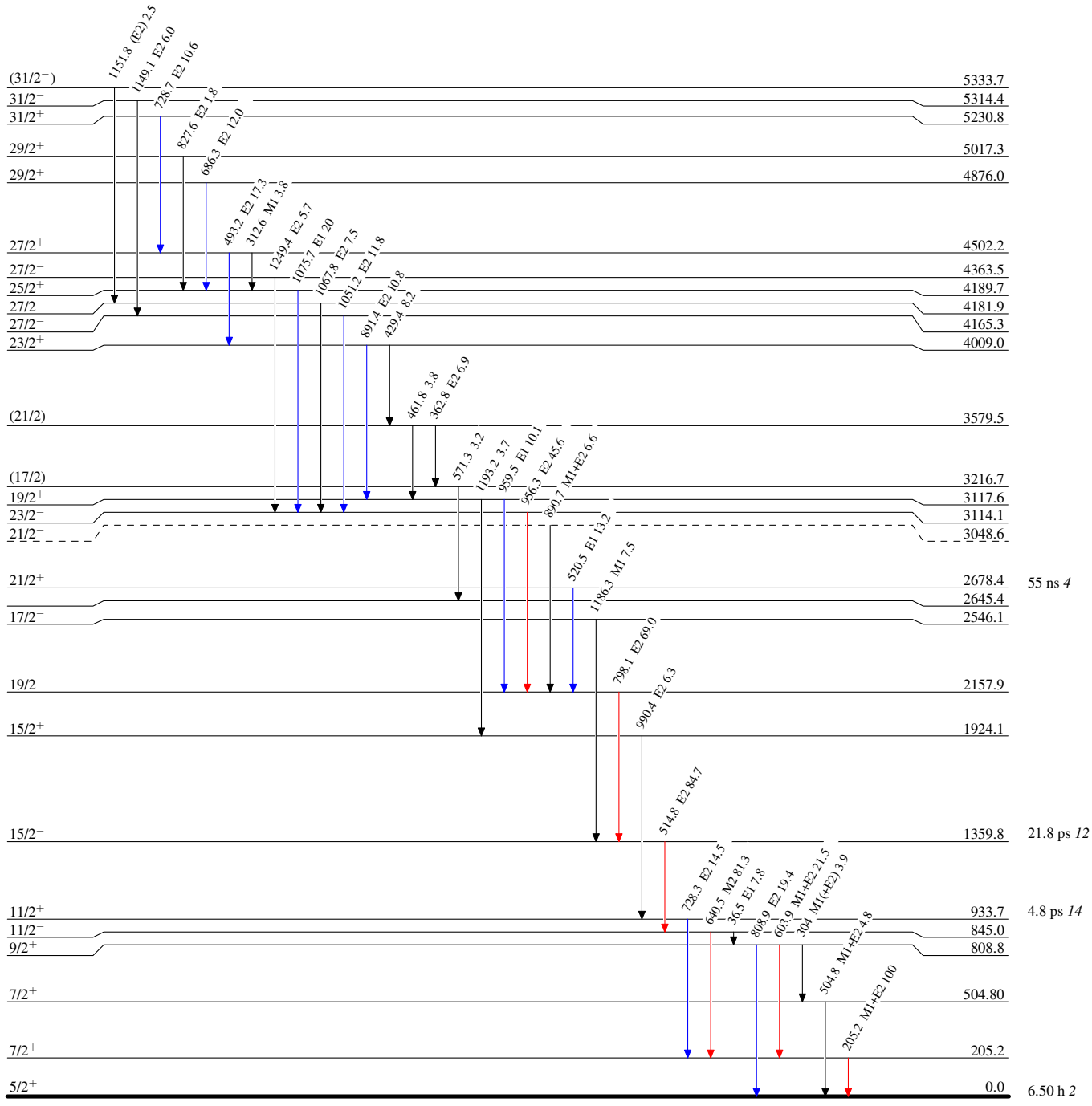


$^{107}_{48}Cd_{59}$

(HI,xnγ) 1992Je02,1978St01,1989Kl02

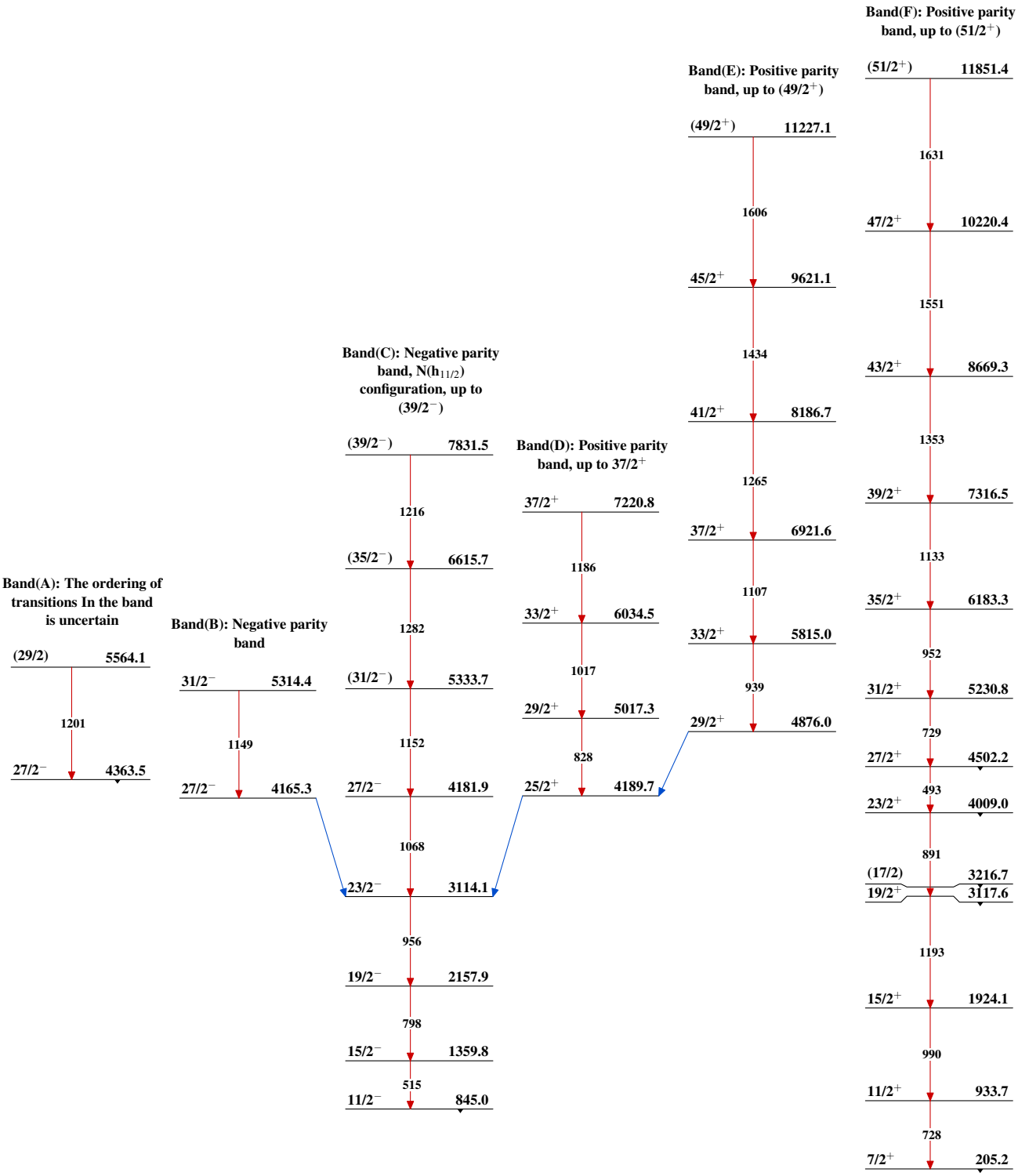
Level Scheme (continued)

Intensities: Relative I_γ



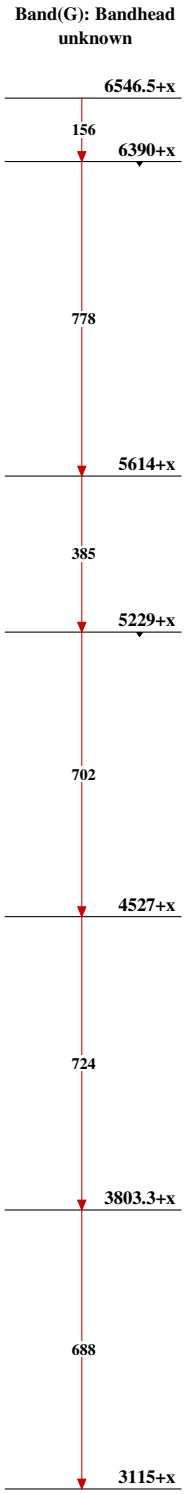
$^{107}_{48}Cd_{59}$

(HI,xnγ) 1992Je02,1978St01,1989Kl02



$^{107}_{48}Cd_{59}$

(HI,xnγ) 1992Je02,1978St01,1989Kl02 (continued)



$^{107}_{48}Cd_{59}$