^{96}Zr(^{16}O,4nγ) 2000Ke01,2005Si23

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	ENSDF	1-Jul-2008

All data are from 2000Ke01 unless otherwise stated.
E=72 MeV. Measured Eγ, $\gamma\gamma$, Iγ, $\gamma\gamma(\theta)$(DCO) and lifetimes (by DSA method) using the Gammasphere array of 99 HPGe detectors. A partial level scheme of two (new) shears bands is reported.

^{108}Cd Levels

E(level)[†]	J$^\pi$	T$_{1/2}$[‡]	Comments
0.0[a]	0$^+$		
632.972[a] *20*	2$^+$		
1508.45[a] *3*	4$^+$		
2541.37[a] *5*	6$^+$		
3683.23[a] *11*	8$^+$		
4152.65[a] *12*	10$^+$		
4708.73[a] *14*	12$^+$	9.98[@] ps *28*	
5502.53[a] *16*	14$^+$	1.52[@] ps *7*	
5589[&b]	(11$^-$)		
5640.3[&b] *9*	12$^-$		
5761.3[b] *8*	13$^-$		
6077.3[b] *8*	14$^-$		
6458.8[a] *3*	16$^+$	0.478[#] ps *+35−28*	
6599.0[b] *8*	15$^-$	0.48 ps *+3−4*	B(M1)=0.58 *+6−4*.
7214.1[c] *8*	(15$^-$)		
7275.7[b] *8*	16$^-$	0.19 ps *+4−6*	B(M1)=0.7 *+3−1*.
7529.1[c] *7*	16$^-$		
7563.8[a] *11*	18$^+$	0.229[#] ps *21*	
7741.2[b] *8*	17$^-$	0.28 ps *4*	B(M1)=0.8 *1*.
7796.7 *5*	17$^-$		
7862.1[c] *5*	17$^-$		
8103.0[b] *8*	18$^-$	0.52 ps *+3−4*	B(M1)=1.6 *1*.
8317.3[c] *5*	18$^-$		
8355.0 *6*	18$^-$		
8585.6[b] *8*	19$^-$	0.201 ps *14*	B(M1)=1.5 *1*, B(E2)=0.07 *5*.
8640.5[c] *5*	19$^-$		
8823.8[a] *15*	(20$^+$)	0.194[#] ps *21*	
8999.4[c] *6*	(20$^-$)		
9175.5[b] *9*	20$^-$	0.14 ps *+2−3*	B(M1)=1.1 *2*, B(E2)=0.06 *4*.
9420.2[c] *6*	(21$^-$)		
9880.1[b] *9*	21$^-$	0.208 ps *7*	B(M1)=0.40 *+6−4*, B(E2)=0.02 *1*.
9897.3[c] *7*	(22$^-$)		
10291.9[a] *18*	(22$^+$)	0.25 ps	T$_{1/2}$: effective half-life from 2005Si23.
10413.2[c] *7*	(23$^-$)		
10677.9[b] *9*	(22$^-$)		
10976.6[c] *8*	(24$^-$)		
11915.9[a] *21*	(24$^+$)		

[†] From least-squares fit to Eγ's (by compilers), assuming Δ(Eγ)=0.2 for Iγ>10 and 0.5 for others.

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^{96}Zr(^{16}O,4nγ) 2000Ke01,2005Si23 (continued)

^{108}Cd Levels (continued)

‡ From Doppler-shift attenuation method (2000Ke01) unless otherwise stated.
# From Doppler-shift attenuation method (2005Si23).
@ 2005Si23 quote value from literature.
& For deexcitation of this level, consult ENSDF for ^{108}Cd: Adopted Levels, gammas; or 1993Th05: Nucl Phys a564, 285.
[a] Band(A): g.s. (yrast) band.
[b] Band(B): Magnetic-dipole (shears) band, based on (11$^-$). Configuration=$\pi[g_{9/2}^{-3}g_{7/2}]\nu[h_{11/2}(g_{7/2}d_{5/2})^1$ before the $\nu h_{11/2}^2$ crossing and $\pi[g_{9/2}^{-3}g_{7/2}]\nu[h_{11/2}^3(g_{7/2}d_{5/2})^1$ after the crossing.
[c] Band(C): Magnetic-dipole (shears) band, based on (15$^-$). Tentative configuration=$\pi[g_{9/2}^{-3}g_{7/2}]\nu[h_{11/2}\ (g_{7/2}d_{5/2})^3$.

γ(^{108}Cd)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	Comments
121.0 *2*	60.6 *24*	5761.3	13$^-$	5640.3	12$^-$	M1	DCO=0.85 *7*.
212.0 *5*	8.4 *5*	7741.2	17$^-$	7529.1	16$^-$	M1+E2	DCO=0.64 *10*.
284.4 *5*	7.9 *7*	8640.5	19$^-$	8355.0	18$^-$	M1	DCO=0.71 *8*.
314.0‡ *5*	8.4 *9*	7529.1	16$^-$	7214.1	(15$^-$)	M1	DCO=0.86 *10*.
316.0 *2*	86 *3*	6077.3	14$^-$	5761.3	13$^-$	M1	DCO=0.75 *+3–4*.
323.4 *2*	19.9 *10*	8640.5	19$^-$	8317.3	18$^-$	M1	DCO=0.86 *7*.
333.0 *5*	5.4 *5*	7862.1	17$^-$	7529.1	16$^-$	M1	DCO=0.7 *+4–3*.
358.8 *2*	26.4 *20*	8999.4	(20$^-$)	8640.5	19$^-$	M1	DCO=0.65 *+6–4*.
361.7 *2*	41.5 *17*	8103.0	18$^-$	7741.2	17$^-$	M1	B(M1)(W.u.)=0.89 *+7–6* DCO=0.82 *+5–4*.
420.8 *2*	13.9 *18*	9420.2	(21$^-$)	8999.4	(20$^-$)	M1	DCO=0.73 *+9–8*.
455.4 *2*	11.6 *7*	8317.3	18$^-$	7862.1	17$^-$	(M1)	
465.5 *2*	22.3 *12*	7741.2	17$^-$	7275.7	16$^-$	M1	B(M1)(W.u.)=0.43 *7* DCO=0.97 *+12–10*.
469.42† *5*		4152.65	10$^+$	3683.23	8$^+$		
476.6 *5*	9.1 *4*	9897.3	(22$^-$)	9420.2	(21$^-$)	M1	DCO=0.90 *+14–13*.
482.3 *2*	30.6 *15*	8585.6	19$^-$	8103.0	18$^-$	M1	B(M1)(W.u.)=0.88 *9* DCO=1.00 *+3–4*.
492.0 *5*	4.8 *5*	8355.0	18$^-$	7862.1	17$^-$	M1+E2	DCO=0.6 *1*.
515.6 *5*		10413.2	(23$^-$)	9897.3	(22$^-$)	(M1)	
520.0 *5*	4.8 *2*	8317.3	18$^-$	7796.7	17$^-$	M1+E2	DCO=0.87 *+7–6*.
521.7 *2*	100	6599.0	15$^-$	6077.3	14$^-$	M1	B(M1)(W.u.)=0.323 *+27–21* DCO=0.80 *+3–2*.
527.0 *5*	9.6 *8*	7741.2	17$^-$	7214.1	(15$^-$)	(E2)	B(E2)(W.u.)=3.9×10^2 *7* DCO=1.21 *+15–18*.
556.08† *7*		4708.73	12$^+$	4152.65	10$^+$		
558.0 *5*	1.6 *3*	8355.0	18$^-$	7796.7	17$^-$	(M1+E2)	
563.6 *5*	6.5 *14*	10976.6	(24$^-$)	10413.2	(23$^-$)	M1	DCO=0.79 *8*.
589.5 *5*	9.0 *10*	9175.5	20$^-$	8585.6	19$^-$	M1	B(M1)(W.u.)=0.60 *+16–12* DCO=0.73 *+10–9*.
615.0 *2*	13.5 *7*	7214.1	(15$^-$)	6599.0	15$^-$	M1+E2	DCO=0.69 *+15–13*.
632.97† *2*		632.972	2$^+$	0.0	0$^+$		
676.7 *2*	22.1 *9*	7275.7	16$^-$	6599.0	15$^-$	M1	B(M1)(W.u.)=0.37 *+12–8* DCO=0.78 *10*.
682.0 *5*	4.4 *4*	8999.4	(20$^-$)	8317.3	18$^-$	E2	DCO=1.47 *+12–11*.
705.6 *5*	7.0 *4*	9880.1	21$^-$	9175.5	20$^-$	M1	B(M1)(W.u.)=0.222 *19* DCO=0.75 *+5–4*.
780.4 *5*	3.2 *3*	9420.2	(21$^-$)	8640.5	19$^-$	(E2)	
793.80† *7*		5502.53	14$^+$	4708.73	12$^+$		
797.9 *2*	5.1 *4*	10677.9	(22$^-$)	9880.1	21$^-$	(M1)	
845.0 *5*	3.3 *3*	8585.6	19$^-$	7741.2	17$^-$	E2	B(E2)(W.u.)=21 *3* DCO=1.31 *+17–15*.

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^{96}Zr(^{16}O,4nγ) 2000Ke01,2005Si23 (continued)

γ(^{108}Cd) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	Comments
875.47† *2*		1508.45	4^+	632.972	2^+		
897.8 *5*	2.7 *4*	9897.3	(22^-)	8999.4	(20^-)	(E2)	
931.0 *5*	7.8 *5*	7529.1	16^-	6599.0	15^-	M1+E2	DCO=0.94 *20*.
956.3† *2*		6458.8	16^+	5502.53	14^+		
993.6 *5*	4.0 *5*	10413.2	(23^-)	9420.2	(21^-)	(E2)	DCO=1.5 *+4−3*.
1032.92† *3*		2541.37	6^+	1508.45	4^+		
1073.9 *5*	2.6 *3*	9175.5	20^-	8103.0	18^-	(E2)	B(E2)(W.u.)=21 *+6−21*
1079.0 *5*	2.8 *3*	10976.6	(24^-)	9897.3	(22^-)	(E2)	
1105		7563.8	18^+	6458.8	16^+	E2	B(E2)(W.u.)=49 *5*
1141.85† *10*		3683.23	8^+	2541.37	6^+		
1260		8823.8	(20^+)	7563.8	18^+		
1293.6 *5*	2.5 *3*	9880.1	21^-	8585.6	19^-	(E2)	B(E2)(W.u.)=6.5 *9*
1337.1 *5*	7.1 *5*	7796.7	17^-	6458.8	16^+	E1	DCO=0.93 *20*.
1404.1 *5*	3.3 *3*	7862.1	17^-	6458.8	16^+	E1	DCO=0.70 *+16−14*.
1468		10291.9	(22^+)	8823.8	(20^+)		
1502.2 *5*	1.6 *3*	10677.9	(22^-)	9175.5	20^-	(E2)	
1624		11915.9	(24^+)	10291.9	(22^+)		

† From Adopted gammas in ^{108}Cd.

‡ Placement of transition in the level scheme is uncertain.

^{96}Zr(^{16}O,4nγ) 2000Ke01,2005Si23

Level Scheme

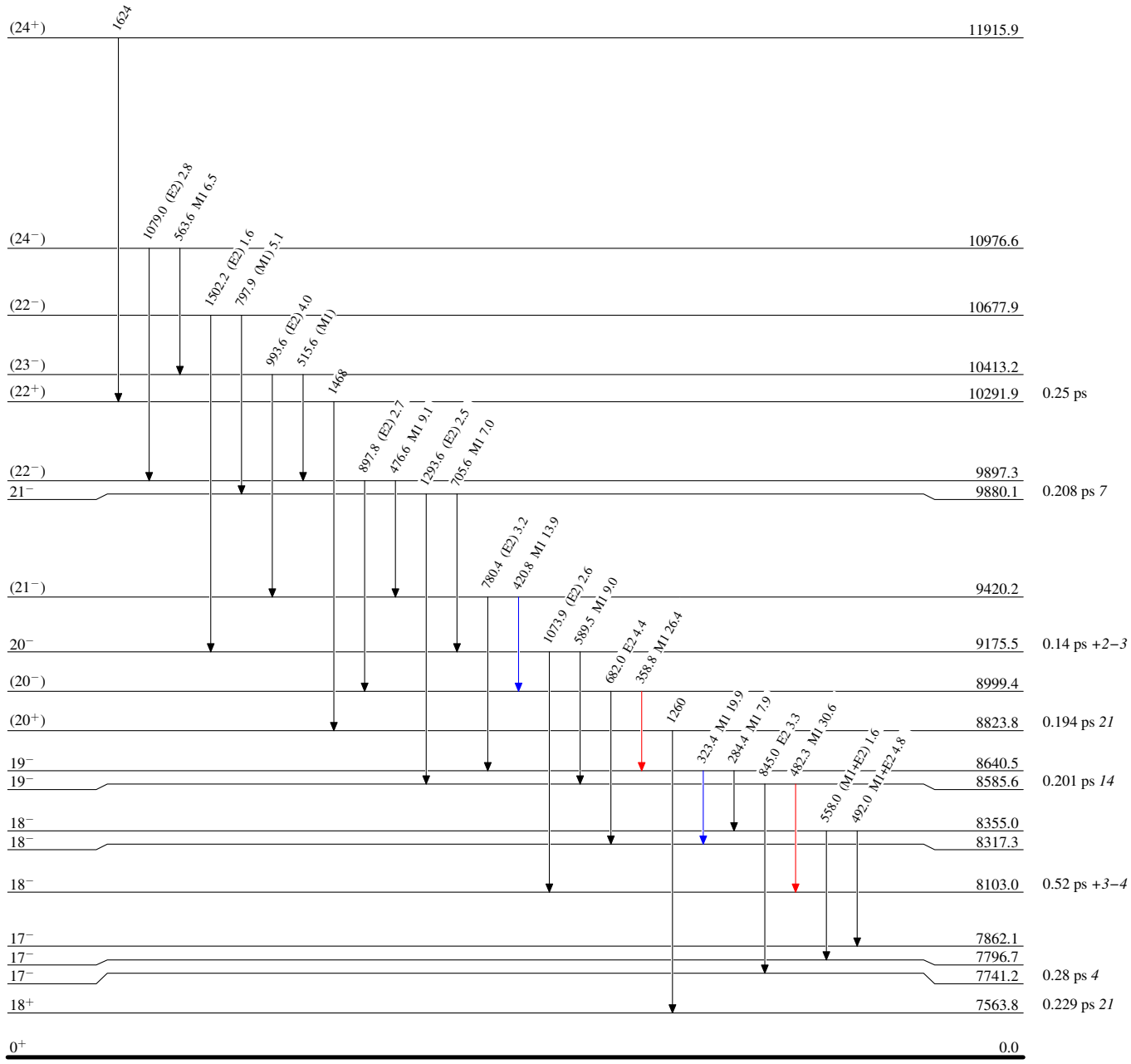
Intensities: Relative I_γ

Legend

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

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

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



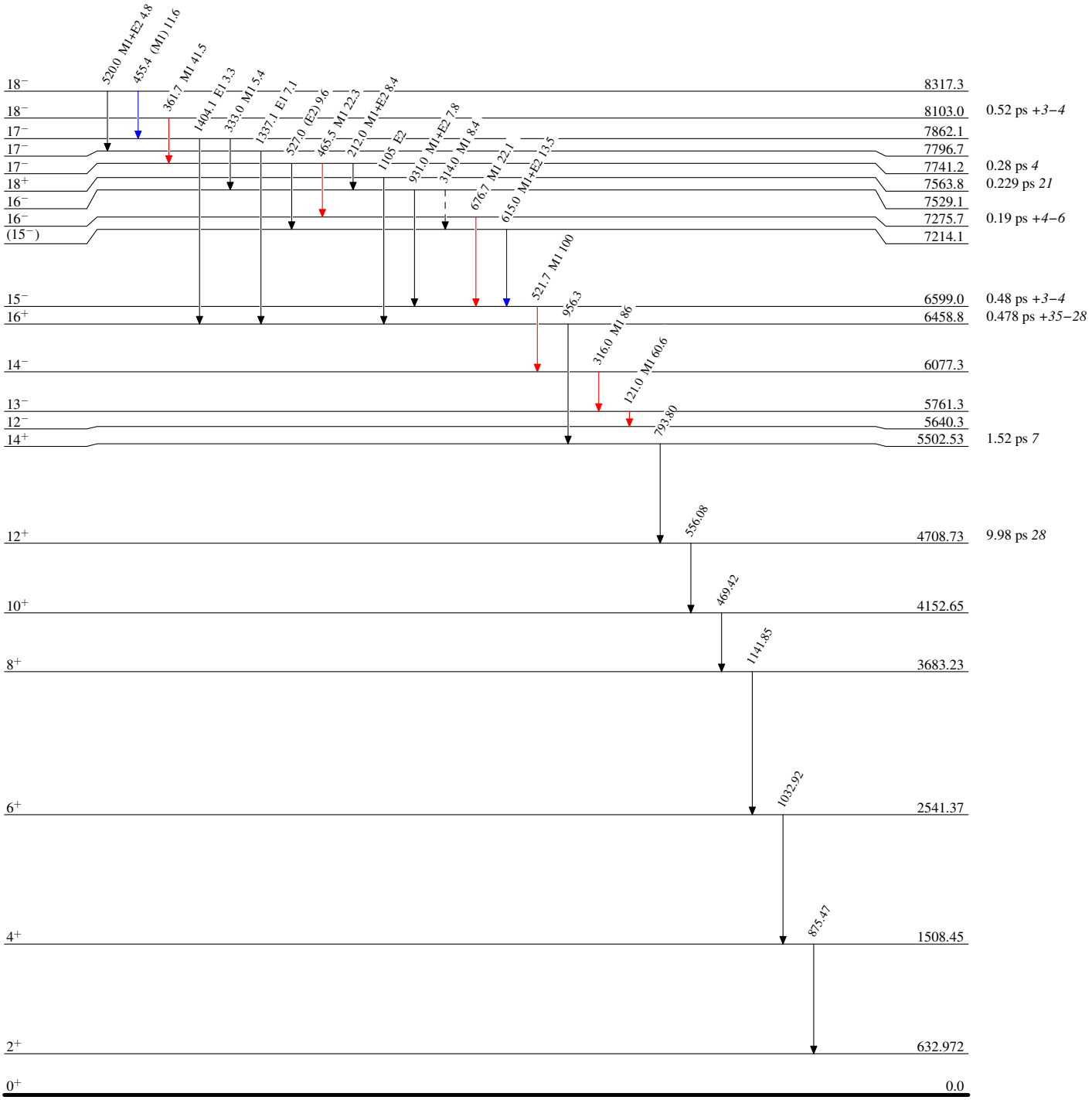
$^{108}_{48}Cd_{60}$

^{96}Zr(^{16}O,4nγ) **2000Ke01,2005Si23**

Level Scheme (continued)

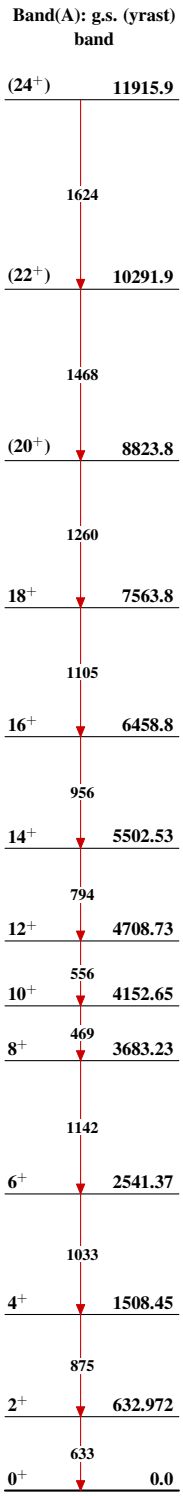
Intensities: Relative I_γ

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)



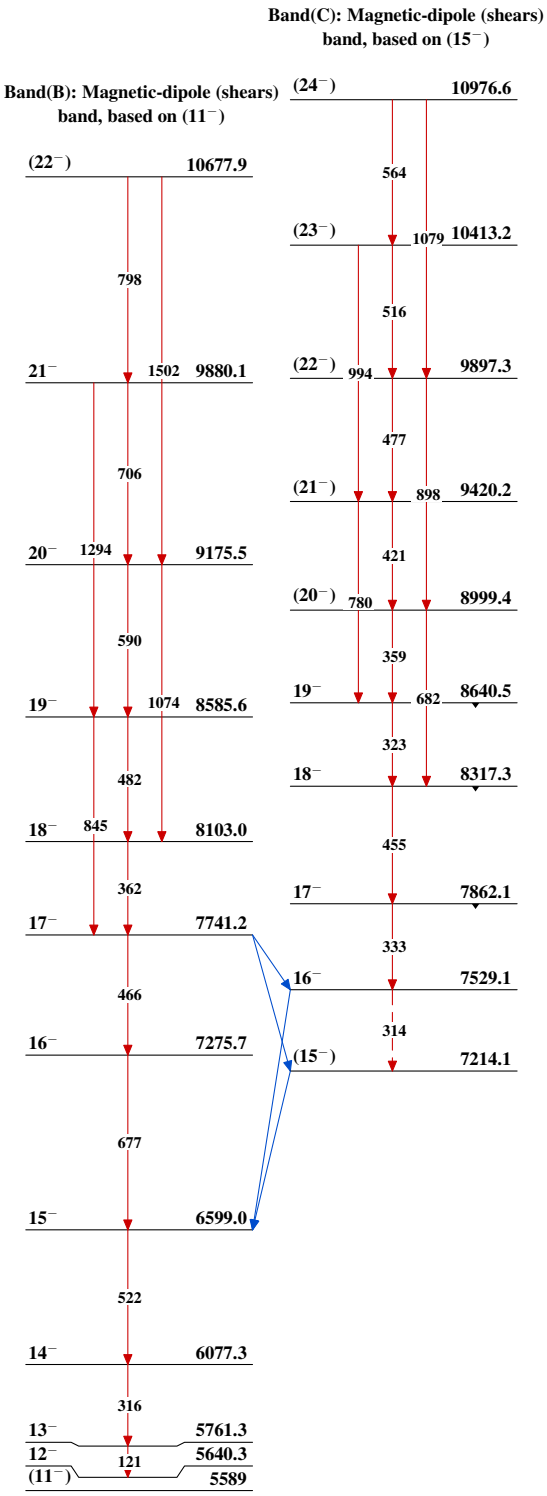
$^{108}_{48}Cd_{60}$

^{96}Zr(^{16}O,4nγ) 2000Ke01,2005Si23



$^{108}_{48}Cd_{60}$

^{96}Zr(^{16}O,4nγ) 2000Ke01,2005Si23 (continued)



$^{108}_{48}Cd_{60}$