^{96}Zr(^{18}O,5nγ) 1994Ju05,2000Ch04,1994Re06

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	S. Kumar(a), J. Chen(b) and F. G. Kondev	NDS 137, 1 (2016)	31-May-2016

1994Ju05: Reaction: ^{96}Zr(^{18}O,5nγ), E(^{18}O)=73 MeV. Target: A stacked target consisting of two 0.9 mg/cm^2, enriched to 85% in ^{96}Zr and a 0.74 mg/cm^2 thick target with a 6 mg/cm^2 thick gold backing. The beams were provided by the Tandem Accelerator Laboratory of the Niels Bohr Institute. γ-rays were detected using Nordball array consisting of 17-20 Compton-suppressed Ge detectors (at 37°, 79°, 101° and 143°) and a BaF_2-multiplicity filter. Measured: Eγ, $\gamma\gamma$, $\gamma(\theta)$. Deduced: ^{109}Cd levels, J^π, $T_{1/2}$, B(M1)/B(E2). 1994Ju05 also report data for ^{100}Mo(^{13}C,4nγ) and (p,nγ).

2000Ch04: Reaction: ^{96}Zr(^{18}O,5nγ), E(^{18}O)=70 MeV, 88-Inch Cyclotron at LBNL. Target: 500 μg/cm^2 (86% enriched ^{96}Zr) backed with 10 μg/cm^2 with natural Pb, and 500 μg/cm^2 thin target. Detectors: 99 Compton-suppressed Ge detectors (GAMMASPHERE array) Measured: Eγ, Iγ, $\gamma(\theta)$, $\gamma\gamma\gamma$, DSA. Deduced: J^π, $T_{1/2}$, B(M1), B(E2) and comparison with Tilted Axis Cranking (TAC).

1994Re06: ^{96}Zr(^{18}O,5nγ) E=60,70 MeV, "TASCC" facility, Chalk River Laboratories. Target: 600 μg/cm^2 (85% enriched ^{96}Zr). Detectors: 20 Compton-suppressed Ge detectors, 70 BGO in an inner ball, an array of CsI(Tl) detectors. Measured: Eγ, Iγ, $\gamma\gamma(\theta)$(DCO), $\gamma(\theta)$,$\gamma\gamma$, MR.

^{109}Cd Levels

Level scheme and band structures of high-spin states are based on the assignments in 1994Ju05, unless otherwise noted.

E(level)[†]	J^π[‡]
0.0	5/2$^+$
203.3 *4*	7/2$^+$
462.9[@] *6*	11/2$^-$
822.5 *4*	9/2$^+$
985.4[@] *6*	15/2$^-$
1066.3 *5*	11/2$^+$
1425.4[d] *7*	13/2$^-$
1821.3[@] *6*	19/2$^-$
1854.3 *6*	13/2$^+$
2141.6 *6*	15/2$^+$
2165.9[d] *6*	17/2$^-$
2589.8 *7*	19/2$^-$
2687.3[&] *7*	17/2$^+$
2700.4[e] *7*	19/2$^-$
2862.1[@] *6*	23/2$^-$
2865.9[g] *7*	21/2$^{(+)}$
2942.1[a] *6*	19/2$^+$
2973.9[f] *7*	21/2$^-$
3042.5[d] *7*	21/2$^-$
3059.1[&] *6*	21/2$^+$
3256.6 *10*	(21/2$^-$)
3279.5 *7*	21/2$^{(+)}$
3353.9[i] *7*	21/2$^-$
3370.0 *7*	23/2$^-$
3383.1[a] *6*	23/2$^+$
3411.0[e] *7*	23/2$^-$
3524.3[c] *7*	21/2$^+$
3524.7[&] *6*	25/2$^+$
3548.8[i] *7*	23/2$^-$

Continued on next page (footnotes at end of table)

^{96}Zr(^{18}O,5nγ) 1994Ju05,2000Ch04,1994Re06 (continued)

^{109}Cd Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$[#]	Comments
3568.7[g] 7	23/2$^{(+)}$		
3615.3 7	23/2^{-}		
3620.7[b] 6	23/2^{+}		
3836.2 11	(25/2^{+})		
3897.5[f] 7	25/2^{-}		
3910.4[c] 7	25/2^{+}		
3939.9[a] 6	27/2^{+}		
4021.7[@] 6	27/2^{-}		
4030.3[i] 7	25/2^{-}		
4088.2[d] 7	25/2^{-}		
4154.1 8			
4232.5[b] 7	27/2^{+}		
4246.7[&] 6	29/2^{+}		
4292.6[g] 7	25/2$^{(+)}$		
4296.4 8	27/2^{-}		
4413.7 11	(27/2^{+})		
4432.0 8	(27/2^{+})		
4458.6[e] 7	27/2^{-}		
4591.1 8	(27/2^{-})		
4630.3[i] 7	27/2^{-}		
4697.8[c] 8	29/2^{+}		
4725.0[a] 6	31/2^{+}		
4874.7 8	27/2^{-}		
4950.2[g] 10	(27/2^{+})		
5051.1[@] 7	31/2^{-}	1.05 ps *+4−5*	T$_{1/2}$: using DSAM in 2000Ch04, weighted average of 0.85 ps *+7−6* 1.26 ps *+11−8*, and 1.25 ps *+10−8*.
5061.6 8	27/2^{-}		
5082.9[b] 7	31/2^{+}		
5122.6[f] 9	29/2^{-}		
5227.3 9			
5254.3 12	(29/2^{-})		
5261.5[&] 8	33/2^{+}		
5279.0[i] 7	29/2^{-}		
5287.4[d] 10	(29/2^{-})		
5399.7 8	31/2^{-}		
5440.6[i] 8	31/2^{-}		
5623.4 9			
5650.2[g] 11	(29/2^{+})		
5671.8[c] 10	33/2^{+}		
5730.5[i] 10	33/2^{-}	0.97 ps *+2−3*	T$_{1/2}$: using DSAM in 2000Ch04, weighted average of 1.12 ps *5*, 0.96 ps *3*, and 0.81 ps *+1−8*.
5775.6[a] 8	35/2^{+}		
5787.9 11	(31/2^{-})		
5813.2[h] 13	29/2^{+}		
5861.9 9	(31/2^{-})		
5954.1 11	(35/2^{-})		
5971.8[@] 9	35/2^{-}	0.233 ps *+15−8*	T$_{1/2}$: using DSAM in 2000Ch04, weighted average of 0.214 ps $^{+14-21}$, 0.277 ps *+21−14*, and 0.236 ps *+42−7*.
5996.1 9	31/2^{+}		
6004.2[h] 8	31/2^{+}		
6008.3 16	(31/2^{-})		

Continued on next page (footnotes at end of table)

^{96}Zr(^{18}O,5nγ) 1994Ju05,2000Ch04,1994Re06 (continued)

^{109}Cd Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	Comments
6154.9[b] 9	35/2+		
6163.8[i] 11	35/2−	0.189 ps +3−4	$T_{1/2}$: using DSAM in 2000Ch04, weighted average of 0.173 ps 7, 0.183 ps +5−6, and 0.202 ps +4−6.
6240.7 10	(35/2−)		
6305.2[h] 9	33/2+	0.248 ps +10−8	$T_{1/2}$: using DSAM in 2000Ch04, weighted average of 0.284 ps +27−21, 0.263 ps +14−14, and 0.222 ps +14−14.
6518.8[&] 10	37/2+		
6573.2 9			
6670.7 14	(37/2−)		
6684.2[h] 14	35/2+	0.175 ps +3−4	$T_{1/2}$: using DSAM in 2000Ch04, weighted average of 0.187 ps 7, 0.173 ps +6−5, and 0.166 ps +5−9.
6795.3[i] 12	37/2−	0.150 ps +3−4	$T_{1/2}$: using DSAM in 2000Ch04, weighted average of 0.215 ps +14−21, 0.194 ps +7−14, and 0.142 ps +2−5.
6861.9[c] 11	(37/2+)		
7010.8[@] 10	39/2−	0.274 ps +10−9	$T_{1/2}$: using DSAM in 2000Ch04, weighted average of 0.28 ps 3, 0.284 ps +14−7, and 0.24 ps 2.
7077.6[a] 10	39/2+		
7147.2[h] 15	37/2+	0.146 ps +1−3	$T_{1/2}$: using DSAM in 2000Ch04, weighted average of 0.148 ps +5−6, 0.146 ps 3, and 0.141 ps +3−15.
7384.9[b] 10	(39/2+)		
7554.3[i] 13	(39/2−)	0.226 ps +8−11	$T_{1/2}$: using DSAM in 2000Ch04, weighted average of 0.187 ps +14−21, 0.235 ps 14, and 0.249 ps +14−21.
7561.3 16	(39/2−)		
7687.8[h] 15	39/2+	0.077 ps +2−3	$T_{1/2}$: using DSAM in 2000Ch04, weighted average of 0.067 ps 4, 0.078 ps +3−7, and 0.091 ps +4−6.
7909.2[&] 11	41/2+		
7950.3 17	(41/2−)		
8202.5[@] 11	43/2−	0.129 ps +3−5	$T_{1/2}$: using DSAM in 2000Ch04, weighted average of 0.110 ps +7−14, 0.130 ps +3−13, and 0.133 ps +6−4.
8264.8[h] 19	41/2+	0.056 ps +2−4	$T_{1/2}$: using DSAM in 2000Ch04, weighted average of 0.059 ps +4−6, 0.049 ps +4−5, and 0.067 ps +3−9.
8599.0[a] 11	43/2+		
8746.3 19	(43/2−)		
8870.8[h] 21	43/2+		
9378.2[&] 12	(45/2+)		
9502.8[h] 23	(45/2+)		
9569.5[@] 12	47/2−	0.124 ps +3−3	$T_{1/2}$: using DSAM in 2000Ch04, weighted average of 0.126 ps +5−5, 0.119 ps +6−5, and 0.126 ps +5−6.
10166[h] 3	(47/2+)		
10898[h] 3	(49/2+)		
11132.5[@] 13	(51/2−)		
x[j]	(37/2)		Additional information 1. E(level): x >5730, since transitions from this level feed members of bands #10 and #11 as labeled by 2000Ch04.
295.0+x[j] 10	(39/2)		
634.0+x[j] 15	(41/2)		
1054.0+x[j] 18	(43/2)		
1542.0+x[j] 20	(45/2)		
2100.0+x[j] 23	(47/2)		
2727.0+x[j] 25	(49/2)		

Continued on next page (footnotes at end of table)

^{96}Zr(^{18}O,5nγ) 1994Ju05,2000Ch04,1994Re06 (continued)

^{109}Cd Levels (continued)

† From a least-squares fit to γ-ray energies.
‡ From deduced γ-ray transition multipolarities, apparent band structures and decay patterns.
# From 2000Ch04 by DSAM, unless otherwise stated; systematic uncertainties of up to 20 % are not included.
@ Band(A): $\Delta J=2$, $\nu h_{11/2}$ band.
& Band(B): $\Delta J=2$, $17/2^+$ band.
a Band(C): $\Delta J=2$, $19/2^+$ band.
b Band(D): $\Delta J=2$, $23/2^+$ band.
c Band(E): $\Delta J=2$, $21/2^+$ band.
d Band(F): $\Delta J=2$, $13/2^-$ band.
e Band(G): $\Delta J=2$, $19/2^-$ band, (band-head at 2701 keV).
f Band(H): $\Delta J=2$, $21/2^-$ band, (band-head at 2974 keV).
g Band(I): $\Delta J=1$, $21/2^{(+)}$ band Band 14 in 2000Ch04.
h Band(J): $\Delta J=1$, magnetic-rotational band, based on $29/2^+$. Configuration=$\pi g_{9/2}^{-2}{}_{8+}\nu[(g_{7/2}/d_{5/2})h_{11/2}^2]$ Band 11 in 2000Ch04.
i Band(K): $\Delta J=1$, magnetic-rotational band, based on $21/2^-$.
j Band(L): $\Delta J=1$, (37/2) band. Band 16 in 2000Ch04.

γ(^{109}Cd)

E_γ†	I_γ†	E_i(level)	J_i^π	E_f	J_f^π	Mult.#	δ@	Comments
141.4 *5*	0.21 *4*	3524.7	$25/2^+$	3383.1	$23/2^+$	(M1)		Mult.: R(angular)=0.99 *14*.
153‡ *1*		5440.6	$31/2^-$	5287.4	$(29/2^-)$			
161.6 *5*	4.2 *4*	5440.6	$31/2^-$	5279.0	$29/2^-$	(M1+E2)	0.22 *6*	E_γ: other: 161.6 *1* (1994Re06). Mult.: R(angular)=0.77 *3*, DCO(Q)=0.80 *6*.
191‡ *1*		6004.2	$31/2^+$	5813.2	$29/2^+$			
195.0 *5*	0.9 *1*	3548.8	$23/2^-$	3353.9	$21/2^-$	(M1+E2)	−0.05 *5*	E_γ: other: 195.3 *2* (1994Re06). Mult.: R(angular)=0.84 *7*, DCO(Q)=0.50 *9*.
203.3 *5*	3.0 *5*	203.3	$7/2^+$	0.0	$5/2^+$	M1(+E2)	0.08 *11*	E_γ: other: 203.6 *2* (1994Re06). Mult.: R(angular)=0.73 *4*, DCO(Q)=0.67 *10*.
216.4 *5*	0.4 *1*	5279.0	$29/2^-$	5061.6	$27/2^-$	(M1)		Mult.: R(angular)=0.84 *4*.
223.6 *5*	0.30 *6*	5954.1	$(35/2^-)$	5730.5	$33/2^-$			Mult.: R(angular)=1.54 *7*.
243.8 *5*	0.20 *4*	1066.3	$11/2^+$	822.5	$9/2^+$	(M1)		Mult.: R(angular)=1.00 *10*.
259.6 *5*		462.9	$11/2^-$	203.3	$7/2^+$			
267‡ *1*		3836.2	$(25/2^+)$	3568.7	$23/2^{(+)}$			
273.4 *5*	0.30 *4*	2973.9	$21/2^-$	2700.4	$19/2^-$	(M1)		Mult.: R(angular)=0.63 *13*.
287.5 *5*	0.13 *3*	3568.7	$23/2^{(+)}$	3279.5	$21/2^{(+)}$	(M1)		Mult.: R(angular)=0.76 *14*.
289.9 *5*	4.9 *4*	5730.5	$33/2^-$	5440.6	$31/2^-$	(M1)		E_γ: other: 290.3 *3* (1994Re06). Mult.: R(angular)=0.81 *3*, DCO(D)=0.97 *17*.
292‡ *1*		3548.8	$23/2^-$	3256.6	$(21/2^-)$			E_γ: other: 290.9 *2* (1994Re06).
295‡ *1*		295.0+x	(39/2)	x	(37/2)			
301.1 *5*	1.8 *2*	6305.2	$33/2^+$	6004.2	$31/2^+$	(M1)		Mult.: R(angular)=0.78 *5*.
309‡ *1*		6305.2	$33/2^+$	5996.1	$31/2^+$			
323.8 *5*	6.1 *1*	3383.1	$23/2^+$	3059.1	$21/2^+$	(M1+E2)	0.31 *5*	E_γ: other: 324.3 *1* (1994Re06). Mult.: R(angular)=1.19 *3*, DCO(Q)=0.89 *5*.
339‡ *1*		634.0+x	(41/2)	295.0+x	(39/2)			
340.3 *5*	0.6 *2*	3383.1	$23/2^+$	3042.5	$21/2^-$	(E1)		
354‡ *1*		6004.2	$31/2^+$	5650.2	$(29/2^+)$			
371.8 *5*	0.4 *1*	3059.1	$21/2^+$	2687.3	$17/2^+$	(E2)		Mult.: R(angular)=1.13 *10*.
379.0 *5*	2.4 *2*	6240.7	$(35/2^-)$	5861.9	$(31/2^-)$	(E2)		Mult.: R(angular)=0.84 *5*.
379‡ *1*		6684.2	$35/2^+$	6305.2	$33/2^+$			
386.0 *5*	0.5 *1*	3910.4	$25/2^+$	3524.3	$21/2^+$	(E2)		Mult.: R(angular)=1.1 *2*.

Continued on next page (footnotes at end of table)

^{96}Zr(^{18}O,5nγ) 1994Ju05,2000Ch04,1994Re06 (continued)

$\gamma(^{109}Cd)$ (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[@]	Comments
396[‡] *1*		7950.3	(41/2$^-$)	7554.3	(39/2$^-$)			
404.4 *5*	0.40 *8*	5279.0	29/2$^-$	4874.7	27/2$^-$	(M1)		Mult.: R(angular)=0.85 *11*.
414.8 *5*	0.4 *1*	4030.3	25/2$^-$	3615.3	23/2$^-$	(M1)		Mult.: R(angular)=0.90 *12*.
415.0 *5*	5.6 *2*	3939.9	27/2$^+$	3524.7	25/2$^+$	(M1+E2)	0.29 *5*	E_γ: other: 415.2 *1* (1994Re06). Mult.: R(angular)=1.30 *6*, DCO(Q)=0.87 *5*.
415.6 *5*	0.65 *5*	3279.5	21/2$^{(+)}$	2862.1	23/2$^-$			Mult.: R(angular)=1.51 *14*.
420[‡] *1*		1054.0+x	(43/2)	634.0+x	(41/2)			
430[‡] *1*		6670.7	(37/2$^-$)	6240.7	(35/2$^-$)			
433.3 *5*	3.6 *2*	6163.8	35/2$^-$	5730.5	33/2$^-$	(M1)		E_γ: other: 433.6 *2* (1994Re06). Mult.: R(angular)=0.81 *5*, DCO(Q)=0.59 *8*.
436.7 *5*	1.0 *1*	3411.0	23/2$^-$	2973.9	21/2$^-$	(M1)		Mult.: R(angular)=0.42 *5*.
441.0 *5*	6.6 *1*	3383.1	23/2$^+$	2942.1	19/2$^+$	(E2)		E_γ: other: 441.3 *2* (1994Re06). Mult.: R(angular)=1.32 16, DCO(Q)=1.05 *9*.
452[‡] *1*		6240.7	(35/2$^-$)	5787.9	(31/2$^-$)			
463.0 *5*	2.2 *2*	7147.2	37/2$^+$	6684.2	35/2$^+$	(M1)		Mult.: R(angular)=1.1 *2*.
465.6 *1*	19.5 *3*	3524.7	25/2$^+$	3059.1	21/2$^+$	(E2)		E_γ: other: 465.8 *1* (1994Re06). Mult.: R(angular)=1.33 *5*, DCO(Q)=1.04 *3*.
478.0 *5*	1.1 *2*	4725.0	31/2$^+$	4246.7	29/2$^+$	(M1+E2)	0.19 *22*	E_γ: other: 478.3 *3* (1994Re06). Mult.: R(angular)=1.7 *3*, DCO(Q)=0.77 *20*.
481.7 *5*	4.0 *2*	4030.3	25/2$^-$	3548.8	23/2$^-$	(M1+E2)	0.04 *6*	E_γ: other: 481.9 *2* (1994Re06). Mult.: R(angular)=0.80 *3*, DCO(Q)=0.63 *5*.
487.0 *5*	<0.5	3897.5	25/2$^-$	3411.0	23/2$^-$			R(angular)<0.7.
488[‡] *1*		1542.0+x	(45/2)	1054.0+x	(43/2)			
491.8 *5*	0.4 *1*	3353.9	21/2$^-$	2862.1	23/2$^-$	(M1)		Mult.: R(angular)=0.76 *5*.
522.4 *1*	115 *1*	985.4	15/2$^-$	462.9	11/2$^-$	E2		E_γ: other: 522.7 *1* (1994Re06). Mult.: R(angular)=1.33 *2*, DCO(Q)=1.01 *1*.
527.3 *5*	1.5 *2*	3910.4	25/2$^+$	3383.1	23/2$^+$	(M1)		Mult.: R(angular)=0.59 *2*.
540.6 *5*	1.0 *2*	7687.8	39/2$^+$	7147.2	37/2$^+$	(M1)		Mult.: R(angular)=0.97 *11*.
542.1 *5*	0.4 *1*	4630.3	27/2$^-$	4088.2	25/2$^-$	(M1)		Mult.: R(angular)=0.76 *9*.
556.8 *1*	10.1 *3*	3939.9	27/2$^+$	3383.1	23/2$^+$	(E2)		E_γ: other: 556.9 *2* (1994Re06). R(angular)=1.50 *7*, DCO(Q)=1.01 *6*.
558[‡] *1*		2100.0+x	(47/2)	1542.0+x	(45/2)			
561.6 *5*	1.4 *2*	3620.7	23/2$^+$	3059.1	21/2$^+$	(M1)		Mult.: R(angular)=0.98 *8*.
577[‡] *1*		4413.7	(27/2$^+$)	3836.2	(25/2$^+$)			
577[‡] *1*		8264.8	41/2$^+$	7687.8	39/2$^+$			
600.0 *5*	3.8 *2*	4630.3	27/2$^-$	4030.3	25/2$^-$	(M1)		E_γ: other: 600.0 *2* (1994Re06). Mult.: R(angular)=0.91 *3*, DCO(D)=0.93 *18*.
606[‡] *1*	0.5 *1*	8870.8	43/2$^+$	8264.8	41/2$^+$			
609.0 *5*	0.27 *3*	4630.3	27/2$^-$	4021.7	27/2$^-$	(E2)		Mult.: R(angular)=1.30 *12*.
611.8 *5*	0.9 *2*	4232.5	27/2$^+$	3620.7	23/2$^+$	(E2)		Mult.: R(angular)=1.4 *2*.
619.3 *5*	0.7 *1*	822.5	9/2$^+$	203.3	7/2$^+$	(M1)		R(angular)=0.64 *7*.
624[‡] *1*		5254.3	(29/2$^-$)	4630.3	27/2$^-$			
627 *1*		2727.0+x	(49/2)	2100.0+x	(47/2)			
631.5 *5*	2.8 *3*	6795.3	37/2$^-$	6163.8	35/2$^-$	(M1)		E_γ: other: 632.0 *2* (1994Re06). Mult.: R(angular)=0.88 *6*, DCO(D)=1.09 *21*.
632[‡] *1*		9502.8	(45/2$^+$)	8870.8	43/2$^+$			
649.0 *5*	3.6 *3*	5279.0	29/2$^-$	4630.3	27/2$^-$	(M1)		E_γ: other: 649.0 *2* (1994Re06). Mult.: R(angular)=0.87 *5*, DCO(D)=1.09 *21*.

Continued on next page (footnotes at end of table)

^{96}Zr(^{18}O,5nγ) 1994Ju05,2000Ch04,1994Re06 (continued)

$\gamma(^{109}Cd)$ (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[@]	Comments
658[‡] *1*		4950.2	(27/2$^+$)	4292.6	25/2$^{(+)}$			
662.8 *5*	9.3 *3*	3524.7	25/2$^+$	2862.1	23/2$^-$	(E1+M2)	0.01 *6*	E_γ: other: 662.8 *3* (1994Re06). Mult.: R(angular)=0.80 *3*, DCO(Q)=0.60 *5*.
663[‡] *1*		10166	(47/2$^+$)	9502.8	(45/2$^+$)			
678.7 *5*	0.5 *1*	3620.7	23/2$^+$	2942.1	19/2$^+$			
686.9 *5*	3.5 *2*	3548.8	23/2$^-$	2862.1	23/2$^-$	(E2)		E_γ: other: 686.9 *2* (1994Re06). Mult.: R(angular)=1.54 *8*, DCO(Q)=1.28 *14*.
700[‡] *1*		5650.2	(29/2$^+$)	4950.2	(27/2$^+$)			
703.4 *5*	0.94 *6*	3568.7	23/2$^{(+)}$	2865.9	21/2$^{(+)}$	(M1)		Mult.: R(angular)=1.0 *2*.
708.0 *5*	2.8 *3*	4232.5	27/2$^+$	3524.7	25/2$^+$	(M1)		Mult.: R(angular)=0.53 *6*.
710.5 *5*	0.8 *1*	3411.0	23/2$^-$	2700.4	19/2$^-$	(E2)		Mult.: R(angular)=1.20 *15*.
722.0 *1*	16.2 *3*	4246.7	29/2$^+$	3524.7	25/2$^+$	(E2)		E_γ: other: 722.1 *1* (1994Re06). Mult.: R(angular)=1.37 *5*, DCO(Q)=1.06 *7*.
723.0 *5*	0.3 *1*	4292.6	25/2$^{(+)}$	3568.7	23/2$^{(+)}$			
732[‡] *1*		10898	(49/2$^+$)	10166	(47/2$^+$)			
740.7 *3*	0.60 *5*	2165.9	17/2$^-$	1425.4	13/2$^-$	(E2)		E_γ: from 1994Re06. 740.8 5 from 1994Ju05. Mult.: DCO(Q)=0.86 *19*.
754[‡] *1*		6008.3	(31/2$^-$)	5254.3	(29/2$^-$)			
754.7 *5*	1.9 *1*	5051.1	31/2$^-$	4296.4	27/2$^-$	(E2)		E_γ: other: 755.0 *3* (1994Re06). Mult.: R(angular)=1.40 *7*, DCO(Q)=1.16 *17*.
758.6 *5*	0.5 *2*	3620.7	23/2$^+$	2862.1	23/2$^-$	(E1)		Mult.: R(angular)=1.3 *2*.
759.0 *5*	1.0 *1*	7554.3	(39/2$^-$)	6795.3	37/2$^-$	(M1)		Mult.: R(angular)=0.9 *2*.
766[‡] *1*		7561.3	(39/2$^-$)	6795.3	37/2$^-$			
768.0 *5*	0.3 *1*	5061.6	27/2$^-$	4292.6	25/2$^{(+)}$			
776.0 *5*	1.6 *2*	2942.1	19/2$^+$	2165.9	17/2$^-$	(E1)		E_γ: other: 776.2 *4* (1994Re06). Mult.: R(angular)=0.83 *8*, DCO(Q)=0.47 *11*.
780.2 *5*	2.3 *1*	3370.0	23/2$^-$	2589.8	19/2$^-$	(E2)		E_γ: other: 780.1 *3* (1994Re06). Mult.: R(angular)=1.47 *7*, DCO(Q)=0.98 *15*.
785.1 *1*	11.2 *2*	4725.0	31/2$^+$	3939.9	27/2$^+$	(E2)		E_γ: other: 785.3 *2* (1994Re06). Mult.: R(angular)=1.48 *6*, DCO(Q)=1.07 *6*.
787.4 *5*	2.3 *3*	4697.8	29/2$^+$	3910.4	25/2$^+$	(E2)		Mult.: R(angular)=1.6 *2*.
788.0 *5*	0.15 *2*	1854.3	13/2$^+$	1066.3	11/2$^+$	(M1)		Mult.: R(angular)=0.38 *11*.
796[‡] *1*		8746.3	(43/2$^-$)	7950.3	(41/2$^-$)			
800.5 *5*	1.2 *2*	2942.1	19/2$^+$	2141.6	15/2$^+$	(E2)		E_γ: other: 799.9 *3* (1994Re06). Mult.: R(angular)=1.5 *2*, DCO(Q)=0.90 *18*.
804.3 *5*		5051.1	31/2$^-$	4246.7	29/2$^+$			E_γ: Not given in Table (1994Ju05).
807.8 *5*	0.90 *5*	2973.9	21/2$^-$	2165.9	17/2$^-$	(E2)		Mult.: R(angular)=1.30 *7*.
811.3 *5*	1.2 *1*	4432.0	(27/2$^+$)	3620.7	23/2$^+$	(E2)		Mult.: R(angular)=1.7 *2*.
822.5 *5*		822.5	9/2$^+$	0.0	5/2$^+$			
836.0 *1*	100.0	1821.3	19/2$^-$	985.4	15/2$^-$	E2		E_γ: other: 836.2 *1* (1994Re06). Mult.: R(angular)=1.33 *2*, DCO(Q)=0.99 *2*.
836.8 *5*	1.0 *4*	5082.9	31/2$^+$	4246.7	29/2$^+$			
844.5 *5*	0.3 *1*	4874.7	27/2$^-$	4030.3	25/2$^-$			Mult.: R(angular)=0.99 *11*.
849.5 *5*	0.5 *2*	4232.5	27/2$^+$	3383.1	23/2$^+$			
850.8 *5*	2.9 *4*	5082.9	31/2$^+$	4232.5	27/2$^+$	(E2)		Mult.: R(angular)=1.26 *12*.
851.4 *5*	1.5 *3*	3910.4	25/2$^+$	3059.1	21/2$^+$	(E2)		Mult.: R(angular)=1.41 *10*.
863.1 *5*	2.4 *2*	1066.3	11/2$^+$	203.3	7/2$^+$	(E2)		E_γ: other: 863.4 *3* (1994Re06). Mult.: R(angular)=1.33 *8*, DCO(Q)=0.93 *14*.
876.7 *5*	2.0 *2*	3042.5	21/2$^-$	2165.9	17/2$^-$	(E2)		Mult.: R(angular)=1.29 *14*.
878.9 *5*	2.0 *4*	2700.4	19/2$^-$	1821.3	19/2$^-$	(E2)		Mult.: R(angular)=1.32 *13*.
920.7 *5*	6.1 *1*	5971.8	35/2$^-$	5051.1	31/2$^-$	(E2)		E_γ: other: 920.7 *2* (1994Re06). Mult.: R(angular)=1.43 *8*, DCO(Q)=0.98 *16*.
923.4 *5*	1.1 *2*	3897.5	25/2$^-$	2973.9	21/2$^-$	(E2)		Mult.: R(angular)=1.6 *2*.

Continued on next page (footnotes at end of table)

^{96}Zr(^{18}O,5nγ) 1994Ju05,2000Ch04,1994Re06 (continued)

$\gamma(^{109}Cd)$ (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[@]	Comments
926.4 *5*	4.0 *2*	4296.4	27/2$^-$	3370.0	23/2$^-$	(E2)		E_γ: other: 926.2 *3* (1994Re06). Mult.: R(angular)=1.7 *2*, DCO(Q)=1.15 *16*.
963.0 *5*	0.6 *1*	1425.4	13/2$^-$	462.9	11/2$^-$	(M1+E2)	−0.08 *21*	E_γ: other: 962.3 *3* (1994Re06). Mult.: DCO(Q)=0.52 *19*.
974.0 *5*	1.1 *2*	5671.8	33/2$^+$	4697.8	29/2$^+$	(E2)		Mult.: R(angular)=1.39 *9*.
1014.8 *5*	7.3 *1*	5261.5	33/2$^+$	4246.7	29/2$^+$	(E2)		E_γ: other: 1014.4 *2* (1994Re06). Mult.: R(angular)=1.40 *13*, DCO(Q)=0.94 *8*.
1029.6 *5*	8.2 *2*	5051.1	31/2$^-$	4021.7	27/2$^-$	(E2)		B(E2)↓=0.043 *5* E_γ: other: 1029.3 *2* (1994Re06). Mult.: R(angular)=1.54 *6*, DCO(Q)=1.04 *16*.
1031.8 *5*	0.30 *5*	1854.3	13/2$^+$	822.5	9/2$^+$	(E2)		Mult.: R(angular)=1.15 *13*.
1035.0 *5*	0.4 *2*	3897.5	25/2$^-$	2862.1	23/2$^-$			
1039.0 *5*	4.0 *1*	7010.8	39/2$^-$	5971.8	35/2$^-$	(E2)		E_γ: other: 1037.9 *2* (1994Re06). Mult.: R(angular)=1.36 *3*, DCO(Q)=0.87 *20*; R(angular) is for 1039γ+1040.7γ.
1040.7 *1*	42.5 *4*	2862.1	23/2$^-$	1821.3	19/2$^-$	E2		E_γ: other: 1040.8 *3* (1994Re06). Mult.: R(angular)=1.36 *3*, DCO(Q)=0.96 *5*, R(angular) is for 1039γ+1040.7γ.
1045.2 *5*	6.5 *8*	2865.9	21/2$^{(+)}$	1821.3	19/2$^-$	(E1)		Mult.: R(angular)=0.80 *14*.
1046.0 *5*	1.0 *1*	4088.2	25/2$^-$	3042.5	21/2$^-$	(E2)		Mult.: R(angular)=1.39 *9*.
1048.1 *5*	0.4 *2*	4458.6	27/2$^-$	3411.0	23/2$^-$	(E2)		Mult.: R(angular)=1.7 *3*.
1048.4 *5*	0.4 *2*	3910.4	25/2$^+$	2862.1	23/2$^-$			
1050.6 *5*	5.2 *2*	5775.6	35/2$^+$	4725.0	31/2$^+$	(E2)		E_γ: other: 1049.7 *3* (1994Re06). Mult.: R(angular)=1.27 *10*, DCO(Q)=1.08 *13*.
1072.0 *5*	1.5 *3*	6154.9	35/2$^+$	5082.9	31/2$^+$	(E2)		Mult.: R(angular)=1.5 *2*.
1075.3 *3*	1.5 *2*	2141.6	15/2$^+$	1066.3	11/2$^+$	(E2)		E_γ: from 1994Re06. 1075.7 *5* from 1994Ju05. Mult.: R(angular)=1.40 *7*, DCO(Q)=1.06 *22*.
1120.8 *5*	5.7 *1*	2942.1	19/2$^+$	1821.3	19/2$^-$	(E1)		E_γ: other: 1120.4 *2* (1994Re06). R(angular)=1.37 *9*, DCO(Q)=0.78 *12*.
1142.0 *5*	<0.3	5082.9	31/2$^+$	3939.9	27/2$^+$			
1152.4 *5*	2.8 *1*	2973.9	21/2$^-$	1821.3	19/2$^-$			Mult.: R(angular)=1.8 *3*.
1159.6 *1*	12.8 *4*	4021.7	27/2$^-$	2862.1	23/2$^-$	(E2)		E_γ: other: 1159.2 *2* (1994Re06). Mult.: R(angular)=1.44 *5*, DCO(Q)= 0.96 *10*.
1168.5 *5*	0.5 *1*	4030.3	25/2$^-$	2862.1	23/2$^-$			
1180.4 *2*	6.0 *1*	2165.9	17/2$^-$	985.4	15/2$^-$	(M1+E2)	0.13 *27*	E_γ: from 1994Re06. 1180.9 5 from 1994Ju05. R(angular)=2.0 *2*, DCO(Q)=0.71 *26*.
1188.0 *5*	0.3 *1*	3353.9	21/2$^-$	2165.9	17/2$^-$			E_γ: other: 1187.3 *8* (1994Re06).
1190.0 *5*	0.3 *1*	6861.9	(37/2$^+$)	5671.8	33/2$^+$			
1191.2 *5*	0.20 *5*	5279.0	29/2$^-$	4088.2	25/2$^-$	(E2)		Mult.: R(angular)=1.4 *2*.
1191.6 *5*	2.5 *2*	8202.5	43/2$^-$	7010.8	39/2$^-$	(E2)		E_γ: other: 1191.4 *2* (1994Re06). Mult.: R(angular)=1.5 *2*, DCO(Q)=1.11 *24*.
1196[‡] *1*		5787.9	(31/2$^-$)	4591.1	(27/2$^-$)			
1199[‡] *1*		5287.4	(29/2$^-$)	4088.2	25/2$^-$			
1221.2 *5*	3.0 *2*	3042.5	21/2$^-$	1821.3	19/2$^-$	(M1)		Mult.: R(angular)=1.33 *11*.
1225.1 *5*	0.57 *5*	5122.6	29/2$^-$	3897.5	25/2$^-$	(E2)		Mult.: R(angular)=1.37 *14*.
1230.0 *5*	0.3 *1*	7384.9	(39/2$^+$)	6154.9	35/2$^+$	(E2)		
1237.8 *1*	30.5 *3*	3059.1	21/2$^+$	1821.3	19/2$^-$	(E1)		E_γ: other: 1237.3 *1* (1994Re06). Mult.: R(angular)=0.81 *3*, DCO(Q)=0.53 *3*.
1249.0 *5*	0.6 *1*	5279.0	29/2$^-$	4030.3	25/2$^-$	(E2)		Mult.: R(angular)=1.6 *2*.
1257.3 *5*	4.1 *3*	6518.8	37/2$^+$	5261.5	33/2$^+$	(E2)		E_γ: other: 1256.7 *3* (1994Re06). Mult.: R(angular)=1.41 *12*, DCO(Q)=0.99 *10*.
1271.0 *5*	0.3 *1*	5861.9	(31/2$^-$)	4591.1	(27/2$^-$)			
1271[‡] *1*		5996.1	31/2$^+$	4725.0	31/2$^+$			
1280[‡] *1*		6004.2	31/2$^+$	4725.0	31/2$^+$			
1292.0 *5*	0.6 *2*	4154.1		2862.1	23/2$^-$			

Continued on next page (footnotes at end of table)

^{96}Zr(^{18}O,5nγ) 1994Ju05,2000Ch04,1994Re06 (continued)

γ(^{109}Cd) (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	Comments
1302.0 *5*	2.5 *4*	7077.6	39/2$^+$	5775.6	35/2$^+$	(E2)	E_γ: other: 1301.6 *3* (1994Re06). Mult.: R(angular)=1.40 *13*, DCO(Q)=1.05 *17*.
1327.0 *5*	0.4 *1*	5623.4		4296.4	27/2$^-$		Mult.: R(angular)=1.0 *2*.
1367.0 *5*	1.1 *1*	9569.5	47/2$^-$	8202.5	43/2$^-$	(E2)	E_γ: other: 1366.8 *3* (1994Re06). Mult.: R(angular)=1.40 *14*, DCO(Q)=0.86 *17*.
1378.0 *5*	1.2 *1*	5399.7	31/2$^-$	4021.7	27/2$^-$	(E2)	Mult.: R(angular)=1.27 *13*.
1381[‡] *1*		4950.2	(27/2$^+$)	3568.7	23/2$^{(+)}$		
1390.4 *5*	1.4 *2*	7909.2	41/2$^+$	6518.8	37/2$^+$	(E2)	E_γ: other: 1389.6 *4* (1994Re06). Mult.: R(angular)=1.29 *11*, DCO(Q)=0.85 *20*.
1426.6 *5*	0.75 *7*	4292.6	25/2$^{(+)}$	2865.9	21/2$^{(+)}$	(E2)	Mult.: R(angular)=1.39 *14*.
1435[‡] *1*		3256.6	(21/2$^-$)	1821.3	19/2$^-$		E_γ: other: 1435.8 *8* (1994Re06).
1468.9 *5*	0.5 *2*	9378.2	(45/2$^+$)	7909.2	41/2$^+$		E_γ: other: 1460.0 *5* (1994Re06).
1521.4 *5*	1.0 *1*	8599.0	43/2$^+$	7077.6	39/2$^+$	(E2)	E_γ: other: 1520.9 *4* (1994Re06). Mult.: R(angular)=1.5 *2*, DCO(Q)=0.91 *18*.
1522.0 *5*	0.4 *1*	6573.2		5051.1	31/2$^-$		
1532.5 *5*	0.3 *1*	3353.9	21/2$^-$	1821.3	19/2$^-$		E_γ: other: 1531.7 *5* (1994Re06).
1548.5 *5*	3.1 *2*	3370.0	23/2$^-$	1821.3	19/2$^-$	(E2)	E_γ: other: 1548.1 *3* (1994Re06). Mult.: R(angular)=1.50 *10*, DCO(Q)=1.05 *3*.
1563.0 *5*	<0.5	11132.5	(51/2$^-$)	9569.5	47/2$^-$		E_γ: other: 1564.5 *5* (1994Re06).
1590[‡] *1*		6004.2	31/2$^+$	4413.7	(27/2$^+$)		
1591.0 *5*	0.6 *1*	3411.0	23/2$^-$	1821.3	19/2$^-$		
1596.0 *5*	0.2 *1*	4458.6	27/2$^-$	2862.1	23/2$^-$		
1604.5 *5*	3.9 *2*	2589.8	19/2$^-$	985.4	15/2$^-$	(E2)	E_γ: other: 1604.1 *4* (1994Re06). Mult.: R(angular)=1.41 *11*, DCO(Q)=1.12 *18*.
1612.0 *5*	0.2 *1*	5227.3		3615.3	23/2$^-$		
1701.8 *5*	1.0 *1*	2687.3	17/2$^+$	985.4	15/2$^-$	(E1)	Mult.: R(angular)=0.79 *10*, both for 1701.8γ+1702.8γ.
1702.8 *5*	0.5 *1*	3524.3	21/2$^+$	1821.3	19/2$^-$		Mult.: R(angular)=0.79 *10*, R(angular) is for 1701.8γ+1702.8γ.
1715.0 *5*	0.87 *10*	2700.4	19/2$^-$	985.4	15/2$^-$	(E2)	Mult.: R(angular)=1.4 *2*.
1729.0 *5*	0.6 *2*	4591.1	(27/2$^-$)	2862.1	23/2$^-$	(E2)	Mult.: R(angular)=1.5 *4*.
1793.8 *5*	0.8 *1*	3615.3	23/2$^-$	1821.3	19/2$^-$	(E2)	Mult.: R(angular)=1.8 *4*.
2056[‡] *1*		5996.1	31/2$^+$	3939.9	27/2$^+$		
2064[‡] *1*		6004.2	31/2$^+$	3939.9	27/2$^+$		

[†] From ^{96}Zr(^{18}O,5nγ) in 1994Ju05, unless otherwise noted. Evaluators assigned $\Delta E\gamma$ according to author's statement in Table 1 (1994Ju05) that the $\Delta E\gamma$=0.1 keV for the strong transitions, rising to 0.5 keV for the weak ones: $\Delta E\gamma$=0.1 keV for I(γ) ≥ 10, $\Delta E\gamma$=0.5 keV for others; $\Delta E\gamma$=1 keV for transitions from 2000Ch04.

[‡] From 2000Ch04 only.

[#] Base on R(angular) (1994Ju05) and DCO ratio (1994Re06) measurements. (R(angular)=I_γ(143° or 37°)/I_γ(79° or 101°)). For ΔI=0 dipole and ΔI=2 quadrupole transitions R(angular)≈1.3-1.5, for stretched dipole transitions R(angular)≈0.80. DCO (R_{DCO} in 1994Re06)=[I(γ_1) observed at 37° gated on γ_2 at 90°]/[I(γ_1) observed at 79° gated on γ_2 at 37°]. Expected values are: 0.56 for ΔJ=1, dipole and 1.0 for ΔJ=2, with gate on ΔJ=2 quadrupole; 1.0 for ΔJ=1, dipole, with gate on ΔJ=1 dipole.

[@] From 1994Re06, based on rigid rotor model.

^{96}Zr(^{18}O,5nγ) 1994Ju05,2000Ch04,1994Re06

Level Scheme

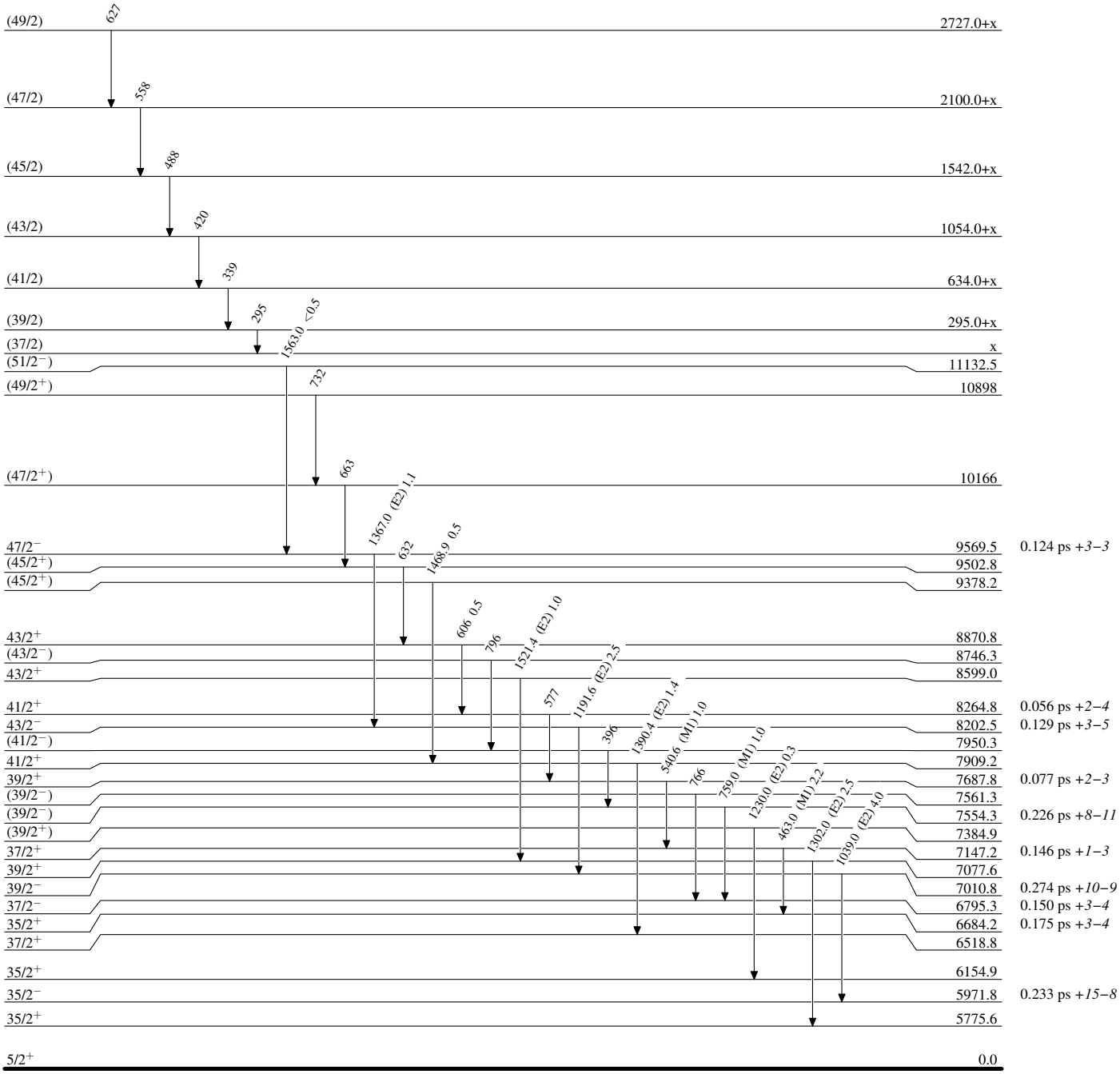
Intensities: Relative I_γ

Legend

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

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

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



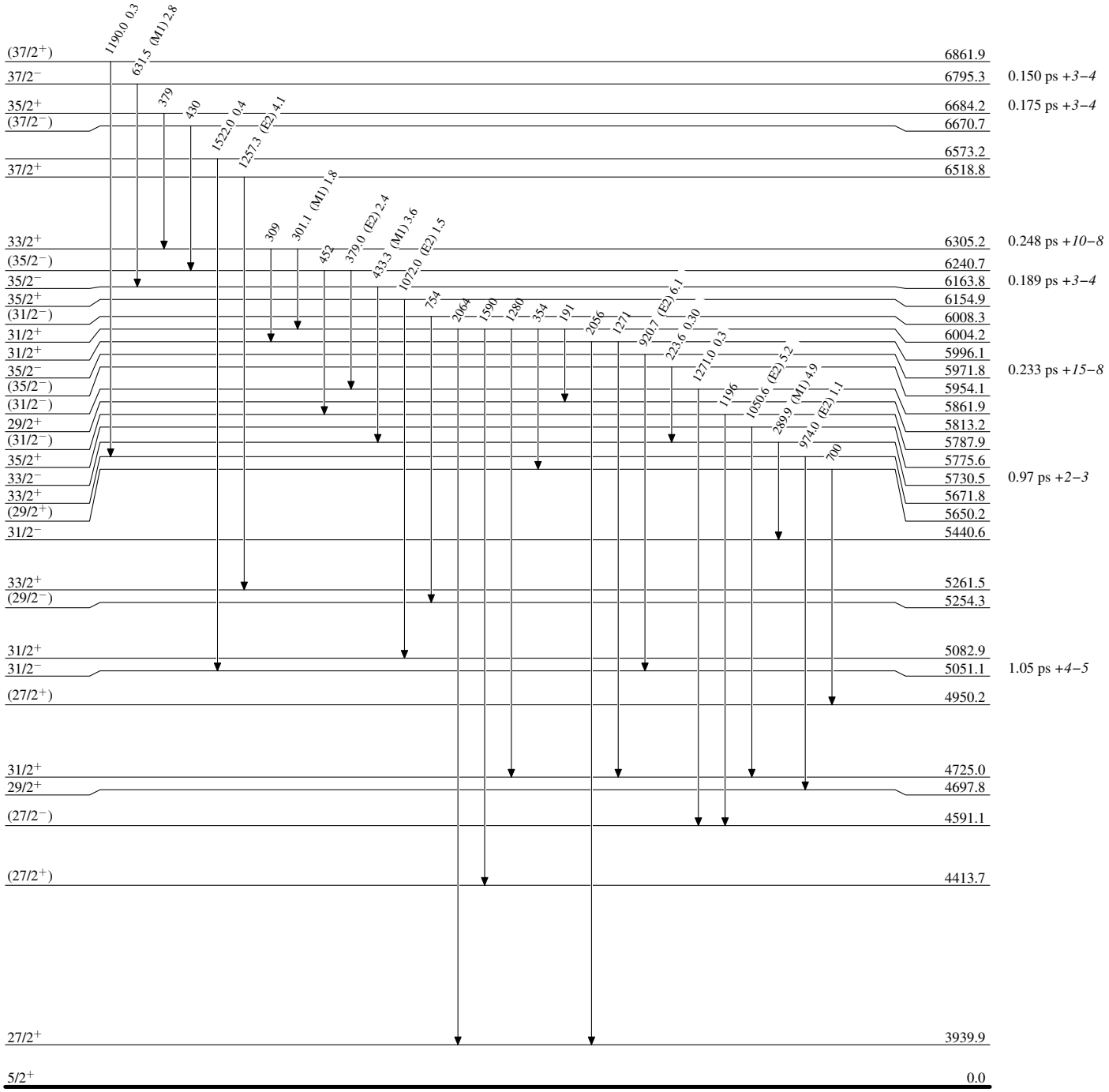
$^{109}_{48}Cd_{61}$

$^{96}Zr(^{18}O,5n\gamma)$ 1994Ju05,2000Ch04,1994Re06

Level Scheme (continued)

Intensities: Relative I_γ

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



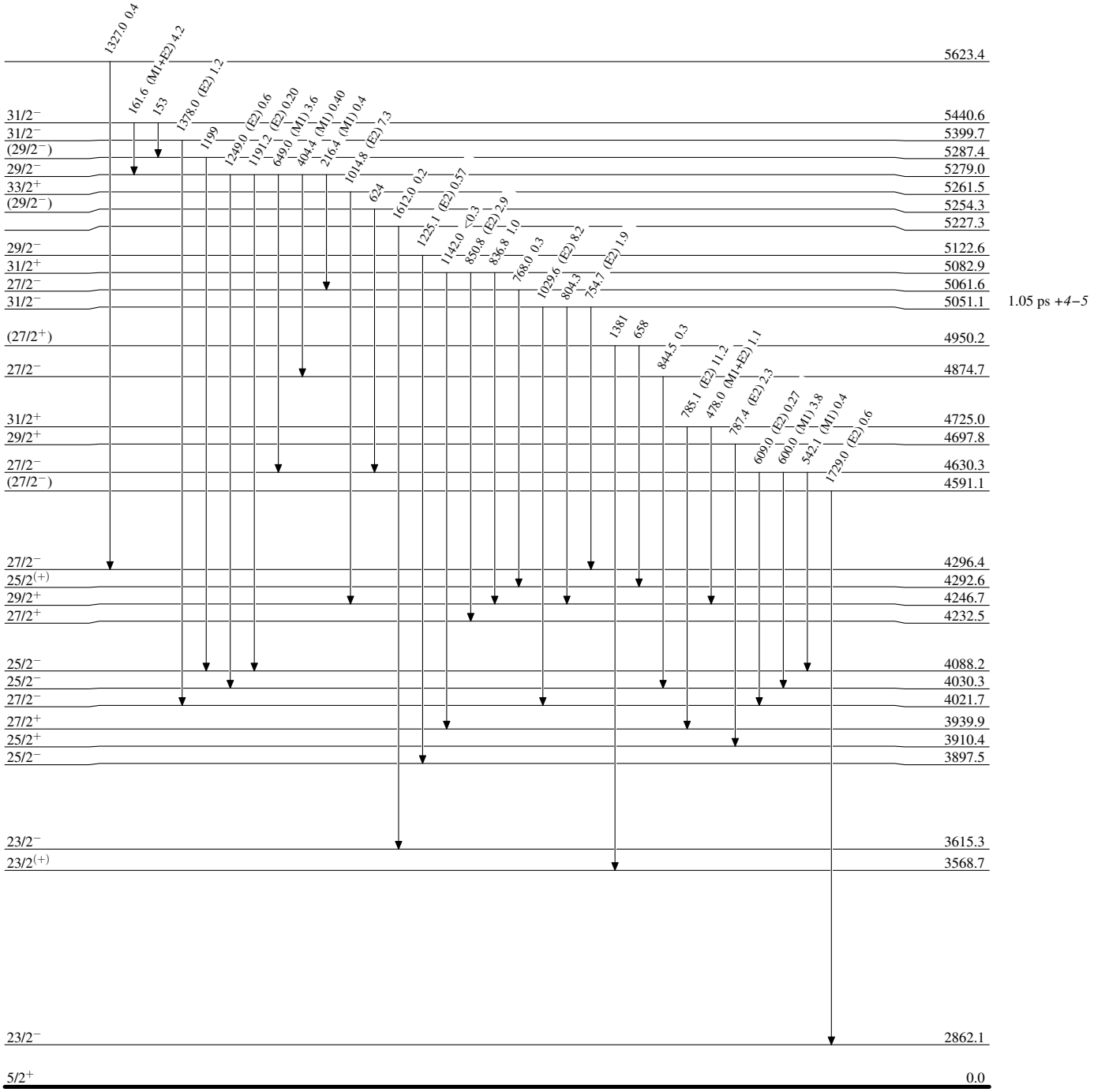
$^{109}_{48}Cd_{61}$

$^{96}Zr(^{18}O,5n\gamma)$ 1994Ju05,2000Ch04,1994Re06

Level Scheme (continued)

Intensities: Relative I_γ

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



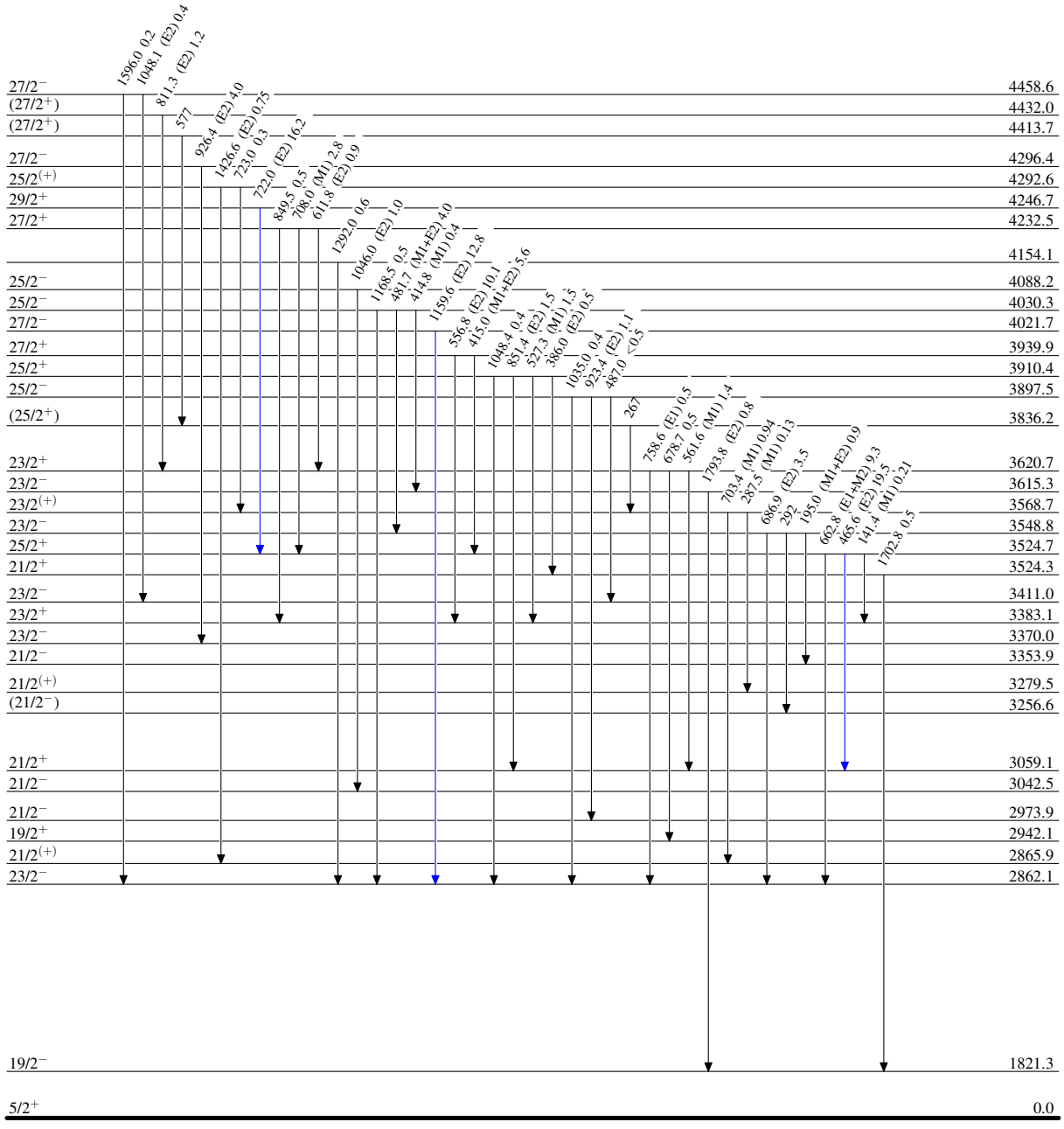
$^{109}_{48}Cd_{61}$

$^{96}Zr(^{18}O,5n\gamma)$ 1994Ju05,2000Ch04,1994Re06

Level Scheme (continued)

Intensities: Relative I_γ

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



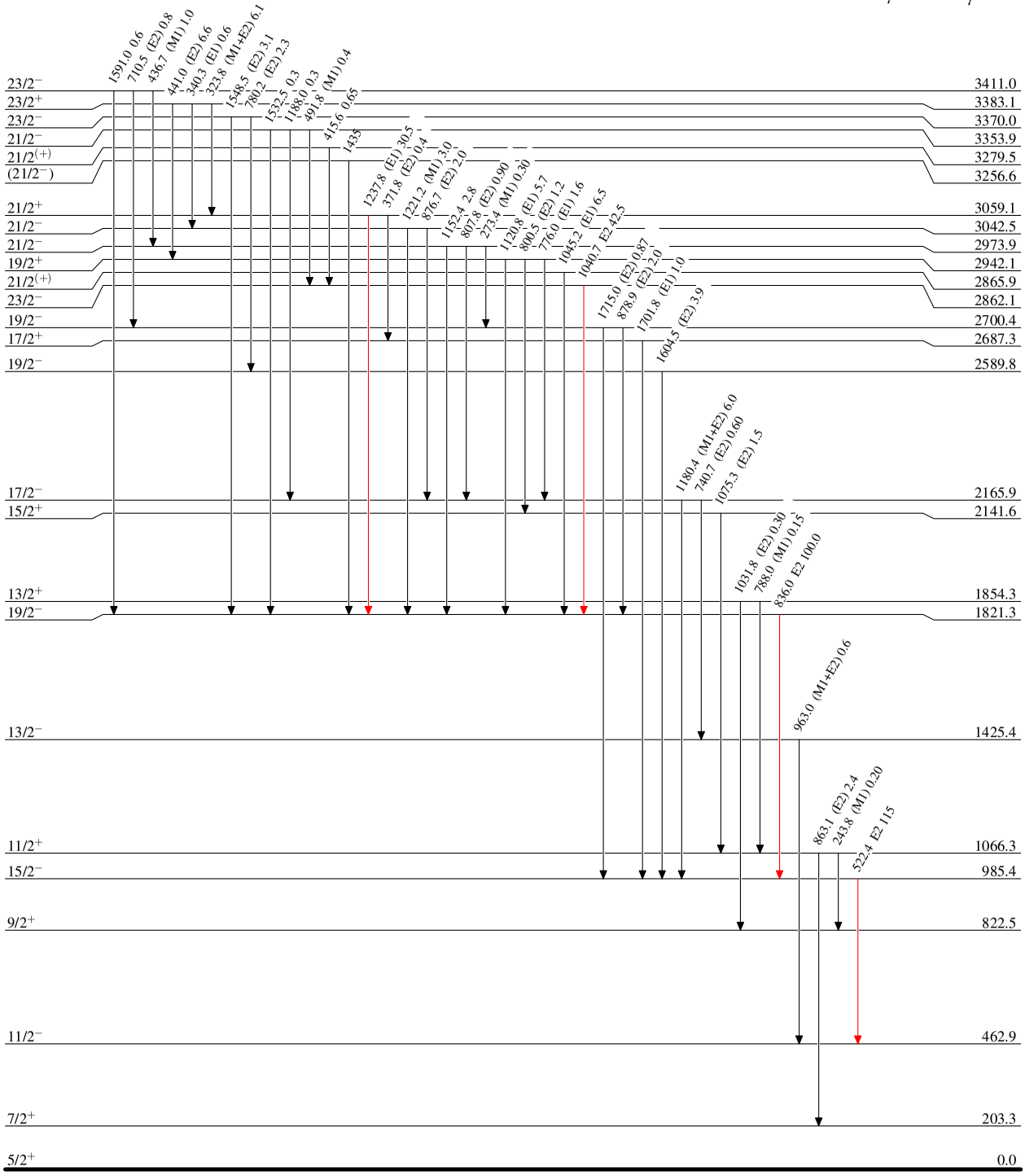
$^{109}_{48}Cd_{61}$

^{96}Zr(^{18}O,5nγ) 1994Ju05,2000Ch04,1994Re06

Level Scheme (continued)

Intensities: Relative I_γ

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

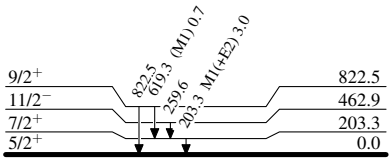


$^{109}_{48}Cd_{61}$

^{96}Zr(^{18}O,5nγ) 1994Ju05,2000Ch04,1994Re06

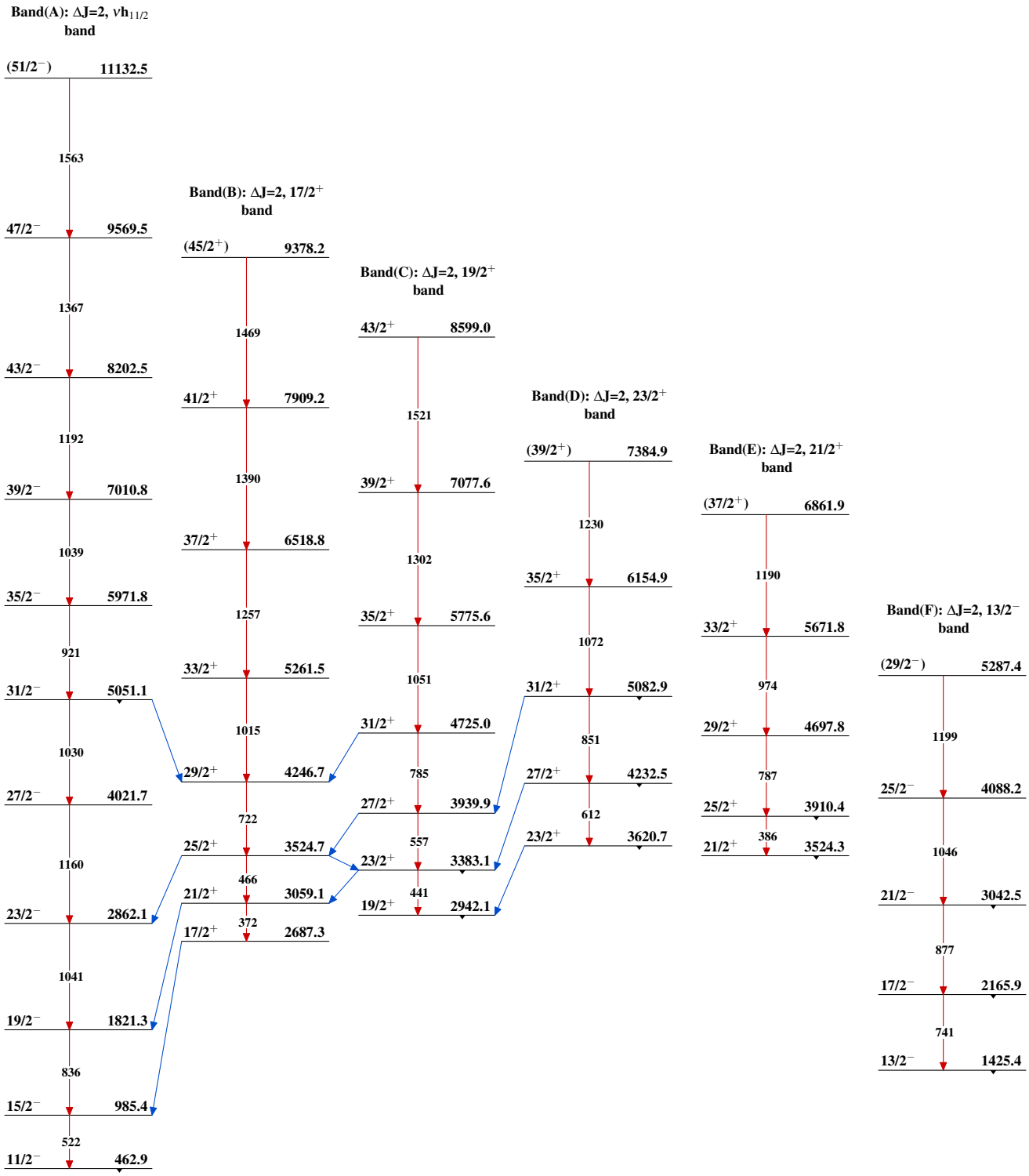
Level Scheme (continued)

Intensities: Relative I_γ



$^{109}_{48}Cd_{61}$

$^{96}Zr(^{18}O,5n\gamma)$ 1994Ju05,2000Ch04,1994Re06



$^{109}_{48}Cd_{61}$

$^{96}Zr(^{18}O,5n\gamma)$ 1994Ju05,2000Ch04,1994Re06 (continued)