^{96}Zr(^{19}F,4nγ) 1998Va03

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	NDS 110, 1239 (2009)	1-Feb-2008

Additional information 1.

1998Va03 (also 1993Mu19): ^{96}Zr(^{19}F,4nγ) E=72 MeV. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma(\theta)$(DCO) using a six-detector Ge detectors and 14-detector BGO filter. Cranked-shell model calculations.

^{111}In Levels

E(level)[†]	J$^\pi$[‡]	Comments
0.0	9/2$^+$	Configuration=((π g$_{9/2}$)$^{-1}$.
1101.77[#] *19*	5/2$^+$	
1152.94[d] *8*	11/2$^+$	configuration=$\pi g_{9/2}^{-1}$ coupled to 2$^+$ In ^{112}Sn.
1401.18[d] *8*	13/2$^+$	configuration=$\pi g_{9/2}^{-1}$ coupled to 2$^+$ In ^{112}Sn.
1500.49[&] *9*	7/2$^+$	
1752.94[#] *23*	(9/2$^+$)	
1994.81[d] *9*	15/2$^+$	configuration=$\pi g_{9/2}^{-1}$ coupled to 4$^+$ In ^{112}Sn.
2032.21[&] *11*	11/2$^+$	
2228.30[j] *10*	13/2$^+$	
2235.32[f] *10*	13/2$^-$	
2361.62[@] *20*	9/2$^+$	
2402.30[f] *10*	15/2$^-$	
2439.92 *11*	15/2$^+$	
2461.82[d] *9*	17/2$^+$	configuration=$\pi g_{9/2}^{-1}$ coupled to 4$^+$ In ^{112}Sn.
2580.9[#] *3*	(13/2$^+$)	
2614.13[f] *10*	17/2$^-$	
2619.11[f] *11*	19/2$^-$	
2650.43[i] *23*	15/2$^-$	
2707.59 *13*	15/2$^+$	
2716.99[d] *11*	21/2$^+$	configuration=$\pi g_{9/2}\nu(d_{5/2}g_{7/2})$ for this isomer ($T_{1/2}$=13.7 ns).
2742.78[f] *11*	21/2$^-$	
2748.95[j] *9*	15/2$^+$	
2769.09[i] *11*	17/2$^-$	
2772.33[&] *11*	15/2$^+$	
2780.23 *10*	19/2$^+$	
2826.47 *12*	17/2$^+$	
2830.40[@] *13*	13/2$^+$	
2905.29 *16*	(17/2$^+$)	
2919.48 *10*	15/2$^+$	
2979.74[i] *11*	19/2$^-$	
3024.63[f] *11*	23/2$^-$	
3039.49 *17*	17/2$^+$	
3043.85 *11*	19/2$^-$	
3157.73[i] *11*	21/2$^-$	
3195.45[j] *9*	17/2$^+$	
3363.48 *12*	(21/2$^-$)	
3425.72 *13*	(19/2$^-$)	
3436.27[@] *13*	17/2$^+$	
3453.38[i] *14*	23/2$^-$	
3461.24[e] *10*	19/2$^+$	

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$^{96}Zr(^{19}F,4n\gamma)$ 1998Va03 (continued)

^{111}In Levels (continued)

E(level)[†]	Jπ[‡]
3466.64[f] *14*	25/2⁻
3565.72[j] *10*	19/2⁺
3583.08 *16*	(23/2⁻)
3588.75[e] *10*	21/2⁺
3599.97[&] *13*	19/2⁺
3707.76[e] *11*	23/2⁺
3865.15 *17*	(23/2)⁺
3907.76[j] *10*	21/2⁺
3912.07[e] *12*	25/2⁺
3971.29[b] *10*	21/2⁺
4019.07[i] *17*	25/2⁻
4109.77 *13*	25/2⁺
4126.04[k] *13*	25/2⁻
4132.67[@] *17*	21/2⁺
4204.70[f] *15*	27/2⁻
4283.46[e] *13*	27/2⁺
4310.37[b] *11*	25/2⁺
4395.40 *14*	23/2⁺
4473.39[k] *13*	27/2⁻
4501.08[&] *24*	(23/2⁺)
4745.58[i] *20*	(27/2⁻)
4796.70[e] *14*	29/2⁺
4821.38[@] *19*	25/2⁺
4873.34 *13*	27/2⁺
4884.57 *14*	27/2⁺
4917.93[f] *16*	29/2⁻
4931.95[c] *12*	27/2⁺
4957.08[b] *14*	29/2⁺
4972.88 *19*	(23/2⁺)
5084.95[k] *15*	29/2⁻
5166.77[c] *13*	29/2⁺
5331.71[e] *15*	31/2⁺
5398.77[c] *16*	31/2⁺
5402.25[k] *18*	31/2⁻
5509.84 *17*	31/2⁺
5586.08[@] *22*	29/2⁺
5670.45[k] *21*	33/2⁻
5678.06[c] *19*	33/2⁺
5691.1[f] *4*	(31/2⁻)
5783.89 *22*	(27/2⁺)
5878.12[e] *16*	(33/2⁺)
5891.68[b] *16*	(33/2⁺)
6037.49[a] *17*	31/2⁺
6050.96[c] *22*	35/2⁺
6070.35[k] *23*	35/2⁻
6432.9[@] *3*	(33/2⁺)
6538.07[c] *24*	(37/2⁺)
6700.79[a] *20*	35/2⁺
7044.43[b] *18*	(37/2⁺)

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^{96}Zr(^{19}F,4nγ) 1998Va03 (continued)

^{111}In Levels (continued)

E(level)[†]	Jπ[‡]	Comments
7175.2[c] 3	(39/2+)	
7280.4[@] 5	(37/2+)	
7605.79[a] 22	(39/2+)	
7917.1[c] 3	(41/2+)	
8183.2[@] 5	(41/2+)	
8335.8[b] 3	(41/2+)	
8681.1[c] 4	(43/2+)	
8811.4[a] 3	(43/2+)	
9213.8[@] 5	(45/2+)	
10432.9[@] 6	(49/2+)	
11868.3[@] 8	(53/2+)	
13502.8[@] 10	(57/2+)	
0+x[g]	(31/2−)	E(level): x≈5500.
390.5+x[g] 1	(33/2−)	
794.7+x[g] 2	(35/2−)	
1244.3+x[g] 2	(37/2−)	
1774.1+x[g] 2	(39/2−)	
2354.6+x[g] 2	(41/2−)	
0+y[h]	(23/2−)	
705.7+y[h] 2	(27/2−)	
1518.9+y[h] 2	(31/2−)	
2410.6+y[h] 3	(35/2−)	
3363.0+y[h] 3	(39/2−)	
4400.1+y[h] 3	(43/2−)	
5508.4+y[h] 4	(47/2−)	
6714.5+y[h] 4	(51/2−)	
8025.0+y[h] 5	(55/2−)	
9403.1+y[h] 6	(59/2−)	
10850.1+y[h] 10	(63/2−)	

† From least-squares fit (by compiler) to Eγ′s.
‡ From 1998Va03, based on their $\gamma\gamma(\theta)$(DCO) data and band assignments.
# Band(A): band 1.
@ Band(B): band 2.
& Band(C): band 3: $\pi g_{7/2}g_{9/2}^{-2}$.
a Band(D): band 4.
b Band(E): band 5.
c Band(F): band 6: magnetic-rotational (ΔJ=1) (?). Possible Configuration=$((\pi\ g_{9/2})^{-1}(\nu\ h_{11/2})^{+2}(\nu\ g_{7/2})^{+2})$.
d Band(G): band 7.
e Band(H): band 8: magnetic-rotational (ΔJ=1) (?). Possible Configuration=$((\pi\ g_{9/2})^{-1}(\nu\ h_{11/2})^{+2})$.
f Band(I): band 9.
g Band(J): band 10: magnetic-rotational (ΔJ=1) (?). Possible configuration=$\pi(g_{9/2}g_{9/2}^{-2})\nu(h_{11/2}g_{7/2}(d_{5/2}))$.
h Band(K): band 11: $\pi h_{11/2}g_{9/2}^{-2}$.
i Band(L): band 12.
j Band(M): cascade 1.
k Band(N): cascade 2.

^{96}Zr(^{19}F,4nγ) 1998Va03 (continued)

γ(^{111}In)

R(DCO)′s are from backed-target data with gates on ΔJ=2, E2 transitions, unless otherwise stated.

E_γ	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	Comments
(5.0)		2619.11	19/2⁻	2614.13	17/2⁻	[M1,E2]	
118.8[@]		2769.09	17/2⁻	2650.43	15/2⁻	[M1,E2]	
118.8 1	14.9 8	3707.76	23/2⁺	3588.75	21/2⁺	M1,E2	R(DCO)=0.50 2.
123.5 1	31.7 16	2742.78	21/2⁻	2619.11	19/2⁻	M1,E2	R(DCO)=0.48 1.
127.4 1	3.5[‡] 2	3588.75	21/2⁺	3461.24	19/2⁺	M1,E2	I_γ: 8.1 4 In thin-target data. R(DCO)=0.47 2.
128.8 1	0.9 1	2742.78	21/2⁻	2614.13	17/2⁻	[E2]	
152.2 2	0.3 1	2614.13	17/2⁻	2461.82	17/2⁺	E1	R(DCO)=1.0 5.
157.1 2	0.2 1	2619.11	19/2⁻	2461.82	17/2⁺	E1	R(DCO)=0.63 26.
166.9 1	1.2 1	2402.30	15/2⁻	2235.32	13/2⁻	M1,E2	R(DCO)=1.14 8 (ΔJ=1, dipole gated).
177.8 1	5.1 3	3157.73	21/2⁻	2979.74	19/2⁻	M1,E2	R(DCO)=0.48 2.
197.7 1	0.6 1	2905.29	(17/2⁺)	2707.59	15/2⁺	[M1,E2]	
204.1 1	36.0 18	3912.07	25/2⁺	3707.76	23/2⁺	M1,E2	R(DCO)=0.43 1.
210.4 1	5.2 4	2979.74	19/2⁻	2769.09	17/2⁻	[M1,E2]	
211.7 1	60 3	2614.13	17/2⁻	2402.30	15/2⁻	M1,E2	R(DCO)=0.49 1.
219.6 1	1.2 1	3583.08	(23/2⁻)	3363.48	(21/2⁻)	[M1,E2]	
232.0 1	17.4 9	5398.77	31/2⁺	5166.77	29/2⁺	M1,E2	R(DCO)=0.45 2.
234.8 1	10.3 5	5166.77	29/2⁺	4931.95	27/2⁺	M1,E2	R(DCO)=0.45 2.
248.1 1	5.4 4	1401.18	13/2⁺	1152.94	11/2⁺	M1,E2	R(DCO)=0.49 8.
255.3 1	3.0 1	2716.99	21/2⁺	2461.82	17/2⁺	E2	R(DCO)=0.90 3.
268.2 1	3.4 2	5670.45	33/2⁻	5402.25	31/2⁻	M1,E2	R(DCO)=0.45 4.
274.9 1	1.7 1	3043.85	19/2⁻	2769.09	17/2⁻	M1,E2	R(DCO)=0.48 6 for a mixed line.
276.1 1	0.4[‡] 1	3195.45	17/2⁺	2919.48	15/2⁺	M1,E2	I_γ: 0.2 1 In thin-target data. R(DCO)=0.59 11.
279.3 1	17.1 9	5678.06	33/2⁺	5398.77	31/2⁺	M1,E2	R(DCO)=0.39 2.
281.7 1	30.6 15	3024.63	23/2⁻	2742.78	21/2⁻	M1,E2	R(DCO)=0.44 1.
282.1 1	2.7 2	5166.77	29/2⁺	4884.57	27/2⁺	M1,E2	R(DCO)=0.48 6.
295.7 1	4.3 2	3453.38	23/2⁻	3157.73	21/2⁻	M1,E2	R(DCO)=0.41 3.
317.3 1	3.9 2	5402.25	31/2⁻	5084.95	29/2⁻	M1,E2	R(DCO)=0.50 4.
318.3 1	0.7 1	2780.23	19/2⁺	2461.82	17/2⁺	M1,E2	R(DCO)=0.57 10.
319.6 1	0.7 1	3363.48	(21/2⁻)	3043.85	19/2⁻	[M1,E2]	
328.8 2	0.3 1	2769.09	17/2⁻	2439.92	15/2⁺	[E1]	
339.1 1	2.5[‡] 1	4310.37	25/2⁺	3971.29	21/2⁺	E2	I_γ: 5.3 3 In thin-target data. R(DCO)=0.92 8.
341.8 1	0.7[‡] 1	3907.76	21/2⁺	3565.72	19/2⁺	M1,E2	I_γ: 0.1 1 In thin-target data. R(DCO)=0.79 11.
347.4 1	0.4 1	4473.39	27/2⁻	4126.04	25/2⁻	M1,E2	R(DCO)=0.66 7 (ΔJ=1, dipole gated).
360.7 1	2.2 2	2979.74	19/2⁻	2619.11	19/2⁻	M1,E2	R(DCO)=0.82 9.
366.8 1	4.6 4	2769.09	17/2⁻	2402.30	15/2⁻	M1,E2	R(DCO)=0.63 3.
369.6[@]		5166.77	29/2⁺	4796.70	29/2⁺	[M1,E2]	
370.4 1	1.2[‡] 1	3565.72	19/2⁺	3195.45	17/2⁺	M1,E2	I_γ: 0.1 1 In thin-target data. R(DCO)=0.75 13.
371.3 1	34.9 18	4283.46	27/2⁺	3912.07	25/2⁺	M1,E2	R(DCO)=0.42 3.
371.6[@]		4873.34	27/2⁺	4501.08	(23/2⁺)	[E2]	
372.9 1	15.7 8	6050.96	35/2⁺	5678.06	33/2⁺	M1,E2	R(DCO)=0.48 2.
381.8 1	0.4[‡] 1	3425.72	(19/2⁻)	3043.85	19/2⁻	[M1,E2]	I_γ: 0.7 1 In thin-target data.
386.7 9	0.1[‡] 1	2826.47	17/2⁺	2439.92	15/2⁺	[M1,E2]	
390.5 1	2.7 2	390.5+x	(33/2⁻)	0+x	(31/2⁻)	(M1,E2)	R(DCO)=0.24 8 (ΔJ=1, dipole gated).
399.9 1	2.5 1	6070.35	35/2⁻	5670.45	33/2⁻	M1,E2	R(DCO)=0.62 5 (ΔJ=1, dipole gated).

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$^{96}Zr(^{19}F,4n\gamma)$ 1998Va03 (continued)

$\gamma(^{111}In)$ (continued)

E_γ	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	Comments
402.7 *1*	1.3[‡] *1*	4310.37	25/2+	3907.76	21/2+	E2	I_γ: 2.7 *2* In thin-target data. R(DCO)=0.98 *10*.
404.2 *1*	9.2 *5*	794.7+x	(35/2−)	390.5+x	(33/2−)	(M1,E2)	R(DCO)=0.44 *4* (ΔJ=1, dipole gated).
405.6 *1*	1.5 *2*	3971.29	21/2+	3565.72	19/2+	M1,E2	R(DCO)=0.58 *4*.
415.0 *1*	0.9 *1*	3157.73	21/2−	2742.78	21/2−	M1,E2	R(DCO)=1.62 *21* (ΔJ=1, dipole gated).
415.1 *2*	0.4[‡] *1*	2650.43	15/2−	2235.32	13/2−	M1,E2	R(DCO)=1.2 *3* (ΔJ=1, dipole gated).
421.7 *3*	0.2[‡] *1*	3461.24	19/2+	3039.49	17/2+	M1,E2	I_γ: 0.8 *1* In thin-target data. R(DCO)=0.21 *13* (ΔJ=1, dipole gated).
428.5 *2*	0.3 *1*	3453.38	23/2−	3024.63	23/2−	M1,E2	R(DCO)=1.4 *4* (ΔJ=1, dipole gated).
429.5 *1*	0.9 *1*	3043.85	19/2−	2614.13	17/2−	M1,E2	R(DCO)=0.75 *11* (ΔJ=1, dipole gated).
442.0 *1*	21.2 *11*	3466.64	25/2−	3024.63	23/2−	M1,E2	R(DCO)=0.37 *1*.
445.2 *2*	0.3[‡] *1*	4310.37	25/2+	3865.15	(23/2)+	[M1,E2]	
446.5 *1*	1.2[‡] *1*	3195.45	17/2+	2748.95	15/2+	M1,E2	I_γ: 0.5 *2* In thin-target data. R(DCO)=0.64 *9*.
449.6 *1*	4.9 *3*	1244.3+x	(37/2−)	794.7+x	(35/2−)	[M1,E2]	
466.9 *1*	18.1 *10*	2461.82	17/2+	1994.81	15/2+	M1,E2	R(DCO)=0.55 *1*.
468.9 *2*	0.2[‡] *1*	2830.40	13/2+	2361.62	9/2+	E2	R(DCO)=1.09 *21*.
478.0 *1*	0.9 *1*	4873.34	27/2+	4395.40	23/2+	[E2]	
487.1 *1*	10.7 *6*	6538.07	(37/2+)	6050.96	35/2+	[M1,E2]	
513.2 *1*	29.7 *15*	4796.70	29/2+	4283.46	27/2+	M1,E2	R(DCO)=0.40 *2*.
520.2 *2*	0.2[‡] *1*	2748.95	15/2+	2228.30	13/2+	[M1,E2]	
529.8 *1*	3.0 *2*	1774.1+x	(39/2−)	1244.3+x	(37/2−)	[M1,E2]	
531.7 *1*	2.4 *4*	2032.21	11/2+	1500.49	7/2+	E2	R(DCO)=0.87 *10*.
533.2[@]		4132.67	21/2+	3599.97	19/2+	[M1,E2]	
534.9 *1*	19.4 *10*	5331.71	31/2+	4796.70	29/2+	[M1,E2]	
538.6 *1*	3.0 *2*	3157.73	21/2−	2619.11	19/2−	M1,E2	R(DCO)=1.04 *14* (ΔJ=1, dipole gated).
546.4 *1*	9.0 *5*	5878.12	(33/2+)	5331.71	31/2+	[M1,E2]	
549.8 *1*	2.6 *1*	3707.76	23/2+	3157.73	21/2−	E1	R(DCO)=0.82 *19* (ΔJ=1, dipole gated).
559.9 *1*	8.9 *5*	5891.68	(33/2+)	5331.71	31/2+	[M1,E2]	
562.9 *1*	2.0 *2*	4873.34	27/2+	4310.37	25/2+	M1,E2	R(DCO)=0.34 *5*.
563.9 *1*	0.6[‡] *1*	3588.75	21/2+	3024.63	23/2−	E1	I_γ: 0.8 *1* In thin-target data. R(DCO)=0.97 *9* (ΔJ=1, dipole gated).
565.7 *1*	2.9 *2*	4019.07	25/2−	3453.38	23/2−	M1,E2	R(DCO)=0.56 *7*.
580.5 *1*	2.3 *2*	2354.6+x	(41/2−)	1774.1+x	(39/2−)	[M1,E2]	
593.6 *1*	34.2 *20*	1994.81	15/2+	1401.18	13/2+	M1,E2	R(DCO)=0.58 *1*.
599.6 *2*	0.5[‡] *1*	3039.49	17/2+	2439.92	15/2+	[M1,E2]	I_γ: 0.4 *3* In thin-target data.
605.9 *1*	3.3 *4*	3436.27	17/2+	2830.40	13/2+	E2	R(DCO)=0.95 *14*.
609.1 *2*	0.4[‡] *1*	3588.75	21/2+	2979.74	19/2−	E1	I_γ: 2.3 *1* In thin-target data. R(DCO)=0.72 *16* (ΔJ=1, dipole gated).
611.5 *1*	1.9 *1*	5084.95	29/2−	4473.39	27/2−	M1,E2	R(DCO)=0.59 *19* (ΔJ=1, dipole gated).
619.4 *1*	5.0 *10*	2614.13	17/2−	1994.81	15/2+	E1	R(DCO)=0.51 *5*.
634.8 *1*	0.8[‡] *1*	3461.24	19/2+	2826.47	17/2+	M1,E2	I_γ: 2.0 *2* In thin-target data. R(DCO)=0.78 *11* (ΔJ=1, dipole gated).
636.5 *1*	2.7 *3*	5509.84	31/2+	4873.34	27/2+	E2	R(DCO)=0.98 *18*.
637.1 *1*	8.2 *4*	7175.2	(39/2+)	6538.07	(37/2+)	[M1,E2]	
646.3 *2*	0.7[‡] *1*	3565.72	19/2+	2919.48	15/2+	E2	R(DCO)=0.94 *7* for 646.3γ+646.8γ.
646.8 *1*	7.0 *4*	4957.08	29/2+	4310.37	25/2+	E2	R(DCO)=0.94 *7* for 646.3γ+646.8γ.
648.4 *1*	3.9 *2*	4931.95	27/2+	4283.46	27/2+	M1,E2	R(DCO)=1.38 *23* (ΔJ=1, dipole gated).
651.1 *2*	0.3[‡] *1*	1752.94	(9/2+)	1101.77	5/2+	[E2]	
663.3 *1*	4.0 *7*	6700.79	35/2+	6037.49	31/2+	E2	R(DCO)=1.05 *21*.
663.9 *1*	0.7 *2*	3436.27	17/2+	2772.33	15/2+	M1,E2	R(DCO)=0.14 *11*.
688.7 *1*	2.2 *2*	4821.38	25/2+	4132.67	21/2+	E2	R(DCO)=0.97 *11*.

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$^{96}Zr(^{19}F,4n\gamma)$ 1998Va03 (continued)

$\gamma(^{111}In)$ (continued)

E_γ	I_γ †	E_i(level)	J^π_i	E_f	J^π_f	Mult.#	Comments
696.4 *1*	2.3 *3*	4132.67	$21/2^+$	3436.27	$17/2^+$	E2	R(DCO)=0.94 *8*.
705.7 *2*	3.0 *2*	705.7+y	$(27/2^-)$	0+y	$(23/2^-)$	(E2)	R(DCO)=1.9 *3* (ΔJ=1, dipole gated).
712.4 *1*	0.9‡ *1*	3907.76	$21/2^+$	3195.45	$17/2^+$	E2	I_γ: 0.1 *1* In thin-target data. R(DCO)=0.98 *18*.
713.1 *1*	4.9 *3*	4917.93	$29/2^-$	4204.70	$27/2^-$	[M1,E2]	
726.5 *1*	0.4 *1*	4745.58	$(27/2^-)$	4019.07	$25/2^-$	[M1,E2]	
738.0 *1*	13.2 *7*	4204.70	$27/2^-$	3466.64	$25/2^-$	M1,E2	R(DCO)=0.42 *2*.
740.1 *1*	1.4‡ *1*	2772.33	$15/2^+$	2032.21	$11/2^+$	E2	I_γ: 1.2 *3* In thin-target data. R(DCO)=1.08 *11*.
741.9 *1*	4.7 *3*	7917.1	$(41/2^+)$	7175.2	$(39/2^+)$	[M1,E2]	
744.4 *1*	0.7 *1*	3363.48	$(21/2^-)$	2619.11	$19/2^-$	[M1,E2]	
762.6 *4*	0.1‡ *1*	3588.75	$21/2^+$	2826.47	$17/2^+$	[E2]	
764.0 *2*	1.6 *1*	8681.1	$(43/2^+)$	7917.1	$(41/2^+)$	[M1,E2]	
764.7 *1*	3.8 *4*	5586.08	$29/2^+$	4821.38	$25/2^+$	E2	R(DCO)=0.84 *12*.
773.2 *3*	1.0 *1*	5691.1	$(31/2^-)$	4917.93	$29/2^-$	[M1,E2]	
774.1 *3*	1.2 *1*	2769.09	$17/2^-$	1994.81	$15/2^+$	[E1]	
774.7 *1*	1.3 *3*	4884.57	$27/2^+$	4109.77	$25/2^+$	M1,E2	R(DCO)=0.52 *6*.
775.9 *1*	0.9 *2*	3971.29	$21/2^+$	3195.45	$17/2^+$	E2	R(DCO)=0.97 *13*.
785.4 *1*	4.4 *4*	2780.23	$19/2^+$	1994.81	$15/2^+$	E2	R(DCO)=1.04 *11*.
795.5 *1*	1.7 *3*	4395.40	$23/2^+$	3599.97	$19/2^+$	E2	R(DCO)=1.00 *13*.
798.2 *1*	0.5‡ *1*	2830.40	$13/2^+$	2032.21	$11/2^+$	M1,E2	I_γ: 1.3 *3* In thin-target data. R(DCO)=0.51 *7*.
806.7 *2*	1.2‡ *1*	3425.72	$(19/2^-)$	2619.11	$19/2^-$	(M1,E2)	I_γ: 1.3 *3* In thin-target data. R(DCO)=0.80 *12* for 806.7γ+808.4γ.
808.4 *2*	0.5‡ *1*	3588.75	$21/2^+$	2780.23	$19/2^+$	M1,E2	I_γ: 0.9 *1* In thin-target data. R(DCO)=0.80 *12* for 806.7γ+808.4γ.
811.0 *1*	2.2 *3*	5783.89	$(27/2^+)$	4972.88	$(23/2^+)$	[E2]	
813.2 *1*	14.3 *9*	1518.9+y	$(31/2^-)$	705.7+y	$(27/2^-)$	[E2]	
816.5 *2*	0.3‡ *1*	3565.72	$19/2^+$	2748.95	$15/2^+$	[E2]	I_γ: 0.1 *1* In thin-target data.
822.3 *1*	2.3 *2*	4931.95	$27/2^+$	4109.77	$25/2^+$	M1,E2	R(DCO)=0.50 *11*.
827.7 *1*	2.2 *4*	3599.97	$19/2^+$	2772.33	$15/2^+$	E2	R(DCO)=0.98 *13*.
828.0 *2*	0.4‡ *1*	2580.9	$(13/2^+)$	1752.94	$(9/2^+)$	[E2]	
832.3 *3*	0.4‡ *1*	2826.47	$17/2^+$	1994.81	$15/2^+$	[M1,E2]	I_γ: 2.2 *4* In thin-target data.
834.2 *2*	2.5 *6*	2235.32	$13/2^-$	1401.18	$13/2^+$	E1	R(DCO)=1.34 *14* (ΔJ=1, dipole gated).
840.2 *1*	1.5 *2*	4972.88	$(23/2^+)$	4132.67	$21/2^+$	M1,E2	R(DCO)=0.80 *18*.
842.0 *1*	1.6 *2*	1994.81	$15/2^+$	1152.94	$11/2^+$	E2	R(DCO)=1.32 *24*.
846.8 *2*	4.0 *3*	6432.9	$(33/2^+)$	5586.08	$29/2^+$	[E2]	
847.5 *3*	7.5 *5*	7280.4	$(37/2^+)$	6432.9	$(33/2^+)$	[E2]	
861.4 *3*	0.1‡ *1*	2361.62	$9/2^+$	1500.49	$7/2^+$	M1,E2	R(DCO)=0.66 *17*.
871.7 *2*	0.7‡ *1*	3588.75	$21/2^+$	2716.99	$21/2^+$	M1,E2	I_γ: 2.0 *3* In thin-target data. R(DCO)=1.11 *11*.
880.3 *1*	4.1 *3*	5084.95	$29/2^-$	4204.70	$27/2^-$	M1,E2	R(DCO)=0.62 *10*.
884.3 *2*	1.2 *2*	4796.70	$29/2^+$	3912.07	$25/2^+$	E2	R(DCO)=1.05 *23* (ΔJ=1, dipole gated).
887.6 *1*	3.4 *2*	3912.07	$25/2^+$	3024.63	$23/2^-$	E1	R(DCO)=0.93 *19* (ΔJ=1, dipole gated).
891.7 *1*	11.6 *7*	2410.6+y	$(35/2^-)$	1518.9+y	$(31/2^-)$	[E2]	
901.1 *2*	0.3‡ *1*	4501.08	$(23/2^+)$	3599.97	$19/2^+$	[E2]	
902.8 *1*	5.1 *4*	8183.2	$(41/2^+)$	7280.4	$(37/2^+)$	[E2]	
905.0 *1*	3.6 *2*	7605.79	$(39/2^+)$	6700.79	$35/2^+$	[E2]	
921.3 *2*	0.3 *2*	5878.12	$(33/2^+)$	4957.08	$29/2^+$	[E2]	
934.8 *3*	1.7 *2*	5891.68	$(33/2^+)$	4957.08	$29/2^+$	[E2]	
952.4 *1*	8.6 *5*	3363.0+y	$(39/2^-)$	2410.6+y	$(35/2^-)$	[E2]	
965.0 *1*	9.7 *5*	3707.76	$23/2^+$	2742.78	$21/2^-$	E1	R(DCO)=0.44 *3*.
967.2 *1*	0.5‡ *1*	3195.45	$17/2^+$	2228.30	$13/2^+$	[E2]	I_γ: 0.2 *1* In thin-target data.

Continued on next page (footnotes at end of table)

$^{96}Zr(^{19}F,4n\gamma)$ 1998Va03 (continued)

$\gamma(^{111}In)$ (continued)

E_γ	I_γ†	E_i(level)	J_i^π	E_f	J_f^π	Mult.#	Comments
969.8 *2*	0.3‡ *1*	3588.75	21/2+	2619.11	19/2−	E1	I_γ: 1.0 *1* In thin-target data. R(DCO)=0.56 *19* (ΔJ=1, dipole gated).
990.9 *1*	3.8 *2*	3707.76	23/2+	2716.99	21/2+	M1,E2	R(DCO)=0.82 *6*.
999.3 *1*	6.4‡ *3*	3461.24	19/2+	2461.82	17/2+	M1,E2	I_γ: 10.7 *7* In thin-target data. R(DCO)=0.77 *9*.
1001.1 *1*	63 *4*	2402.30	15/2−	1401.18	13/2+	E1	R(DCO)=0.51 *1*.
1006.5 *2*	1.7 *2*	4473.39	27/2−	3466.64	25/2−	[M1,E2]	
1019.9 *1*	2.0 *2*	4931.95	27/2+	3912.07	25/2+	[M1,E2]	
1021.4 *2*	0.5‡ *1*	3461.24	19/2+	2439.92	15/2+	[E2]	
1023.6 *2*	0.8‡ *1*	3425.72	(19/2−)	2402.30	15/2−	[E2]	
1030.6 *2*	3.6 *3*	9213.8	(45/2+)	8183.2	(41/2+)	[E2]	
1037.1 *1*	6.1 *4*	4400.1+y	(43/2−)	3363.0+y	(39/2−)	[E2]	
1038.7 *1*	2.8‡ *2*	2439.92	15/2+	1401.18	13/2+	M1,E2	R(DCO)=0.76 *10*.
1048.4 *2*	3.3 *2*	5331.71	31/2+	4283.46	27/2+	[E2]	
1060.5 *1*	6.1 *4*	2461.82	17/2+	1401.18	13/2+	E2	R(DCO)=1.05 *5*.
1075.3 *1*	1.0‡ *1*	2228.30	13/2+	1152.94	11/2+	[M1,E2]	
1080.4 *1*	4.0 *7*	6037.49	31/2+	4957.08	29/2+	M1,E2	R(DCO)=0.39 *6*.
1081.3 *2*	2.9 *2*	5878.12	(33/2+)	4796.70	29/2+	[E2]	
1082.3 *1*	3.2 *6*	2235.32	13/2−	1152.94	11/2+	E1	R(DCO)=0.93 *13* (ΔJ=1, dipole gated).
1084.9 *2*	0.6‡ *1*	3865.15	(23/2)+	2780.23	19/2+	[E2]	
1095.0 *2*	2.9 *2*	5891.68	(33/2+)	4796.70	29/2+	[E2]	
1101.7 *2*	1.1‡ *1*	1101.77	5/2+	0.0	9/2+	[E2]	
1103.7 *1*	0.8‡ *1*	3565.72	19/2+	2461.82	17/2+	[M1,E2]	I_γ: 0.3 *3* In thin-target data.
1108.3 *2*	4.7 *3*	5508.4+y	(47/2−)	4400.1+y	(43/2−)	[E2]	
1127.0 *1*	3.5‡ *2*	3588.75	21/2+	2461.82	17/2+	E2	I_γ: 8.7 *5* In thin-target data. R(DCO)=0.95 *11*.
1127.4 *1*	1.2‡ *1*	3907.76	21/2+	2780.23	19/2+	M1,E2	R(DCO)=1.3 *3*.
1152.7 *1*	5.8 *4*	7044.43	(37/2+)	5891.68	(33/2+)	[E2]	
1152.9 *1*	20.5 *16*	1152.94	11/2+	0.0	9/2+	M1,E2	R(DCO)=1.08 *11*.
1166.7 *3*	2.7 *2*	7044.43	(37/2+)	5878.12	(33/2+)	[E2]	
1190.8 *2*	0.6 *1*	3971.29	21/2+	2780.23	19/2+	[M1,E2]	
1200.8 *1*	0.6‡ *1*	3195.45	17/2+	1994.81	15/2+	[M1,E2]	I_γ: 0.3 *1* In thin-target data.
1205.6 *2*	2.0 *3*	8811.4	(43/2+)	7605.79	(39/2+)	[E2]	
1206.1 *2*	4.0 *3*	6714.5+y	(51/2−)	5508.4+y	(47/2−)	[E2]	
1219.1 *3*	2.2 *3*	10432.9	(49/2+)	9213.8	(45/2+)	[E2]	
1224.1 *1*	5.4 *3*	4931.95	27/2+	3707.76	23/2+	E2	R(DCO)=1.4 *4* (ΔJ=1, dipole gated).
1254.8 *1*	4.0 *7*	5166.77	29/2+	3912.07	25/2+	E2	R(DCO)=1.6 *4* (ΔJ=1, dipole gated).
1286.7 *3*	0.3‡ *1*	2439.92	15/2+	1152.94	11/2+	[E2]	
1291.4 *2*	3.7 *3*	8335.8	(41/2+)	7044.43	(37/2+)	[E2]	
1306.4 *1*	0.8‡ *1*	2707.59	15/2+	1401.18	13/2+	M1,E2	I_γ: 1.0 *10* from thin-target data. R(DCO)=0.43 *11*.
1310.5 *2*	3.0 *3*	8025.0+y	(55/2−)	6714.5+y	(51/2−)	[E2]	
1347.8 *1*	1.1‡ *1*	2748.95	15/2+	1401.18	13/2+	M1,E2	R(DCO)=1.13 *22*.
1371.3 *2*	0.5‡ *1*	2772.33	15/2+	1401.18	13/2+	[M1,E2]	I_γ: 0.6 *2* In thin-target data.
1378.1 *4*	2.0 *3*	9403.1+y	(59/2−)	8025.0+y	(55/2−)	[E2]	
1383.3 *1*	1.9 *3*	4126.04	25/2−	2742.78	21/2−	E2	R(DCO)=2.0 *3* (ΔJ=1, dipole gated).
1392.8 *1*	3.4 *6*	4109.77	25/2+	2716.99	21/2+	E2	R(DCO)=0.90 *6*.
1401.2 *1*	100 *8*	1401.18	13/2+	0.0	9/2+	E2	R(DCO)=1.05 *3*.
1425.2 *2*	0.9‡ *1*	2826.47	17/2+	1401.18	13/2+	[E2]	I_γ: 1.1 *3* In thin-target data.
1435.4 *5*	1.7 *7*	11868.3	(53/2+)	10432.9	(49/2+)	[E2]	
1447.0 *7*	1.0 *3*	10850.1+y	(63/2−)	9403.1+y	(59/2−)	[E2]	
1448.7 *1*	2.3 *3*	4473.39	27/2−	3024.63	23/2−	E2	R(DCO)=2.4 *5* (ΔJ=1, dipole gated).

Continued on next page (footnotes at end of table)

^{96}Zr(^{19}F,4nγ) 1998Va03 (continued)

γ(^{111}In) (continued)

E_γ	I_γ†	E_i(level)	J^π_i	E_f	J^π_f	Mult.#	Comments
1451.4 *1*	2.3 *2*	4917.93	29/2$^-$	3466.64	25/2$^-$	E2	R(DCO)=1.7 *7* (ΔJ=1, dipole gated).
1466.2 *2*	0.8‡ *1*	3461.24	19/2$^+$	1994.81	15/2$^+$	E2	I_γ: 2.1 *2* In thin-target data. R(DCO)=2.2 *4* (ΔJ=1, dipole gated).
1500.5 *1*	4.0 *4*	1500.49	7/2$^+$	0.0	9/2$^+$	M1,E2	R(DCO)=0.97 *7*.
1518.3 *1*	0.8‡ *1*	2919.48	15/2$^+$	1401.18	13/2$^+$	M1,E2	R(DCO)=1.10 *15*.
1596.0 *1*	0.5‡ *1*	2748.95	15/2$^+$	1152.94	11/2$^+$	[E2]	
1619.4 *2*	0.3‡ *1*	2772.33	15/2$^+$	1152.94	11/2$^+$	[E2]	
1634.5 *6*	1.2 *3*	13502.8	(57/2$^+$)	11868.3	(53/2$^+$)	[E2]	
1638.2 *3*	0.7‡ *1*	3039.49	17/2$^+$	1401.18	13/2$^+$	[E2]	
1753.2 *4*	0.2‡ *1*	1752.94	(9/2$^+$)	0.0	9/2$^+$	[M1,E2]	
1767.1 *2*	0.2‡ *1*	2919.48	15/2$^+$	1152.94	11/2$^+$	[E2]	

† Relative coincidence intensities from thin target data, unless otherwise stated. Data for backed-target data are also given by 1998Va03.

‡ From backed-target data, when intensity for a transition from a level is either not available or very weak In thin-target data. Intensity available from thin-target data is given under comments.

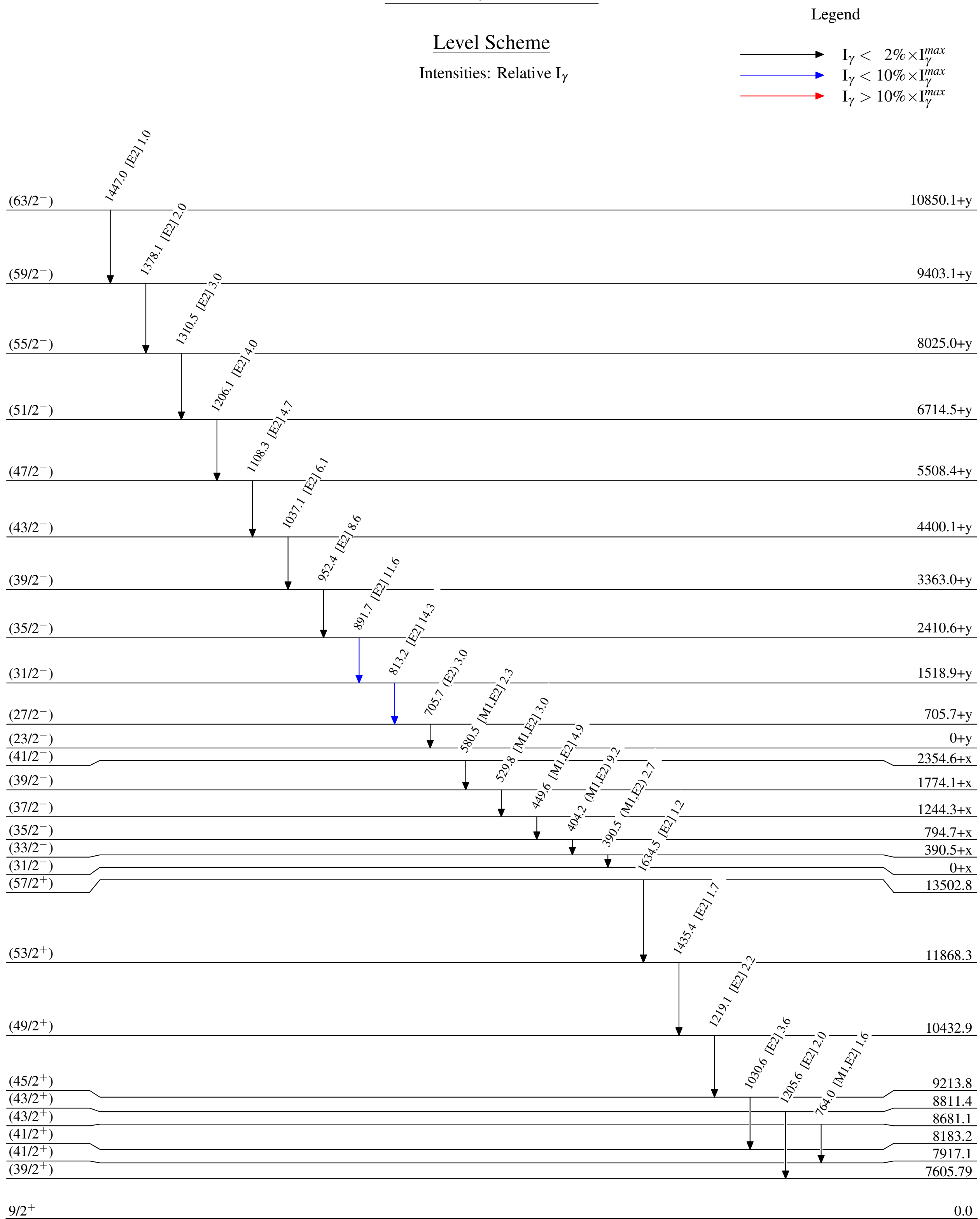
From table 1 of 1998Va03, except that these are given (by compiler) In square brackets when implied by ΔJ^π and No $\gamma\gamma(\theta)$(DCO) data are available from 1998Va03. Mult=E2 is assigned (1998Va03) when $\gamma\gamma(\theta)$(DCO) data are consistent (typical R(DCO)=1 for E2 gated spectra) with ΔJ=2, stretched quadrupole. Mult=M1,E2 or E1 is assigned when DCO data are consistent (typical R(DCO)=0.5 for E2 gated and 1.0 for ΔJ=1, dipole gated) with ΔJ=1, D+Q or dipole. Only nine transitions out of a total of about 200 involve ΔJ=0, D+Q or dipole.

@ Placement of transition in the level scheme is uncertain.

$^{96}Zr(^{19}F,4n\gamma)$ 1998Va03

Level Scheme

Intensities: Relative I_γ



$^{111}_{49}In_{62}$

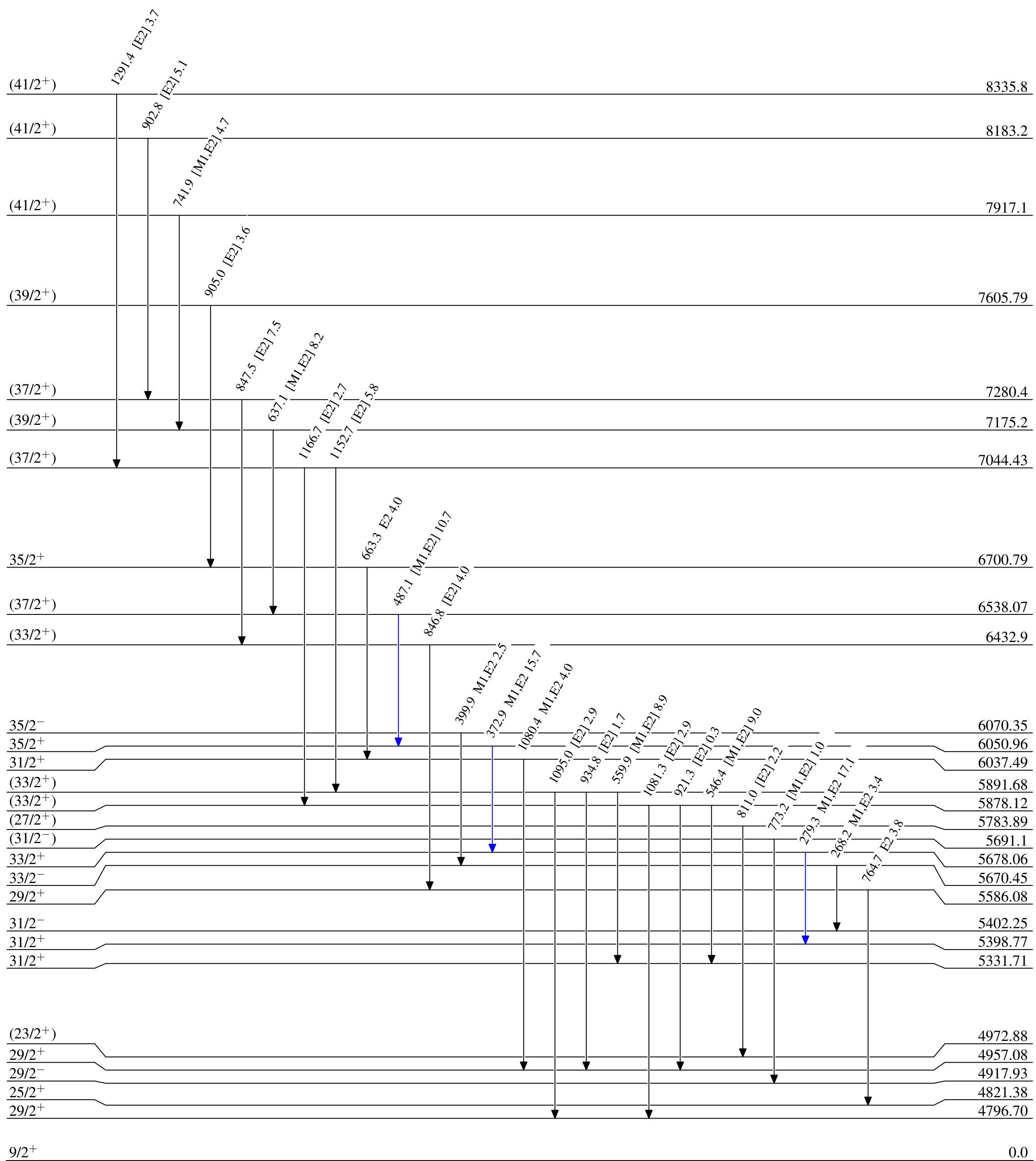
^{96}Zr(^{19}F,4nγ) 1998Va03

Level Scheme (continued)

Intensities: Relative I_γ

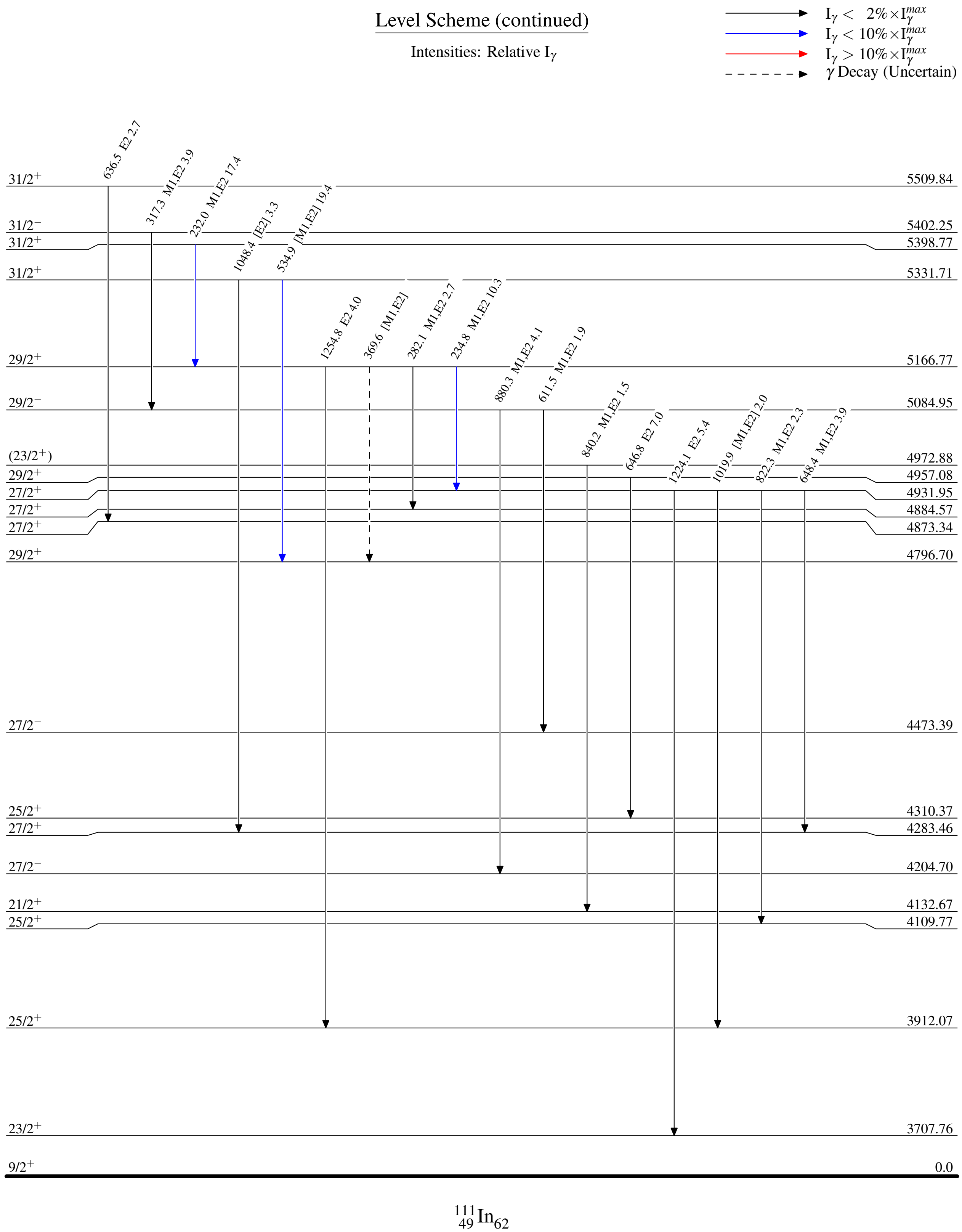
Legend

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



$^{111}_{49}$In$_{62}$

$^{96}Zr(^{19}F,4n\gamma)$ 1998Va03



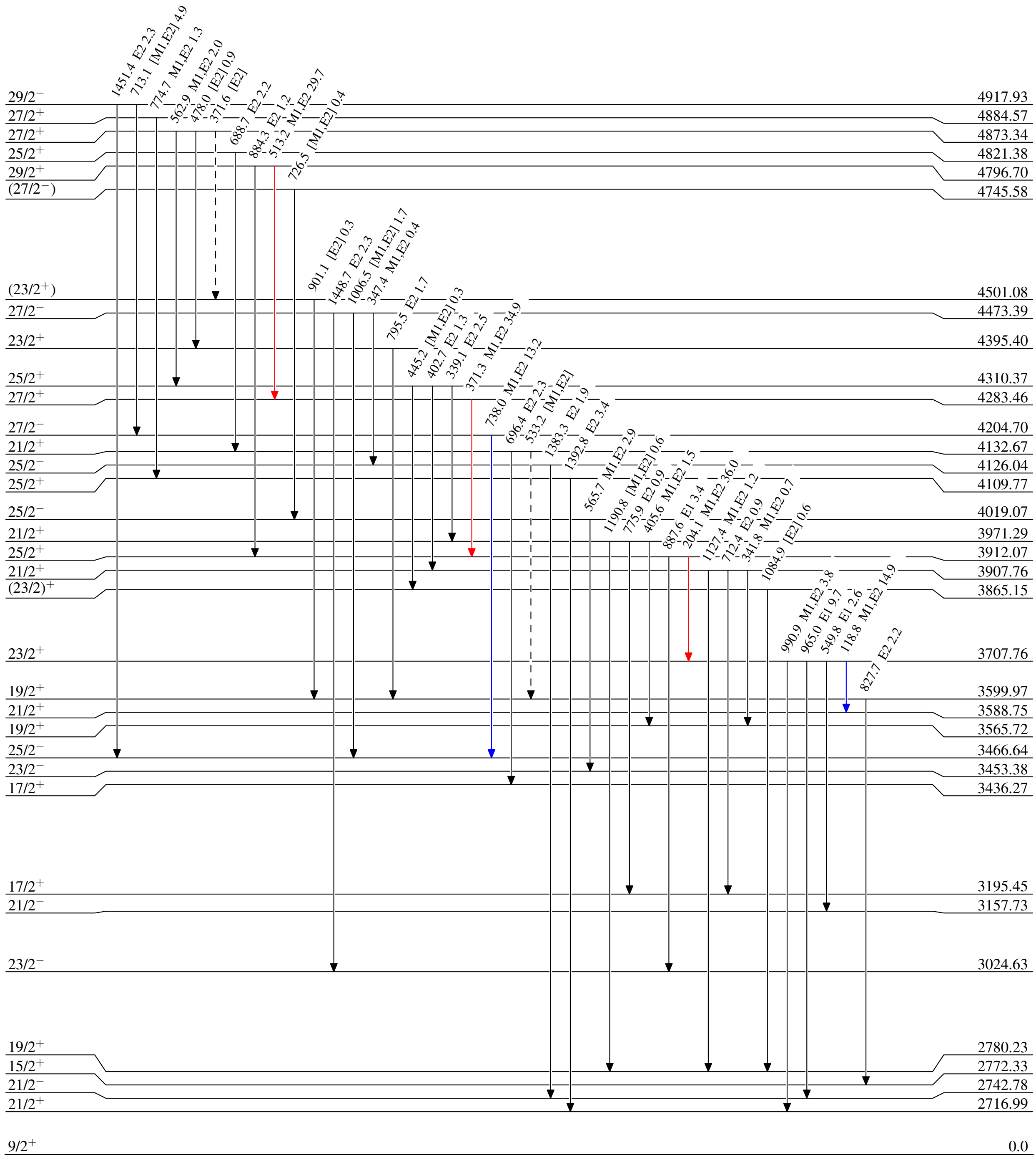
^{96}Zr(^{19}F,4nγ) 1998Va03

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)



$^{111}_{49}In_{62}$

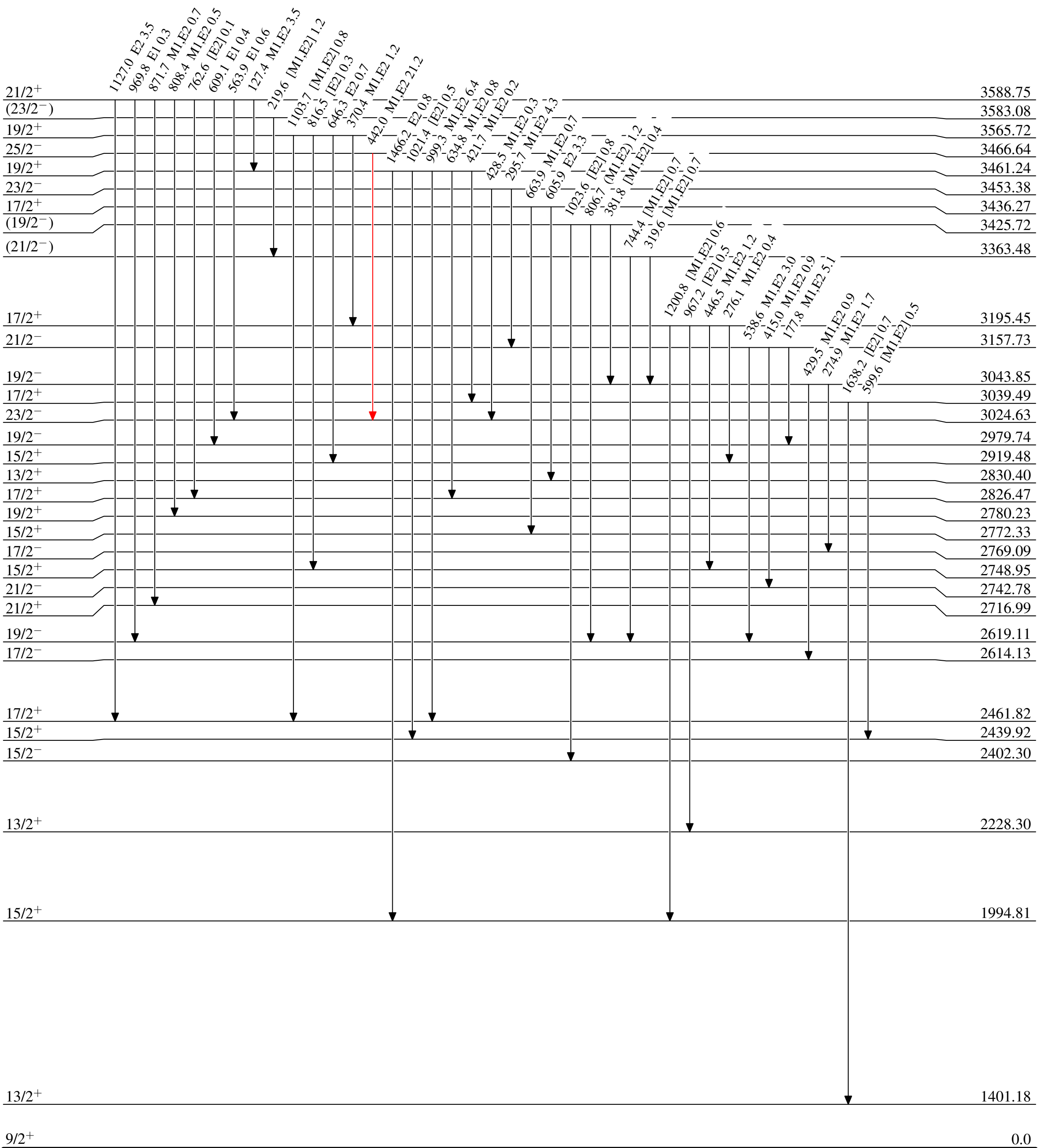
$^{96}Zr(^{19}F,4n\gamma)$ 1998Va03

Level Scheme (continued)

Intensities: Relative I_γ

Legend

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



$^{111}_{49}In_{62}$

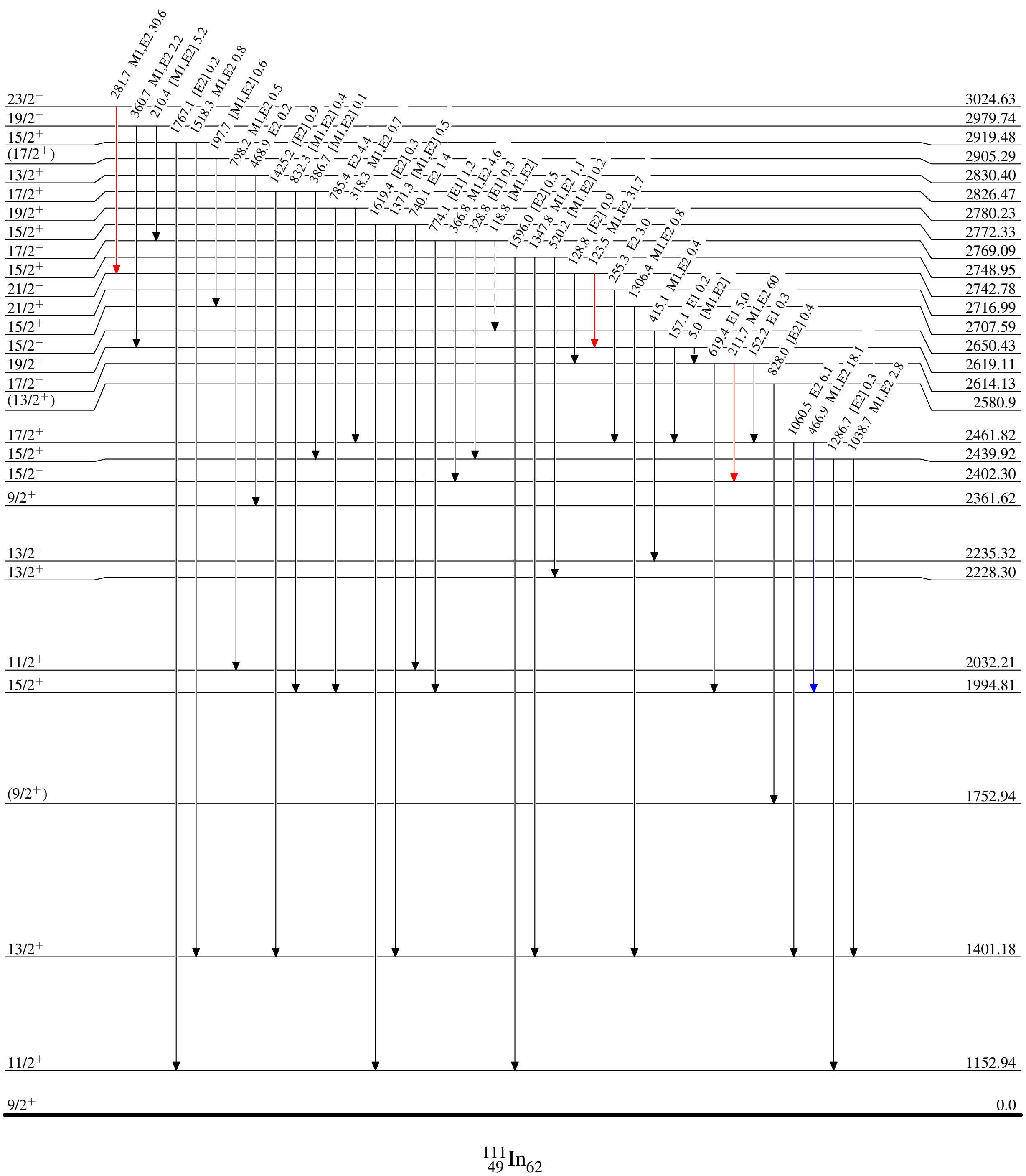
$^{96}Zr(^{19}F,4n\gamma)$ 1998Va03

Level Scheme (continued)

Intensities: Relative I_γ

Legend

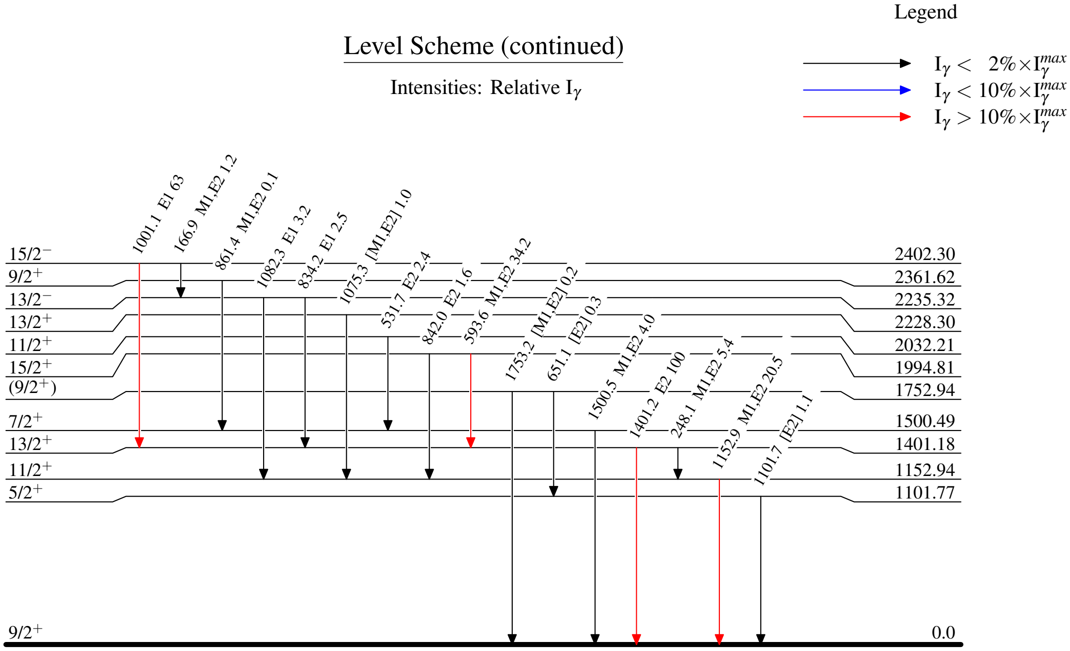
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)



$^{96}Zr(^{19}F,4n\gamma)$ 1998Va03

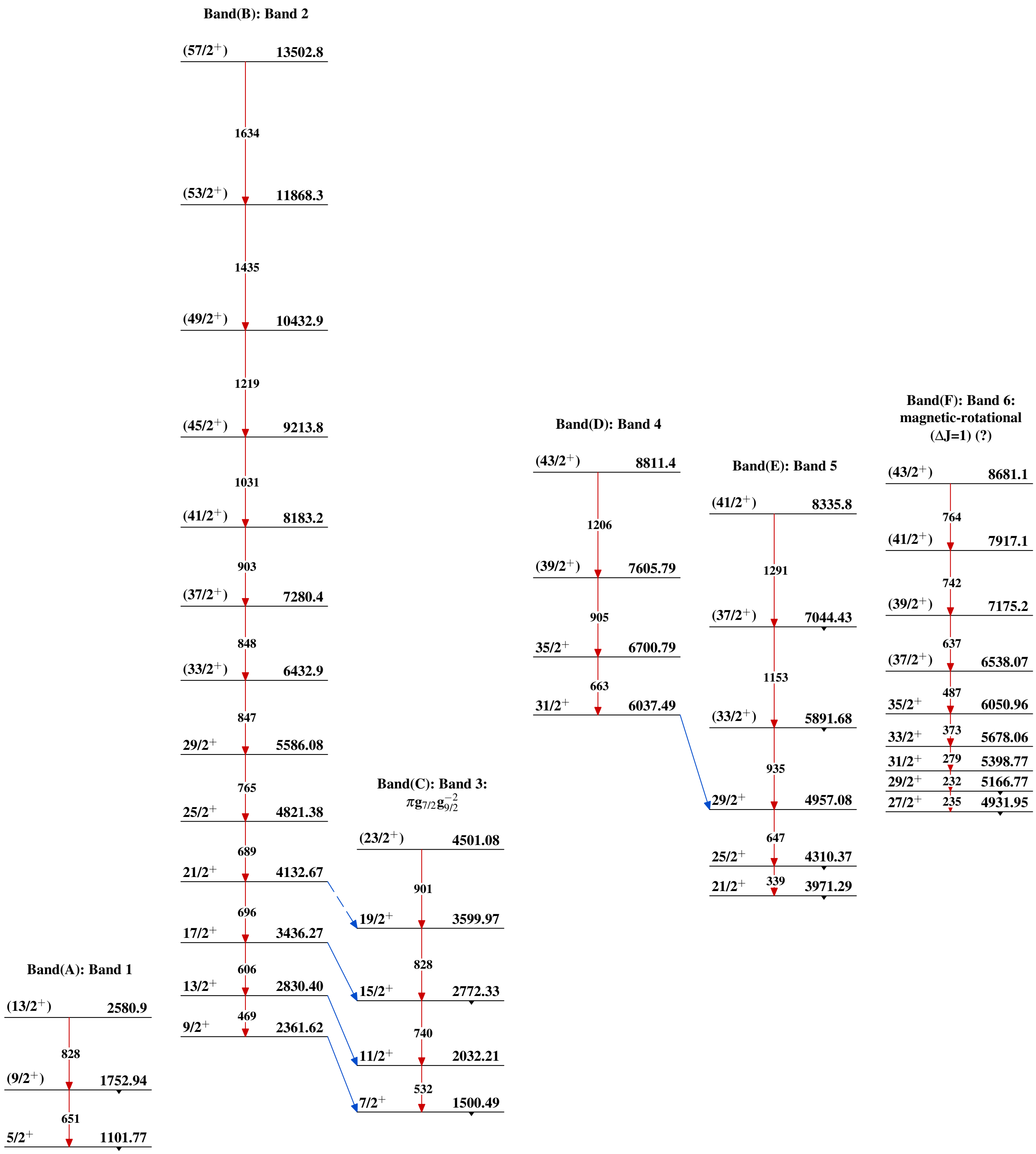
Level Scheme (continued)

Intensities: Relative I_γ



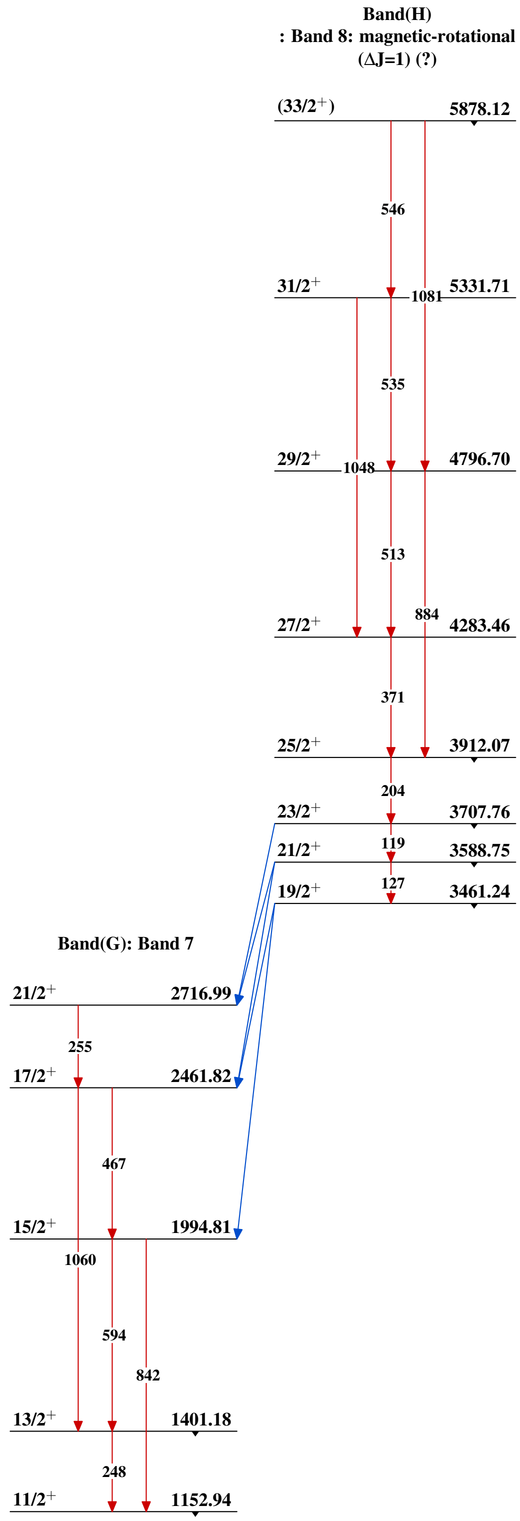
$^{111}_{49}In_{62}$

$^{96}Zr(^{19}F,4n\gamma)$ 1998Va03



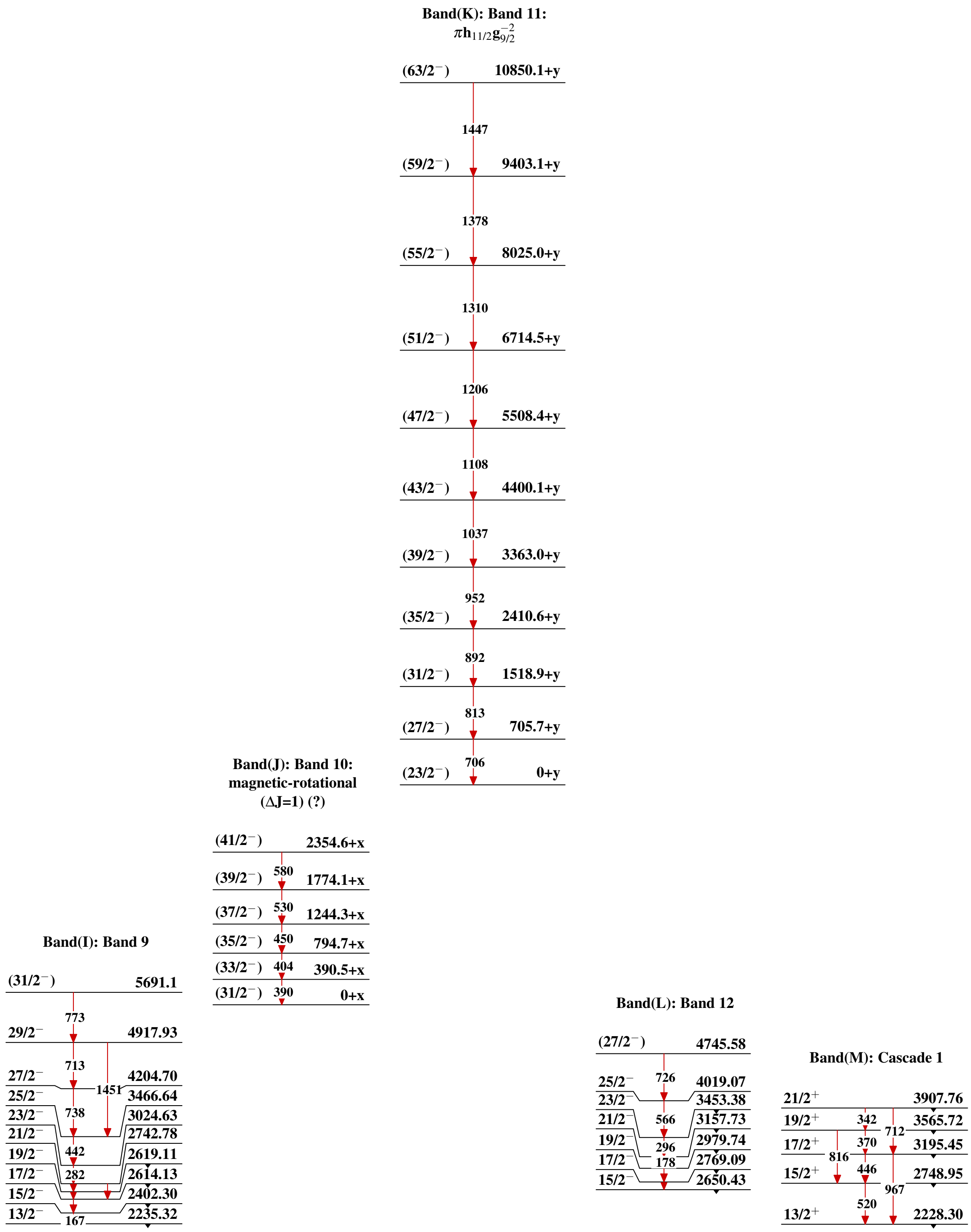
$^{111}_{49}In_{62}$

$^{96}Zr(^{19}F,4n\gamma)$ 1998Va03 (continued)



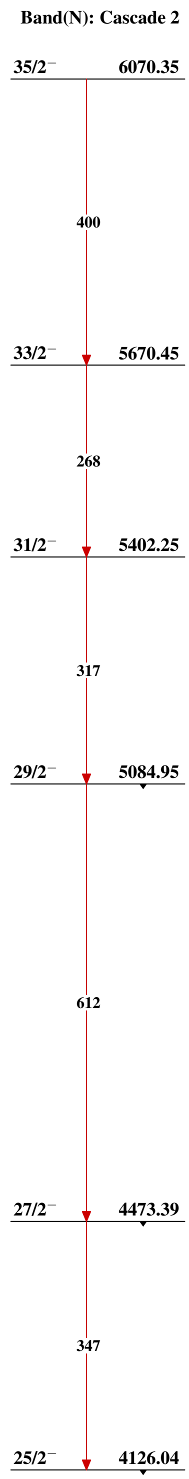
$^{111}_{49}In_{62}$

$^{96}Zr(^{19}F,4n\gamma)$ 1998Va03 (continued)



$^{111}_{49}In_{62}$

$^{96}Zr(^{19}F,4n\gamma)$ 1998Va03 (continued)



$^{111}_{49}In_{62}$