^{152}Sm(α,3nγ) 2002Br52,1972Lo04

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2002Br52 compiled for XUNDL database by M. Lee and B. Singh (McMaster University).
Data are from 2002Br52, unless otherwise noted.
1968Ej01: E(α)=36 and 40 MeV; measured conversion electrons in magnetic spectrometer for 8 γ's.
1972Lo04: E(α)=32-43 MeV; measured γ singles, $\gamma(\theta)$, and $\gamma\gamma$ coincidences for bands to $27/2^-$ and $33/2^+$.
1972Re04: E(α)=27-32 MeV; measured Eγ and Iγ for bands to $23/2^-$ and $25/2^+$.
2002Br52: E(α)=37 MeV; measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma(\theta)$(DCO) using nine Compton-suppressed HPGe detectors of the FSU-Pitt array. Also, ^{124}Sn(^{36}S,α3nγ) E=165 MeV; measured Eγ using 93 HPGe detectors of the Gammasphere array.

^{153}Gd Levels

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	Comments
0.0[j]	$3/2^-$		E(level),J$^\pi$: from ^{153}Gd Adopted Levels.
41.6[#k]	$5/2^-$		Additional information 1. E(level): shown as bandhead of band #8 in figure 1 of 2002Br52, but as bandhead of band #12 in figure 2; the latter is correct (private communication from author M. A. Riley) May 15, 2003.
93.3[#j]	$7/2^-$		Additional information 2.
95.2[#d]	$9/2^+$		Additional information 3.
109.9[g] 5	$5/2^-$		
139.01[d] 20	$13/2^+$		
171.2[#@]	$11/2^-$	76.0 μs 14	Additional information 4. $T_{1/2}$: from ^{153}Gd Adopted Levels.
212.1[i] 5	$(3/2^+)$		
216.4[h] 4	$7/2^-$		E(level): this level is shown in band #11 in Table I of 2002Br52; but as in figure 1 of 2002Br52 it is associated with band #9; the latter is correct (priv. comm. from author M.A. Riley, May 15, 2003).
219.76[g] 16	$9/2^-$		
249.5 8	$5/2^-$		
333.4[k] 3	$9/2^-$		
363.67[&] 16	$13/2^-$		
365.40[d] 22	$17/2^+$		
377.9?[c] 6	$(11/2^+)$		
395.5[i] 3	$7/2^+$		
430.4[j] 3	$11/2^-$		E(level): this level is shown in band #9 in Table I of 2002Br52; but as in figure 1 of 2002Br52 it is associated with band #11; the latter is correct (priv. comm. from author M.A. Riley, May 15, 2003).
515.0[h] 3	$11/2^-$		E(level): this level is shown in band #11 in Table I of 2002Br52; but as in figure 1 of 2002Br52 it is associated with band #9; the latter is correct (priv. comm. from author M. A. Riley, May 15, 2003).
565.22[g] 21	$13/2^-$		
575.43[@] 16	$15/2^-$		
615.38[c] 23	$15/2^+$		
632.87[e] 17	$13/2^+$		
674.9[i] 4	$11/2^+$		
716.8[k] 4	$13/2^-$		
728.59[d] 24	$21/2^+$		
805.17[&] 19	$17/2^-$		
852.3[j] 4	$15/2^-$		E(level): this level is shown in band #9 in Table I of 2002Br52; but as in figure 1 of

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^{152}Sm(α,3nγ) 2002Br52,1972Lo04 (continued)

^{153}Gd Levels (continued)

E(level)†	Jπ‡	Comments
		2002Br52 it is associated with band #11; the latter is correct (priv. comm. from author M. A. Riley, May 15, 2003).
873.99[e] *21*	17/2+	
899.3[h] *4*	15/2−	E(level): this level is shown in band #11 in Table I of 2002Br52; but as in figure 1 of 2002Br52 it is associated with band #9; the latter is correct (priv. comm. from author M. A. Riley, May 15, 2003).
977.32[c] *24*	19/2+	
1010.87[g] *25*	17/2−	
1036.6[i] *5*	15/2+	
1051.43[@] *21*	19/2−	
1141.8[k] *6*	17/2−	
1195.8[d] *3*	25/2+	
1208.87[e] *24*	21/2+	
1312.58[&] *23*	21/2−	
1339.6[a] *4*	(17/2−)	
1357.6[h] *5*	19/2−	
1437.3[c] *3*	23/2+	
1464.0[i] *5*	19/2+	
1504.0[g] *3*	21/2−	
1520.3[f] *4*	21/2−	
1574.1[b] *4*	(19/2−)	
1587.06[@] *25*	23/2−	
1628.7[e] *3*	25/2+	
1703.6?[k] *11*	(21/2−)	
1746.2[d] *3*	29/2+	
1819.1[a] *4*	(21/2−)	
1873.5[&] *3*	25/2−	
1891.9[h] *7*	23/2−	
1902.8[f] *4*	25/2−	
1945.1[i] *7*	23/2+	
1980.3[c] *3*	27/2+	
2039.4[g] *4*	25/2−	
2073.4[b] *6*	(23/2−)	
2103.3 *4*	(27/2−)	Jπ: from Table I of 2002Br52; (25/2−) given in figure 1 of 2002Br52 is an error (priv. comm. from author M. A. Riley on May 15, 2003).
2132.3[e] *4*	29/2+	
2170.3[@] *3*	27/2−	
2330.9[a] *7*	(25/2−)	
2361.4[f] *4*	29/2−	
2362.7[d] *4*	33/2+	
2459.2[h] *9*	27/2−	
2464.3[i] *9*	27/2+	
2476.2[&] *5*	29/2−	
2580.9[g] *5*	29/2−	
2596.0[c] *4*	31/2+	
2717.5[e] *4*	33/2+	
2790.0[@] *5*	31/2−	
2884.8[f] *5*	33/2−	
3019.3[i] *13*	(31/2+)	

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^{152}Sm(α,3nγ) 2002Br52,1972Lo04 (continued)

^{153}Gd Levels (continued)

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
3031.1[d] 7	37/2+	3276.5[c] 11	(35/2+)	4044.7[e] 12	(41/2+)	5297.7[d] 19	(49/2+)
3050.2[h] 13	(31/2−)	3368.4[e] 7	(37/2+)	4124.1[f] 13	(41/2−)	5456.7[e] 19	(49/2+)
3109.7[&] 6	33/2−	3427.3[@] 9	35/2−	4498.7[d] 16	(45/2+)	6144.7[d] 21	(53/2+)
3126.3[g] 6	(33/2−)	3471.1[f] 7	(37/2−)	4732.7[e] 16	(45/2+)	6230.7[e] 21	(53/2+)
3159.7 11	(33/2−)	3743.7[d] 12	41/2+	4841.2[f] 16	(45/2−)	7034.7[d] 24	(57/2+)

† From least-squares fit to Eγ′s.
‡ From 2002Br52.
# Rounded off value from ^{153}Gd Adopted Levels (held fixed in the least-squares fit to Eγ′s.
@ Band(A): 11/2[505] band, α=+1/2.
& Band(a): 11/2[505] band, α=−1/2.
[a] Band(B): 11/2[505] β−vibration band, α=−1/2.
[b] Band(b): 11/2[505] β−vibration band, α=+1/2.
[c] Band(C): 1/2[660] band, α=−1/2.
[d] Band(c): 1/2[660] band, α=+1/2.
[e] Band(D): 3-qp band based on 13/2+.
[f] Band(E): $i_{13/2}$ (octupole phonon) or 3-qp band.
[g] Band(F): $h_{9/2}$ band based on 5/2−.
[h] Band(G): $h_{9/2}$ band based on 5/2−.
[i] Band(H): 3/2[402] band with extra neutron promoted to $h_{9/2}$ or $f_{7/2}$ orbital.
[j] Band(I): $f_{7/2}$ band based on 3/2−, α=−1/2.
[k] Band(i): $f_{7/2}$ band based on 5/2−, α=+1/2.

γ(^{153}Gd)

2002Br52 DCO ratios in table comments correspond to gates on stretched quadrupole transitions (with typical values of ≈1.0 for stretched quadrupole and ≈0.5 for stretched dipole), except for transitions in 11/2[505] bands and in 11/2[505]+β vibrational bands where gates are on stretched dipole transitions (with typical values of ≈2.5 for stretched quadrupole and ≈1.0 for stretched dipole, noted for distinction in comments). 2002Br52 also adopted nonstretched dipole for DCO values of ≈1.0 from gates on stretched quadrupole transitions.

Eγ†	Iγ	Ei(level)	Jiπ	Ef	Jfπ	Mult.‡	Comments
41.6[&]		41.6	5/2−	0.0	3/2−		
51.8[&]		93.3	7/2−	41.6	5/2−		
76.0[&]		171.2	11/2−	95.2	9/2+		
77.9[&]		171.2	11/2−	93.3	7/2−		
93.3[&]		93.3	7/2−	0.0	3/2−		Iγ: Iγ(93)/Iγ(51)=0.113 (1972Lo04).
97 1	0.4 1	430.4	11/2−	333.4	9/2−		
110 1		109.9	5/2−	0.0	3/2−	D	Mult.: DCO=0.5 1.
110 1	<0.5	219.76	9/2−	109.9	5/2−		
126.5 2	4.6 13	219.76	9/2−	93.3	7/2−	D	Mult.: DCO=0.5 1.
135 1	<0.5	565.22	13/2−	430.4	11/2−	D	Mult.: DCO=0.5 2.
146.0 10	<0.5	395.5	7/2+	249.5	5/2−	D	Mult.: DCO=0.5 2.
174.8 5	≈2	216.4	7/2−	41.6	5/2−	(M1+E2)	Mult.: DCO=0.6 2.
176 1	<0.5	395.5	7/2+	219.76	9/2−	D	DCO=0.5 2.

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^{152}Sm(α,3nγ) 2002Br52,1972Lo04 (continued)

$\gamma(^{153}Gd)$ (continued)

E_γ †	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult. ‡	δ #	Comments
178.2 *5*	1.4 *4*	219.76	9/2$^-$	41.6	5/2$^-$	E2		Mult.: DCO=1.1 *2*.
183.4 *10*	<0.5	395.5	7/2$^+$	212.1	(3/2$^+$)	E2		Mult.: DCO=0.9 *1*.
192.5 *2*	27 *3*	363.67	13/2$^-$	171.2	11/2$^-$	(M1+E2)	−0.35 +*22*−*30*	Mult.: DCO=0.9 *1* in stretched dipole gate.
211.8 *2*	24.3 *15*	575.43	15/2$^-$	363.67	13/2$^-$	(M1+E2)	−0.24 +*18*−*34*	Mult.: DCO=1.0 *1* in stretched dipole gate.
212.1 *5*	1.0 *5*	212.1	(3/2$^+$)	0.0	3/2$^-$	D		Mult.: DCO=0.6 *1*, ΔJ=0 γ.
226.5 *10*		365.40	17/2$^+$	139.01	13/2$^+$	E2		Mult.: DCO=1.1 *1*.
229.8 *2*	16.1 *10*	805.17	17/2$^-$	575.43	15/2$^-$	(M1+E2)	−0.34 +*18*−*30*	Mult.: DCO=0.9 *1* in stretched dipole gate.
231.2 *5*	0.9 *1*	1208.87	21/2$^+$	977.32	19/2$^+$	(M1+E2)		DCO much less than 1. E_γ: Assignment from 17/2$^+$ to 15/2$^+$ shown in Table I of 2002Br52 seems to be an error; it should be 21/2$^+$ to 19/2$^+$.
234.1 *5*	0.6 *1*	1980.3	27/2$^+$	1746.2	29/2$^+$	(M1+E2)		Mult.: DCO=0.5 *2*.
234.6 *5*	0.6 *1*	1574.1	(19/2$^-$)	1339.6	(17/2$^-$)			
238 *1*	0.9 *1*	615.38	15/2$^+$	377.9?	(11/2$^+$)			
239 *1*	0.6 *1*	377.9?	(11/2$^+$)	139.01	13/2$^+$			
240.1 *5*	2.0 *3*	333.4	9/2$^-$	93.3	7/2$^-$	D		Mult.: DCO=0.4 *1*.
241.1 *2*	3.0 *2*	873.99	17/2$^+$	632.87	13/2$^+$	E2		Mult.: DCO=1.1 *1*.
241.7 *5*	1.7 *1*	1437.3	23/2$^+$	1195.8	25/2$^+$	(M1+E2)		Mult.: DCO=0.6 *2*.
245 *1*	0.7 *1*	1819.1	(21/2$^-$)	1574.1	(19/2$^-$)			
246.3 *2*	10.5 *6*	1051.43	19/2$^-$	805.17	17/2$^-$	(M1+E2)	−0.31 +*22*−*44*	Mult.: DCO=0.9 *1* in stretched dipole gate.
248.8 *2*	5.4 *4*	977.32	19/2$^+$	728.59	21/2$^+$	(M1+E2)		Mult.: DCO=0.8 *2* for 249.9γ+248.8γ.
249.6 *10*	0.3 *1*	249.5	5/2$^-$	0.0	3/2$^-$			
249.9 *2*	7.5 *5*	615.38	15/2$^+$	365.40	17/2$^+$	(M1+E2)		Mult.: DCO=0.8 *2*. DCO for 249.9+248.8.
254 *1*	0.6 *1*	2073.4	(23/2$^-$)	1819.1	(21/2$^-$)			
257 *1*	0.6 *1*	2330.9	(25/2$^-$)	2073.4	(23/2$^-$)			
258.1 *10*	<0.5	2361.4	29/2$^-$	2103.3	(27/2$^-$)			
258.7 *5*	0.9 *1*	873.99	17/2$^+$	615.38	15/2$^+$	(M1+E2)		Mult.: DCO=0.3 *1*.
261.2 *2*	6.5 *4*	1312.58	21/2$^-$	1051.43	19/2$^-$	(M1+E2)	−0.27 +*10*−*22*	Mult.: DCO=1.0 *1* in stretched dipole gate.
274.5 *2*	3.9 *2*	1587.06	23/2$^-$	1312.58	21/2$^-$	(M1+E2)	−0.20 +*10*−*16*	Mult.: DCO=1.0 *1* in stretched dipole gate.
279.4 *5*	1.8 *1*	674.9	11/2$^+$	395.5	7/2$^+$	E2		Mult.: DCO=1.0 *1*.
283 *1*	<0.5	377.9?	(11/2$^+$)	95.2	9/2$^+$			
285.6 *5*	0.6 *1*	395.5	7/2$^+$	109.9	5/2$^-$	D		Mult.: DCO=0.6 *1*.
286.4 *5*	2.4 *2*	1873.5	25/2$^-$	1587.06	23/2$^-$	(M1+E2)	−0.24 +*20*−*30*	Mult.: DCO=1.0 *1* in stretched dipole gate.
286.5 *5*	0.7 *1*	716.8	13/2$^-$	430.4	11/2$^-$	(M1+E2)		Mult.: DCO=0.4 *2*.
289.6 *10*	<0.5	1141.8	17/2$^-$	852.3	15/2$^-$			
291.7 *5*	1.1 *2*	430.4	11/2$^-$	139.01	13/2$^+$			
291.9 *5*	1.7 *2*	333.4	9/2$^-$	41.6	5/2$^-$	E2		Mult.: DCO=1.0 *1*.
295.3 *5*	0.6 *1*	515.0	11/2$^-$	219.76	9/2$^-$	(M1+E2)		DCO much less than 1.
296.9 *5*	1.3 *1*	2170.3	27/2$^-$	1873.5	25/2$^-$	(M1+E2)	−0.43 +*25*−*70*	Mult.: DCO=0.9 *2* in stretched dipole gate.
298.6 *5*	1.5 *2*	515.0	11/2$^-$	216.4	7/2$^-$	E2		Mult.: DCO=1.1 *2*.
302.0 *5*	0.4 *1*	395.5	7/2$^+$	93.3	7/2$^-$	D,Q		Mult.: DCO=1.1 *2*, ΔJ=0 γ.
306.0 *5*	0.8 *2*	2476.2	29/2$^-$	2170.3	27/2$^-$	(M1+E2)		Mult.: DCO=0.8 *2* in stretched dipole gate.
313.8 *10*	0.4 *1*	2790.0	31/2$^-$	2476.2	29/2$^-$			
317.6 *10*	<0.5	3427.3	35/2$^-$	3109.7	33/2$^-$			
319.5 *10*	<0.5	3109.7	33/2$^-$	2790.0	31/2$^-$			

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^{152}Sm(α,3nγ) 2002Br52,1972Lo04 (continued)

$\gamma(^{153}Gd)$ (continued)

E_γ[†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	Comments
320 *1*	<0.5	1036.6	$15/2^+$	716.8	$13/2^-$		
335 *1*	3 *1*	430.4	$11/2^-$	95.2	$9/2^+$		
335.0 *2*	13.4 *8*	1208.87	$21/2^+$	873.99	$17/2^+$	E2	Mult.: DCO=1.0 *1*.
337 *1*	7.8 *9*	430.4	$11/2^-$	93.3	$7/2^-$	(E2)	Mult.: DCO=1.3 *2*.
341.5 *5*	0.7 *1*	674.9	$11/2^+$	333.4	$9/2^-$	D(+Q)	Mult.: DCO=0.8 *2*.
345.5 *2*	7.4 *5*	565.22	$13/2^-$	219.76	$9/2^-$	E2	Mult.: DCO=1.0 *1*.
353.9 *5*	0.4 *1*	395.5	$7/2^+$	41.6	$5/2^-$	D	Mult.: DCO=0.6 *1*.
361.8 *5*	2.0 *2*	1036.6	$15/2^+$	674.9	$11/2^+$	E2	Mult.: DCO=1.1 *1*.
361.9 *2*	6.4 *4*	977.32	$19/2^+$	615.38	$15/2^+$		Unresolved for 361.9γ+363.2γ.
363.2 *2*	≈133	728.59	$21/2^+$	365.40	$17/2^+$	E2	Mult.: DCO=1.0 *1*. DCO for 363.2+361.9.
379[a] *1*		1520.3	$21/2^-$	1141.8	$17/2^-$		
381.2 *5*	0.6 *1*	2361.4	$29/2^-$	1980.3	$27/2^+$		
382.7 *10*	<0.5	1902.8	$25/2^-$	1520.3	$21/2^-$		
383.3 *5*	2.0 *2*	716.8	$13/2^-$	333.4	$9/2^-$	E2	Mult.: DCO=1.0 *1*.
384.5 *5*	0.6 *1*	899.3	$15/2^-$	515.0	$11/2^-$	(E2)	Mult.: DCO=1.2 *3*.
398.9 *10*	<0.5	1902.8	$25/2^-$	1504.0	$21/2^-$	(E2)	Mult.: DCO=1.5 *4*.
404.2 *2*	5.9 *4*	575.43	$15/2^-$	171.2	$11/2^-$	E2	Mult.: DCO=2.2 *2* in stretched dipole gate.
419.6 *5*	0.6 *1*	515.0	$11/2^-$	95.2	$9/2^+$		
420.0 *2*	15.2 *9*	1628.7	$25/2^+$	1208.87	$21/2^+$	E2	Mult.: DCO=1.1 *1*.
422.0 *5*	0.6 *1*	515.0	$11/2^-$	93.3	$7/2^-$		
422.1 *5*	2.9 *2*	852.3	$15/2^-$	430.4	$11/2^-$	E2	Mult.: DCO=1.0 *1*.
424.9 *5*	0.9 *1*	1141.8	$17/2^-$	716.8	$13/2^-$	(E2)	Mult.: DCO=1.2 *2*.
426.1 *5*	0.6 *1*	565.22	$13/2^-$	139.01	$13/2^+$	D,Q	Mult.: DCO=1.3 *2*, ΔJ=0 γ.
427.4 *5*	2.2 *2*	1464.0	$19/2^+$	1036.6	$15/2^+$	E2	Mult.: DCO=1.1 *1*.
441.5 *2*	8.7 *5*	805.17	$17/2^-$	363.67	$13/2^-$	E2	Mult.: DCO=2.9 *2* in stretched dipole gate.
445.7 *2*	5.5 *4*	1010.87	$17/2^-$	565.22	$13/2^-$	E2	Mult.: DCO=1.0 *1*.
453.1 *5*	0.3 *1*	1464.0	$19/2^+$	1010.87	$17/2^-$	D	Mult.: DCO=0.6 *1*.
455 *1*	0.6 *2*	674.9	$11/2^+$	219.76	$9/2^-$		
458.3 *5*	0.8 *1*	1357.6	$19/2^-$	899.3	$15/2^-$	E2	Mult.: DCO=0.9 *1*.
458.5 *5*	2.1 *2*	2361.4	$29/2^-$	1902.8	$25/2^-$	(E2)	Mult.: DCO=1.2 *2*.
460.0 *2*	8.1 *5*	1437.3	$23/2^+$	977.32	$19/2^+$	E2	Mult.: DCO=1.1 *1*.
465.2 *5*	1.6 *2*	1902.8	$25/2^-$	1437.3	$23/2^+$		
467.2 *2*	67 *8*	1195.8	$25/2^+$	728.59	$21/2^+$	E2	Mult.: DCO=1.0 *1*.
471 *1*	0.5 *1*	1036.6	$15/2^+$	565.22	$13/2^-$		
476.0 *2*	8.0 *5*	1051.43	$19/2^-$	575.43	$15/2^-$	E2	Mult.: DCO=2.9 *2* in stretched dipole gate.
476.4 *2*	7.4 *6*	615.38	$15/2^+$	139.01	$13/2^+$	(M1+E2)	Mult.: DCO=1.1 *1*.
479 *1*	<0.5	1819.1	$(21/2^-)$	1339.6	$(17/2^-)$		
480.5 *2*	3.0 *2*	1208.87	$21/2^+$	728.59	$21/2^+$	(M1+E2)	Mult.: DCO=0.9 *1*, ΔJ=0 γ.
481.1 *5*	1.2 *1*	1945.1	$23/2^+$	1464.0	$19/2^+$	(E2)	Mult.: DCO=1.2 *3*.
493.4 *5*	1.5 *1*	1504.0	$21/2^-$	1010.87	$17/2^-$	E2	Mult.: DCO=0.9 *1*.
493.9 *2*	5.4 *4*	632.87	$13/2^+$	139.01	$13/2^+$	(M1+E2)	Mult.: DCO=1.1 *1*.
499 *1*	<0.5	2073.4	$(23/2^-)$	1574.1	$(19/2^-)$		
503.5 *2*	9.2 *6*	2132.3	$29/2^+$	1628.7	$25/2^+$	E2	Mult.: DCO=1.0 *1*.
505.2 *5*	2.3 *2*	1357.6	$19/2^-$	852.3	$15/2^-$	E2	Mult.: DCO=1.1 *1*.
507.4 *2*	7.3 *4*	1312.58	$21/2^-$	805.17	$17/2^-$	E2	Mult.: DCO=2.8 *2* in stretched dipole gate.
508.8 *2*	5.8 *4*	873.99	$17/2^+$	365.40	$17/2^+$	(M1+E2)	Mult.: DCO=1.1 *1*, ΔJ=0 γ.
509.6 *5*	1.3 *1*	1520.3	$21/2^-$	1010.87	$17/2^-$	E2	Mult.: DCO=1.0 *1*.
512 *1*	<0.5	2330.9	$(25/2^-)$	1819.1	$(21/2^-)$		
519.2 *5*	1.1 *1*	2039.4	$25/2^-$	1520.3	$21/2^-$	(E2)	Mult.: DCO=1.3 *2*.
519.2 *5*	0.6 *1*	2464.3	$27/2^+$	1945.1	$23/2^+$	(E2)	Mult.: DCO=0.9 *2*.
522.4 *5*	0.7 *2*	2884.8	$33/2^-$	2362.7	$33/2^+$	D,Q	Mult.: DCO=1.0 *2*, ΔJ=0 γ.
523.2 *5*	1.9 *2*	2884.8	$33/2^-$	2361.4	$29/2^-$	E2	Mult.: DCO=1.0 *1*.
526.8 *5*	0.8 *1*	1504.0	$21/2^-$	977.32	$19/2^+$	D(+Q)	Mult.: DCO=0.4 *2*.
534.3 *5*	1.3 *1*	1891.9	$23/2^-$	1357.6	$19/2^-$	(E2)	Mult.: DCO=1.2 *2*.
535.3 *5*	2.5 *2*	2039.4	$25/2^-$	1504.0	$21/2^-$	(E2)	Mult.: DCO=0.9 *2*.

Continued on next page (footnotes at end of table)

^{152}Sm(α,3nγ) 2002Br52,1972Lo04 (continued)

$\gamma(^{153}Gd)$ (continued)

E_γ[†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	Comments
535.6 *2*	5.6 *3*	1587.06	23/2$^-$	1051.43	19/2$^-$	E2	Mult.: DCO=2.9 *2* in stretched dipole gate.
537.6 *2*	6.6 *5*	632.87	13/2$^+$	95.2	9/2$^+$	E2	Mult.: DCO=1.0 *1*.
541.4 *5*	1.6 *2*	2580.9	29/2$^-$	2039.4	25/2$^-$	E2	Mult.: DCO=1.0 *1*.
543.1 *2*	5.6 *3*	1980.3	27/2$^+$	1437.3	23/2$^+$	E2	Mult.: DCO=1.0 *1*.
545.4 *5*	0.6 *1*	3126.3	(33/2$^-$)	2580.9	29/2$^-$		
550.3 *2*	28.4 *17*	1746.2	29/2$^+$	1195.8	25/2$^+$	E2	Mult.: DCO=1.0 *1*.
555 *1*	<0.5	3019.3	(31/2$^+$)	2464.3	27/2$^+$		
560.9 *2*	4.1 *3*	1873.5	25/2$^-$	1312.58	21/2$^-$	E2	Mult.: DCO=3.1 *2* in stretched dipole gate.
562[a] *1*	0.5 *1*	1703.6?	(21/2$^-$)	1141.8	17/2$^-$		
567.3 *5*	0.7 *1*	2459.2	27/2$^-$	1891.9	23/2$^-$	E2	Mult.: DCO=0.9 *1*.
577.8 *5*	0.9 *2*	716.8	13/2$^-$	139.01	13/2$^+$		
583.2 *2*	3.1 *2*	2170.3	27/2$^-$	1587.06	23/2$^-$	E2	Mult.: DCO=3.2 *3* in stretched dipole gate.
585.2 *2*	3.9 *3*	2717.5	33/2$^+$	2132.3	29/2$^+$	E2	Mult.: DCO=1.0 *1*.
586.3 *5*	0.7 *1*	3471.1	(37/2$^-$)	2884.8	33/2$^-$	(E2)	Mult.: DCO=1.3 *2*.
591 *1*	<0.5	3050.2	(31/2$^-$)	2459.2	27/2$^-$		
602.8 *5*	2.6 *2*	2476.2	29/2$^-$	1873.5	25/2$^-$	E2	Mult.: DCO=2.3 *2* in stretched dipole gate.
611.9 *2*	12.7 *8*	977.32	19/2$^+$	365.40	17/2$^+$	(M1+E2)	Mult.: DCO=1.4 *2*.
614.8 *5*	2.2 *2*	2361.4	29/2$^-$	1746.2	29/2$^+$		
616.3 *5*	2.3 *2*	2596.0	31/2$^+$	1980.3	27/2$^+$	E2	Mult.: DCO=1.0 *2*.
616.6 *2*	10.0 *6*	2362.7	33/2$^+$	1746.2	29/2$^+$	E2	Mult.: DCO=1.0 *1*.
619.7 *5*	1.4 *1*	2790.0	31/2$^-$	2170.3	27/2$^-$	E2	Mult.: DCO=3.2 *4* in stretched dipole gate.
633.5 *5*	0.7 *2*	3109.7	33/2$^-$	2476.2	29/2$^-$		
637.3 *10*	0.4 *1*	3427.3	35/2$^-$	2790.0	31/2$^-$		
645.7 *5*	1.5 *2*	1010.87	17/2$^-$	365.40	17/2$^+$		
650.9 *5*	1.1 *1*	3368.4	(37/2$^+$)	2717.5	33/2$^+$	(E2)	Mult.: DCO=0.9 *2*.
653[@] *1*		4124.1	(41/2$^-$)	3471.1	(37/2$^-$)		
668.4 *5*	2.1 *2*	3031.1	37/2$^+$	2362.7	33/2$^+$	E2	Mult.: DCO=1.0 *1*.
676.3[@] *10*	<0.5	4044.7	(41/2$^+$)	3368.4	(37/2$^+$)		
680.5 *10*	<0.5	3276.5	(35/2$^+$)	2596.0	31/2$^+$		
688[@] *1*		4732.7	(45/2$^+$)	4044.7	(41/2$^+$)		
707.1 *2*	4.5 *3*	1902.8	25/2$^-$	1195.8	25/2$^+$	D,Q	Mult.: DCO=1.1 *1*, ΔJ=0 γ.
708.7 *2*	5.5 *4*	1437.3	23/2$^+$	728.59	21/2$^+$	D,Q	Mult.: DCO=1.3 *2*, ΔJ=1 γ.
712.6 *10*	0.4 *1*	3743.7	41/2$^+$	3031.1	37/2$^+$	(E2)	Mult.: DCO=0.8 *2*.
713.2 *5*	2.7 *3*	852.3	15/2$^-$	139.01	13/2$^+$	D	Mult.: DCO=0.6 *1*.
717[@] *1*		4841.2	(45/2$^-$)	4124.1	(41/2$^-$)		
724[@] *1*		5456.7	(49/2$^+$)	4732.7	(45/2$^+$)		
734.9 *2*	8.6 *6*	873.99	17/2$^+$	139.01	13/2$^+$	E2	Mult.: DCO=1.0 *1*.
744 *1*	<0.5	2330.9	(25/2$^-$)	1587.06	23/2$^-$		
755[@] *1*		4498.7	(45/2$^+$)	3743.7	41/2$^+$		
760.2 *5*	2.1 *5*	899.3	15/2$^-$	139.01	13/2$^+$	D,Q	Mult.: DCO=1.2 *3*, ΔJ=1 γ.
761 *1*	<0.5	2073.4	(23/2$^-$)	1312.58	21/2$^-$		
763.7 *10*	<0.5	3126.3	(33/2$^-$)	2362.7	33/2$^+$		
764.3 *5*	1.0 *1*	1339.6	(17/2$^-$)	575.43	15/2$^-$	(M1+E2)	Mult.: DCO=0.8 *2* in stretched dipole gate.
767.8 *5*	0.6 *1*	1819.1	(21/2$^-$)	1051.43	19/2$^-$	(M1+E2)	Mult.: DCO=0.7 *2* in stretched dipole gate.
769.1 *5*	0.8 *1*	1574.1	(19/2$^-$)	805.17	17/2$^-$		
774[@] *1*		6230.7	(53/2$^+$)	5456.7	(49/2$^+$)		
775.3 *2*	3.8 *3*	1504.0	21/2$^-$	728.59	21/2$^+$	D,Q	Mult.: DCO=1.0 *1*, ΔJ=0 γ.
776[a] *1*	3.7 *1*	1141.8	17/2$^-$	365.40	17/2$^+$		
784.5 *5*	1.3 *1*	1980.3	27/2$^+$	1195.8	25/2$^+$	D,Q	Mult.: DCO=1.2 *2*, ΔJ=1 γ.
791.5 *5*	2.5 *2*	1520.3	21/2$^-$	728.59	21/2$^+$	D,Q	Mult.: DCO=1.0 *1*, ΔJ=0 γ.
797 *1*		3159.7	(33/2$^-$)	2362.7	33/2$^+$		E_γ: from figure 1 of 2002Br52, not given in authors' Table I.
799[@] *1*		5297.7	(49/2$^+$)	4498.7	(45/2$^+$)		

Continued on next page (footnotes at end of table)

^{152}Sm(α,3nγ) 2002Br52,1972Lo04 (continued)

$\gamma(^{153}Gd)$ (continued)

E_γ †	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	Comments
834.8 *5*	0.9 *1*	2580.9	$29/2^-$	1746.2	$29/2^+$	D,Q	Mult.: DCO=0.9 *2*, Q or Q+D $\Delta J=0$ γ.
843.3 *2*	8.4 *5*	1208.87	$21/2^+$	365.40	$17/2^+$	E2	Mult.: DCO=0.9 *1*.
843.7 *5*	1.6 *1*	2039.4	$25/2^-$	1195.8	$25/2^+$	D,Q	Mult.: DCO=0.8 *2*, $\Delta J=0$ γ.
847@ *1*		6144.7	$(53/2^+)$	5297.7	$(49/2^+)$		
849.7 *2*	4.8 *2*	2596.0	$31/2^+$	1746.2	$29/2^+$	D(+Q)	Mult.: DCO=0.5 *1*.
890@ *1*		7034.7	$(57/2^+)$	6144.7	$(53/2^+)$		
900.0 *2*	3.0 *2*	1628.7	$25/2^+$	728.59	$21/2^+$	E2	Mult.: DCO=0.9 *1*.
907.5 *2*	4.3 *3*	2103.3	$(27/2^-)$	1195.8	$25/2^+$	D	Mult.: DCO=0.5 *1*.
937 *1*	0.5 *1*	2132.3	$29/2^+$	1195.8	$25/2^+$		
975.8 *5*	1.5 *1*	1339.6	$(17/2^-)$	363.67	$13/2^-$	(E2)	Mult.: DCO=3.0 *6* in stretched dipole gate.
998.4 *5*	0.8 *1*	1574.1	$(19/2^-)$	575.43	$15/2^-$	(E2)	Mult.: DCO=2.2 *5* in stretched dipole gate.
1014 *1*	0.8 *1*	1819.1	$(21/2^-)$	805.17	$17/2^-$	(E2)	Mult.: DCO=2.1 *2* in stretched dipole gate.

† $\Delta(E\gamma)$ assigned as 0.2 keV for $I\gamma>3$, 0.5 keV for $0.5<I\gamma<3$, and 1.0 keV for others, based on a general statement by 2002Br52.

‡ Adopted by the evaluator based on DCO ratio measurements of 2002Br52 unless otherwise mentioned. If not specified otherwise, all transitions are stretched. Based on the type of reaction the Q (quadrupole) transitions are very likely E2, the admixed D+Q (dipole plus quadrupole) ones are more likely (M1+E2), while for the relatively pure D (dipole) transitions their magnetic or electric character cannot be assesed without extra polarization measurements.

From $\gamma(\theta)$ (1972Lo04).

@ γ observed only in ^{124}Sn(^{36}S,α3nγ) (2002Br52).

& Rounded off value from ^{153}Gd Adopted γ's.

a Placement of transition in the level scheme is uncertain.

^{152}Sm(α,3nγ) 2002Br52,1972Lo04

Level Scheme

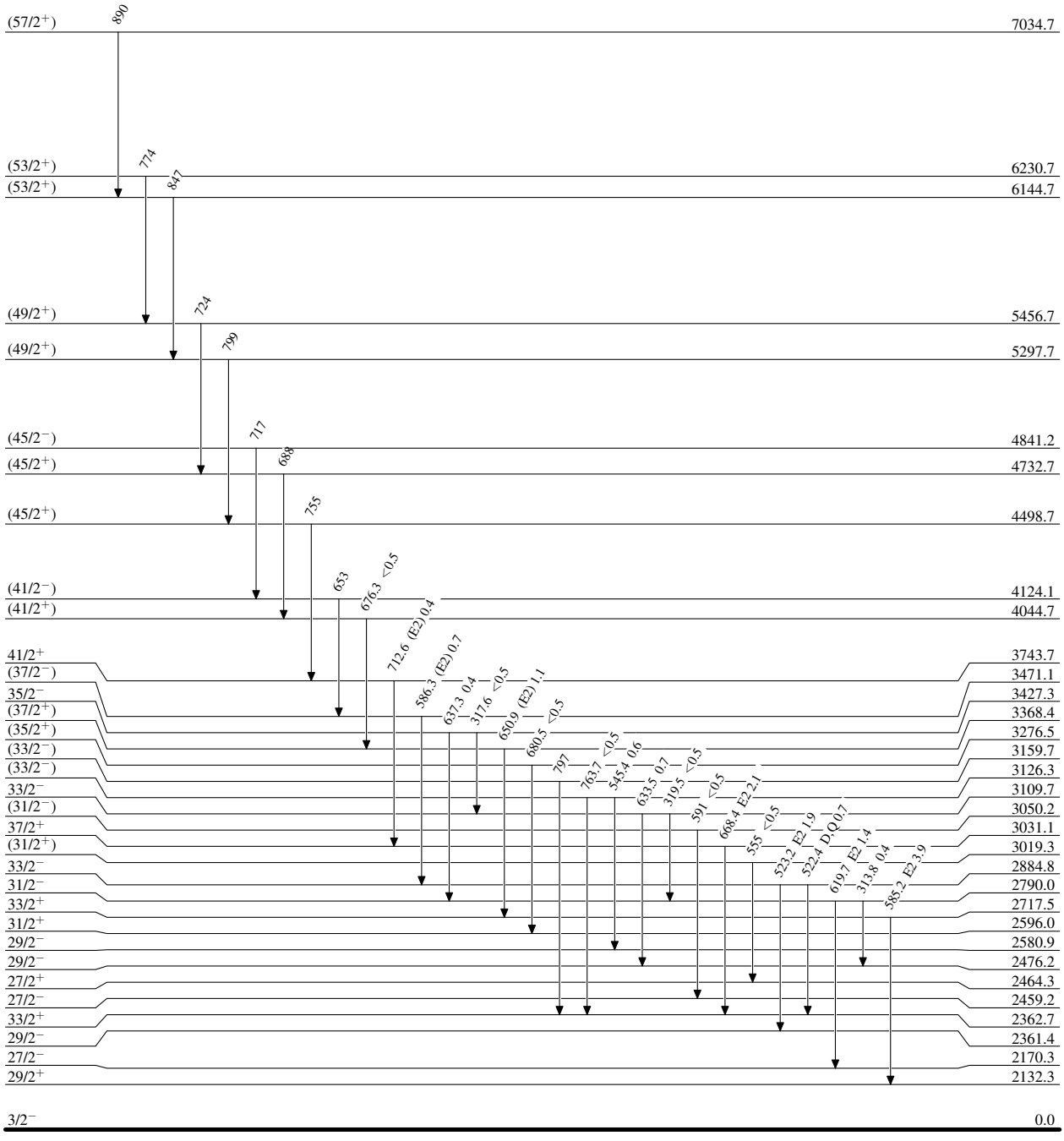
Intensities: Relative I_γ

Legend

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

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

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

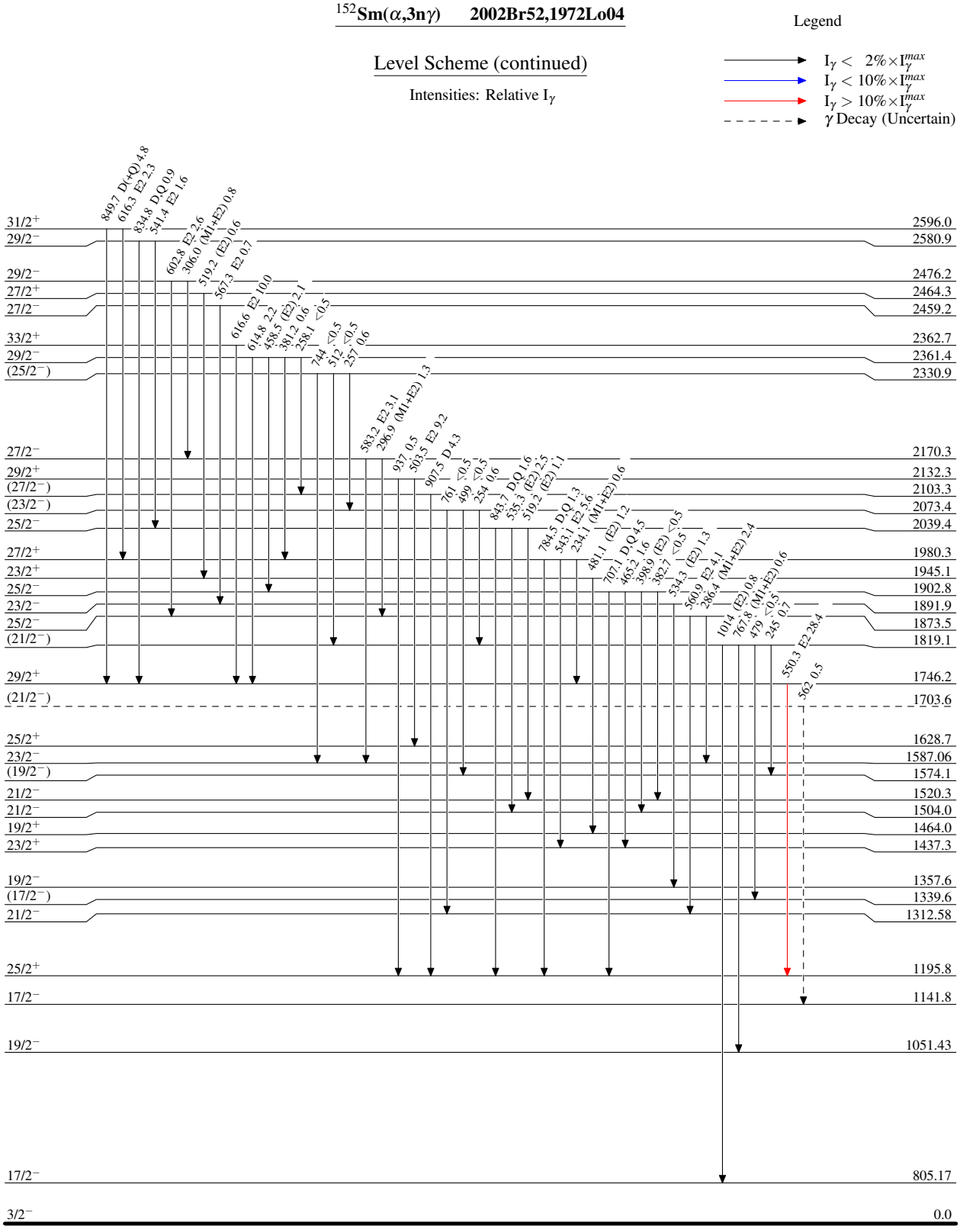


$^{153}_{64}Gd_{89}$

^{152}Sm(α,3nγ) 2002Br52,1972Lo04

Level Scheme (continued)

Intensities: Relative I_γ



$^{153}_{64}Gd_{89}$

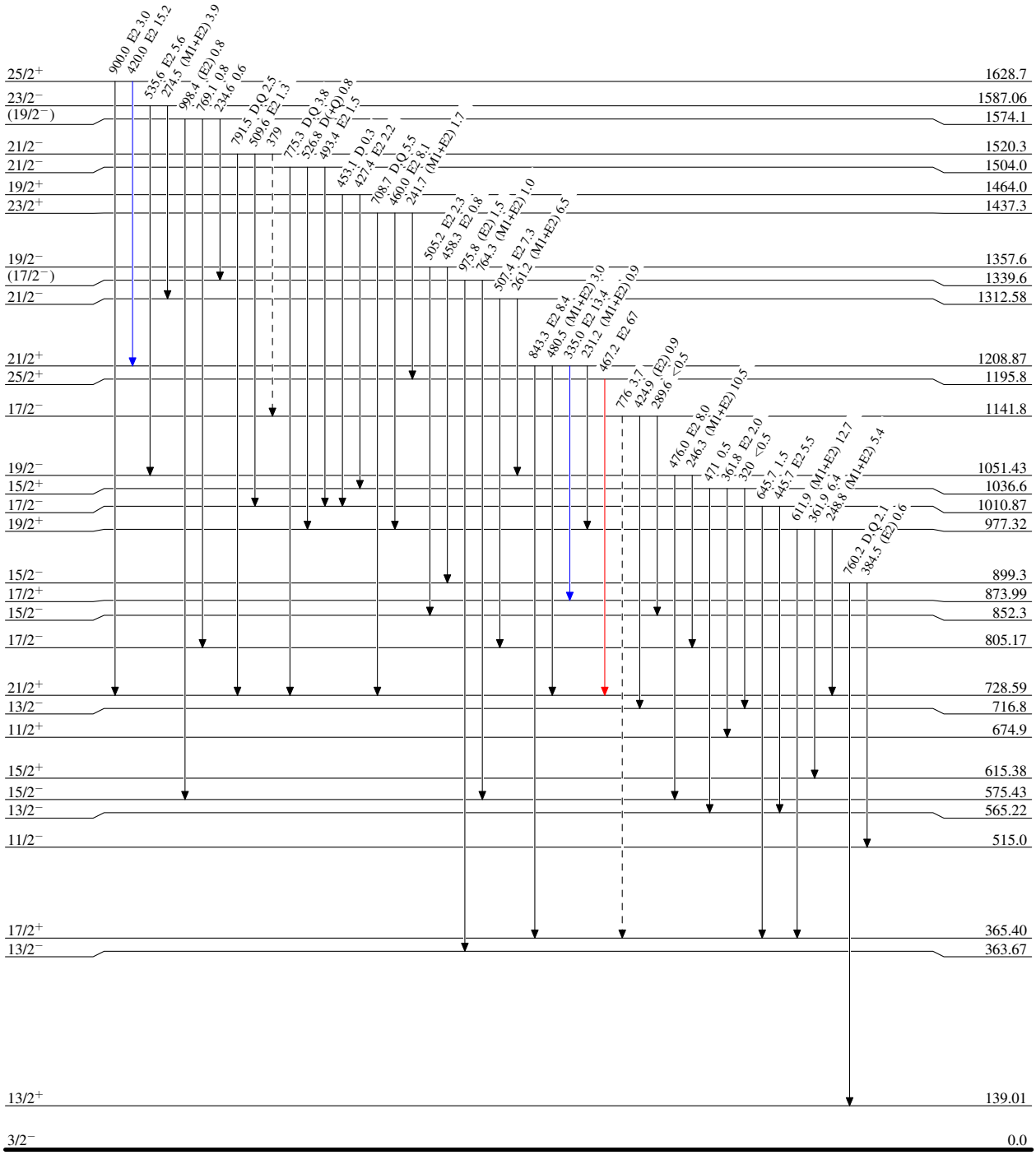
^{152}Sm(α,3nγ) **2002Br52,1972Lo04**

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)

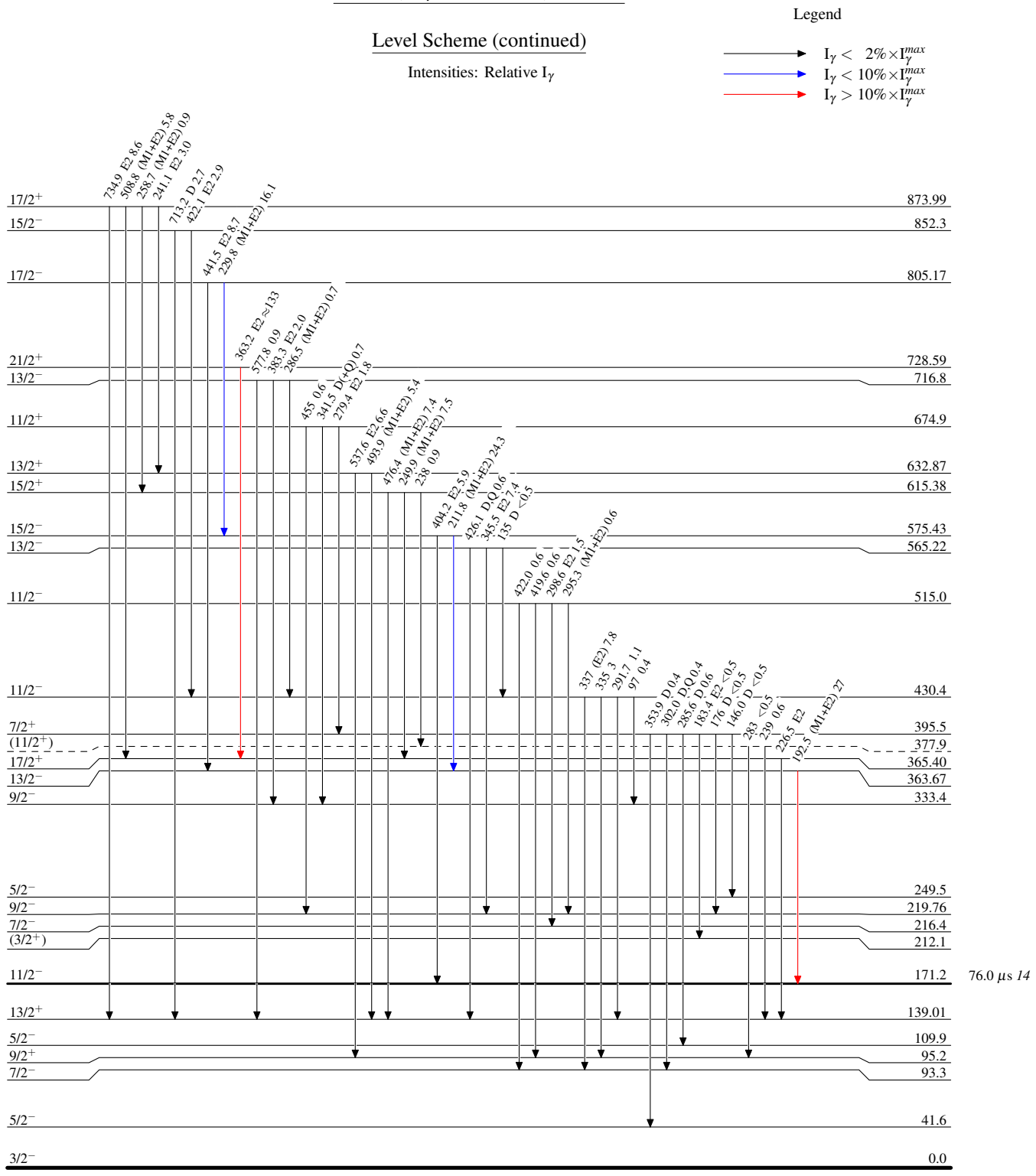


$^{153}_{64}Gd_{89}$

^{152}Sm(α,3nγ) 2002Br52,1972Lo04

Level Scheme (continued)

Intensities: Relative I_γ

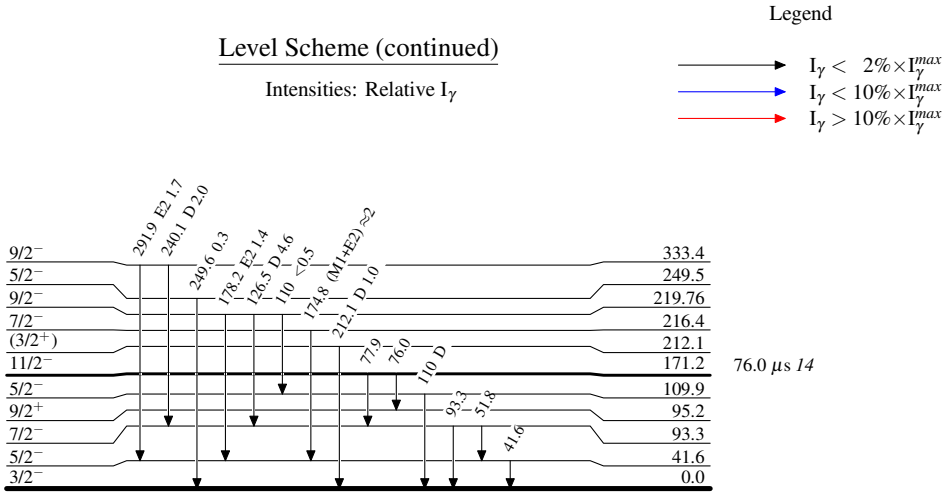


$^{153}_{64}Gd_{89}$

^{152}Sm(α,3nγ) 2002Br52,1972Lo04

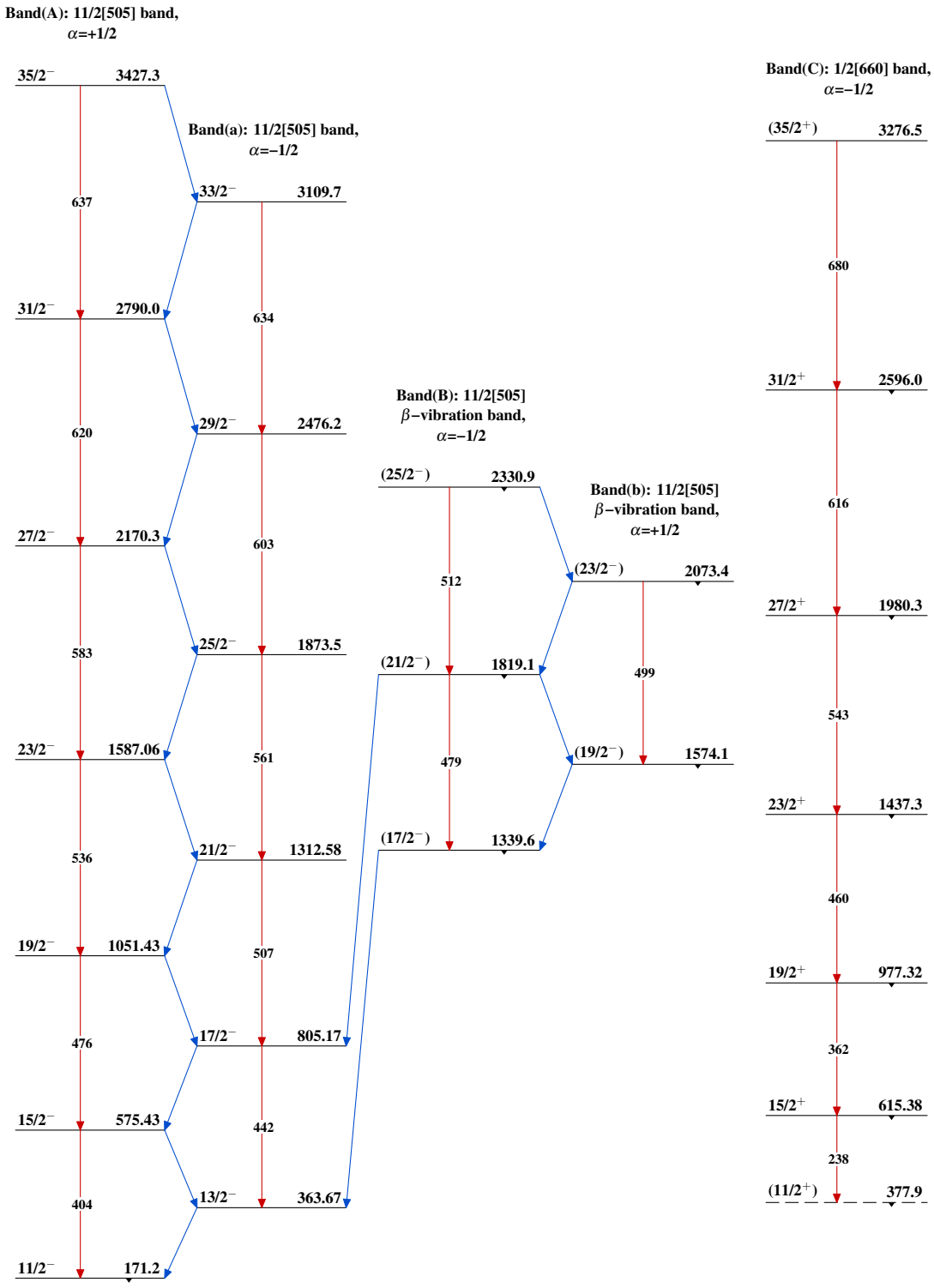
Level Scheme (continued)

Intensities: Relative I_γ



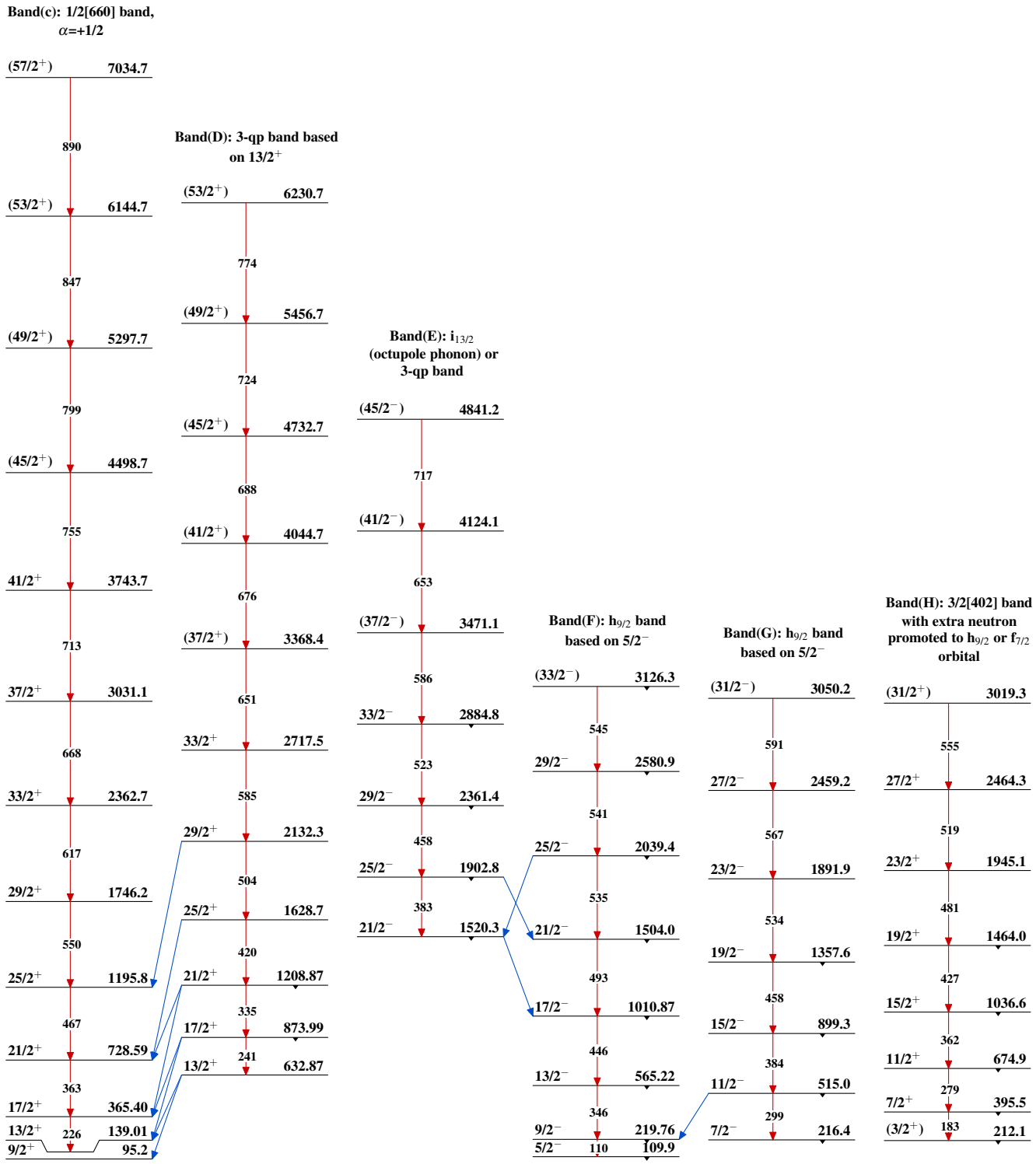
$^{153}_{64}Gd_{89}$

^{152}Sm(α,3nγ) 2002Br52,1972Lo04

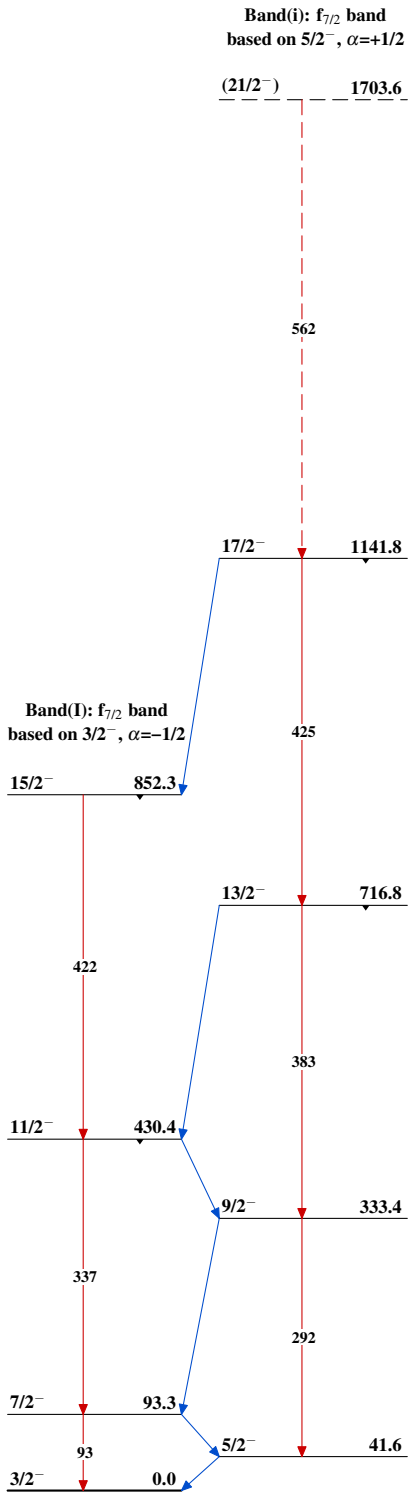


$^{153}_{64}Gd_{89}$

^{152}Sm(α,3nγ) 2002Br52,1972Lo04 (continued)



^{152}Sm(α,3nγ) 2002Br52,1972Lo04 (continued)



$^{153}_{64}Gd_{89}$