^{155}Gd(^{32}S,4nγ) E=160 MeV 1995Sh04,1993Bi17

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 134, 149 (2016)	15-Apr-2015

1995Sh04: E=160 MeV; ^{155}Gd enriched self-supporting target; 10 Compton-suppressed Ge detectors, one low-energy photon spectrometer, multiplicity filter with 28 BGO detectors; θ=35°, 90°, 145°; measured Eγ, Iγ, $\gamma\gamma$ coin, γ(K x ray) coin, DCO ratios (90°, 35 (or 145) °); $\gamma\gamma$ coin matrix added to that from 1993Bi17.

1993Bi17: E=160 MeV; fragment mass analyzer for identification of evaporation residues; Compton-suppressed Ge-detector array; measured Eγ, Iγ (unstated), residue-γ coin, $\gamma\gamma$ coin, residue-$\gamma\gamma$ coin; identified 9/2[624] and 7/2[514] bands.

The level scheme is taken from 1995Sh04; this is similar to, and presumably supersedes, that from 1993Bi17 for the 9/2[624] and 7/2[514] bands, and also includes the 1/2[521] band. The proposed 1/2[521] band structure differs from that shown in Adopted Levels in several respects (see comments on that band), but is included in the present dataset for completeness.

^{183}Hg Levels

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
0.0#	1/2$^-$	585.10+x[a] 24	(15/2$^-$)	1718.7+x[&] 4	(25/2$^-$)	3027.3[@] 12	31/2$^-$
0.0+x[a]	(7/2$^-$)	700.05+y[d] 20	(19/2$^+$)	1807.2+y[c] 4	(29/2$^+$)	3101.0# 9	33/2$^-$
0.0+y[b]	(13/2$^+$)	778.4+x[&] 3	(17/2$^-$)	1866.6[@] 9	23/2$^-$	3211.5+x[a] 9	(35/2$^-$)
86.4[@] 4	3/2$^-$	832.32+y[c] 23	(21/2$^+$)	1921.2# 6	25/2$^-$	3514.2+x[&] 9	(37/2$^-$)
89.0# 4	5/2$^-$	924.7[@] 6	15/2$^-$	1995.4+x[a] 5	(27/2$^-$)	3563.8+y[d] 9	(39/2$^+$)
104.90+x[&] 16	(9/2$^-$)	954.0# 5	17/2$^-$	2229.6+y[d] 5	(31/2$^+$)	3649.2[@] 13	(35/2$^-$)
251.30+x[a] 16	(11/2$^-$)	991.8+x[a] 3	(19/2$^-$)	2274.0+x[&] 5	(29/2$^-$)	3710.0+y[c] 5	(41/2$^+$)
280.5[@] 4	7/2$^-$	1135.36+y[d] 24	(23/2$^+$)	2389.9+y[c] 4	(33/2$^+$)	3727.3# 11	(37/2$^-$)
287.8# 5	9/2$^-$	1217.9+x[&] 4	(21/2$^-$)	2425.5[@] 11	27/2$^-$	3880.3+x[a] 9	(39/2$^-$)
353.78+y[b] 18	(15/2$^+$)	1286.3+y[c] 3	(25/2$^+$)	2491.4# 8	29/2$^-$	4285.8?[@] 14	(39/2$^-$)
406.40+x[&] 23	(13/2$^-$)	1363.2[@] 8	19/2$^-$	2580.0+x[a] 7	(31/2$^-$)	4292.8+y[d] 10	(43/2$^+$)
429.02+y[c] 18	(17/2$^+$)	1404.9# 6	21/2$^-$	2870.9+y[d] 7	(35/2$^+$)	4367.2?# 12	(41/2$^-$)
561.0[@] 5	11/2$^-$	1464.0+x[a] 4	(23/2$^-$)	2876.2+x[&] 7	(33/2$^-$)	4433.1+y[c] 7	(45/2$^+$)
578.6# 5	13/2$^-$	1648.2+y[d] 3	(27/2$^+$)	3026.9+y[c] 5	(37/2$^+$)		

† From least-squares fit to Eγ. from Adopted Levels, Gammas, the energy offset y=266 *20*.

‡ From 1995Sh04, based on measured γ multipolarity data and deduced band structure.

Band(A): 1/2[521], α=+1/2 band. This band differs from that in Adopted Levels primarily because 1995Sh04 assign an 88.9γ (rather than the 86.5γ) as the 5/2 to 1/2 transition.

@ Band(a): 1/2[521], α=−1/2 band. This signature partner differs significantly from that in Adopted Levels. Here, the J=3/2 to 1/2 transition has Eγ=86.5 instead of the adopted value of 67.1 and the other three transitions connecting to the the 1/2[521] α=+1/2 band also differ from the adopted ones; so does the J=31/2 to 27/2 in-band transition (Eγ=601.8 here but 613.6 in Adopted Gammas).

& Band(B): 7/2[514], α=+1/2 band.

a Band(b): 7/2[514], α=−1/2 band.

b Band(C): $i_{13/2}$ band.

c Band(D): 9/2[624], α=+1/2 band.

d Band(d): 9/2[624], α=−1/2 band.

^{155}Gd(^{32}S,4nγ) E=160 MeV 1995Sh04,1993Bi17 (continued)

$\gamma(^{183}Hg)$

E_γ[‡]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	Comments
86.5 *5*	1.3 *2*	86.4	3/2$^-$	0.0	1/2$^-$		
88.9 *5*	3.8 *6*	89.0	5/2$^-$	0.0	1/2$^-$	Q	DCO=1.1 *3*.
104.9 *2*	29 *3*	104.90+x	(9/2$^-$)	0.0+x	(7/2$^-$)		E_γ: 105.7 in 1993Bi17. DCO=0.8 *3*.
146.4 *2*	5 *1*	251.30+x	(11/2$^-$)	104.90+x	(9/2$^-$)		DCO=0.8 *4*.
155.1 *5*	1.5 *2*	406.40+x	(13/2$^-$)	251.30+x	(11/2$^-$)		DCO=0.7 *2*.
178.7 *5*	1.0 *1*	585.10+x	(15/2$^-$)	406.40+x	(13/2$^-$)		DCO=0.7 *3*.
191.4 *5*	4 *2*	280.5	7/2$^-$	89.0	5/2$^-$		DCO=0.8 *3*, but γ is not well separated from 194.1γ.
193.3 *5*	1.2 *2*	778.4+x	(17/2$^-$)	585.10+x	(15/2$^-$)		DCO=0.7 *3*.
194.1 *2*	10 *2*	280.5	7/2$^-$	86.4	3/2$^-$		DCO=0.8 *2*, but γ is not well separated from 191.4γ.
198.9 *2*	13 *2*	287.8	9/2$^-$	89.0	5/2$^-$	Q	DCO=1.0 *1*.
251.3 *2*	20 *2*	251.30+x	(11/2$^-$)	0.0+x	(7/2$^-$)		DCO=0.9 *3*.
271.0 *2*	13 *1*	700.05+y	(19/2$^+$)	429.02+y	(17/2$^+$)	D	E_γ: 271.8 in 1993Bi17. DCO=0.4 *1*.
273.2 *5*		561.0	11/2$^-$	287.8	9/2$^-$		I_γ: weak. Absent In (^{32}S,4nγ) E=159 MeV; omitted from Adopted Gammas.
280.4 *2*	6.9 *4*	561.0	11/2$^-$	280.5	7/2$^-$	Q	DCO=1.0 *2*.
290.8 *2*	11.4 *5*	578.6	13/2$^-$	287.8	9/2$^-$		DCO=0.8 *2*.
301.5 *2*	19 *3*	406.40+x	(13/2$^-$)	104.90+x	(9/2$^-$)	Q	DCO=0.9 *1*.
303.0 *2*	7.8 *8*	1135.36+y	(23/2$^+$)	832.32+y	(21/2$^+$)	D	E_γ: 303.9 in 1993Bi17. DCO=0.6 *2*.
333.8 *2*	17 *1*	585.10+x	(15/2$^-$)	251.30+x	(11/2$^-$)	Q	DCO=1.0 *2*.
346.1 *5*		924.7	15/2$^-$	578.6	13/2$^-$		I_γ: weak. Absent In (^{32}S,4nγ) E=159 MeV; omitted from Adopted Gammas.
346.3 *2*	13 *1*	700.05+y	(19/2$^+$)	353.78+y	(15/2$^+$)		DCO=1.0 *3*.
353.8 *2*	20 *2*	353.78+y	(15/2$^+$)	0.0+y	(13/2$^+$)	D	DCO=0.5 *2*.
361.9 *5*	3.6 *6*	1648.2+y	(27/2$^+$)	1286.3+y	(25/2$^+$)	D	E_γ: 362.6 in 1993Bi17. DCO=0.4 *2*.
363.7 *5*	4.5 *4*	924.7	15/2$^-$	561.0	11/2$^-$	Q	DCO=1.1 *3*.
372.0 *2*	13.0 *5*	778.4+x	(17/2$^-$)	406.40+x	(13/2$^-$)		DCO=0.9 *2*.
375.4 *2*	10.8 *5*	954.0	17/2$^-$	578.6	13/2$^-$	Q	DCO=1.1 *2*.
403.3 *2*	66 *3*	832.32+y	(21/2$^+$)	429.02+y	(17/2$^+$)	Q	DCO=1.0 *2*.
406.7 *2*	10.7 *7*	991.8+x	(19/2$^-$)	585.10+x	(15/2$^-$)		DCO=0.9 *2*.
422.6 *5*	3 *2*	2229.6+y	(31/2$^+$)	1807.2+y	(29/2$^+$)	D	DCO=0.6 *2*.
429.0 *2*	100	429.02+y	(17/2$^+$)	0.0+y	(13/2$^+$)	Q	DCO=1.1 *2*.
435.3 *2*	10 *3*	1135.36+y	(23/2$^+$)	700.05+y	(19/2$^+$)		DCO=1.0 *4*.
438.5 *5*	3.9 *4*	1363.2	19/2$^-$	924.7	15/2$^-$		DCO=1.1 *4*.
439.5 *2*	9.1 *5*	1217.9+x	(21/2$^-$)	778.4+x	(17/2$^-$)		DCO=0.8 *2*.
450.9 *2*	6.7 *5*	1404.9	21/2$^-$	954.0	17/2$^-$		DCO=1.0 *3*.
454.0 *2*	47 *2*	1286.3+y	(25/2$^+$)	832.32+y	(21/2$^+$)		DCO=0.9 *2*.
472.2 *2*	8.7 *7*	1464.0+x	(23/2$^-$)	991.8+x	(19/2$^-$)		DCO=1.1 *4*.
500.8 *2*	7.0 *5*	1718.7+x	(25/2$^-$)	1217.9+x	(21/2$^-$)		DCO=1.1 *3*.
503.4 *5*	2.6 *3*	1866.6	23/2$^-$	1363.2	19/2$^-$		DCO=1.2 *4*.
512.8 *2*	5.5 *5*	1648.2+y	(27/2$^+$)	1135.36+y	(23/2$^+$)		DCO=0.8 *4*.
516.3 *2*	5.4 *5*	1921.2	25/2$^-$	1404.9	21/2$^-$		DCO=1.1 *3*.
521.0 *2*	29 *2*	1807.2+y	(29/2$^+$)	1286.3+y	(25/2$^+$)		DCO=1.2 *3*.
531.4 *2*	7.8 *7*	1995.4+x	(27/2$^-$)	1464.0+x	(23/2$^-$)		E_γ: 532.2 in 1993Bi17. DCO=1.0 *3*.
555.3 *2*	5.6 *5*	2274.0+x	(29/2$^-$)	1718.7+x	(25/2$^-$)		DCO=0.8 *3*.
558.9 *5*	2.1 *3*	2425.5	27/2$^-$	1866.6	23/2$^-$		DCO=1.1 *5*.
570.2 *5*	3.9 *4*	2491.4	29/2$^-$	1921.2	25/2$^-$		DCO=1.0 *4*.
581.1 *5*	2.8 *4*	2229.6+y	(31/2$^+$)	1648.2+y	(27/2$^+$)		DCO=0.9 *5*.
582.7 *2*	25 *2*	2389.9+y	(33/2$^+$)	1807.2+y	(29/2$^+$)		DCO=1.0 *4*.
584.6 *5*	3.5 *6*	2580.0+x	(31/2$^-$)	1995.4+x	(27/2$^-$)		DCO=1.0 *5*.
601.8 *5*	1.1 *2*	3027.3	31/2$^-$	2425.5	27/2$^-$		DCO=1.3 *9*.

Continued on next page (footnotes at end of table)

^{155}Gd(^{32}S,4nγ) E=160 MeV 1995Sh04,1993Bi17 (continued)

γ(^{183}Hg) (continued)

E_γ ‡	I_γ ‡	E_i(level)	J_i^π	E_f	J_f^π	Comments
602.2 *5*	2.3 *4*	2876.2+x	(33/2$^-$)	2274.0+x	(29/2$^-$)	DCO=1.0 *5*.
609.6 *5*	2.6 *4*	3101.0	33/2$^-$	2491.4	29/2$^-$	DCO=0.8 *4*.
621.9 *5*	0.7 *2*	3649.2	(35/2$^-$)	3027.3	31/2$^-$	
626.3 *5*	2 *1*	3727.3	(37/2$^-$)	3101.0	33/2$^-$	
631.5 *5*	1.7 *8*	3211.5+x	(35/2$^-$)	2580.0+x	(31/2$^-$)	E_γ: 630.6 in 1993Bi17. DCO=1.2 *9*.
636.6# *5*		4285.8?	(39/2$^-$)	3649.2	(35/2$^-$)	I_γ: weak.
637.0 *2*	13 *2*	3026.9+y	(37/2$^+$)	2389.9+y	(33/2$^+$)	DCO=1.1 *5*.
638.0 *5*	1.0 *3*	3514.2+x	(37/2$^-$)	2876.2+x	(33/2$^-$)	E_γ: 640.0 in 1993Bi17.
639.9# *5*	1 *1*	4367.2?	(41/2$^-$)	3727.3	(37/2$^-$)	
641.3 *5*	1.1 *3*	2870.9+y	(35/2$^+$)	2229.6+y	(31/2$^+$)	DCO=1.0 *7*.
668.8 *5*	0.3 *3*	3880.3+x	(39/2$^-$)	3211.5+x	(35/2$^-$)	
683.1 *2*	8 *3*	3710.0+y	(41/2$^+$)	3026.9+y	(37/2$^+$)	
692.9 *5*	0.6 *3*	3563.8+y	(39/2$^+$)	2870.9+y	(35/2$^+$)	
723.1 *5*	4 *1*	4433.1+y	(45/2$^+$)	3710.0+y	(41/2$^+$)	
729.0 *5*	0.6 *3*	4292.8+y	(43/2$^+$)	3563.8+y	(39/2$^+$)	

† Assigned by evaluator based on measured DCO ratios. 1995Sh04 expect DCO ratios of≈1.0 and 0.6 for stretched Q (or D ΔJ=0) transitions and pure stretched D transitions, respectively. They assign Q transitions As E2, D transitions As M1; see 1995Sh04 for authors′ suggested assignments based on DCO ratio, if available, and on deduced level scheme.

‡ From 1995Sh04. ΔE_γ=0.5 keV for weak lines, 0.2 keV for all others (1995Sh04); for the purpose of assigning energy uncertainties, the evaluator designates as "weak" all lines with Iγ<5. 1993Bi17 do not state Iγ data or energy uncertainties.

Placement of transition in the level scheme is uncertain.

^{155}Gd(^{32}S,4nγ) E=160 MeV 1995Sh04,1993Bi17

Level Scheme

Intensities: Relative I_γ

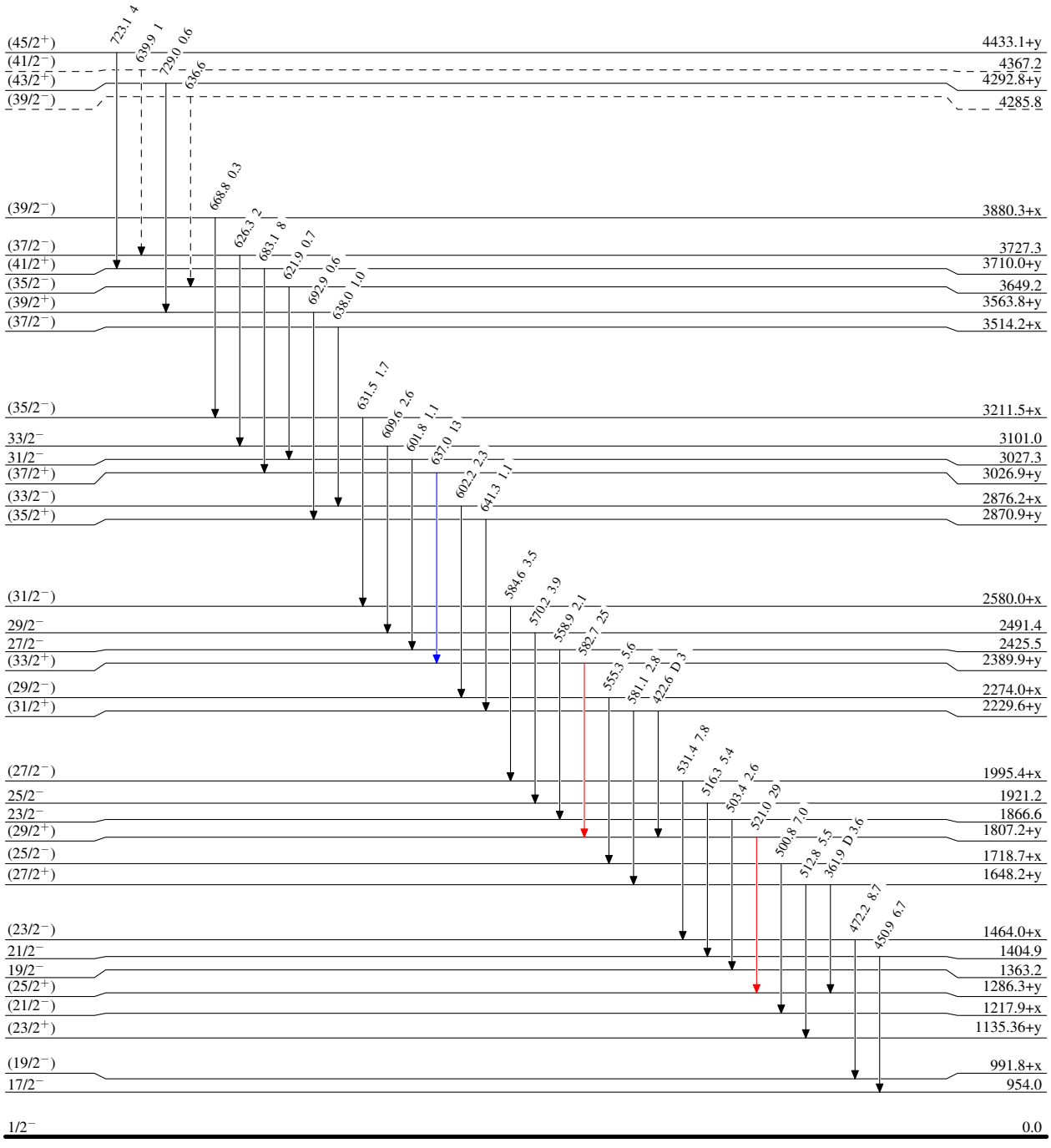
Legend

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

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

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

γ Decay (Uncertain)



$^{183}_{80}Hg_{103}$

^{155}Gd(^{32}S,4nγ) E=160 MeV 1995Sh04,1993Bi17

Level Scheme (continued)

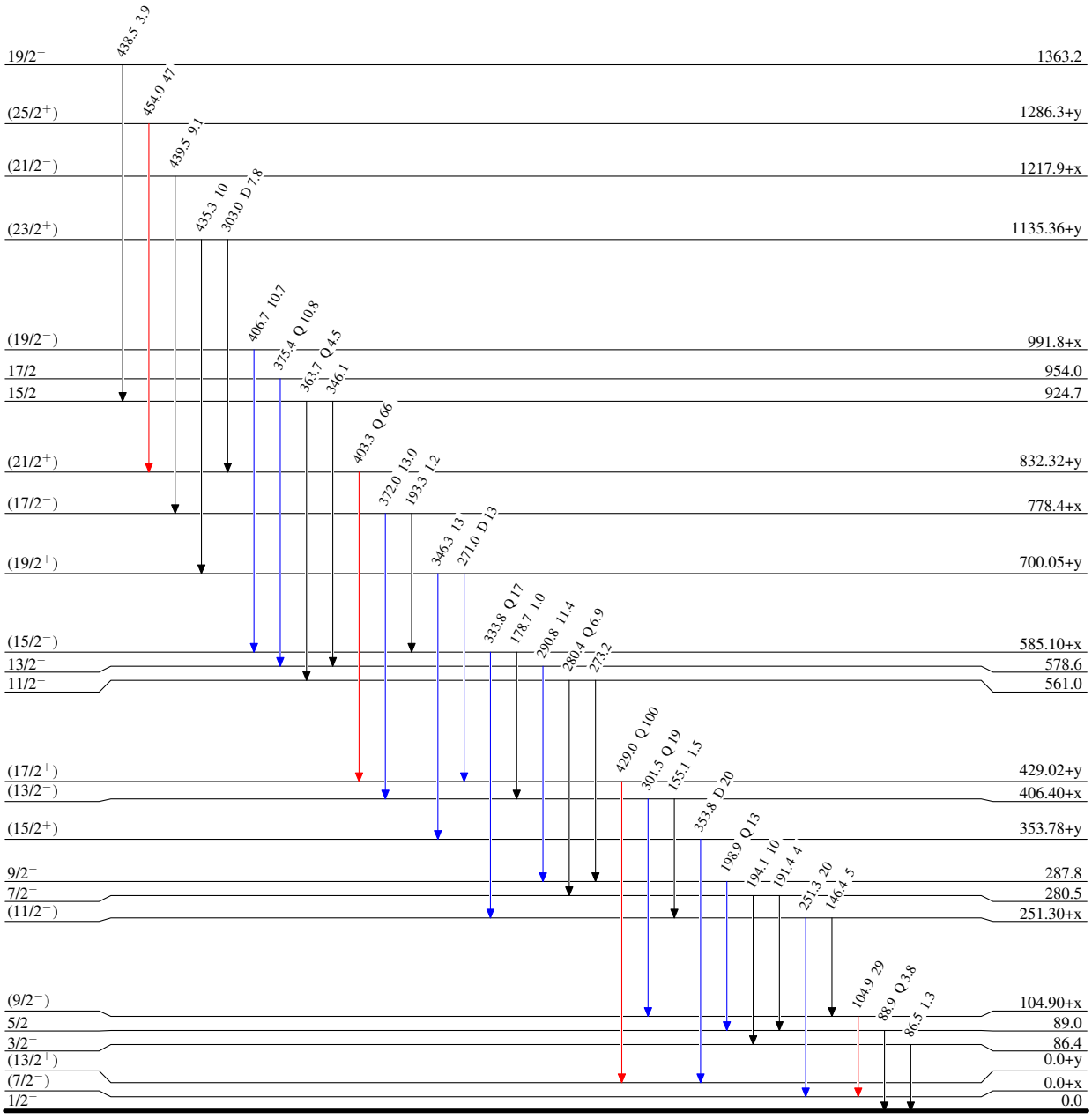
Intensities: Relative I_γ

Legend

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

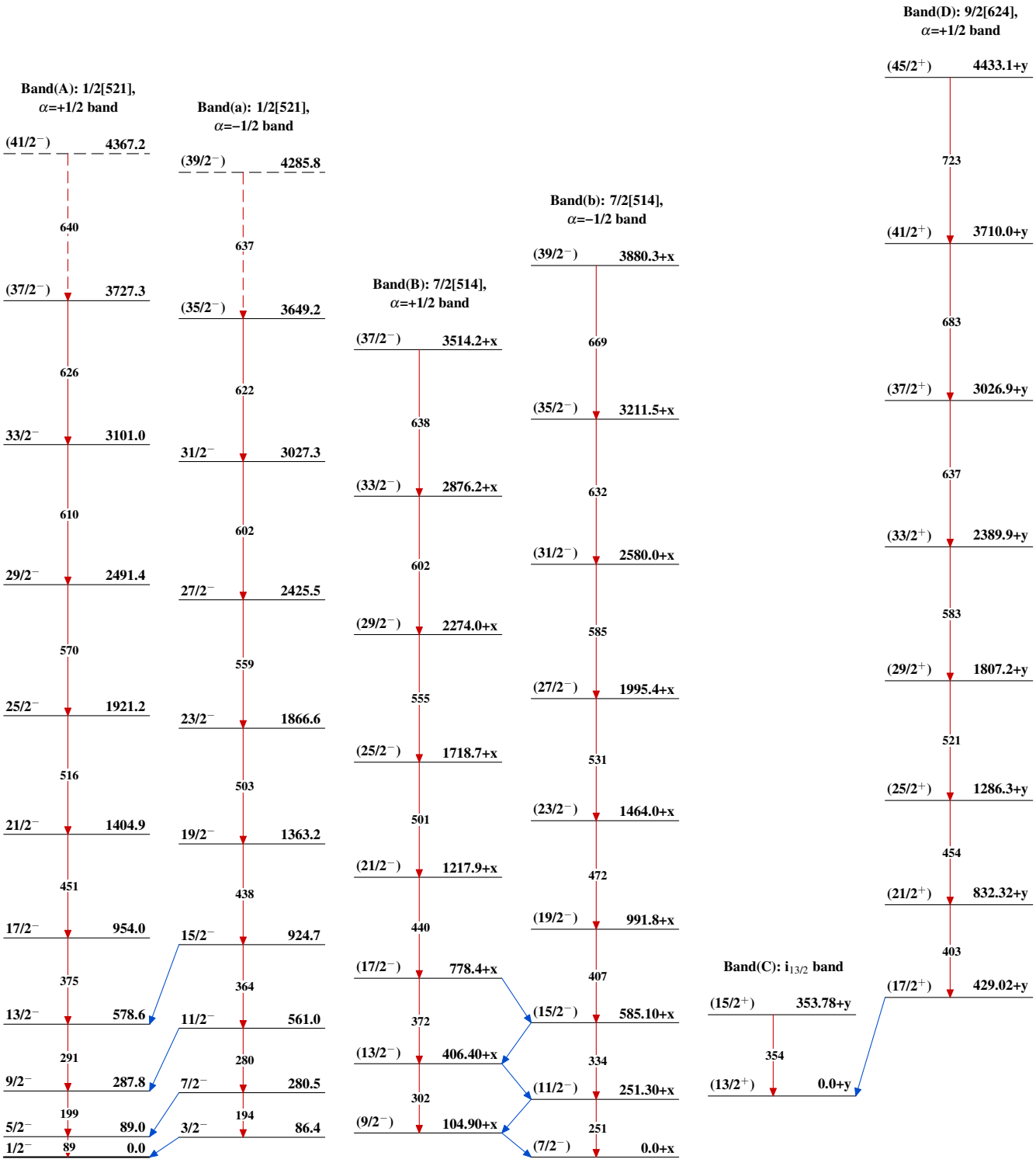
$I_\gamma < 10\% \times I_\gamma^{max}$

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



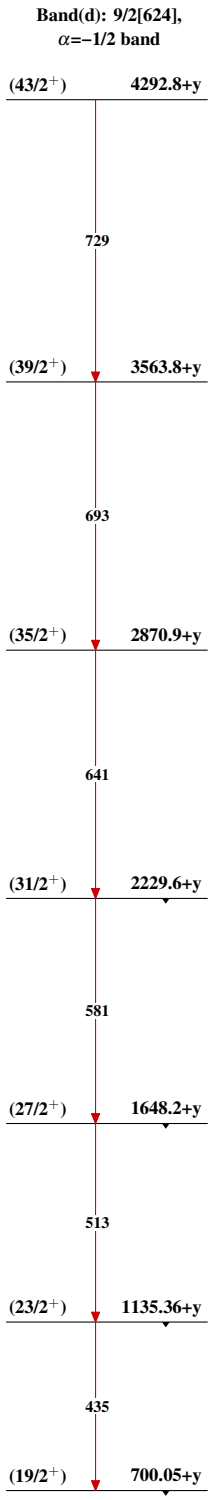
$^{183}_{80}Hg_{103}$

^{155}Gd(^{32}S,4nγ) E=160 MeV 1995Sh04,1993Bi17



$^{183}_{80}Hg_{103}$

^{155}Gd(^{32}S,4nγ) E=160 MeV 1995Sh04,1993Bi17 (continued)



$^{183}_{80}Hg_{103}$