Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 135,193 (2016)	31-May-2016

Q(β^-)=−1626 *3*; S(n)=10687 *4*; S(p)=6331.1 *13*; Q(α)=−5458.8 *16* 2012Wa38
S(2n)=19306 *10*, S(2p)=15739 *4* (2012Wa38).
Other reactions:
^{78}Se(p,γ): 2001Ra44: E=1.8-3.5 MeV. Measured primary γ rays with a pair spectrometer and deduced E1 transition strengths from about 35 primary γ transitions observed in the energy range of 5.8-8.2 MeV. Details of γ-ray data are not given in 2001Ra44.
^{78}Se(p,γ): 1977ChZQ: E=1.3 MeV, measured $\gamma\gamma$, $\gamma(\theta)$. No details are available. Four excited states, each with a g.s. transition, were reported at 382, 397, 606 and 832. Mixing ratios (δ(Q/D)) for the four g.s. transitions were: −0.21 *5*, +0.12 *8*, +0.1 *1* and <+16, respectively.
Additional information 1.
^{79}Br(p,p) data analyzed: 1986Is04.
Hyperfine structure studies: 1997Se13, 1987Si21, 1979Ku21, 1973Ho31, 1971Am02, 1970Lu02, 1970Bl08, 1969He04, 1966Br03.
Mass measurement: 1978Di09.

^{79}Br Levels

B(E2): from Coulomb excitation data, weighted averages of available data.

Cross Reference (XREF) Flags

A	^{79}Se β^- decay (3.26×10^5 y)	F	^{76}Ge(^{7}Li,4nγ) E=35 MeV	K	^{78}Se(α,p2nγ),^{77}Se(α,npγ)
B	^{79}Se β^- decay (3.92 min)	G	^{76}Ge(^{7}Li,4nγ) E=32 MeV	L	^{79}Br(γ,γ')
C	^{79}Br IT decay (4.85 s)	H	^{78}Se(p,p) IAR	M	^{79}Br(n,n$'\gamma$)
D	^{79}Kr ε decay (35.04 h)	I	^{78}Se(d,nγ)	N	Coulomb excitation
E	^{76}Ge(^{6}Li,3nγ)	J	^{78}Se(^{3}He,d)		

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$	XREF	Comments
0.0[e]	3/2$^-$	stable	ABCDEFG IJKLMN	μ=+2.106400 *4* (1972Bl07,2014StZZ) Q=+0.313 *3* (1954Ki11,2001Bi17,2008Py02,2014StZZ,2013StZZ) Evaluated rms charge radius=4.1629 fm *21* (2013An02). J$^\pi$: atomic-beam method (1932To02,1930Br01,1976Fu06); L(^{3}He,d)=1. Probable πp$_{3/2}$ orbital. μ: NMR method (1972Bl07). Others: 1954Wa37, 1951Sh33, 1949Zi02, 1947Br24, 1947Po16. Q: atomic-beam magnetic resonance method (1954Ki11), reanalyzed by 2001Bi17. Recalculations: +0.318 *5* (2004Al08), +0.305 *5* (2000Ha64), +0.331 *4* (1978Ta24), +0.293 (1962Ko22), +0.367 or +0.445 (1971Am02). Others: 1954Sc10, 1954Ro43, 1953Ko22, 1953Fa33, 1951De16, 1951Go37, 1950Sm56, 1948To10, 1948Po09. Q(^{79}Br)/Q(^{81}Br) (1969He04). Magnetic octupole moment=+0.116 (1966Br03,1989Ra17) (hyperfine structure measurement using atomic-beam magnetic resonance method). Recalculated as +0.123 or +0.093 by 1971Am02.
207.61[a] *9*	9/2$^+$	4.85 s *4*	C EFG IJKLMN	%IT=100 J$^\pi$: E3 γ to 3/2$^-$. Probable πg$_{9/2}$ orbital. T$_{1/2}$: weighted average of 4.86 s 10 (1986Al11), 4.97 s 10 (1972Jo05), 4.86 s 4 (1967Bo26,1968Bo52), 4.88 s *7* (1967Yu01), 4.87 s *15* (1967Sc14), 4.80 s *5* (1963Ka34), 4.78 s *15* (1961Go39). Others: 5.1 s 4 (2009Mu15), 5.08 s *7* (1962An13), 1974Co11, 1970Ru08, 1967Ab08, 1954Sc37.
217.10[d] *6*	5/2$^-$	47 ps *4*	DEFG IJK MN	μ=1.00 *25* (1994Sp05,2014StZZ) B(E2)↑=0.029 *5*

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{79}Br Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	$T_{1/2}$	XREF	Comments
				J$^{\pi}$: M1+E2 γ to 3/2$^-$; L(^{3}He,d)=3+4 for a doublet 207+217 where L=4 corresponds to 207 level and L=3 to 217 level. $T_{1/2}$: from DSAM in Coul. ex. (1994Sp05). Others: 51 ps *12* (RDDS in (α,pnγ) (1988Sc13)), 34 ps *23* or 52 ps *35* (from B(E2) in Coul. ex.); ≤0.14 ns (1970Be79,1969Sh12). μ: from $\gamma(\theta$,H) in Coul. ex. (1994Sp05).
261.33[g] *6*	3/2$^-$	0.13 ns *2*	DEFG I KLMN	B(E2)↑=0.0049 *10* J$^{\pi}$: M1 γ to 5/2$^-$; M1+E2 γ to 3/2$^-$; log *ft*=6.15 from 1/2$^-$. $T_{1/2}$: from γce(t) (1972OhZX). Others: 0.91 ns *8* $\gamma\gamma$(t) (1970Be79), >125 ps ((γ,γ') 1970We01). Value from 1970Be79 is inconsistent with B(E2) (from Coul. ex.) and δ(261γ).
306.51 *6*	1/2$^-$,3/2$^-$	4.23 ps *7*	DE IJ LMN	B(E2)↑=0.015 *3* J$^{\pi}$: L(^{3}He,d)=1. 1970We01 suggest that J=1/2 is favored from a comparison of measured A_2 for 306$\gamma(\theta)$ in Coul. ex. (1967Ro03) and that expected from δ=0.13 (deduced from B(E2)(↑) and $T_{1/2}$). $T_{1/2}$: from DSAM in Coul. ex. (1994Sp05). Other: 8.3 ps *17* for J=1/2, 17 ps *3* for J=5/2 in (γ,γ') (1970We01).
381.50 *22*	5/2$^+$	≈0.5 ns	E IJ L	XREF: J(383.6). J$^{\pi}$: L(^{3}He,d)=2; γ to 9/2$^+$. $T_{1/2}$: from $T_{1/2}$(173.7γ)(partial)=6 ns *2* (1995Kh02) in (γ,γ') and adopted branching ratio.
397.48 *6*	1/2$^-$,3/2$^-$	13 ps *4*	D IJKLMN	B(E2)↑=0.0032 *4* XREF: J(402.9). J$^{\pi}$: L(^{3}He,d)=1; excitation function in (d,nγ) supports 3/2. $T_{1/2}$: from (γ,γ') (1970We01) for 1/2. $T_{1/2}$=26 ps *8* for J=3/2.
523.11[f] *8*	5/2$^-$	1.91 ps *6*	DEFG IJ LMN	μ=2.8 *8* (1994Sp05,2014StZZ) B(E2)↑=0.092 *8* XREF: J(525.1). J$^{\pi}$: L(^{3}He,d)=3; ΔJ=0,1 γ to 3/2$^-$ and Coul. ex. $T_{1/2}$: from DSAM in Coul. ex. (1994Sp05). Other: 1.3 ps *4* (from (γ,γ') (1970We01)). μ: $\gamma(\theta$,H) in Coul. ex.
606.03 *6*	3/2$^-$	1.87 ps *7*	D IJ LMN	B(E2)↑=0.0159 *23* XREF: J(608.6). J$^{\pi}$: L(^{3}He,d)=1; M1+E2 γ to 5/2$^-$. $T_{1/2}$: from DSAM in Coul. ex. (1994Sp05). Other: 2.0 ps *3* in (γ,γ') (1970We01).
761.31[e] *7*	7/2$^-$	1.50 ps *4*	EFG IJKLMN	μ=1.9 *3* (1994Sp05,2014StZZ) B(E2)↑=0.117 *10* XREF: J(764.5). J$^{\pi}$: ΔJ=1, M1+E2 γ to 5/2$^-$; ΔJ=2, E2 γ to 3/2$^-$. $T_{1/2}$: from DSAM in Coul. ex. (1994Sp05). Other: 1.2 ps *2* in (γ,γ') (1970We01). μ: $\gamma(\theta$,H) in Coul. ex.
793.40 *21*	(3/2$^-$,5/2)	2.08 ps *14*	E IJ MN	J$^{\pi}$: ΔJ=0,1 γ to 3/2$^-$; excitation function in (d,nγ) supports 5/2; not 1/2 from $\gamma(\theta)$. $T_{1/2}$: DSAM in Coul. ex. (1994Sp05).
796.83[a] *11*	13/2$^+$	9.0 ps *21*	EF I K N	J$^{\pi}$: ΔJ=2, E2 γ to 9/2$^+$. $T_{1/2}$: RDDS in (α,p2nγ) (1988Sc13).
831.97 *6*	1/2$^-$,3/2$^-$	0.20 ps *4*	D IJ LMN	XREF: J(835.3). J$^{\pi}$: L(^{3}He,d)=1. $T_{1/2}$: from (γ,γ') (1970We01) for J=3/2; 0.10 ps *2* for J=1/2.
906.45 *24*	(7/2)$^-$		E IJ	XREF: J(910.7).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{79}Br Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	XREF	Comments
				Jπ: ΔJ=0,1 γ to 9/2+; γ to (5/2)+; L(3He,d)=3.
940.1 *4*	(3/2)		E I	Jπ: ΔJ=0,1 γ to (5/2)+; excitation function in (d,nγ).
954.04[g] *13*	(7/2−)	1.11 ps *7*	EFG I K MN	Jπ: ΔJ=0,1 γ to 5/2−; excitation function in (d,nγ); γ to 3/2−. T1/2: DSAM (1994Sp05) in Coul. ex.
954.7 *18*	3/2+,5/2+		J	Jπ: L(3He,d)=2. E(level): from energy matching this level seems to correspond to 954.08 but L(3He,d)=2 is inconsistent with Jπ deduced γ(θ) and excitation data for 954.08 level.
1032.4?[#] *5*			I	Jπ: possibly 3/2 from γ(θ) and excitation function.
1038.8 *18*	1/2+		J	Jπ: L(3He,d)=0.
1068.29[d] *9*	9/2−		EFG I K	Jπ: ΔJ=2, E2 γ from 13/2−; ΔJ=1 γ to 7/2−.
1079.7 *22*	5/2−,7/2−		J	Jπ: L(3He,d)=3.
1112.50 *11*	1/2−,3/2−		D IJK M	XREF: J(1116.2). Jπ: L(3He,d)=1.
1124.0 *4*	(3/2−,5/2)		I M	Jπ: ΔJ=0,1 γ to 3/2−; not 1/2 from γ(θ).
1131.67 *14*	1/2,3/2		D IJ M	Jπ: log *ft*=7.5 from 1/2−.
1176.7 *3*	(5/2+)		E IJ M	XREF: J(1182.6). Jπ: L(3He,d)=(2); γ to 7/2−.
1180.68[b] *13*	11/2+	0.55 ps *14*	EFG I K	Jπ: ΔJ=1, M1+E2 γ to 9/2+; (M1) γ to 13/2+. T1/2: DSA in (α,p2nγ) (1988Sc13).
1189.4 *5*	(7/2)		E IJ M	Jπ: ΔJ=1 γ to 5/2−; possible γ to 3/2−; L(3He,d)=4 implies 7/2+ or 9/2+, but L(3He,d)=3 implying 5/2−,7/2− is also suggested.
1221.6 *6*	5/2−,7/2−		E IJ	Jπ: L(3He,d)=3; excitation function in (d,nγ) supports 7/2 whereas γ(θ) in (6Li,3nγ) favors 9/2.
1254.3? *4*			Ij	Jπ: possibly 3/2 from excitation function in (d,nγ).
1256.5 *4*	(7/2)		E Ij	Jπ: ΔJ=0,1 γ to (5/2)+; excitation function in (d,nγ).
1313.8 *3*	(3/2−,5/2,7/2−)		E I	Jπ: γs to 3/2− and (7/2)−. Excitation function in (d,nγ) suggests 3/2 whereas 9/2 is suggested by γ(θ) in (6Li,3nγ). There may be two separate levels near this energy.
1332.28 *6*	3/2−		D IJ M	Jπ: log *ft*=5.8 from 1/2−; M1+E2 γ to 5/2−.
1332.92[f] *17*	(9/2−)		EFG I K M	Jπ: ΔJ=0,1 γ to (7/2)−; ΔJ=(2) γ to 5/2−.
1376	5/2−,7/2−		J	Jπ: L(3He,d)=3.
1390.4 *4*	(9/2)+		E IJ	XREF: J(1395.1). Jπ: L(3He,d)=4; ΔJ=(2) γ to (5/2)+.
1470.8?[#] *5*			I	Jπ: possibly 3/2 from γ(θ) and excitation function.
1491.7 *6*	(9/2+)		E I	Jπ: from γ(θ), excitation function and γ to 13/2+.
1495	5/2−,7/2−		J	Jπ: L(3He,d)=3.
1501.6 *3*	1/2,3/2		D I	Jπ: log *ft*=6.7 from 1/2−.
1512.7? *6*			I	
1512.8 *6*			M	Jπ: γs to 3/2− and 5/2− suggest 1/2−:7/2−.
1517.3 *18*	1/2+		J	Jπ: L(3He,d)=0.
1561?			J	
1573.5 *5*	(5/2)+		DE IJ M	XREF: J(1578.2). Jπ: L(3He,d)=2; γ to (7/2)−. Uncertain in ^{79}Kr ε decay. There may be two separate levels near this energy. One deexcited by 666γ (in (6Li,3nγ) and (d,nγ)) and the other by 1358γ, 1575γ (in (n,n′γ)).
1613.1 *5*			j M	Jπ: γ to 3/2−.
1621.6 *5*			E Ij	Jπ: possibly 11/2 from excitation function and γ(θ) in (d,nγ); γ to 7/2.
1682.77[c] *15*	13/2+		EFG K	Jπ: ΔJ=2, E2 γ from 17/2+; (E2) γ to 9/2+.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{79}Br Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	XREF	Comments
1692.2 *6*	1/2⁻,3/2⁻		J M	Jπ: L(^{3}He,d)=1.
1713.53[e] *10*	11/2⁻	0.55 ps *17*	EFG I K	Jπ: ΔJ=2, E2 γ to 7/2⁻; ΔJ=1, (M1+E2) γ to 9/2⁻. $T_{1/2}$: from DSAM in (^{7}Li,4nγ) E=32 MeV (1999Ra02). Other: 0.42 ps *+35−14* (DSA in (α,p2nγ),1988Sc13).
1732.02[a] *13*	17/2⁺	0.76[&] ps *21*	EFG I K	Jπ: ΔJ=2, E2 γ to 13/2⁺; excitation function in (^{6}Li,3nγ). $T_{1/2}$: other: 1.18 ps *21* (1988Sc13).
1742.3?[@] *6*			E	Jπ: possibly 15/2 from γ(θ) and excitation function; γ to 13/2⁺.
1778.6 *5*			J M	Uncertain in (^{3}He,d). Jπ: γ to 3/2⁻.
1780.79[g] *16*	(11/2⁻)		EFG	Jπ: ΔJ=2 γ to 7/2⁻; ΔJ=(1) γ to (9/2⁻).
1792.7?[@] *8*			E	Jπ: possibly 11/2 from excitation function.
1794.7 *20*	3/2⁺,5/2⁺		J	Jπ: L(^{3}He,d)=2.
1.8×10^3 *1*	(7/2⁻)		L	Jπ: possible (E2) excitation from 3/2⁻. E(level): level proposed by 1993Ca24 in (γ,γ′).
1908.2 *19*			J	E(level): may be a doublet. Jπ: L(^{3}He,d)=4 gives 7/2⁺, 9/2⁺. But L=1+3 is also suggested.
1946.7 *6*	3/2⁺,5/2⁺		J	Jπ: L(^{3}He,d)=2.
1948.21[d] *11*	13/2⁻		EFG I K	Jπ: ΔJ=2, E2 γ from 17/2⁻; γ to 11/2⁻.
1957.22[b] *14*	15/2⁺	0.21[&] ps *7*	EFG I K	Jπ: ΔJ=2, E2 γ to 11/2⁺; ΔJ=1, M1+E2 γ to 13/2⁺. $T_{1/2}$: other: 0.52 ps *17* (1999Ra02).
1973.8 *24*	1/2⁻,3/2⁻		J	Jπ: L(^{3}He,d)=1.
2016.1 *19*	3/2⁺,5/2⁺		J	Jπ: L(^{3}He,d)=2.
2039.8 *25*	(5/2⁻,7/2⁻)		J	Jπ: L(^{3}He,d)=(3).
2048.9?[@] *6*	(13/2)		E	Jπ: from γ(θ) and excitation function; γ to 11/2⁺.
2075.1 *19*	1/2⁺		J	Jπ: L(^{3}He,d)=0.
2159.4 *18*	1/2⁻,3/2⁻		J	Jπ: L(^{3}He,d)=1.
2182.8 *24*			J	
2202.7 *24*			J	
2235.2 *29*			J	
2260.2 *20*			J	
2279.5[f] *3*	(13/2⁻)		EF	Jπ: ΔJ=1, dipole γ from 15/2⁻; γs to (9/2⁻) and 11/2⁻. In ^{76}Ge(^{6}Li,3nγ), (9/2⁻) suggested by 1988NaZP from γ(θ) and excitation function is inconsistent.
2314.6 *19*	5/2⁻,7/2⁻		J	Jπ: L(^{3}He,d)=3.
2344.7 *23*			J	
2355.7? *4*			E I	Jπ: ΔJ=0,1 γ to 17/2⁺; excitation function in (^{6}Li,3nγ).
2363.3 *25*			J	
2392.89[h] *13*	13/2⁻	3.5 ps *21*	EFG K	Jπ: ΔJ=2, E2 γ to 9/2⁻; γ to 13/2⁺. $T_{1/2}$: effective $T_{1/2}$ (not corrected for feeding time) from DSA in (α,p2nγ) (1988Sc13).
2414.4 *32*	5/2⁻,7/2⁻		J	Jπ: L(^{3}He,d)=3.
2421.32[c] *20*	17/2⁺		EFG K	Jπ: ΔJ=2, E2 γ to 13/2⁺; ΔJ=1 γ to 15/2⁺.
2424.8? *25*			J	
2434.9? *28*			J	
2463.4 *24*			J	
2468.59[e] *18*	15/2⁻		EFG K	Jπ: ΔJ=2, E2 γ to 11/2⁻; ΔJ=1 γ to 13/2⁻.
2478.71 *14*	(13/2⁻)		EFG K	Jπ: ΔJ=(0) γ to 13/2$^{(-)}$; γ to 9/2⁻; excitation function in (^{6}Li,3nγ).
2511.4 *24*			J	E(level): L(^{3}He,d)=(1+3) indicates a doublet. Part of the doublet may correspond to 2506.9 level.
2528.9 *24*	(1/2⁻,3/2⁻)		J	Jπ: L(^{3}He,d)=(1).
2548.0 *22*			J	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{79}Br Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	XREF	Comments
2568.5 *25*			J	
2574.8?[@] *6*	(13/2)		E	Jπ: from γ(θ) and excitation function; γ to 17/2+.
2580.12[h] *11*	15/2−		EFG K	Jπ: ΔJ=1, E1 γ to 13/2+; ΔJ=2 γ to 11/2−.
2725.59[d] *14*	17/2−	0.55[&] ps *28*	EFG K	Jπ: ΔJ=2, E2 γ to 13/2−; γ to 15/2−.
2773.78[h] *14*	17/2−	8 ps *3*	EFG K	Jπ: ΔJ=2 γ to 13/2; ΔJ=1, M1+E2 γ to 15/2−. $T_{1/2}$: RDDS in (α,p2nγ) (1988Sc13).
2802.1?[@] *10*			E	
2866.24[a] *16*	21/2+	0.28[&] ps *4*	EFG K	Jπ: ΔJ=2, E2 γ to 17/2+; band member. $T_{1/2}$: others: 0.44 ps *17* (1999Ra02), 0.42 ps *14* (1988Sc13).
2902.36[b] *22*	19/2+	0.17[&] ps *5*	EFG K	Jπ: ΔJ=1, M1+E2 γ to 17/2+; ΔJ=2, (E2) γ to 15/2+.
3088.04[h] *16*	(19/2)−	0.76[&] ps *21*	EFG K	Jπ: ΔJ=1 M1+E2 γ to 17/2−. $T_{1/2}$: other: 1.0 ps *5* (1988Sc13).
3169.32[e] *20*	19/2−		EFG	Jπ: ΔJ=2, E2 γ to 15/2+; ΔJ=1 γ to 17/2−.
3235.3[f] *6*			F	
3365.58[c] *22*	21/2+		FG K	Jπ: ΔJ=2, E2 γ to 17/2+; γ to 19/2+.
3535.28[h] *18*	(21/2)−	0.38[&] ps *10*	EFG K	Jπ: ΔJ=1, M1+E2 γ to (19/2)−; ΔJ=(2), (E2) γ to 17/2−. $T_{1/2}$: others: 0.76 ps *14* (1988Sc13), 0.69 ps *21* (1999Ra02).
3559.62[d] *19*	21/2(−)	0.42[&] ps *14*	EFG K	Jπ: ΔJ=2, (E2) γ to 17/2−; ΔJ=1 γ to 19/2−.
3670.9[j] *3*	(21/2+)		F	Jπ: ΔJ=(2) γ to 17/2+; γ to 21/2+.
3816.9 *4*	(17/2+ to 23/2+)		F	Jπ: γs to 19/2+ and 21/2+.
3908.4[i] *4*	(17/2−,19/2,21/2−)		F	Jπ: γs to 17/2− and 21/2(−).
3936.09[b] *24*	(23/2)+	0.187[&] ps *35*	FG K	Jπ: ΔJ=1, M1+E2 γ to 21/2+; (E2) γ to 19/2+. $T_{1/2}$: other: ≤0.7 ps (1999Ra02).
4066.7[e] *3*	23/2−	1.2 ps *4*	FG	Jπ: ΔJ=2, E2 γ to 19/2−; γ to 21/2(−). $T_{1/2}$: DSAM in (^{7}Li,4nγ) E=32 MeV (1999Ra02).
4116.89[a] *19*	25/2+	0.159[&] ps *21*	EFG K	Jπ: ΔJ=2, E2 γ to 21/2+; band member. $T_{1/2}$: others: 0.28 ps *14* (1988Sc13), 0.25 ps *+17−10* (1999Ra02).
4153.1[h] *3*	(23/2)−	0.139[&] ps *28*	FG	Jπ: ΔJ=2, E2 γ to (19/2)−; ΔJ=1, M1 γ to (21/2)−. $T_{1/2}$: other: ≤0.35 ps (1999Ra02).
4340.9 *4*	(17/2+ to 23/2+)		F	Jπ: γs to 19/2+ and 21/2+.
4530.2[c] *3*	25/2+	0.35[&] ps *7*	FG	Jπ: ΔJ=2, E2 γ to 21/2+; band member. $T_{1/2}$: effective lifetime, not corrected for side feeding.
4581.3[d] *3*	(25/2)−	0.26[&] ps *6*	FG	Jπ: ΔJ=2, E2 γ to (21/2)−; γ to 23/2−.
4721.0[j] *3*	(25/2+)		F	Jπ: γs to 21/2+ and 25/2+; probable band member.
4803.6[h] *4*	(25/2)−	0.118[&] ps *21*	F	Jπ: ΔJ=1, M1 γ to (23/2)−; probable band member.
4896.1 *7*			F	
4965.1[i] *6*			F	
5132.0[b] *3*	(27/2+)		F	Jπ: ΔJ=1 γ to 25/2+; probable band member.
5214.1[e] *4*	(27/2−)		F	Jπ: ΔJ=2 γ to 23/2−; probable band member.
5505.5[a] *3*	29/2+	0.049[&] ps *21*	FG	Jπ: ΔJ=2, E2 γ to 25/2+; band member. $T_{1/2}$: other: 0.29 ps *10* (1999Ra02).
5579.3[h] *5*	(27/2−)		F	Jπ: ΔJ=1 γ to (25/2)−; probable band member.
5824.1[d] *4*	(29/2)−	0.097[&] ps *28*	F	Jπ: ΔJ=2, E2 γ to (25/2)−; probable band member.
5863.8[c] *6*	(29/2+)		F	Jπ: ΔJ=(2) γ to 25/2+; probable band member.
6019.3[j] *4*	(29/2+)		F	Jπ: γs to 25/2+ and 29/2+; probable band member.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{79}Br Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	$T_{1/2}$	XREF	Comments
6199.4[i] *8*			F	
6384.6[h] *5*	(29/2$^-$)		F	J$^{\pi}$: γs to (25/2)$^-$ and (27/2$^-$); probable band member.
6526.9[b] *5*	(31/2$^+$)	0.17[&] ps *6*	F	J$^{\pi}$: ΔJ=2, E2 γ to (27/2$^+$); γ to 29/2$^+$.
6536.9[e] *7*	(31/2$^-$)		F	J$^{\pi}$: ΔJ=2 γ to (27/2$^-$); probable band member.
7066.8[a] *5*	(33/2$^+$)		FG	J$^{\pi}$: ΔJ=(2) γ to 29/2$^+$; probable band member.
7224.3[d] *7*	(33/2$^-$)		F	J$^{\pi}$: γ to (29/2$^-$); probable band member.
7379.9[c] *8*	(33/2$^+$)		F	J$^{\pi}$: γ to (29/2$^+$); probable band member.
7591.8[i] *10*			F	
8061.7[e] *9*	(35/2$^-$)		F	J$^{\pi}$: γ to (31/2$^-$); probable band member.
8149.4[b] *6*	(35/2$^+$)		F	J$^{\pi}$: γs to (31/2$^+$) and (33/2$^+$); probable band member.
8777.8[d] *8*	(37/2$^-$)		F	J$^{\pi}$: γ to (33/2$^-$); probable band member.
8811.5[a] *8*	(37/2$^+$)		F	J$^{\pi}$: γ to (33/2$^+$); probable band member.
10846	(3/2$^-$)		H	J$^{\pi}$: IAR of 975, 3/2$^-$ in ^{79}Se.
10969 *11*	(1/2$^+$)		H	J$^{\pi}$: IAR of L=0, 1156, 1/2$^+$ in ^{79}Se.
11080 *11*	(5/2$^+$)		H	J$^{\pi}$: IAR of L=2, 1253, 5/2$^+$ in ^{79}Se.
11355 *11*	(1/2$^+$)		H	J$^{\pi}$: IAR of L=0, 1491, 1/2$^+$ in ^{79}Se.
11434 *11*	(3/2$^+$)		H	J$^{\pi}$: IAR of 1597, 3/2$^+$ in ^{79}Se.
11560 *11*	(5/2$^+$)		H	J$^{\pi}$: IAR of 1662, 5/2$^+$ in ^{79}Se.
11626 *11*	(3/2$^+$)		H	J$^{\pi}$: IAR of 1739, 3/2$^+$ in ^{79}Se.
11834	(1/2$^-$,3/2$^-$)		H	J$^{\pi}$: IAR of 2039, 1/2$^-$,3/2$^-$ in ^{79}Se.

[†] For levels populated in γ-ray studies, E(level) values are from least-squares fitting to Eγ values.
[‡] In cases where $\gamma(\theta)$ argument is used in J^{π} assignment, M1+E2 is assumed (rather than E1+M2) for transitions indicative of significant admixtures (Q/D) from angular distribution coefficients (A_2 and A_4). Arguments referring to ΔJ are based on $\gamma(\theta)$ and/or $\gamma\gamma(\theta)$ data in in-beam reactions: (^{6}Li,3nγ); (^{7}Li,4nγ); (d,nγ); and (α,p2nγ), (α,npγ).
[#] This level reported in (d,nγ) only is treated here as tentative.
[@] This level reported in (^{6}Li,3nγ) only is treated here as tentative.
[&] From DSA in (^{7}Li,4nγ) E=35 MeV (2002Sc13).
[a] Band(A): $\pi g_{9/2}$ band, α=+1/2.
[b] Band(a): $\pi g_{9/2}$ band, α=−1/2.
[c] Band(B): Band based on (13/2$^+$), α=+1/2.
[d] Band(C): $\pi p_{3/2}$ band, α=+1/2.
[e] Band(c): $\pi p_{3/2}$ band, α=−1/2.
[f] Band(D): band based on 3/2$^-$ band (?), α=+1/2.
[g] Band(d): band based on 3/2$^-$ band (?), α=−1/2.
[h] Band(E): Magnetic-dipole (rotational) band. Band based on 13/2$^-$.
[i] Band(F): Band structure.
[j] Band(G): band based on (21/2$^+$).

Adopted Levels, Gammas (continued)

γ(^{79}Br)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[#]	α[b]	Comments
207.61	9/2$^+$	207.5 *1*	100	0.0	3/2$^-$	E3		0.311 *5*	B(E3)(W.u.)=0.0311 *4* α(K)=0.263 *4*; α(L)=0.0410 *6*; α(M)=0.00653 *10*; α(N)=0.000541 *8* Mult.: from α(K)exp in ^{79}Br IT decay.
217.10	5/2$^-$	217.07 *10*	100	0.0	3/2$^-$	M1+E2	+0.089 *11*	0.01498 *23*	B(M1)(W.u.)=0.045 *4*; B(E2)(W.u.)=9.6 *25* α(K)=0.01329 *20*; α(L)=0.001444 *22*; α(M)=0.000230 *4*; α(N)=2.14×10^{-5} *4* δ: from weighted average of +0.08 *3*, 0.09 *3* (γ(θ) in Coul. ex.), +0.10 *3* (γ(θ) in (^{7}Li,4nγ) E=32 MeV), +0.03 *3* (γ(θ) in (α,p2nγ)), 0.107 *14*, and 0.086 *11* (from $T_{1/2}$=51 ps *12* and B(E2)=0.040 *3* (1967Ro03), B(E2)=0.0260 *22* (1985Si08) in Coul. ex.).
261.33	3/2$^-$	44.2 *4*	1.7 *2*	217.10	5/2$^-$	M1		1.15 *4*	B(M1)(W.u.)=0.032 *7* α(K)=1.01 *3*; α(L)=0.114 *4*; α(M)=0.0182 *6* α(N)=0.00168 *5* E_γ,I_γ: from ^{79}Kr ε decay.
		261.35 *10*	100	0.0	3/2$^-$	M1+E2	0.13 *2*	0.00947 *16*	B(M1)(W.u.)=0.0090 *14*; B(E2)(W.u.)=2.8 *10* α(K)=0.00841 *15*; α(L)=0.000909 *16*; α(M)=0.000145 *3* α(N)=1.346×10^{-5} *23* δ: average value deduced from $T_{1/2}$(261 level)=0.13 ns *2* and B(E2)=0.0070 *6* (1967Ro03), 0.0040 *4* (1985Si08). Use of $T_{1/2}$=0.91 ns *8* (1970Be79) leads to δ=0.35 *5*. Lower δ value is supported by δ=−0.04 *5* deduced from γγ(θ) data in ^{78}Kr ε decay.
306.51	1/2$^-$,3/2$^-$	306.47 *10*	100	0.0	3/2$^-$	M1+E2	0.11 *2*	0.00630 *10*	B(M1)(W.u.)=0.179 *3*; B(E2)(W.u.)=29 *11* α(K)=0.00559 *9*; α(L)=0.000601 *10*; α(M)=9.56×10^{-5} *15* α(N)=8.92×10^{-6} *14* δ: average value (of 0.13 *2* and 0.096 *14*) deduced from $T_{1/2}$ (from (γ,γ′),(1970We01)) and B(E2)(↑)(Coul. ex.)=0.0211 *18* (1967Ro03), 0.0115 *20* (1985Si08).
381.50	5/2$^+$	173.7 *5*	9	207.61	9/2$^+$	[E2]		0.1137 *20*	B(E2)(W.u.)≈29 α(K)=0.0994 *18*; α(L)=0.01218 *22*; α(M)=0.00193 *4* α(N)=0.000169 *3*
		381.5 *3*	100	0.0	3/2$^-$	[E1]		0.00179	B(E1)(W.u.)≈1.2×10^{-5} α(K)=0.001596 *23*; α(L)=0.0001681 *24*; α(M)=2.66×10^{-5} *4* α(N)=2.48×10^{-6} *4*
397.48	1/2$^-$,3/2$^-$	136.09 *10*	9.1 *12*	261.33	3/2$^-$	M1+E2	+0.25 *2*	0.0633 *23*	B(M1)(W.u.)=0.052 *18*; B(E2)(W.u.)=2.2×10^2 *9* α(K)=0.0558 *20*; α(L)=0.0064 *3*; α(M)=0.00102 *5* α(N)=9.3×10^{-5} *4* α: from δ=0.25. ce data suggests pure E2 (see ^{79}Kr ε).

$^{79}_{35}Br_{44}$-7

Adopted Levels, Gammas (continued)

γ(^{79}Br) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[#]	α[b]	Comments
397.48	1/2⁻,3/2⁻	180.25 *15*	1.1 *5*	217.10	5/2⁻	M1,E2		0.061 *38*	B(M1)(W.u.)=0.0014 *8*; B(E2)(W.u.)=6.E+1 *4* α(K)=0.054 *33*; α(L)=0.0064 *42*; α(M)=1.02×10^{-3} *66* α(N)=9.1×10^{-5} *57*
		397.54 *10*	100 *3*	0.0	3/2⁻	M1+E2	−0.35 *4*	0.00361 *9*	B(M1)(W.u.)=0.022 *7*; B(E2)(W.u.)=21 *8* α(K)=0.00321 *8*; α(L)=0.000345 *9*; α(M)=5.48×10^{-5} *13* α(N)=5.10×10^{-6} *12* δ: from ^{79}Kr ε decay. Other: 0.13 *2* from B(E2) in Coul. ex. and $T_{1/2}$ in (γ,γ′).
523.11	5/2⁻	306.5[c] *10*	11 *1*	217.10	5/2⁻				δ(E2/M1)<1 from RUL for E2.
		523.1 *1*	100	0.0	3/2⁻	M1+E2	+0.26 *3*	0.00179	B(M1)(W.u.)=0.0680 *25*; B(E2)(W.u.)=21 *5* α(K)=0.001594 *25*; α(L)=0.000169 *3*; α(M)=2.69×10^{-5} *5* α(N)=2.52×10^{-6} *4* Mult.,δ: γ(θ) in Coul. ex. other: 0.21 *5* from $T_{1/2}$ in (γ,γ′) and B(E2) in Coul. ex.
606.03	3/2⁻	208.48 *10*	9.5 *6*	397.48	1/2⁻,3/2⁻	M1(+E2)	<0.2	0.0171 *9*	B(M1)(W.u.)>0.073; B(E2)(W.u.)<100 α(K)=0.0152 *8*; α(L)=0.00166 *9*; α(M)=0.000263 *15* α(N)=2.45×10^{-5} *13*
		299.53 *10*	18.9 *9*	306.51	1/2⁻,3/2⁻	M1+E2	0.45 *20*	0.0081 *13*	B(M1)(W.u.)=0.046 *8*; B(E2)(W.u.)=1.3×10^2 *10* α(K)=0.0072 *11*; α(L)=0.00079 *13*; α(M)=0.000125 *20* α(N)=1.16×10^{-5} *18* δ: from α(K)exp in ^{79}Kr ε decay.
		344.71 *10*	2.91 *23*	261.33	3/2⁻	(M1)		0.00465	B(M1)(W.u.)=0.0056 *5* α(K)=0.00413 *6*; α(L)=0.000442 *7*; α(M)=7.03×10^{-5} *10* α(N)=6.57×10^{-6} *10* δ: from α(K)exp in ^{79}Kr ε decay.
		388.97 *10*	18.6 *9*	217.10	5/2⁻	M1+E2	−0.19 *2*	0.00359 *6*	B(M1)(W.u.)=0.0239 *16*; B(E2)(W.u.)=7.3 *16* α(K)=0.00319 *5*; α(L)=0.000341 *6*; α(M)=5.42×10^{-5} *9* α(N)=5.06×10^{-6} *8*
		606.09 *10*	100.0 *25*	0.0	3/2⁻	M1+E2	0.30 *3*	1.28×10^{-3} *2*	B(M1)(W.u.)=0.0323 *17*; B(E2)(W.u.)=10.1 *20* α(K)=0.001139 *17*; α(L)=0.0001206 *19*; α(M)=1.92×10^{-5} *3* α(N)=1.79×10^{-6} *3* δ: from $T_{1/2}$ in (γ,γ′) and B(E2) in Coul. ex.

Adopted Levels, Gammas (continued)

γ(^{79}Br) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[#]	α[b]	Comments
761.31	7/2$^-$	238.2 *4*	15 *1*	523.11	5/2$^-$				δ(Q/D)=+0.14 *+26−19* from γ(θ) in (d,nγ). δ: from RUL (for E2), δ(E2/M1)<0.3.
		544.1 *1*	100 *8*	217.10	5/2$^-$	M1+E2	+0.19 *6*	0.00161 *3*	B(M1)(W.u.)=0.049 *5*; B(E2)(W.u.)=8 *5* α(K)=0.00143 *3*; α(L)=0.000152 *3*; α(M)=2.42×10^{-5} *5* α(N)=2.26×10^{-6} *4*
		553.8 *10*	6.9 *8*	207.61	9/2$^+$	[E1]			B(E1)(W.u.)=5.6×10^{-5} *8* γ reported only in Coul. ex. and (^{7}Li,4nγ) E=32 MeV.
		761.4 *1*	57 *5*	0.0	3/2$^-$	E2			B(E2)(W.u.)=23.3 *25* I_γ: value of 29 *1* (from (α,p2nγ)) which seems low by a factor of ≈2 was not used in averaging.
793.40	(3/2$^-$,5/2)	487.1 *5*	18	306.51	1/2$^-$,3/2$^-$				
		532.0 *5*	32 *4*	261.33	3/2$^-$				
		576.0 *5*	68 *8*	217.10	5/2$^-$				
		793.4 *3*	100 *10*	0.0	3/2$^-$				
796.83	13/2$^+$	589.1 *1*	100	207.61	9/2$^+$	E2		0.00182	B(E2)(W.u.)=44 *11* α(K)=0.001617 *23*; α(L)=0.0001750 *25*; α(M)=2.78×10^{-5} *4* α(N)=2.57×10^{-6} *4* Mult.: γ(θ,pol).
831.97	1/2$^-$,3/2$^-$	434.50 *10*	3.1 *4*	397.48	1/2$^-$,3/2$^-$				
		525.35 *15*	31 *6*	306.51	1/2$^-$,3/2$^-$				δ: from RUL for E2, δ(E2/M1)<1.
		571.1 *6*	0.43 *6*	261.33	3/2$^-$				
		614.89 *10*	7.5 *25*	217.10	5/2$^-$				
		831.97 *10*	100 *5*	0.0	3/2$^-$	M1(+E2)	<0.12		B(M1)(W.u.)>0.10; B(E2)(W.u.)<4.3 δ: from $T_{1/2}$ value in (γ,γ′) and B(E2) in Coul. ex.
906.45	(7/2)$^-$	524.9 *5*	17	381.50	5/2$^+$				
		698.7 *3*	100	207.61	9/2$^+$				δ(Q/D)=−0.3 *3* from γ(θ) in (^{6}Li,3nγ) but −2.4 *+2−49* from γ(θ) in (d,nγ).
940.1	(3/2)	558.5 *3*	100	381.50	5/2$^+$				
954.04	(7/2$^-$)	692.7 *2*	100 *10*	261.33	3/2$^-$	E2		1.16×10^{-3}	B(E2)(W.u.)=73 *10* α(K)=0.001027 *15*; α(L)=0.0001103 *16*; α(M)=1.749×10^{-5} *25* α(N)=1.623×10^{-6} *23*
		737.0 *2*	68 *10*	217.10	5/2$^-$	(M1+E2)			B(M1)(W.u.)=0.0078 *14*; B(E2)(W.u.)=18 *4* δ(Q/D)=+1.3 *5* from γ(θ) in (^{6}Li,3nγ).
		954.0 *5*	48 *5*	0.0	3/2$^-$	[E2]			B(E2)(W.u.)=7.1 *10* I_γ: other 16 in (d,nγ), 23 in (^{6}Li,3nγ).
1032.4?		650.9 *5*	100	381.50	5/2$^+$				δ(Q/D)=−0.09 *+8−1* from γ(θ).
1068.29	9/2$^-$	306.7 *3*	11.6 *16*	761.31	7/2$^-$	D			

$^{79}_{35}Br_{44}$-9

Adopted Levels, Gammas (continued)

γ(^{79}Br) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[#]	α[b]	Comments
1068.29	9/2$^-$	545.3 *5*	8.6 *19*	523.11	5/2$^-$	(Q)			E_γ: reported only in (^{7}Li,4nγ) E=32 MeV.
		851.3 *1*	100 *8*	217.10	5/2$^-$	(E2)			
1112.50	1/2$^-$,3/2$^-$	280.46 *25*	27 *4*	831.97	1/2$^-$,3/2$^-$				
		506.6 *10*	230	606.03	3/2$^-$				
		715.04 *20*	16 *3*	397.48	1/2$^-$,3/2$^-$				
		851.13 *15*	100 *10*	261.33	3/2$^-$				
		895.5 *4*	29 *5*	217.10	5/2$^-$				
		1112.8 *5*	175 *80*	0.0	3/2$^-$				
1124.0	(3/2$^-$,5/2)	862.6 *5*	27 *7*	261.33	3/2$^-$				
		907.8[@]	52 *30*	217.10	5/2$^-$				
		1123.8 *5*	100 *25*	0.0	3/2$^-$				
1131.67	1/2,3/2	734.12 *20*	30 *9*	397.48	1/2$^-$,3/2$^-$				
		871.2 *5*	18 *6*	261.33	3/2$^-$				
		914.8 *5*	17 *7*	217.10	5/2$^-$				I_γ: 39 *11* in (n,n′γ).
		1131.56 *20*	100 *12*	0.0	3/2$^-$				
1176.7	(5/2$^+$)	236.5[&] *5*	12	940.1	(3/2)				
		270.6 *5*	70 *20*	906.45	(7/2)$^-$				
		795.3 *3*	100	381.50	5/2$^+$				
		915.2[@c]		261.33	3/2$^-$				
		1175.9		0.0	3/2$^-$				
1180.68	11/2$^+$	383.6 *4*	12.9 *14*	796.83	13/2$^+$	(M1)		0.00360	B(M1)(W.u.)=0.081 *24* α(K)=0.00320 *5*; α(L)=0.000341 *5*; α(M)=5.42×10^{-5} *8* α(N)=5.07×10^{-6} *8* δ(Q/D)=−2.1 *8* from γ(θ) in (^{6}Li,3nγ).
		973.1 *1*	100 *8*	207.61	9/2$^+$	M1+E2	−0.25 *5*		B(M1)(W.u.)=0.036 *10*; B(E2)(W.u.)=3.1 *15* δ: from γ(θ) in (^{7}Li,4nγ) and RUL. Other: −2.6 *9* from γ(θ) in (α,p2nγ).
1189.4	(7/2)	972.0 *5*	100 *25*	217.10	5/2$^-$				δ(E2/M1)=−1.0 +*6*−*11* for J^π=7/2$^-$ (from (^{6}Li,3nγ)).
		1190.8[c]	75 *19*	0.0	3/2$^-$				γ from (n,n′γ) only.
1221.6	5/2$^-$,7/2$^-$	840.1 *5*	100	381.50	5/2$^+$				
1254.3?		993.0 *5*	100	261.33	3/2$^-$				
		1254.2 *5*	28	0.0	3/2$^-$				
1256.5	(7/2)	875.0 *3*	100	381.50	5/2$^+$				
		1256.6[c]		0.0	3/2$^-$				
1313.8	(3/2$^-$,5/2,7/2$^-$)	552.4[&] *5*	51	761.31	7/2$^-$				
		790.6 *5*	100	523.11	5/2$^-$				
		1052.6[&]		261.33	3/2$^-$				
		1313.8[&] *5*	14	0.0	3/2$^-$				
1332.28	3/2$^-$	500.7 *7*	3.8 *12*	831.97	1/2$^-$,3/2$^-$				

$^{79}_{35}Br_{44}$-10

Adopted Levels, Gammas (continued)

γ(^{79}Br) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[#]	α[b]	Comments
1332.28	3/2⁻	726.56 *20*	4.4 *9*	606.03	3/2⁻				
		809.17 *10*	22.4 *15*	523.11	5/2⁻				
		934.84 *15*	28.0 *18*	397.48	1/2⁻,3/2⁻	M1,E2			
		1025.73 *10*	35 *2*	306.51	1/2⁻,3/2⁻	M1,E2			
		1070.97 *15*	14 *2*	261.33	3/2⁻	M1,E2			
		1115.1 *3*	86 *9*	217.10	5/2⁻	M1+E2	+0.8 *+13−6*		δ: from γγ(θ) in ^{79}Kr ε decay (1970Be79,1969Be82).
		1332.21 *10*	100 *7*	0.0	3/2⁻	M1,E2			
1332.92	(9/2⁻)	571.7 *2*	100 *11*	761.31	7/2⁻				
		809.8 *5*	29 *3*	523.11	5/2⁻	(Q)			I_γ: from (^{7}Li,4nγ) E=35 MeV. Iγ=63 *13* in (^{7}Li,4nγ) E=32 MeV.
		1115.5[c] *5*	9 *3*	217.10	5/2⁻				This γ reported in (^{7}Li,4nγ) E=35 MeV could be from 1332, 3/2⁻ level.
1390.4	(9/2)⁺	484.1 *5*	32	906.45	(7/2)⁻				I_γ: from (^{6}Li,3nγ). Iγ=107 in (d,nγ). δ(Q/D)=+0.8 *+17−6* from γ(θ) in (d,nγ).
		1008.8 *5*	100	381.50	5/2⁺	Q			
1470.8?		438.4 *5*	95	1032.4?					
		1089.3 *5*	100	381.50	5/2⁺				
1491.7	(9/2⁺)	694.9 *5*	100	796.83	13/2⁺				
1501.6	1/2,3/2	1104.0 *5*	100 *50*	397.48	1/2⁻,3/2⁻				
		1195.3 *4*	20 *10*	306.51	1/2⁻,3/2⁻				
		1239.2 *10*	60 *30*	261.33	3/2⁻				
		1501.6 *5*	<8	0.0	3/2⁻				
1512.7?		572.6 *5*		940.1	(3/2)				
1512.8		1252.5	59 *15*	261.33	3/2⁻				
		1294.3[@]	85 *21*	217.10	5/2⁻				
		1513.0	100 *25*	0.0	3/2⁻				
1573.5	(5/2)⁺	666.2 *5*		906.45	(7/2)⁻				γ reported in (^{6}Li,3nγ) and (d,nγ).
		1357.8	100 *25*	217.10	5/2⁻				γ reported in (n,n′γ) only.
		1575.2[c]	23 *6*	0.0	3/2⁻				γ not reported in (d,nγ) and (^{6}Li,3nγ).
1613.1		1090.0	100 *25*	523.11	5/2⁻				
		1214.8	88 *22*	397.48	1/2⁻,3/2⁻				
		1307.0	5 *2*	306.51	1/2⁻,3/2⁻				
		1613.5	40 *10*	0.0	3/2⁻				
1621.6		365.3[@]		1256.5	(7/2)				
		715.1 *5*	100	906.45	(7/2)⁻				
1682.77	13/2⁺	502.1 *1*	100 *9*	1180.68	11/2⁺	(M1+E2)	−0.35 *5*	0.00202 *4*	α(K)=0.00180 *4*; α(L)=0.000192 *4*; α(M)=3.04×10^{-5} *7* α(N)=2.84×10^{-6} *6* δ: γ(θ) in (α,p2nγ).
		885.8 *5*	56 *6*	796.83	13/2⁺	(D)			I_γ: from (^{7}Li,4nγ) E=35 MeV. Iγ=23 *6* in (^{7}Li,4nγ) E=32 MeV.

$^{79}_{35}Br_{44}$-11

Adopted Levels, Gammas (continued)

γ(^{79}Br) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[#]	α[b]	Comments
1682.77	13/2$^+$	1475.3 *5*	62 *6*	207.61	9/2$^+$	(E2)			
1692.2	1/2$^-$,3/2$^-$	1432.3	32 *8*	261.33	3/2$^-$				
		1474.0	37 *10*	217.10	5/2$^-$				
		1691.7	100 *25*	0.0	3/2$^-$				
1713.53	11/2$^-$	380.3 *5*	20 *3*	1332.92	(9/2$^-$)				
		645.2 *2*	50 *4*	1068.29	9/2$^-$	(M1+E2)		0.00124 *17*	B(M1)(W.u.)=0.019 *6*; B(E2)(W.u.)=57 *19* α(K)=0.00111 *15*; α(L)=0.000118 *17*; α(M)=1.9×10^{-5} *3* α(N)=1.75×10^{-6} *24* I_γ: 18 *2* in (α,p2nγ) is too low by a factor of ≈3. δ(Q/D)=+4.7 *+38−15* from γ(θ) in (d,nγ).
		759.4 *5*	29 *2*	954.04	(7/2$^-$)				
		952.2 *1*	100 *10*	761.31	7/2$^-$	E2			B(E2)(W.u.)=33 *11*
1732.02	17/2$^+$	935.1 *1*	100	796.83	13/2$^+$	E2			B(E2)(W.u.)=52 *15*
1742.3?		945.5 *5*	100	796.83	13/2$^+$				
1778.6		945.6[c]		831.97	1/2$^-$,3/2$^-$				
		984.6[c]		793.40	(3/2$^-$,5/2)				
		1473.0	47 *12*	306.51	1/2$^-$,3/2$^-$				
		1779.3	100 *25*	0.0	3/2$^-$				
1780.79	(11/2$^-$)	447.6 *5*	46 *4*	1332.92	(9/2$^-$)	(D)			
		712.4 *5*	44 *4*	1068.29	9/2$^-$				
		826.9 *3*	83 *11*	954.04	(7/2$^-$)	Q			
		1019.4 *3*	100 *11*	761.31	7/2$^-$	Q			
1792.7?		571.1 *5*	100	1221.6	5/2$^-$,7/2$^-$				
1948.21	13/2$^-$	234.9 *5*	2.7 *7*	1713.53	11/2$^-$				
		880.0 *1*	100 *13*	1068.29	9/2$^-$	E2			
		1151.2 *5*	6.3 *16*	796.83	13/2$^+$				E_γ: γ from (^{7}Li,4nγ) E=32 MeV.
1957.22	15/2$^+$	776.5 *5*	10.8 *18*	1180.68	11/2$^+$	E2			B(E2)(W.u.)=46 *18*
		1160.4 *1*	100 *10*	796.83	13/2$^+$	M1+E2			B(M1)(W.u.)=0.030 *11*; B(E2)(W.u.)=29 *11* δ(Q/D)=−0.9 *5* from γ(θ) in (^{6}Li,3nγ).
2048.9?	(13/2)	868.2 *5*	100	1180.68	11/2$^+$				
2279.5	(13/2$^-$)	565.2 *5*	95 *11*	1713.53	11/2$^-$				
		947.4 *5*	100 *11*	1332.92	(9/2$^-$)				
2355.7?		623.0 *5*	100	1732.02	17/2$^+$				
		1559.6 *5*	<77	796.83	13/2$^+$				Reported in (^{6}Li,3nγ) only.
2392.89	13/2$^-$	444.9 *2*	100 *10*	1948.21	13/2$^-$	(D)			
		611.7 *5*	71 *24*	1780.79	(11/2$^-$)	D			
		1324.9 *5*	66 *5*	1068.29	9/2$^-$	E2			B(E2)(W.u.)=0.4 *3*
		1596.2 *3*	67 *6*	796.83	13/2$^+$	(E1)			B(E1)(W.u.)=6.E−6 *4*
2421.32	17/2$^+$	464.3 *5*	38 *3*	1957.22	15/2$^+$	D(+Q)	+0.04 *4*		I_γ: 100 in (α,p2nγ) is too large by a factor of ≈3. δ: γ(θ) in (α,p2nγ).
		738.7 *3*	100 *11*	1682.77	13/2$^+$	E2			

$^{79}_{35}Br_{44}$-12

Adopted Levels, Gammas (continued)

γ(^{79}Br) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[#]	α[b]	Comments
2421.32	17/2$^+$	1624.4 *3*	76 *8*	796.83	13/2$^+$	E2			I_γ: 36 *4* in (α,p2nγ) is too low by a factor of ≈2.
2468.59	15/2$^-$	521.9 *5*	10.4 *21*	1948.21	13/2$^-$	D			
		687.8 *3*	75 *8*	1780.79	(11/2$^-$)	Q			
		736.7 *5*	29.2 *21*	1732.02	17/2$^+$	(D)			
		754.9 *3*	100 *10*	1713.53	11/2$^-$	E2			
2478.71	(13/2$^-$)	530.5 *3*	100 *13*	1948.21	13/2$^-$	(D+Q)			
		1410.2 *5*	27 *7*	1068.29	9/2$^-$				
2574.8?	(13/2)	842.8 *5*	100	1732.02	17/2$^+$				
2580.12	15/2$^-$	101.4 *1*	27 *5*	2478.71	(13/2$^-$)	D(+Q)	−0.08 *8*		E_γ: 104.3 *5* in (^{7}Li,4nγ) E=35 seems in error. δ: γ(θ) in (α,p2nγ).
		187.3 *1*	77 *2*	2392.89	13/2$^-$	D(+Q)	−0.07 *3*		δ: γ(θ) in (α,p2nγ). Other: +0.04 *5* in (^{7}Li,4nγ).
		300.7 *5*	17 *3*	2279.5	(13/2$^-$)	D			
		631.9 *5*	37 *8*	1948.21	13/2$^-$	D			I_γ: unweighted average of three values available.
		799.4 *3*	69 *6*	1780.79	(11/2$^-$)	Q			I_γ: other: 36 *6* in (^{7}Li,4nγ) E=32 MeV.
		847.5 *3*	66 *6*	1732.02	17/2$^+$				I_γ: other: 12 *3* in (^{7}Li,4nγ) E=32 MeV.
		866.7 *5*	46 *6*	1713.53	11/2$^-$	Q			I_γ: other: 22 *5* in (^{7}Li,4nγ) E=32 MeV.
		1783.2 *1*	100 *10*	796.83	13/2$^+$	E1			
2725.59	17/2$^-$	256.9 *5*	17.0 *17*	2468.59	15/2$^-$				
		777.4 *1*	100 *10*	1948.21	13/2$^-$	E2			B(E2)(W.u.)=1.3×10^2 *7*
		993.9[a] *5*	18 *4*	1732.02	17/2$^+$				
2773.78	17/2$^-$	193.6 *1*	100 *7*	2580.12	15/2$^-$	M1+E2	−0.04 *1*	0.0198	B(M1)(W.u.)=0.29 *12*; B(E2)(W.u.)=16 *10* α(K)=0.0176 *3*; α(L)=0.00191 *3*; α(M)=0.000304 *5* α(N)=2.83×10^{-5} *4* δ: γ(θ,pol) in (α,p2nγ). Other: +0.03 *4* in (^{7}Li,4nγ).
		305.1 *5*	11.0 *22*	2468.59	15/2$^-$	D			
		825.7 *3*	20 *2*	1948.21	13/2$^-$	E2			B(E2)(W.u.)=1.4 *6* I_γ: 53 in (^{6}Li,3nγ) is too high by a factor of ≈3.
2802.1?		1070.1		1732.02	17/2$^+$				
2866.24	21/2$^+$	1134.2 *1*	100	1732.02	17/2$^+$	E2			B(E2)(W.u.)=53 *8*
2902.36	19/2$^+$	945.4 *5*	39 *4*	1957.22	15/2$^+$	(E2)			B(E2)(W.u.)=61 *21*
		1170.9 *3*	100 *18*	1732.02	17/2$^+$	M1+E2			B(M1)(W.u.)=0.029 *11*; B(E2)(W.u.)=27 *10*
3088.04	(19/2)$^-$	314.3 *1*	100 *9*	2773.78	17/2$^-$	M1+E2	−0.09 *4*	0.00589 *11*	B(M1)(W.u.)=0.9 *3*; B(E2)(W.u.)=9.E+1 *9* α(K)=0.00523 *10*; α(L)=0.000561 *11*; α(M)=8.92×10^{-5} *17* α(N)=8.33×10^{-6} *16* δ: γ(θ,pol) in (α,p2nγ). Other: +0.10 *6* in (^{7}Li,4nγ).
		362.4 *5*	6.9 *12*	2725.59	17/2$^-$	(M1+E2)		0.0062 *22*	B(M1)(W.u.)=0.020 *7*; B(E2)(W.u.)=1.9×10^2 *7* α(K)=0.0055 *19*; α(L)=6.1×10^{-4} *22*; α(M)=9.6×10^{-5} *35* α(N)=8.9×10^{-6} *31*
3169.32	19/2$^-$	395.2 *3*	40 *4*	2773.78	17/2$^-$	D			
		442.8 *5*	4 *2*	2725.59	17/2$^-$				

$^{79}_{35}Br_{44}$-13

Adopted Levels, Gammas (continued)

γ(^{79}Br) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.‡	δ#	α[b]	Comments
3169.32	19/2$^-$	589.0[a] *10*	<12	2580.12	15/2$^-$				
		700.7 *3*	100 *10*	2468.59	15/2$^-$	E2		1.12×10^{-3}	α(K)=0.000996 *14*; α(L)=0.0001068 *15*; α(M)=1.694×10^{-5} *24* α(N)=1.573×10^{-6} *22*
		1437.6 *5*	25.4 *20*	1732.02	17/2$^+$				
3235.3		955.8 *5*	100	2279.5	(13/2$^-$)				
3365.58	21/2$^+$	462.6 *5*	14 *3*	2902.36	19/2$^+$				
		499.6[a] *10*	38 *11*	2866.24	21/2$^+$				
		944.4 *3*	100 *11*	2421.32	17/2$^+$	(E2)			
		1633.4 *3*	78 *8*	1732.02	17/2$^+$	E2			
3535.28	(21/2)$^-$	447.3 *1*	100 *11*	3088.04	(19/2)$^-$	M1+E2	−0.09 *2*	0.00251	B(M1)(W.u.)=0.43 *13*; B(E2)(W.u.)=22 *12* α(K)=0.00223 *4*; α(L)=0.000238 *4*; α(M)=3.78×10^{-5} *6* α(N)=3.54×10^{-6} *5* δ: γ(θ) in (α,p2nγ).
		760.3 *5*	17.4 *22*	2773.78	17/2$^-$	[E2]			B(E2)(W.u.)=34 *11*
		809.9 *5*	33 *4*	2725.59	17/2$^-$	(E2)			B(E2)(W.u.)=47 *14*
3559.62	21/2$^{(-)}$	389.9 *5*	42 *3*	3169.32	19/2$^-$	D			
		471.6 *3*	100 *10*	3088.04	(19/2)$^-$	D+Q			δ(Q/D)=−2.5 *+10−19* from γ(θ) in (^{6}Li,3nγ).
		694.1[a] *10*	20 *6*	2866.24	21/2$^+$				
		785.8 *5*	32 *3*	2773.78	17/2$^-$	[E2]			B(E2)(W.u.)=26 *9*
		834.6 *3*	81 *6*	2725.59	17/2$^-$	(E2)			B(E2)(W.u.)=49 *17* I_γ: from (^{7}Li,4nγ). Other: 207 in (^{6}Li,3nγ).
3670.9	(21/2$^+$)	769.3 *5*	22 *6*	2902.36	19/2$^+$				
		804.7 *5*	100 *11*	2866.24	21/2$^+$				
		1937.5 *5*	61 *6*	1732.02	17/2$^+$	(Q)			
3816.9	(17/2$^+$ to 23/2$^+$)	914.4 *5*	100 *9*	2902.36	19/2$^+$				
		950.8 *5*	82 *9*	2866.24	21/2$^+$				
3908.4	(17/2$^-$,19/2,21/2$^-$)	348.6 *5*	60 *10*	3559.62	21/2$^{(-)}$				
		820.5 *5*	50 *10*	3088.04	(19/2)$^-$				
		1134.6 *5*	100 *10*	2773.78	17/2$^-$				
3936.09	(23/2)$^+$	570.6 *5*	33 *3*	3365.58	21/2$^+$				
		1034.1 *3*	64 *6*	2902.36	19/2$^+$	(E2)			B(E2)(W.u.)=41 *9* I_γ: other: <20 in (^{7}Li,4nγ) E=32 MeV.
		1070.0 *3*	100 *9*	2866.24	21/2$^+$	M1+E2			B(M1)(W.u.)=0.024 *6*; B(E2)(W.u.)=27 *6*
4066.7	23/2$^-$	508.1 *5*	30.2 *23*	3559.62	21/2$^{(-)}$				
		896.9 *3*	100 *9*	3169.32	19/2$^-$	E2			B(E2)(W.u.)=27 *10*
		977.9 *5*	19 *2*	3088.04	(19/2)$^-$	[E2]			B(E2)(W.u.)=3.3 *12* I_γ: other: 63 *6* in (^{7}Li,4nγ) E=32 MeV.
4116.89	25/2$^+$	1250.6 *1*	100	2866.24	21/2$^+$	E2			B(E2)(W.u.)=58 *8*

$^{79}_{35}Br_{44}$-14

Adopted Levels, Gammas (continued)

γ(^{79}Br) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[#]	α[b]	Comments
4153.1	(23/2)$^-$	593.5 *3*	100 *11*	3559.62	21/2$^{(-)}$				
		617.6 *4*	79 *8*	3535.28	(21/2)$^-$	M1(+E2)	−0.02 *5*	1.19×10^{-3}	B(M1)(W.u.)=0.27 *7* α(K)=0.001061 *15*; α(L)=0.0001121 *16*; α(M)=1.78×10^{-5} *3* α(N)=1.670×10^{-6} *24*
		1064.9 *5*	18 *3*	3088.04	(19/2)$^-$	E2			B(E2)(W.u.)=13 *4*
4340.9	(17/2$^+$ to 23/2$^+$)	669.6 *5*	100 *11*	3670.9	(21/2$^+$)				
		1439.3 *5*	67 *11*	2902.36	19/2$^+$				
		1474.2 *5*	67 *11*	2866.24	21/2$^+$				
4530.2	25/2$^+$	415[ac] *1*		4116.89	25/2$^+$				
		1164.4 *3*	100 *9*	3365.58	21/2$^+$	E2			B(E2)(W.u.)=31 *8*
		1664.2 *5*	21 *3*	2866.24	21/2$^+$	E2			B(E2)(W.u.)=1.1 *3*
4581.3	(25/2)$^-$	513.6 *5*	59 *7*	4066.7	23/2$^-$				
		1021.8 *3*	93 *11*	3559.62	21/2$^{(-)}$	E2			B(E2)(W.u.)=36 *10*
		1046.2 *3*	100 *11*	3535.28	(21/2)$^-$	E2			B(E2)(W.u.)=34 *9*
4721.0	(25/2$^+$)	603.9 *5*	100 *11*	4116.89	25/2$^+$				
		785.3 *5*	56 *6*	3936.09	(23/2)$^+$				
		1050.0 *5*	50 *6*	3670.9	(21/2$^+$)				
		1854.5 *5*	39 *6*	2866.24	21/2$^+$				
4803.6	(25/2)$^-$	649.9 *5*	100 *13*	4153.1	(23/2)$^-$	M1		1.06×10^{-3}	B(M1)(W.u.)=0.54 *14* α(K)=0.000947 *14*; α(L)=0.0001000 *14*; α(M)=1.588×10^{-5} *23* α(N)=1.489×10^{-6} *21*
		1268.6 *5*	27 *7*	3535.28	(21/2)$^-$	[E2]			B(E2)(W.u.)=15 *6*
4896.1		1079.2 *5*	100	3816.9	(17/2$^+$ to 23/2$^+$)	Q			
4965.1		1056.7 *5*	100	3908.4	(17/2$^-$,19/2,21/2$^-$)	(Q)			
5132.0	(27/2$^+$)	1015.4 *5*	100 *12*	4116.89	25/2$^+$	D			
		1196.3 *3*	88 *12*	3936.09	(23/2)$^+$				
5214.1	(27/2$^-$)	1147.4 *3*	100	4066.7	23/2$^-$	Q			
5505.5	29/2$^+$	1388.2 *3*	100	4116.89	25/2$^+$	E2			B(E2)(W.u.)=1.1×10^2 *5*
5579.3	(27/2$^-$)	775.4 *5*	100 *14*	4803.6	(25/2)$^-$	D			
		1426.5 *5*	71 *14*	4153.1	(23/2)$^-$				
5824.1	(29/2)$^-$	1242.8 *3*	100	4581.3	(25/2)$^-$	E2			B(E2)(W.u.)=1.0×10^2 *3*
5863.8	(29/2$^+$)	1333.6 *5*	100	4530.2	25/2$^+$	(Q)			
6019.3	(29/2$^+$)	512.9 *5*	57 *14*	5505.5	29/2$^+$				
		888.7 *5*	100 *14*	5132.0	(27/2$^+$)				
		1298.3 *5*	57 *14*	4721.0	(25/2$^+$)				
		1902.1 *5*	43 *14*	4116.89	25/2$^+$				
6199.4		1234.3 *5*	100	4965.1					
6384.6	(29/2$^-$)	805.4 *5*	100 *25*	5579.3	(27/2$^-$)				
		1580.9 *5*	75 *25*	4803.6	(25/2)$^-$				

Adopted Levels, Gammas (continued)

γ(^{79}Br) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	Comments
6526.9	(31/2$^+$)	1021.0 *5*	86 *14*	5505.5	29/2$^+$		
		1395.0 *5*	100 *14*	5132.0	(27/2$^+$)	E2	B(E2)(W.u.)=17 *7*
6536.9	(31/2$^-$)	1322.8 *5*	100	5214.1	(27/2$^-$)	Q	
7066.8	(33/2$^+$)	1561.6 *5*	100	5505.5	29/2$^+$	(Q)	
7224.3	(33/2$^-$)	1400.2 *5*	100	5824.1	(29/2)$^-$		
7379.9	(33/2$^+$)	1516.1 *5*	100	5863.8	(29/2$^+$)		
7591.8		1392.4 *5*	100	6199.4			
8061.7	(35/2$^-$)	1524.8 *5*	100	6536.9	(31/2$^-$)		
8149.4	(35/2$^+$)	1082.8 *5*	66 *33*	7066.8	(33/2$^+$)		
		1622.2 *5*	100 *33*	6526.9	(31/2$^+$)		
8777.8	(37/2$^-$)	1553.5 *5*	100	7224.3	(33/2$^-$)		
8811.5	(37/2$^+$)	1744.6 *5*	100	7066.8	(33/2$^+$)		

[†] Weighted average values from different γ-ray studies.

[‡] From ce data in ^{79}Kr ε decay (1954Th39,1964Bo25). For levels seen in in-beam γ-ray studies ((α,p2nγ),(d,nγ),(^{6}Li,3nγ),(^{7}Li, 4nγ)) values are from γ(θ), γγ(θ)(DCO) and γ(θ,pol). From systematics and expected short half−lives (of levels) mult=D+Q is most likely M1+E2 and mult=Q is E2.

[#] Unless otherwise stated, from γγ(θ) in ^{79}Kr ε decay (1973Lu07). Data from 1973Lu07 reanalyzed by the evaluator. In most cases δ is double valued. However, the second solution gives an almost pure E2 transition which in the present case disagrees with $T_{1/2}$ available from (γ,γ′) data (1970We01) and Coul. ex. data (1967Ro03). For levels seen in in-beam γ-ray studies, values are from γ(θ) and/or γ(θ,pol).

[@] Reported in (n,n′γ) only.

[&] Reported in (d,nγ) only.

[a] This γ is reported only in (^{7}Li,4nγ) E=32 MeV (1999Ra02); not in the (^{7}Li,4nγ) E=35 MeV reaction (2002Sc13), where the overall statistics is much higher.

[b] From BrIcc v2.3b (16-Dec-2014) 2008Ki07, "Frozen Orbitals" appr. If no δ(E2/M1) value given, α overlaps values for E2 and M1.

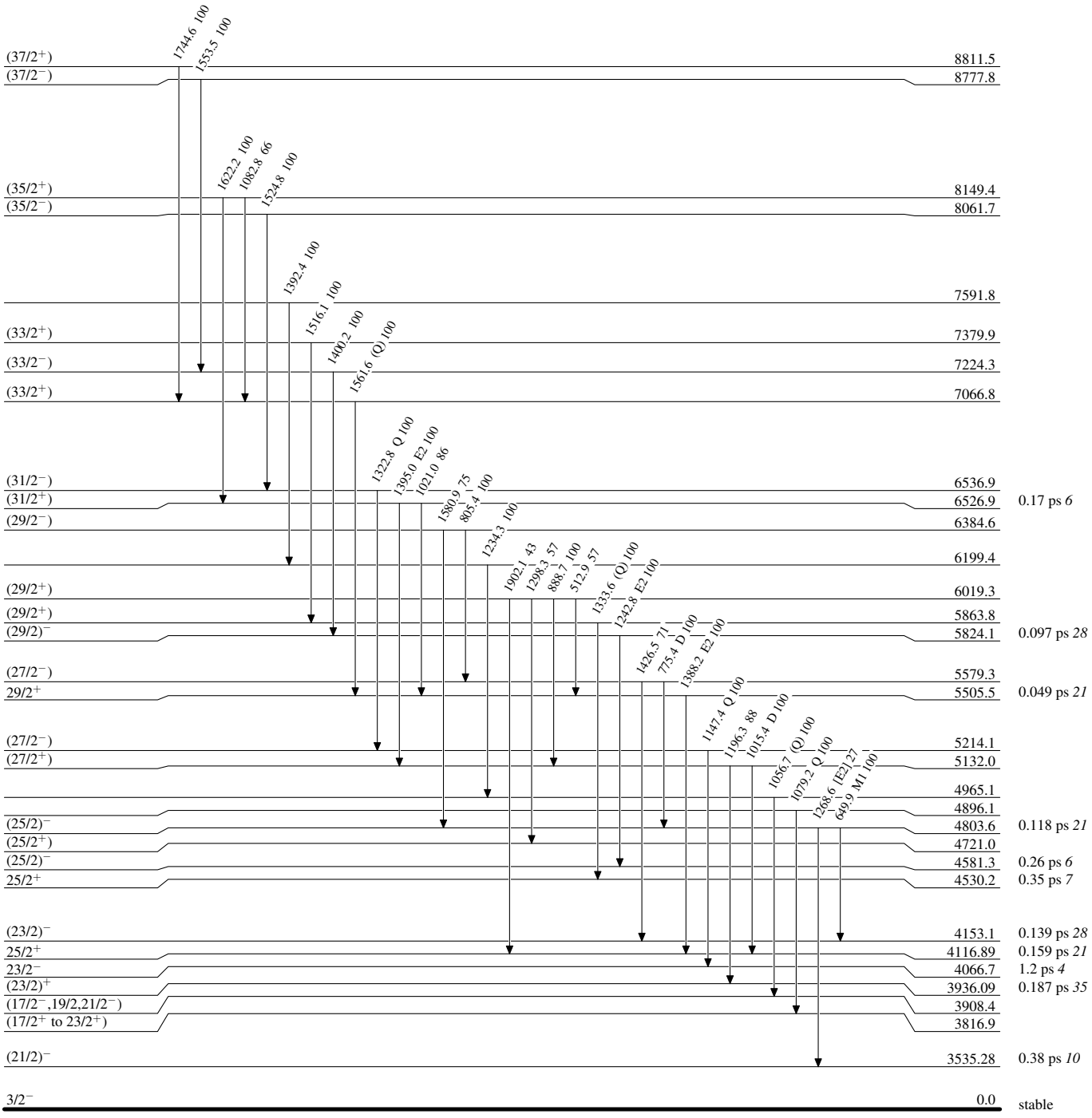
[c] Placement of transition in the level scheme is uncertain.

$^{79}_{35}Br_{44}$-16

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



$^{79}_{35}Br_{44}$

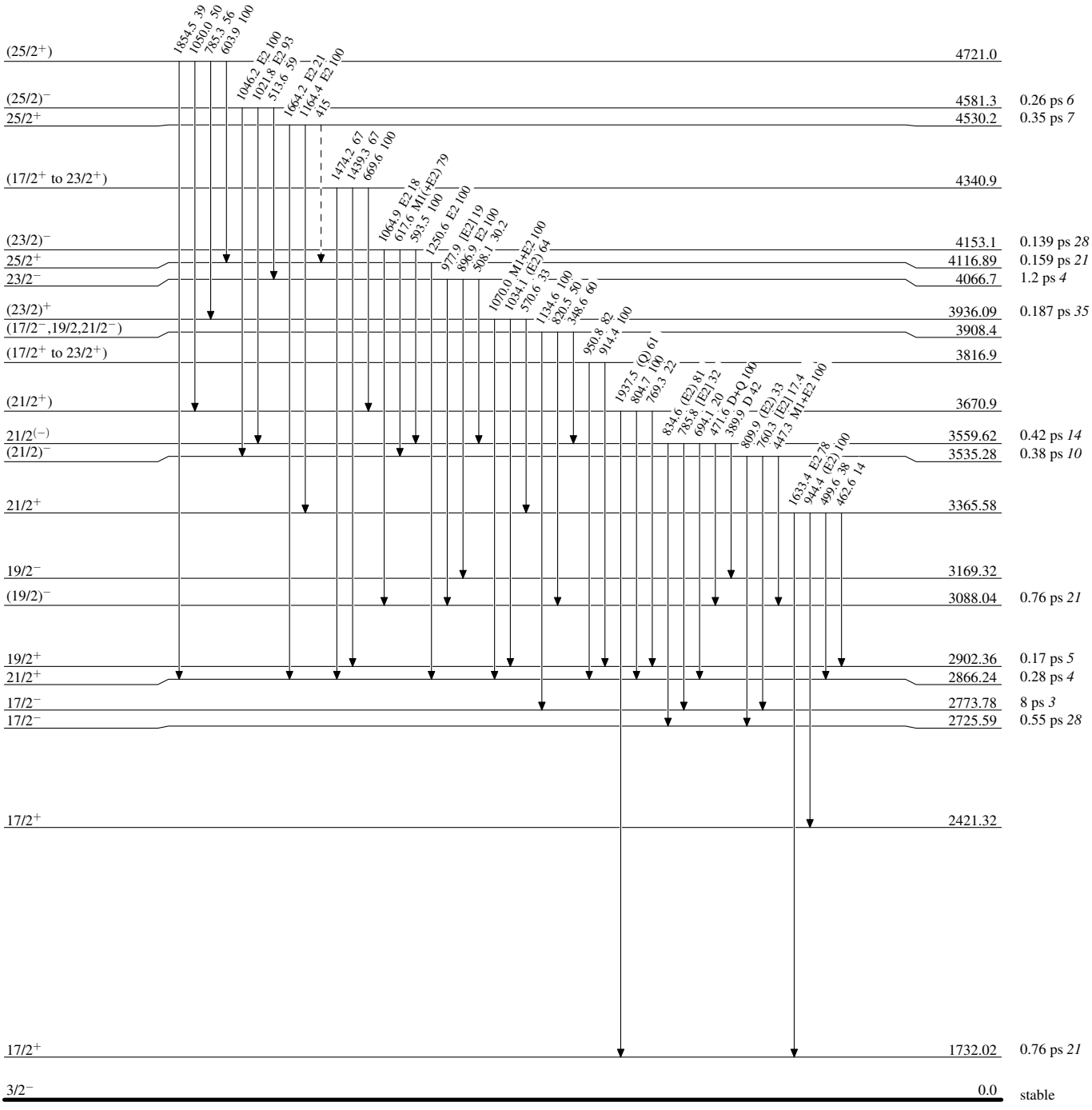
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

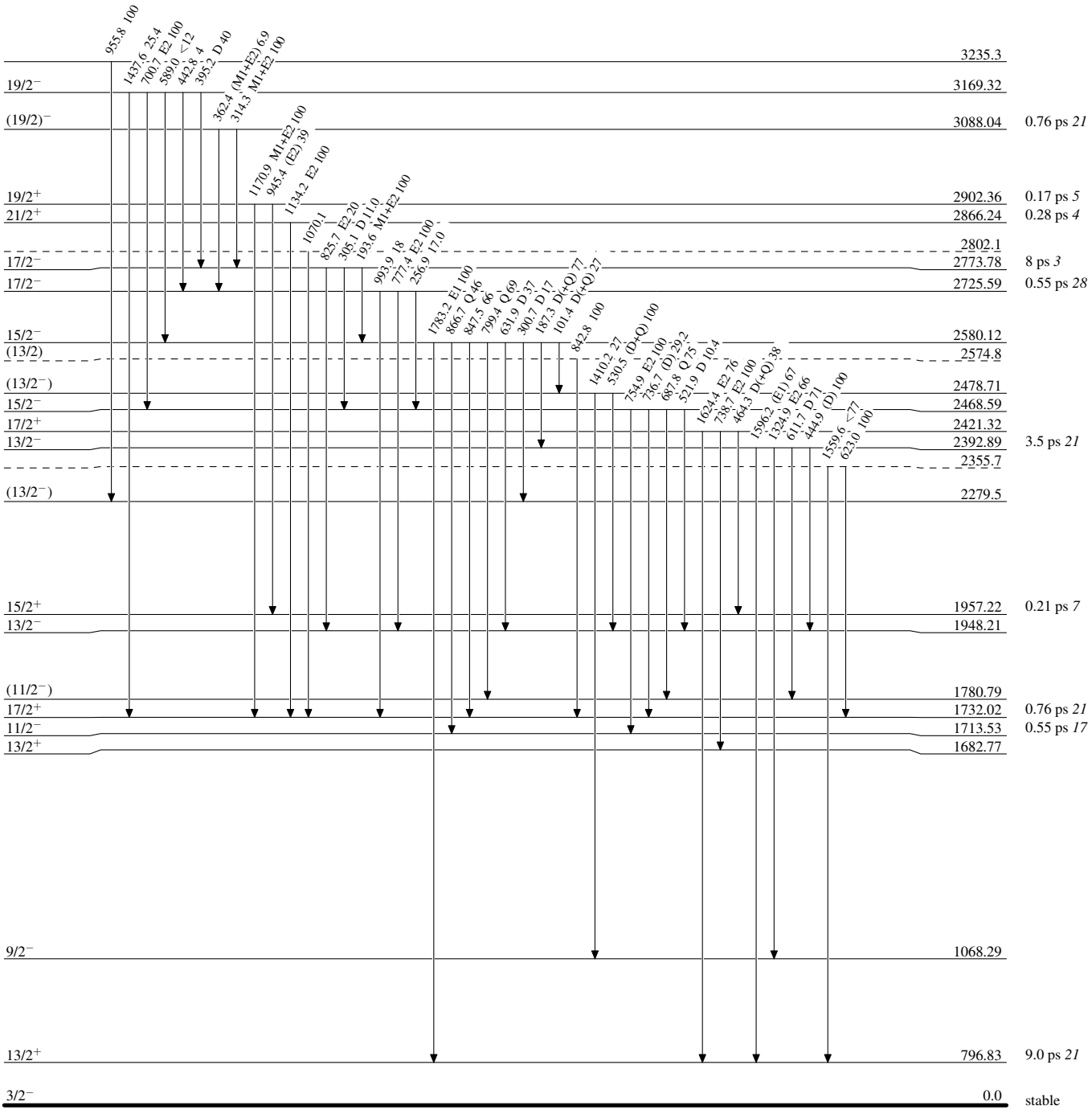


$^{79}_{35}Br_{44}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{79}_{35}Br_{44}$

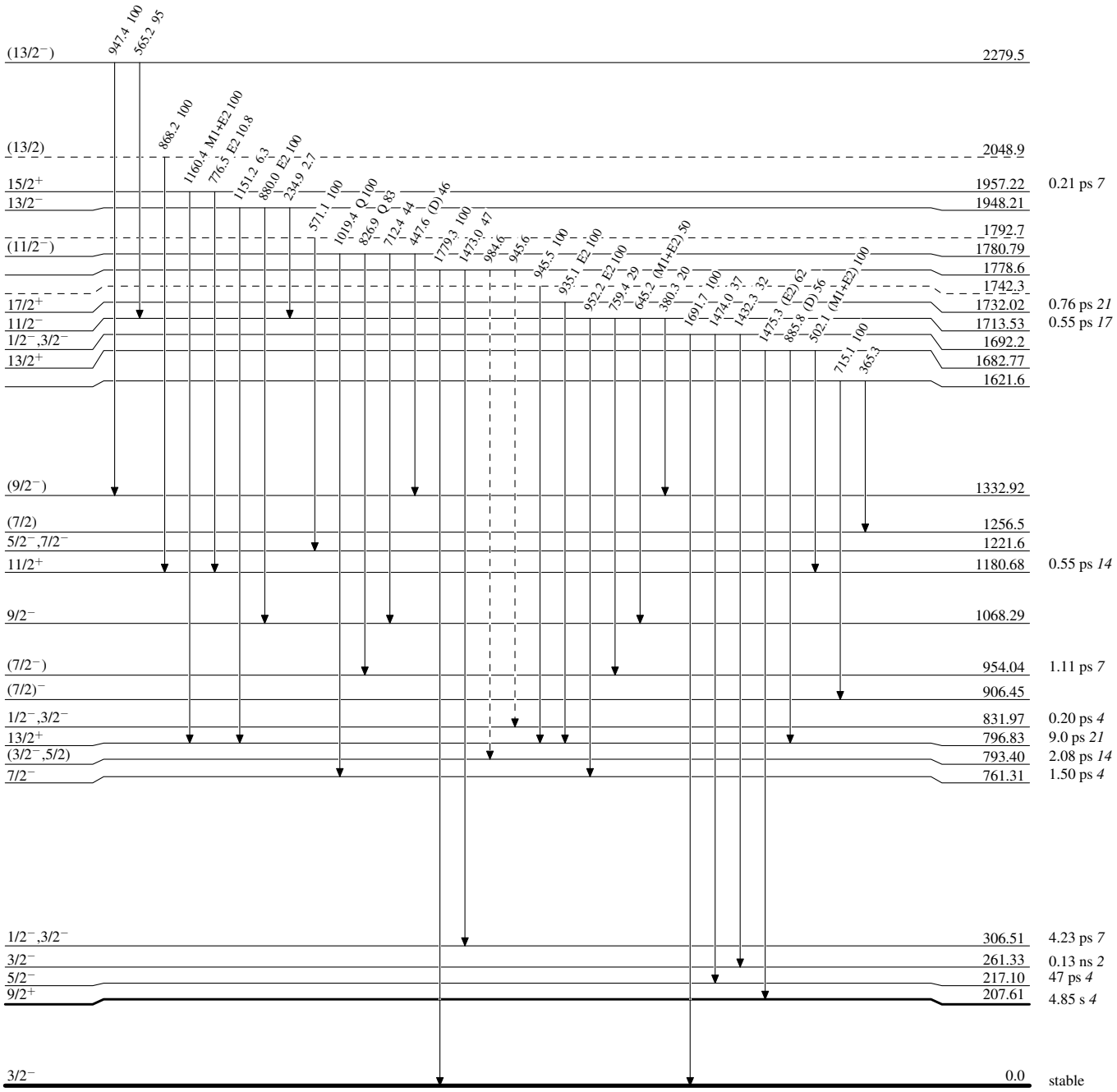
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{79}_{35}Br_{44}$

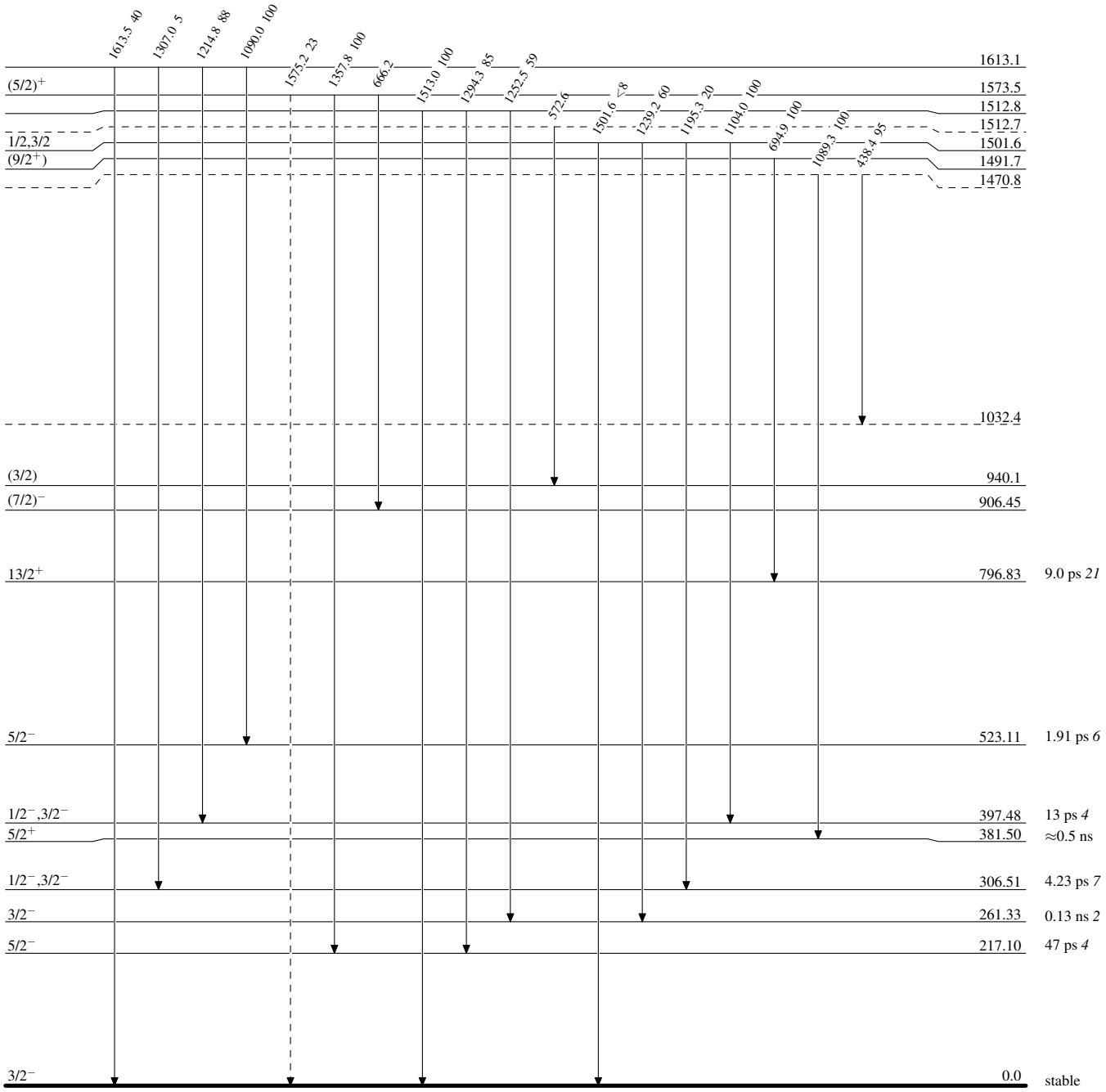
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



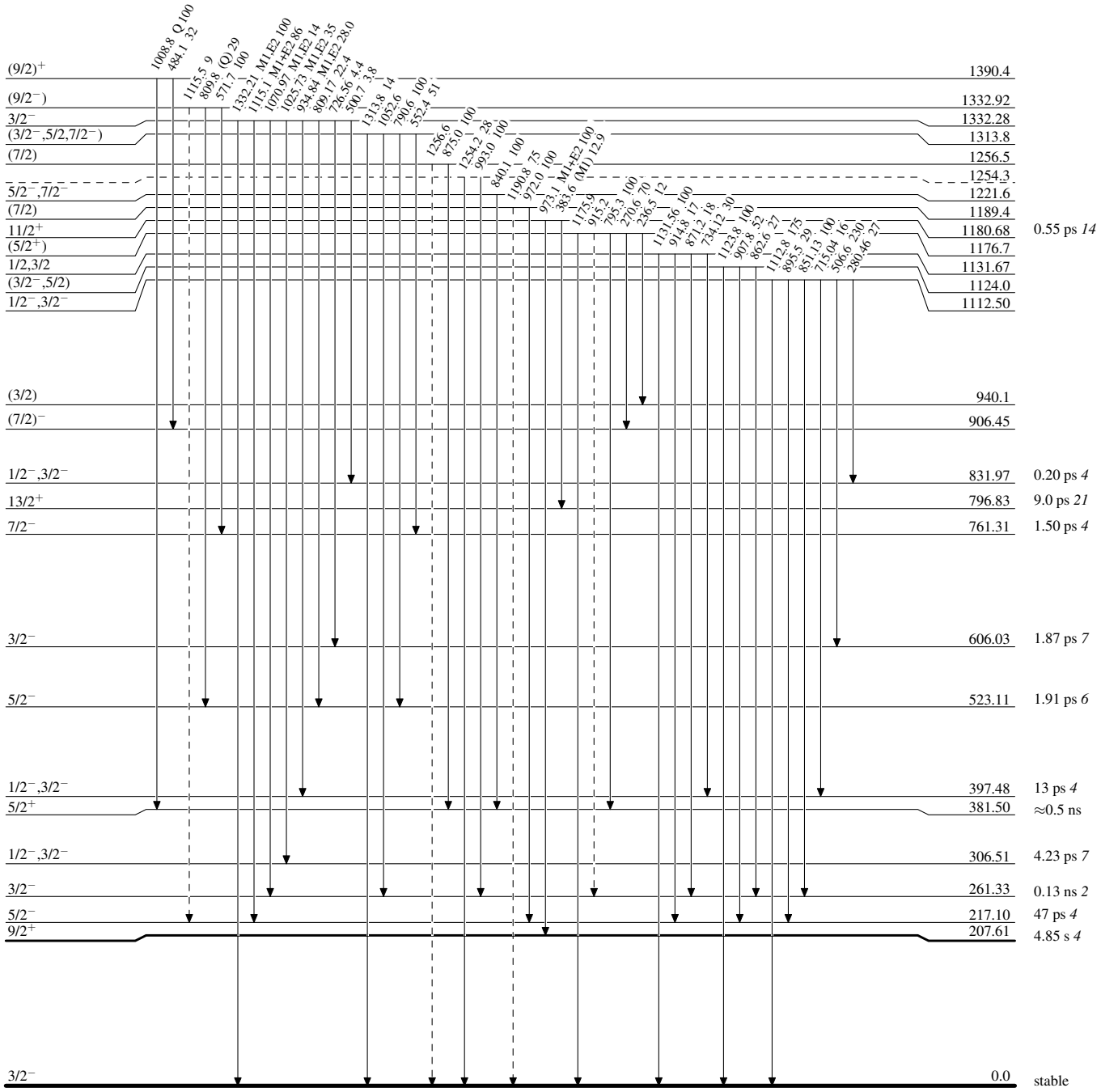
$^{79}_{35}Br_{44}$

Adopted Levels, Gammas Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{79}_{35}Br_{44}$

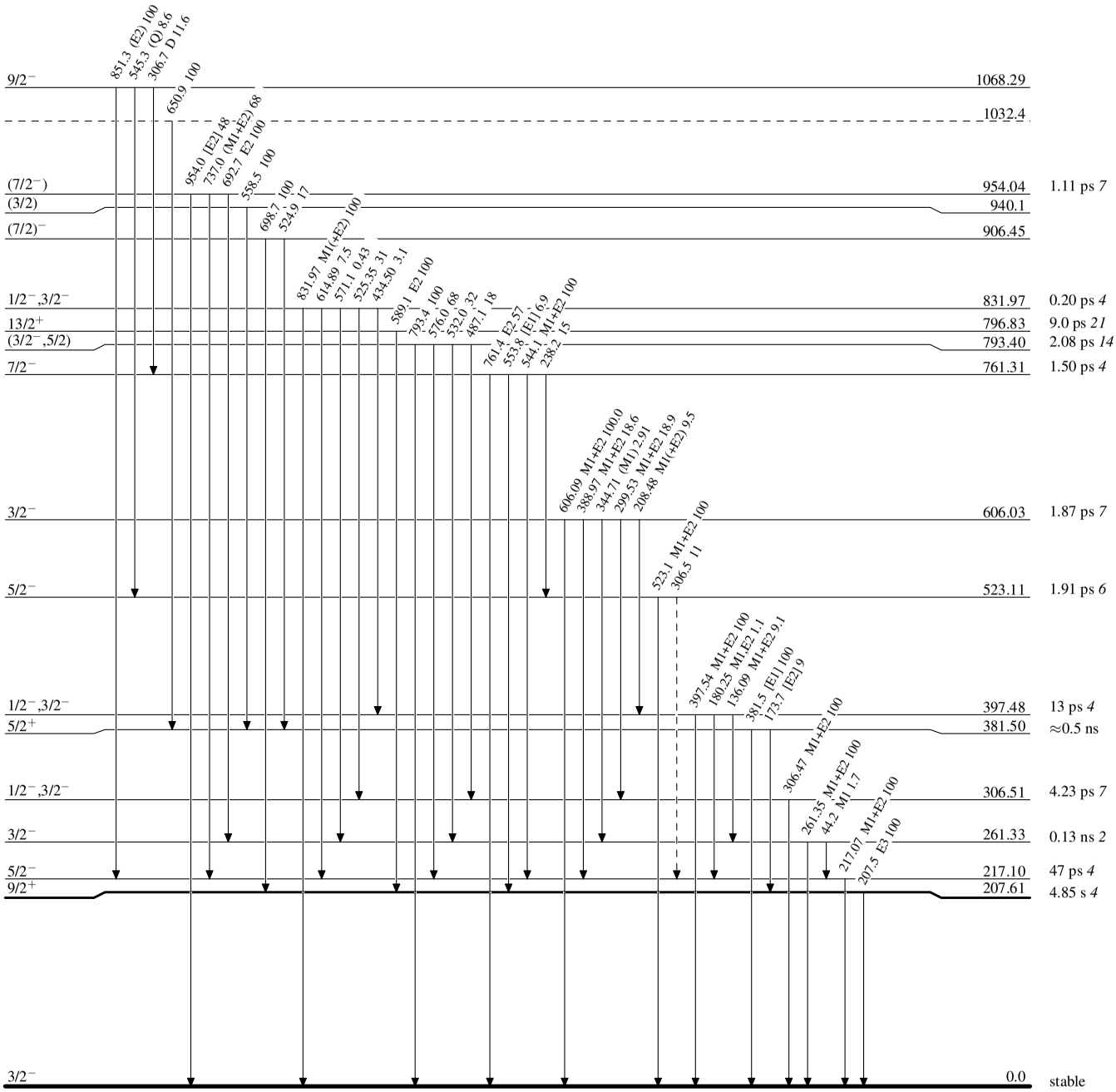
Adopted Levels, Gammas

Legend

Level Scheme (continued)

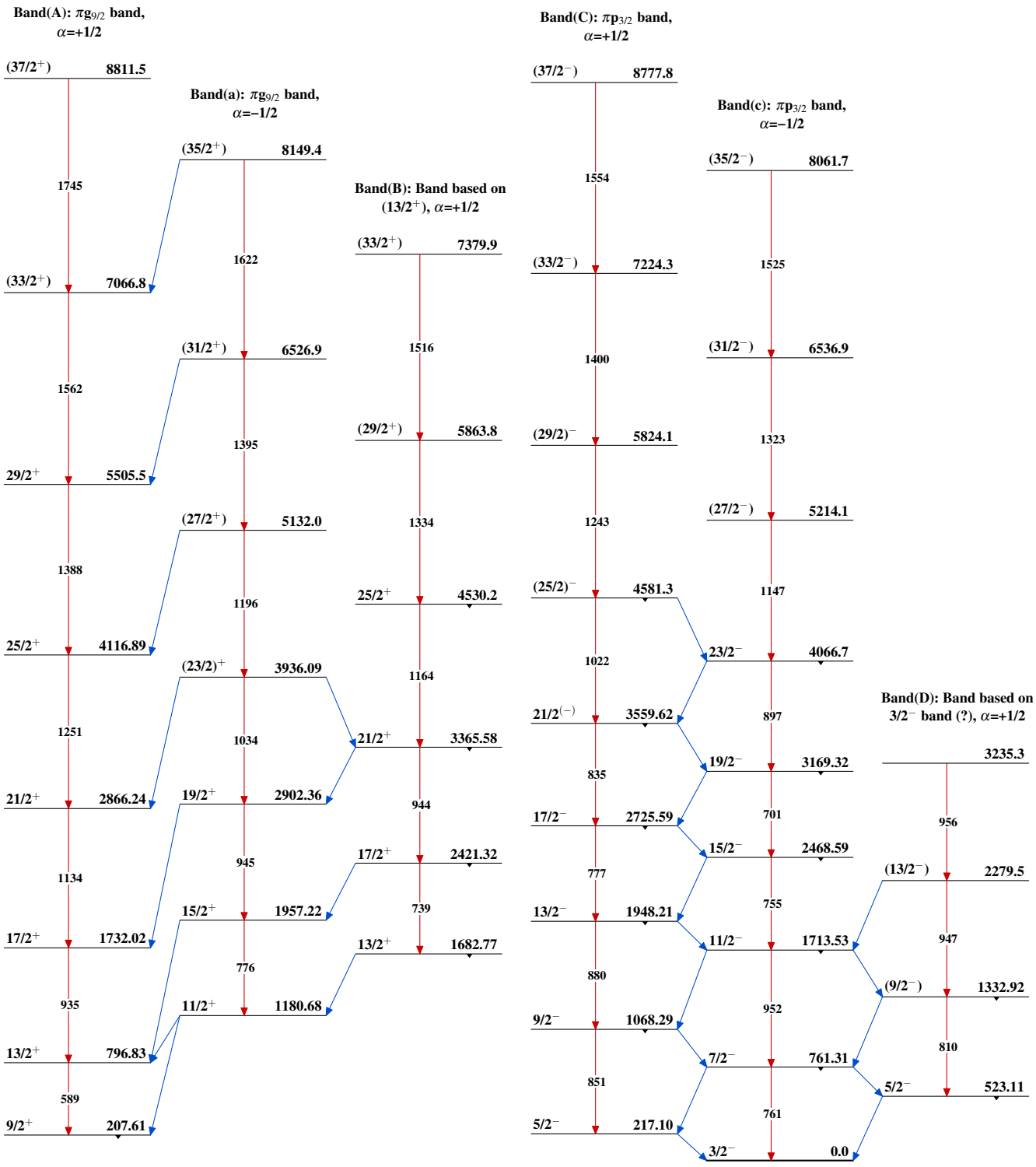
Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{79}_{35}Br_{44}$

Adopted Levels, Gammas



$^{79}_{35}Br_{44}$

Adopted Levels, Gammas (continued)